ANNOTATED MINUTES

Monday, June 13, 1994 - 2:00 PM
Multnomah County Courthouse, Room 602

BUDGET WORK SESSION

WS-1 *The Multnomah County Board Will Propose, Review and Discuss Amendments to the 1994-95 Multnomah County Budget*

GINNIE COOPER, JEANNE GOODRICH, JIM McCONNELL, MICHAEL SCHRUNK, TOM SIMPSON, TAMARA HOLDEN, SUSAN KAESER, MIKE OSWALD, DAVE WARREN, TOM FRONK, GARY OXMAN, DAVE BOYER, LINDA WOODS, KEN UPTON, LAURENCE KRESSEL AND BILL FARVER RESPONSE TO BOARD QUESTIONS AND DISCUSSION.

Monday, June 13, 1994 - 6:00 PM
Portland Building, Second Floor Auditorium
1120 SW Fifth Avenue, Portland

MULTNOMAH COUNTY COMMISSION/PLANNING COMMISSION JOINT LAND USE HEARING

Chair Beverly Stein convened the hearing at 6:05 p.m., with Vice-Chair Tanya Collier, Commissioners Sharron Kelley, Gary Hansen and Dan Saltzman, and Planning Commission Chair Leonard Yoon, Vice-Chair Karin Hunt, and Commissioners Laurie Craghead, Sam Diack, Bill Fritz, Peter Fry, John Ingle and Dave Kunkel present.

PH-1 *The County Commission and Planning Commission Will Conduct a Joint Public Hearing to Take Testimony on the Completed Goal 5 Work Pertaining to the West Hills and Howard Canyon Area Reconciliation Reports. The Hearing Will be Conducted in a Quasi-Judicial Manner and Only Evidence Germane to Either Report Will be Accepted.*

BOARD, PLANNING COMMISSION AND COUNTY STAFF INTRODUCTIONS. SCOTT PEMBLE PRESENTED THE HOWARD CANYON AND WEST HILLS STAFF REPORTS. CHAIR YOON CONVENED THE PLANNING COMMISSION FOR THE PURPOSE OF ADOPTING RULES OF PROCEDURE FOR TODAY'S QUASI-JUDICIAL HEARING. COMMISSIONER FRITZ MOVED AND COMMISSIONER KUNKEL SECONDED, ADOPTION OF THE RULES OF PROCEDURE. COMMISSIONER FRY EXPLAINED HE DOES NOT

FEEL THIS HEARING IS A QUASI-JUDICIAL PROCEEDING AND WILL ABSTAIN FROM THE VOTE. RULES ADOPTED, WITH COMMISSIONERS CRAGHEAD, DIACK, FRITZ, HUNT, INGLE, KUNKEL AND YOON VOTING AYE, AND COMMISSIONER FRY ABSTAINING. AT THE REQUEST OF CHAIR STEIN, COMMISSIONERS KELLEY, HUNT, KUNKEL, YOON, FRY AND SALTZMAN DISCLOSED EX PARTE CONTACTS AND/OR POTENTIAL CONFLICTS OF INTEREST, BIAS OR PARTIALITY. SHARON TIMKO DISCLOSED HOWARD CANYON AND ANGELL BROTHERS QUARRY SITE VISITS. IN RESPONSE TO A QUESTION OF CHAIR STEIN, ARNOLD ROCHLIN OBJECTED TO SECTION 2(D) OF THE RULES OF PROCEDURE. COMMISSIONER FRY RESPONDED TO CONCERNS OF PAUL HRIBERNICK REGARDING A MEMO FROM COMMISSIONER FRY TO THE PLANNING STAFF. IN RESPONSE TO A QUESTION OF CHAIR STEIN, NO PROCEDURAL OBJECTIONS WERE RAISED.

COMMISSIONER KELLEY SUBMITTED A LETTER FROM BOB AND NEV SCOTT REGARDING HOWARD CANYON QUARRY. SHERWOOD DAVIS, CLINT DAVIS, ALLAN BAKER, GERARD WELCH, JOHN WINDUST, PAUL HRIBERNICK AND RAYMOND SMITH TESTIMONY IN SUPPORT OF HOWARD CANYON RECONCILIATION REPORT AND/OR QUARRY EXPANSION AND RESPONSE TO BOARD QUESTIONS.

CHARLES CIECKO, NEIL KAGAN, KLAUS HEYNE, MICHAEL GAMA, DAVE BLACK, CAROL GAMA, RON CARLEY, LYN MATTEI, KATHY HARWOOD LONG, CAROLYN COONS, JEFF ROGERSON, STEVE DIXON, KERRIE OKADA, NANCY WEBB, DIANE TRIBE, JAMES ANDERSON, JIM REAVIS, SUSAN FRY, VERA DAFOE, LLOYD HAMMEL, LEN SWENSON AND PRISCILLA GOODWIN TESTIMONY IN OPPOSITION TO HOWARD CANYON RECONCILIATION REPORT AND/OR QUARRY EXPANSION AND RESPONSE TO BOARD QUESTIONS. MR. PEMBLE AND JOHN DuBAY RESPONSE TO BOARD QUESTIONS. STEVE OULMAN TESTIMONY AND RESPONSE TO BOARD QUESTIONS. LORI HANSEN TESTIMONY IN OPPOSITION TO HOWARD CANYON QUARRY EXPANSION.

The hearing was recessed at 8:45 p.m. and reconvened at 8:55 p.m.

FRANK SCHNITZER AND PAUL KEIRAN TESTIMONY AND RESPONSE TO BOARD QUESTIONS CONCERNING ANGELL BROTHERS QUARRY.

JANE HART, NEIL KAGAN, DONNA MATRAZZO, CHRIS WRENCH, ESTHER LEV, LYN MATTEI, JOHN SHERMAN, ARNOLD ROCHLIN, JODEANNE BELLANT, RON CARLEY, GORDON HOAVE, SETH TANE, RICHARD SHEPARD, JEAN ADAMS, SKIP ANDERSON, DONIS McARDLE AND ART WAGNER TESTIMONY IN OPPOSITION TO WEST HILLS RECONCILIATION REPORT AND/OR EXPANSION OF ANGELL BROTHERS QUARRY AND RESPONSE TO BOARD QUESTIONS.

CHAIR STEIN ANNOUNCED THE RECORD WOULD BE LEFT OPEN FOR SEVEN DAYS, WITH ADDITIONAL TESTIMONY DELIVERED TO THE PLANNING OFFICE BY 4:00 PM, MONDAY, JUNE 20, 1994. MR. PEMBLE, MR. DuBAY AND MR. OULMAN RESPONSE TO BOARD QUESTIONS. MR. PEMBLE ANNOUNCED THE PLANNING COMMISSION MEETING TO DELIBERATE ON THE RECONCILIATION REPORTS IS SCHEDULED FOR TUESDAY, JUNE 21, 1994.

There being no further business, the hearing was adjourned at 11:15 p.m.

OFFICE OF THE BOARD CLERK
for MULTNOMAH COUNTY, OREGON

Deborah L. Bogstad

Deborah L. Bogstad

Tuesday, June 14, 1994 - 9:30 AM
Multnomah County Courthouse, Room 602

BUDGET WORK SESSION

WS-2 *The Multnomah County Board Will Propose, Review and Discuss Amendments to the 1994-95 Multnomah County Budget*

LOLENZO POE RESPONSE TO BOARD QUESTIONS AND DISCUSSION. THE WORK SESSION WAS RECESSED AT 10:05 AM AND RECONVENED AT 10:45 AM. HOWARD KLINK, VICKI SMEAD, LOLENZO POE, NORMA JAEGER, ANTOINETTE EDWARDS AND MARILYN RICH PRESENTATIONS AND RESPONSE TO

BOARD QUESTIONS AND DISCUSSION.

Tuesday, June 14, 1994 - 10:00 AM
Multnomah County Courthouse, Room 602

BUDGET HEARING

PH-2 *The Tax Supervising and Conservation Commission Will Meet to Discuss and Conduct a Public Hearing on the 1994-95 Annual Budgets for MULTNOMAH COUNTY, DUNTHORPE-RIVERDALE COUNTY SERVICE DISTRICT NO. 1, and MID-COUNTY SERVICE DISTRICT NO. 14*

TSCC CHAIR LIANNE THOMAS CONVENED THE HEARING AT 10:11 AM. COMMISSIONERS STEIN, KELLEY, HANSEN, COLLIER AND SALTZMAN, AND DAVE WARREN AND MEGANNE STEELE RESPONDED TO QUESTIONS AND DISCUSSION OF COMMISSIONERS LIANNE THOMAS AND ROBERT BRUNMEIER AND TSCC STAFF COURTNEY WILTON. NO ONE WISHED TO TESTIFY. HEARING ADJOURNED AT 10:45 AM.

Tuesday, June 14, 1994 - 1:30 PM
Multnomah County Courthouse, Room 602

PLANNING ITEMS

Vice-Chair Tanya Collier convened the meeting at 1:30 p.m., with Commissioners Sharron Kelley and Dan Saltzman present, Chair Beverly Stein excused, and Commissioner Gary Hansen arriving at 1:32 p.m.

P-1 *PRE 1-94* *Review the May 11, 1994 Hearings Officer Decision DENYING Appeal and Affirming Planning Director's Decision, for Property Located at 41313 SE TROUTCREEK ROAD, CORBETT*

DECISION READ, NO APPEAL FILED, DECISION STANDS.

P-2 *ORDER in the Matter of the Appointments of Multnomah County Planning and Zoning Hearings Officers*

COMMISSIONER SALTZMAN MOVED AND COMMISSIONER KELLEY SECONDED, APPROVAL OF P-2. SCOTT PEMBLE EXPLANATION AND RESPONSE TO BOARD QUESTIONS. ORDER 94-115 IN THE

MATTER OF THE APPOINTMENTS OF BARRY ADAMSON, JOAN CHAMBERS AND PHILLIP GRILLO AS MULTNOMAH COUNTY PLANNING AND ZONING HEARINGS OFFICERS UNANIMOUSLY APPROVED.

MR. PEMBLE AND BOARD DISCUSSION REGARDING JUNE 13 JOINT HEARING.

There being no further business, the meeting was adjourned at 1:45 p.m.

OFFICE OF THE BOARD CLERK
for MULTNOMAH COUNTY, OREGON

Deborah L. Bogstad

Deborah L. Bogstad

Wednesday, June 15, 1994 - 9:30 AM
Multnomah County Courthouse, Room 602

BUDGET WORK SESSION

WS-3 *The Multnomah County Board Will Propose, Review and Discuss Amendments to the 1994-95 Multnomah County Budget*

ROBERT SKIPPER, LARRY AAB, DAVE WARREN, BILL COLLINS AND GLEN POST PRESENTATIONS AND RESPONSE TO BOARD QUESTIONS AND DISCUSSION. BILL FARVER, HELEN RICHARDSON, MR. WARREN, MEGANNE STEELE AND BARRY CROOK RESPONSE TO BOARD QUESTIONS AND DISCUSSION.

Wednesday, June 15, 1994 - 1:30 PM
Multnomah County Courthouse, Room 602

BUDGET WORK SESSION - IF NEEDED

WS-4 *The Multnomah County Board Will Propose, Review and Discuss Amendments to the 1994-95 Multnomah County Budget*

MEGANNE STEELE, DAVE WARREN AND BILL FARVER RESPONSE TO BOARD QUESTIONS. BOARD DISCUSSION AND CONSENSUS ON VARIOUS PROPOSED AMENDMENTS. MIKE OSWALD, TOM FRONK, BILLI ODEGAARD, MR. WARREN, SHAUN COLDWELL AND DAVE BOYER EXPLANATION AND

RESPONSE TO BOARD QUESTIONS CONCERNING VARIOUS PROPOSED TECHNICAL AND CARRYOVER AMENDMENTS. BOARD CONSENSUS. LOLENZO POE EXPLANATION AND RESPONSE TO BOARD QUESTIONS AND DISCUSSION. BOARD CONSENSUS. MR. WARREN EXPLANATION AND RESPONSE TO BOARD QUESTIONS CONCERNING PROPOSED REVENUE AMENDMENTS. BOARD CONSENSUS. MR. WARREN, MR. FARVER, MR. OSWALD AND LANCE DUNCAN EXPLANATION AND RESPONSE TO BOARD QUESTIONS AND DISCUSSION CONCERNING PROPOSED BUDGET NOTES. BOARD CONSENSUS. BOARD DISCUSSION CONCERNING SALTZMAN RESOLUTION.

Thursday, June 16, 1994 - 9:30 AM
Multnomah County Courthouse, Room 602

REGULAR MEETING

Chair Beverly Stein convened the meeting at 9:35 a.m., with Vice-Chair Tanya Collier, Commissioners Sharron Kelley, Gary Hansen and Dan Saltzman present.

CONSENT CALENDAR

AT THE REQUEST OF CHAIR STEIN AND UPON MOTION OF COMMISSIONER COLLIER, SECONDED BY COMMISSIONER KELLEY, CONSENT CALENDAR ITEMS C-1 THROUGH C-3, C-5 AND C-6, AND C-8 THROUGH C-13 WERE UNANIMOUSLY APPROVED.

NON-DEPARTMENTAL

C-1 *In the Matter of the Appointments of Jo Ann Allen, Chris Cameron, Warren Cook, Lance Duncan, Linda Easley, Shelley Immel, Chris Johnson, Karen Rhein, Jim Stegmiller, Theresa Sullivan and Nancy Wilson as Voting Members to the CAMPAIGN MANAGEMENT COUNCIL*

C-2 *In the Matter of the Appointments of Dave Hadley, Peter Roscoe, Anthony Borzotta, Sam Bush and Carolyn Brattain; and the Reappointments of Doug Bray, Charleah Couckuyt, Dan Croy, Carole Ford, Fred Lenzser and Byron Moore, to the DUII COMMUNITY ADVISORY BOARD*

C-3 *In the Matter of the Appointment of Arnold Dingley to the FOOD SERVICE ADVISORY COMMITTEE*

C-5 *Ratification of Amendment No. 2 to Intergovernmental Agreement Contract 500782 Between Multnomah County and the Regional Organized Crime Narcotics Agency (ROCN), Providing Civilian Employees of ROCN the Opportunity to Continue Participation in the County's Self-Insured Group Health Plan for the 1994-95 Plan Year, Subject to Premium Contribution*

SHERIFF'S OFFICE

C-6 *Package Store Liquor License Change of Ownership Application Submitted by Sheriff's Office with Recommendation for Approval, for BOB'S CORNER GROCERY & DELI, 13110 SE DIVISION, PORTLAND*

COMMUNITY AND FAMILY SERVICES DIVISION

C-8 *Ratification of Amendment No. 5 to Intergovernmental Agreement Contract 100274 Between Multnomah County and Oregon Health Sciences University, Increasing Non-Residential Adult Mental Health Services State Funds to Adjust for 91/92 Medicaid Match, Effective July 1, 1993 through June 30, 1994*

C-9 *Ratification of Intergovernmental Agreement Contract 100635 Between Multnomah County and Tri Met, Providing Transportation to Employment and Alternative Services for People with Developmental Disabilities, for the Period July 1, 1994 through June 30, 1995*

C-10 *Ratification of Amendment No. 1 to Intergovernmental Agreement Contract 103224 Between Multnomah County and Portland Public Schools, Purchasing an Additional 44 Infant/Toddler Child Care Slots for Children of Teen Parents, for the Period Upon Execution through June 30, 1994*

DEPARTMENT OF ENVIRONMENTAL SERVICES

C-11 *Ratification of Amendment No. 7 to Intergovernmental Agreement Contract 3013087 Between Multnomah County and the City of Fairview, to Perform Certain Maintenance Functions on City Streets, for the Period July 1, 1994 through June 30, 1995*

C-12 *Ratification of Amendment No. 7 to Intergovernmental Agreement Contract 3012987 Between Multnomah County and the City of Troutdale, to Perform Certain Maintenance Functions on City Streets, for the Period July 1, 1994 through June 30, 1995*

C-13 *Ratification of Amendment No. 7 to Intergovernmental Agreement Contract 3012887 Between Multnomah County and the City of Wood Village, to Perform Certain Maintenance Functions on City Streets, for the Period July 1, 1994 through June 30, 1995*

NON-DEPARTMENTAL

C-4 *In the Matter of the Appointment of Paul Bragdon to the MULTNOMAH COUNTY LIBRARY ADVISORY BOARD*

COMMISSIONER COLLIER MOVED AND COMMISSIONER SALTZMAN SECONDED, APPROVAL OF C-4. PAUL BRAGDON COMMENTS IN RESPONSE TO CHAIR STEIN ACKNOWLEDGEMENT. VICE-CHAIR COLLIER EXPRESSED APPRECIATION FOR MR. BRAGDON'S EFFORTS. APPOINTMENT UNANIMOUSLY APPROVED.

SHERIFF'S OFFICE

C-7 *Restaurant Liquor License New Outlet Application Submitted by Sheriff's Office with Recommendation for Approval, for BIG BEAR'S CROWN POINT MARKET, 31815 E CROWN POINT HIGHWAY, TROUTDALE*

MIKE EELING EXPLANATION IN RESPONSE TO QUESTIONS OF COMMISSIONER KELLEY. BOARD DISCUSSION WITH BOB HALL, KATHY FERRELL AND JOHN DuBAY. UPON MOTION OF COMMISSIONER COLLIER, SECONDED BY COMMISSIONER KELLEY, C-7 WAS UNANIMOUSLY CONTINUED TO THURSDAY, JUNE 23, 1994.

REGULAR AGENDA

SHERIFF'S OFFICE

R-1 *Ratification of Intergovernmental Agreement Contract 800215 Between Multnomah County and Portland Community College, to Allow GED Testing for Inmates at Multnomah County Correctional Facilities and Provide Coordination with State Department of Education, for the Period July 1, 1994 through June 30, 1995*

COMMISSIONER KELLEY MOVED AND COMMISSIONER HANSEN SECONDED, APPROVAL OF R-1. LARRY AAB EXPLANATION AND RESPONSE TO BOARD QUESTIONS. COMMISSIONER SALTZMAN ADVISED HE WOULD ABSTAIN FROM VOTING DUE TO HIS POSITION ON THE PCC BOARD. AGREEMENT APPROVED, WITH COMMISSIONERS KELLEY, COLLIER, HANSEN AND STEIN VOTING AYE, AND COMMISSIONER SALTZMAN ABSTAINING.

R-2 *Ratification of Intergovernmental Agreement Contract 800714 Between Multnomah County and the Port of Portland, for Lease of the Land and/or*

Improvements Located at Terminal 1 for the River Patrol's Houseboat Moorage, for the Period May 1, 1994 through June 30, 2004

COMMISSIONER KELLEY MOVED AND COMMISSIONER SALTZMAN SECONDED, APPROVAL OF R-2. MR. AAB EXPLANATION. AGREEMENT UNANIMOUSLY APPROVED.

DEPARTMENT OF ENVIRONMENTAL SERVICES

R-3 *Ratification of Intergovernmental Agreement 301904 Between METRO and Multnomah County, Providing County Participation in the South/North Transit Corridor Study Alternatives Analysis/Draft Environmental Impact Statement, for the Period January 1, 1994 through December 31, 1996*

COMMISSIONER COLLIER MOVED AND COMMISSIONER KELLEY SECONDED, APPROVAL OF R-3. ED PICKERING EXPLANATION AND RESPONSE TO BOARD QUESTIONS. AGREEMENT UNANIMOUSLY APPROVED.

SERVICE DISTRICTS

(Recess as the Board of County Commissioners and convene as the Governing Body of Dunthorpe Riverdale Sanitary Service District No. 1)

R-4 *RESOLUTION in the Matter of the Adoption of the 1994-95 Budget for Dunthorpe Riverdale Sanitary Service District No. 1, for the Fiscal Year July 1, 1994 to June 30, 1995 and Making the Appropriations Thereunder, Pursuant to ORS 294.435*

COMMISSIONER HANSEN MOVED AND COMMISSIONER SALTZMAN SECONDED, APPROVAL OF R-4. KERI HARDWICK EXPLANATION. RESOLUTION 94-116 UNANIMOUSLY APPROVED.

(Recess as the Governing Body of Dunthorpe Riverdale Sanitary Service District No. 1 and convene as the Governing Body of Mid County Street Lighting Service District No. 14)

R-5 *RESOLUTION in the Matter of the Adoption of the 1994-95 Budget for Mid County Street Lighting Service District No. 14, for the Fiscal Year July 1, 1994 to June 30, 1995 and Making the Appropriations Thereunder, Pursuant to ORS 294.435*

COMMISSIONER KELLEY MOVED AND COMMISSIONER COLLIER SECONDED, APPROVAL OF

R-5. MS. HARDWICK EXPLANATION. RESOLUTION 94-117 UNANIMOUSLY APPROVED.

(Recess as the Governing Body of Mid County Street Lighting Service District No. 14 and reconvene as the Board of County Commissioners)

NON-DEPARTMENTAL

R-6 *Second Reading and Possible Adoption of a Proposed ORDINANCE Amending the County Code Section 5.50.050(5) to Authorize Transfer of $600,000 Per Year, for Three Years to the Portland Center for the Performing Arts (PCPA) and $100,000 Per Year, for Three Years to the Metropolitan Arts Commission (MAC)*

PROPOSED ORDINANCE READ BY TITLE ONLY. COPIES AVAILABLE. COMMISSIONER HANSEN MOVED AND COMMISSIONER KELLEY SECONDED, APPROVAL OF R-6. NO ONE WISHED TO TESTIFY. ORDINANCE 790 UNANIMOUSLY APPROVED.

R-7 *Second Reading and Possible Adoption of a Proposed ORDINANCE Amending the Multnomah County Code, Section 5.10.090 and 5.10.160(D), Relating to Fees Assessed to Recover the Costs of Dishonored Checks*

PROPOSED ORDINANCE READ BY TITLE ONLY. COPIES AVAILABLE. COMMISSIONER KELLEY MOVED AND COMMISSIONER HANSEN SECONDED, APPROVAL OF R-7. NO ONE WISHED TO TESTIFY. ORDINANCE 791 UNANIMOUSLY APPROVED.

R-8 *Second Reading and Possible Adoption of a Proposed ORDINANCE Relating to the Pay Ranges and COLA Increases for Exempt Employees and Repealing Ordinance Nos. 767, 774, 777 and 788*

PROPOSED ORDINANCE READ BY TITLE ONLY. COPIES AVAILABLE. COMMISSIONER COLLIER MOVED AND COMMISSIONER HANSEN SECONDED, APPROVAL OF R-8. NO ONE WISHED TO TESTIFY. ORDINANCE 792 UNANIMOUSLY APPROVED.

R-9 *RESOLUTION in the Matter of Adopting and Defining the Various County Funds*

COMMISSIONER SALTZMAN MOVED AND COMMISSIONER KELLEY SECONDED, APPROVAL OF R-9. JEAN UZELAC EXPLANATION. RESOLUTION 94-118 UNANIMOUSLY APPROVED.

R-10 *Ratification of an Amendment to Article 14, Section H of the Collective Bargaining Agreement Between Multnomah County, the Multnomah County Sheriff and the Multnomah County Deputy Sheriffs Association, for the Period 1992-95*

COMMISSIONER COLLIER MOVED AND COMMISSIONER SALTZMAN SECONDED, APPROVAL OF R-10. KEN UPTON EXPLANATION AND RESPONSE TO BOARD QUESTIONS. AMENDMENT UNANIMOUSLY APPROVED.

R-11 *RESOLUTION in the Matter of Creating the School Support Reserve Fund and Establishing Guidelines for Receipts and Disbursements*

COMMISSIONER SALTZMAN MOVED AND COMMISSIONER HANSEN SECONDED, APPROVAL OF SUBSTITUTE RESOLUTION. COMMISSIONER SALTZMAN EXPLANATION. DAVE WARREN RESPONSE TO BOARD QUESTIONS. BOARD DISCUSSION AND COMMENTS. STEPHEN KAFOURY, SUSAN STONER, CAROL TURNER, TOM CROPPER, CHARLOTTE COOK, ED SHEETS AND VICKY BARROWS TESTIMONY IN SUPPORT OF SCHOOLS. BOARD COMMENTS. RESOLUTION 94-119 IN THE MATTER OF CREATING THE SCHOOLS/COUNTY BENCHMARK ACCOUNT AND ESTABLISHING GUIDELINES FOR RECEIPTS AND DISBURSEMENTS UNANIMOUSLY APPROVED.

R-12 *RESOLUTION in the Matter of the Adoption of the 1994-95 Budget for Multnomah County, Oregon, for the Fiscal Year July 1, 1994 to June 30, 1995 and Making the Appropriations Thereunder, Pursuant to ORS 294.435*

COMMISSIONER HANSEN MOVED AND COMMISSIONER KELLEY SECONDED, APPROVAL OF R-12. KATHY MINDEN AND SHARON GARY-SMITH TESTIMONY IN SUPPORT OF FUNDING CHILDREN AND FAMILY PROGRAMS. FOLLOWING DAVE WARREN AND LARRY AAB EXPLANATION, AND UPON MOTION OF COMMISSIONER KELLEY, SECONDED BY COMMISSIONER COLLIER, THE INCLUSION OF TECHNICAL AMENDMENT SO 9 WAS UNANIMOUSLY APPROVED. FOLLOWING TOM SIMPSON EXPLANATION AND RESPONSE TO BOARD QUESTIONS, AND UPON MOTION OF COMMISSIONER COLLIER, SECONDED BY COMMISSIONER HANSEN, THE INCLUSION OF CARRYOVER AMENDMENT DA 11

WAS UNANIMOUSLY APPROVED. UPON MOTION OF COMMISSIONER KELLEY, SECONDED BY COMMISSIONER COLLIER, INCLUSION OF THE TECHNICAL, REVENUE, CARRYOVER AND PROGRAM AMENDMENTS CONTAINED IN ATTACHMENT B WERE UNANIMOUSLY APPROVED. FOLLOWING EXPLANATION AND RESPONSE TO BOARD QUESTIONS, AND UPON MOTION OF COMMISSIONER HANSEN, SECONDED BY COMMISSIONER SALTZMAN, INCLUSION OF THE RESPONSE TO RECOMMENDATIONS FROM THE TAX SUPERVISING AND CONSERVATION COMMISSION CONTAINED IN ATTACHMENT C WAS UNANIMOUSLY APPROVED. FOLLOWING BOARD DISCUSSION REGARDING PROPOSED BUDGET NOTES, AND UPON MOTION OF COMMISSIONER COLLIER, SECONDED BY COMMISSIONER KELLEY, AN AMENDMENT TO THE WORDING OF BUDGET NOTE 2 AND THE INCLUSION OF 14 BUDGET NOTES WERE UNANIMOUSLY APPROVED. RESOLUTION 94-120, AS AMENDED, UNANIMOUSLY APPROVED.

R-13 *RESOLUTION in the Matter of Levying Ad Valorem Property Taxes for Multnomah County, Oregon for Fiscal Year 1994-95*

UPON MOTION OF COMMISSIONER HANSEN, SECONDED BY COMMISSIONER SALTZMAN, RESOLUTION 94-121 WAS UNANIMOUSLY APPROVED.

PUBLIC COMMENT

R-14 *Opportunity for Public Comment on Non-Agenda Matters. Testimony Limited to Three Minutes Per Person.*

There being no further business, the meeting was adjourned at 11:37 a.m.

OFFICE OF THE BOARD CLERK
for MULTNOMAH COUNTY, OREGON

Deborah L. Bogstad

Deborah L. Bogstad

MULTNOMAH COUNTY OREGON

OFFICE OF THE BOARD CLERK
SUITE 1510, PORTLAND BUILDING
1120 S.W. FIFTH AVENUE
PORTLAND, OREGON 97204

AGENDA

MEETINGS OF THE MULTNOMAH COUNTY BOARD OF COMMISSIONERS

FOR THE WEEK OF

JUNE 13, 1994 - JUNE 17, 1994

Monday, June 13, 1994 - 2:00 PM - Budget Work Session . . . . . Page 2

Monday, June 13, 1994 - 6:00 PM - Land Use Hearing . . . . . Page 2
Portland Building Second Floor Auditorium
1120 SW Fifth, Portland

Tuesday, June 14, 1994 - 9:30 AM - Budget Work Session . . . . . Page 2

Tuesday, June 14, 1994 - 1:30 PM - Planning Items . . . . . Page 2

Wednesday, June 15, 1994 - 9:30 AM - Budget Work Session . . . . . Page 3

Wednesday, June 15, 1994 - 1:30 PM - Budget Work Session . . . . . Page 3

Thursday, June 16, 1994 - 9:30 AM - Regular Meeting . . . . . Page 3

Thursday Meetings of the Multnomah County Board of Commissioners are taped and can be seen by Paragon Cable subscribers at the following times:

Thursday, 6:00 PM, Channel 30 - East County only
Friday, 10:00 PM, Channel 30
Saturday, 12:30 PM, Channel 30
Sunday, 1:00 PM, Channel 30

INDIVIDUALS WITH DISABILITIES MAY CALL THE OFFICE OF THE BOARD CLERK AT 248-3277 OR 248-5222, OR MULTNOMAH COUNTY TDD PHONE 248-5040, FOR INFORMATION ON AVAILABLE SERVICES AND ACCESSIBILITY.

Monday, June 13, 1994 - 2:00 PM

Multnomah County Courthouse, Room 602

BUDGET WORK SESSION

WS-1 *The Multnomah County Board Will Propose, Review and Discuss Amendments to the 1994-95 Multnomah County Budget*

Monday, June 13, 1994 - 6:00 PM

Portland Building, Second Floor Auditorium
1120 SW Fifth Avenue, Portland

MULTNOMAH COUNTY COMMISSION/PLANNING COMMISSION JOINT LAND USE HEARING

PH-1 *The County Commission and Planning Commission Will Conduct a Joint Public Hearing to Take Testimony on the Completed Goal 5 Work Pertaining to the West Hills and Howard Canyon Area Reconciliation Reports. The Hearing Will be Conducted in a Quasi-Judicial Manner and Only Evidence Germane to Either Report Will be Accepted.*

Tuesday, June 14, 1994 - 9:30 AM

Multnomah County Courthouse, Room 602

BUDGET WORK SESSION

WS-1 *The Multnomah County Board Will Propose, Review and Discuss Amendments to the 1994-95 Multnomah County Budget*

Tuesday, June 14, 1994 - 1:30 PM

Multnomah County Courthouse, Room 602

PLANNING ITEMS

P-1 *PRE 1-94* *Review the May 11, 1994 Hearings Officer Decision DENYING Appeal and Affirming Planning Director's Decision, for Property Located at 41313 SE TROUTCREEK ROAD, CORBETT*

P-2 *ORDER in the Matter of the Appointments of Multnomah County Planning and Zoning Hearings Officers*

Wednesday, June 15, 1994 - 9:30 AM

Multnomah County Courthouse, Room 602

BUDGET WORK SESSION

WS-3 *The Multnomah County Board Will Propose, Review and Discuss Amendments to the 1994-95 Multnomah County Budget*

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Multnomah County Courthouse, Room 602

BUDGET WORK SESSION - IF NEEDED

WS-4 *The Multnomah County Board Will Propose, Review and Discuss Amendments to the 1994-95 Multnomah County Budget*

Thursday, June 16, 1994 - 9:30 AM

Multnomah County Courthouse, Room 602

REGULAR MEETING

CONSENT CALENDAR

NON-DEPARTMENTAL

C-1 *In the Matter of the Appointments of Jo Ann Allen, Chris Cameron, Warren Cook, Lance Duncan, Linda Easley, Shelley Immel, Chris Johnson, Karen Rhein, Jim Stegmiller, Theresa Sullivan and Nancy Wilson as Voting Members to the CAMPAIGN MANAGEMENT COUNCIL*

C-2 *In the Matter of the Appointments of Dave Hadley, Peter Roscoe, Anthony Borzotta, Sam Bush and Carolyn Brattain; and the Reappointments of Doug Bray, Charleah Couckuyt, Dan Croy, Carole Ford, Fred Lenzser and Byron Moore, to the DUII COMMUNITY ADVISORY BOARD*

C-3 *In the Matter of the Appointment of Arnold Dingley to the FOOD SERVICE ADVISORY COMMITTEE*

C-4 *In the Matter of the Appointment of Paul Bragdon to the MULTNOMAH COUNTY LIBRARY ADVISORY BOARD*

C-5 *Ratification of Amendment No. 2 to Intergovernmental Agreement Contract 500782 Between Multnomah County and the Regional Organized Crime*

Narcotics Agency (ROCN), Providing Civilian Employees of ROCN the Opportunity to Continue Participation in the County's Self-Insured Group Health Plan for the 1994-95 Plan Year, Subject to Premium Contribution

SHERIFF'S OFFICE

C-6 *Package Store Liquor License Change of Ownership Application Submitted by Sheriff's Office with Recommendation for Approval, for BOB'S CORNER GROCERY & DELI, 13110 SE DIVISION, PORTLAND*

C-7 *Restaurant Liquor License New Outlet Application Submitted by Sheriff's Office with Recommendation for Approval, for BIG BEAR'S CROWN POINT MARKET, 31815 E CROWN POINT HIGHWAY, TROUTDALE*

COMMUNITY AND FAMILY SERVICES DIVISION

C-8 *Ratification of Amendment No. 5 to Intergovernmental Agreement Contract 100274 Between Multnomah County and Oregon Health Sciences University, Increasing Non-Residential Adult Mental Health Services State Funds to Adjust for 91/92 Medicaid Match, Effective July 1, 1993 through June 30, 1994*

C-9 *Ratification of Intergovernmental Agreement Contract 100635 Between Multnomah County and Tri Met, Providing Transportation to Employment and Alternative Services for People with Developmental Disabilities, for the Period July 1, 1994 through June 30, 1995*

C-10 *Ratification of Amendment No. 1 to Intergovernmental Agreement Contract 103224 Between Multnomah County and Portland Public Schools, Purchasing an Additional 44 Infant/Toddler Child Care Slots for Children of Teen Parents, for the Period Upon Execution through June 30, 1994*

DEPARTMENT OF ENVIRONMENTAL SERVICES

C-11 *Ratification of Amendment No. 7 to Intergovernmental Agreement Contract 3013087 Between Multnomah County and the City of Fairview, to Perform Certain Maintenance Functions on City Streets, for the Period July 1, 1994 through June 30, 1995*

C-12 *Ratification of Amendment No. 7 to Intergovernmental Agreement Contract 3012987 Between Multnomah County and the City of Troutdale, to Perform Certain Maintenance Functions on City Streets, for the Period July 1, 1994 through June 30, 1995*

C-13 *Ratification of Amendment No. 7 to Intergovernmental Agreement Contract 3012887 Between Multnomah County and the City of Wood Village, to Perform Certain Maintenance Functions on City Streets, for the Period July 1, 1994 through June 30, 1995*

REGULAR AGENDA

SHERIFF'S OFFICE

R-1 *Ratification of Intergovernmental Agreement Contract 800215 Between Multnomah County and Portland Community College, to Allow GED Testing for Inmates at Multnomah County Correctional Facilities and Provide Coordination with State Department of Education, for the Period July 1, 1994 through June 30, 1995*

R-2 *Ratification of Intergovernmental Agreement Contract 800714 Between Multnomah County and the Port of Portland, for Lease of the Land and/or Improvements Located at Terminal 1 for the River Patrol's Houseboat Moorage, for the Period May 1, 1994 through June 30, 2004*

DEPARTMENT OF ENVIRONMENTAL SERVICES

R-3 *Ratification of Intergovernmental Agreement 301904 Between METRO and Multnomah County, Providing County Participation in the South/North Transit Corridor Study Alternatives Analysis/Draft Environmental Impact Statement, for the Period January 1, 1994 through December 31, 1996*

SERVICE DISTRICTS

(Recess as the Board of County Commissioners and convene as the Governing Body of Dunthorpe Riverdale Sanitary Service District No. 1)

R-4 *RESOLUTION in the Matter of the Adoption of the 1994-95 Budget for Dunthorpe Riverdale Sanitary Service District No. 1, for the Fiscal Year July 1, 1994 to June 30, 1995 and Making the Appropriations Thereunder, Pursuant to ORS 294.435*

(Recess as the Governing Body of Dunthorpe Riverdale Sanitary Service District No. 1 and convene as the Governing Body of Mid County Street Lighting Service District No. 14)

R-5 *RESOLUTION in the Matter of the Adoption of the 1994-95 Budget for Mid County Street Lighting Service District No. 14, for the Fiscal Year July 1, 1994 to June 30, 1995 and Making the Appropriations Thereunder, Pursuant to ORS 294.435*

(Recess as the Governing Body of Mid County Street Lighting Service District No. 14 and reconvene as the Board of County Commissioners)

NON-DEPARTMENTAL

R-6 *Second Reading and Possible Adoption of a Proposed ORDINANCE Amending the County Code Section 5.50.050(5) to Authorize Transfer of $600,000 Per*

Year, for Three Years to the Portland Center for the Performing Arts (PCPA) and $100,000 Per Year, for Three Years to the Metropolitan Arts Commission (MAC)

R-7 *Second Reading and Possible Adoption of a Proposed ORDINANCE Amending the Multnomah County Code, Section 5.10.090 and 5.10.160(D), Relating to Fees Assessed to Recover the Costs of Dishonored Checks*

R-8 *Second Reading and Possible Adoption of a Proposed ORDINANCE Relating to the Pay Ranges and COLA Increases for Exempt Employees and Repealing Ordinance Nos. 767, 774, 777 and 788*

R-9 *RESOLUTION in the Matter of Adopting and Defining the Various County Funds*

R-10 *Ratification of an Amendment to Article 14, Section H of the Collective Bargaining Agreement Between Multnomah County, the Multnomah County Sheriff and the Multnomah County Deputy Sheriffs Association, for the Period 1992-95*

R-11 *RESOLUTION in the Matter of Creating the School Support Reserve Fund and Establishing Guidelines for Receipts and Disbursements*

R-12 *RESOLUTION in the Matter of the Adoption of the 1994-95 Budget for Multnomah County, Oregon, for the Fiscal Year July 1, 1994 to June 30, 1995 and Making the Appropriations Thereunder, Pursuant to ORS 294.435*

R-13 *RESOLUTION in the Matter of Levying Ad Valorem Property Taxes for Multnomah County, Oregon for Fiscal Year 1994-95*

PUBLIC COMMENT

R-14 *Opportunity for Public Comment on Non-Agenda Matters. Testimony Limited to Three Minutes Per Person.*

1994-2.AGE/62-67/dlb

Meeting Date: 6/13/94

Agenda No.: PH-1

(Above Space for Board Clerk's Use *ONLY*)

AGENDA PLACEMENT FORM

SUBJECT: JOINT BOARD OF COUNTY COMMISSIONERS/PLANNING COMMISSION PUBLIC HEARING

BOARD BRIEFING: Date Requested:
Amount of Time Needed:

REGULAR MEETING: Date Requested: JUNE 13, 1994
Amount of Time Needed: 4 HOURS

DEPARTMENT: NON-DEPARTMENTAL DIVISION: CHAIR BEVERLY STEIN

CONTACT: SHARON TIMKO TELEPHONE: 248-3308
BLDG/ROOM: 106/1410

PERSON(S) MAKING PRESENTATION: PLANNING STAFF, PUBLIC TESTIMONY

ACTION REQUESTED:

[X] INFORMATIONAL ONLY [] POLICY DIRECTION [ ] APPROVAL [] OTHER

SUMMARY (Statement of rationale for action requested, personnel and fiscal/budgetary impacts, if available):

THE MULTNOMAH COUNTY BOARD OF COMMISSIONERS AND THE MULTNOMAH COUNTY PLANNING COMMISSION WILL CONDUCT A JOINT PUBLIC HEARING TO TAKE TESTIMONY ON THE COMPLETED GOAL 5 WORK PERTAINING TO THE WEST HILLS AND HOWARD CANYON AREA RECONCILIATION REPORTS. THE HEARING WILL BE CONDUCTED PURSUANT TO RULES SET FORTH IN RESOLUTION 94-95.

SIGNATURES REQUIRED:

ELECTED OFFICIAL: Beverly Stein
OR
DEPARTMENT MANAGER: _____

ALL ACCOMPANYING DOCUMENTS MUST HAVE REQUIRED SIGNATURES

Any Questions? Call the Office of the Board Clerk at 248-3277 or 248-5222.

MULTNOMAH COUNTY OREGON

DEPARTMENT OF ENVIRONMENTAL SERVICES
DIVISION OF PLANNING
AND DEVELOPMENT
2115 S.E. MORRISON STREET
PORTLAND, OREGON 97214
(503) 248-3043

COMPLETED GOAL 5 WORK: WEST HILLS AND HOWARD CANYON AREA RECONCILIATION REPORTS

Notice Date
May 23, 1994

WHAT IS GOAL 5?

Last Year, between April 1993 and January 1994, Multnomah County completed Goal 5 work in response to the Land Conservation and Development Commission Remand Order 93-RA-876. This work was prepared by the Multnomah County Planning staff and reviewed by affected local governments and state agencies. Hearings were held before the Multnomah County Planning Commission and Multnomah County Board of Commissioners. The Land Conservation and Development Commission (LCDC), at their March 4, 1994 meeting, established new requirements for the completion of remaining Remand Order 93-RA-876 work. These new requirements are established by LCDC in a Revised Periodic Review Work Program (94 - WKPROG - 00038).

The revised work program requires Multnomah County to complete "Reconciliation Reports" on Goal 5 resources (streams, wildlife, scenic views and mineral aggregate resources) and hold public hearings to take comments on the completed reports. This notice advises interested parties that County Staff and Consultants have completed work two "Reconciliation Reports" as required by the LCDC Periodic Review Revised Work Program (94-WKPROG-00038). This notice also describes how to review or obtain copies of the reports and how public comments on the reports may be submitted.

WHAT ARE RECONCILIATION REPORTS?

Two Reconciliation Reports have been prepared: one for the West Hills rural area and another for the Howard Canyon rural area. The objective of each Reconciliation Report is to resolve identified conflicts between "significant" Goal 5 resources and conflicting uses, and other Statewide Planning Goals.

The West Hills and Howard Canyon Area Reconciliation Reports include significance analysis, impact area delineation, identification of conflicting uses, economic/social/environmental/energy analysis of conflicting uses, recommended levels of protection and protection programs for four types of Goal 5 resources within the West Hills (streams, scenic views, wildlife, and

mineral/aggregate) and two Goal 5 resource types within the Howard Canyon area (streams and mineral/aggregate). Both Reconciliation Reports include staff work and responses to public comments received on previous Significance Reports and Resource Analysis Reports. The previous Significance and Resource Analysis Reports have been amended in response to comments received and these amended reports are now incorporated into the appropriate Reconciliation Report.

The two completed Reconciliation Reports available for public review and comment are:

1. **West Hills Reconciliation Report.** This report completes required Goal 5 work for specific streams, wildlife areas, scenic views, and mineral/aggregate sites located within the West Hills rural area of Multnomah County. The specific Goal 5 resources evaluated are identified in the West Hills Reconciliation Report. In general, the entire rural area of the West Hills has been analyzed for wildlife value. Only the east face of the West Hills has been analyzed for scenic value. All streams in the West Hills rural area have been evaluated. And the Angell Brothers quarry site has been evaluated.

2. **Howard Canyon Area Reconciliation Report.** This report completes required Goal 5 work for specific streams and a mineral/aggregate site located within the Howard Canyon rural area. The specific Goal 5 resources evaluated are identified in the Howard Canyon Area Reconciliation Report. In general, three streams in the surrounding Howard Canyon (Howard Canyon Creek, Knierem Creek, and Big Creek) and the Howard Canyon aggregate site have been evaluated.

Where can these reports be reviewed?

Reconciliation Reports. On May 23, 1994, Reconciliation Reports will be available **for review at** the Multnomah Count Planning office located at 2115 S.E. Morrison St., Portland. The Planning Office is open between 8:30 A.M. to 4:30 P.M., Monday through Friday (except holidays). Persons are invited to review work products at the Planning office during these times.

On May 26, 1994, copies of both reports will be **available** at the Multnomah Count Planning office for public distribution. The cost of each report will be $2.00 and may be purchased between 8:30 A.M. to 4:30 P.M., Monday through Fridays (except holidays). No reports will be mailed.

Where can written comments or public testimony be given?

Written Comments. Any person may submit written comments on the Reconciliation Reports by **June 10, 1994., 4:30 P.M.** All written comments will be made available for review at the Multnomah County Planning Office (2115 S.E. Morrison St., Portland, Oregon, 97214). Persons and organizations making comments, also are requested to forward a copy of their comment(s)

to: **Attn. Steve Oulman, Department of Land Conservation and Development, 1175 Court St, N.E., Salem, Oregon, 97310.** The Multnomah County Planning staff will prepare responses to comments and will include a summary of all responses in the appropriate report.

Joint Board/Planning Commission Hearing. On June 13, 1994, at 6:00 P.M., in the Second Floor Auditorium of the Portland Building (1120 S.W. 5th, Portland, OR), the Multnomah County Planning Commission and the Board of County Commissioners will conduct a joint public hearing to take testimony on the two Reconciliation Reports. All interested parties may appear and be heard at the hearing. Rules for the conduct of the joint hearing will be available at the Multnomah County Planning office June 3, 1994.

This hearing will be conducted in a quasi-judicial manner and only evidence germane to either report will be accepted.

Will there be any other meetings on this issue?

Board Briefing. On June 7, 1994, at 1:30 P.M., in the Multnomah County Courthouse, room 602, the Multnomah County Planning Staff will brief the Board of County Commissioners and Planning Commission members on the two Reconciliation Reports. Public and agency representatives are invited to the briefing, however, no testimony or questions will be allowed.

Members of the Multnomah County Board of Commissioners and Planning Commission

Board of Commissioners:
Beverly Stein, Chair of the Board
Dan Saltzman, District 1 Commissioner
Gary Hansen, District 2 Commissioner
Tanya Collier, District 3 Commissioner
Sharron Kelley, District 4 Commissioner

Planning Commission:
Leonard Yoon, Chair
Karin Hunt, Vice Chair
Laurie Craghead
Samuel L. Diack
Chris Foster
William Fritz
Peter Finley Fry
John Ingle
Dave Kunkel

BEFORE THE BOARD OF COUNTY COMMISSIONERS FOR MULTNOMAH COUNTY, OREGON

In the Matter of Adopting Hearing Rules for the Conduct of a Joint Planning Commission and Board Quasi judicial Hearing on June 13, 1994	))))	**RESOLUTION** 94 - 95

WHEREAS, ORS 197 requires the Land Conservation and Development Commission to Review the Multnomah County Comprehensive Framework Plan periodically to determine consistency with the State Land Use Goals; and

WHEREAS, the Land Conservation and Development Commission reviewed in April 1993 the Multnomah County Comprehensive Framework Plan and determined it did not comply with State Land Use Goal 5; and

WHEREAS, the Land Conservation and Development Commission required Multnomah County to complete Goal 5 work by December 31, 1993 and subsequently approved a detailed work Program extending the County's deadline to September 6, 1994; and

WHEREAS, the Land Conservation and Development Commission approved a work program which requires the Multnomah County Planning Commission and Board to conduct a Hearing to consider two "Reconciliation Reports"; and

WHEREAS, both the Multnomah County Planning Commission and Board have adopted rules for the conduct of quasi judicial hearings; and

WHEREAS, the Board must amend their rules to hold a hearing with the Planning Commission;

NOW, THEREFORE, IT IS RESOLVED for the June 13, 1994, joint hearing of the Planning Commission and Board of County Commissioners on the two Reconciliation Reports, or any continuation thereof, the RULES FOR THE CONDUCT OF PLANNING COMMISSION AND BOARD OF COUNTY COMMISSIONERS JOINT QUASI-JUDICIAL HEARING as set forth in Exhibit "A" are hereby adopted.

APPROVED this 24th day of May, 1994

MULTNOMAH COUNTY, OREGON

By _____
Beverly Stein
Multnomah County Chair

REVIEWED:
COUNTY COUNSEL FOR
MULTNOMAH COUNTY, OREGON

By _____
John L. Dubay, Deputy County Counsel

Exhibit "A"
RULES FOR THE CONDUCT OF PLANNING COMMISSION AND BOARD OF COUNTY COMMISSIONERS JOINT QUASI-JUDICIAL HEARING

SECTION 1. NATURE AND CONDUCT OF HEARING

A. Parties are entitled to an opportunity to appear, in person or by a representative or Counsel, to present and rebut testimony and evidence to an impartial approval authority, to have the proceedings recorded and to receive a written decision which includes Findings of Fact and Conclusions based on the record made at the hearing.

B. The following persons are parties and shall be entitled, either themselves or through their representatives or Counsel, to make an appearance of record before the Board of Commissioners and the Planning Commission:

1. All persons entitled to individual mailed notice under the applicable Ordinance; and
2. Other persons who demonstrate an interest in the proposed action.

C. The Board of Commissioners or the Planning Commission may call as a witness a person with technical or specialized knowledge regarding an issue in an action.

D. No person shall testify without:

1. Receiving recognition from the Chair of the County Commissioner;
2. Stating his or her full name and residence address; and
3. If requested, stating the basis on which he or she is entitled to status as a party, pursuant to these Rules or as a witness on behalf of a party pursuant to these Rules.
   (a) A challenge to the party or witness status of a person, and a ruling thereon by the Chairperson, shall be made at the time the person requests recognition to testify.
   (b) A challenge to the party or witness status of a person may be made only by a party.

E. There shall be no audience demonstration, such as applause, cheering, display of signs, or other conduct disruptive of the hearing. Disruptive conduct may be cause for expulsion from the hearing, termination of the hearing, or other appropriate action.

F. The term person includes an individual, partnership, corporation, association, governmental unit or public or private organization.

SECTION 2. CONFLICT OF INTEREST: BIAS, EX PARTE CONTACT

A. Any actual or potential conflicts of interest, bias or partiality shall be disclosed at the hearing where the action is considered.

B. Any party may challenge the impartiality of any member before or during the hearing. A challenge must include the facts relied on by the challenging party, relating to the member's alleged bias, prejudgment, or personal interest, or other facts from which the party has concluded that the member cannot participate in a decision in an impartial manner.

C. In the event of a challenge for bias, the challenged member shall respond in a statement which shall be part of the record. The statement shall refer to the challenge and include the reasons why the member has elected to participate or abstain. The statement shall not be subject to cross examination or rebuttal.

D. In the event any member has pre-hearing *ex parte* contact with a party, the member shall publicly disclose the occurrence and the substance of such contact and the persons involved. The statement shall also indicate any interest or independent knowledge of the member. The term independent knowledge refers to facts received by other than public means which are not capable of judicial or official notice, are not in the record of the action and are not a matter of general knowledge. The statement shall be made at the beginning of the hearing on the action or at such time during the course of the hearing that the member becomes aware of the existence of an ex parte contact or independent knowledge. The statement regarding ex parte contact shall be subject to the same Rules as for a statement of bias in paragraph (C) in this section.

SECTION 3. QUORUM and PRESIDING OFFICER

A. A quorum of the Planning Commission and a quorum of the Board of Commissioners shall constitute a quorum for the joint meeting.

B. The Presiding Officer of a joint meeting shall be the Chair of the County Commission or a person designated by the Chair.

SECTION 4. RULES OF EVIDENCE

A. Evidence received at a hearing shall be of the quality that reasonable persons rely on in the conduct of everyday affairs.

B. Irrelevant, immaterial or repetitious testimony or evidence shall not be admitted.

SECTION 5. ORDER OF PROCEDURE

The order of procedure shall be as follows.

A. Call the session to order.

B. Call for the Staff Report relating to actions previously decided, if appropriate. And list the applicable and substantive criteria governing the action.

C. Summarize the nature and conduct of the hearing as described in these Rules and explain where the public can obtain copies of the Rules of Procedure and the Agenda.

D. Explain the sequence of events to be followed at the hearings as described in Subsections (F) through (O) of this Section.

E. Instruct the audience that only testimony or evidence directed to the approval criteria will be accepted and that failure to raise an issue with sufficient specificity to afford the Commission and the parties an opportunity to respond to the issue precludes appeal to LUBA on that issue.

F. Call the first Agenda item and describe the Action.

G. Request a representative of the Division of Planning and Development to describe the nature of the proposal, explain any graphic or pictorial displays which are to be part of the record and summarize the Staff Report and Recommendation.

H. Call for the presentation by Proponents of the Action.

1. Those testifying in support of an action have three minutes per person, exclusive of time used by the Board and Planning Commission for questions. Additional time shall only be granted if the evidence/testimony is not repetitious, irrelevant, or immaterial.
2. Proponents shall be heard in the following order.

(a) Representatives of agencies or interested governments,

(b) Persons receiving notice of the hearing.

(c) Neighborhood associations, organizations or other groups.

(d) Persons not entitled to receive notice of the hearing but who demonstrate to the Approval Authority that they have an interest in the action.

I. Call for the presentation by opponents of the Action.

1. Those testifying in opposition to an application have three minutes per person, exclusive of time used by the Board and Planning Commission for questions. Additional time shall only be granted if the evidence/testimony is not repetitious, irrelevant, or immaterial.

2. Opponents shall be heard in the following order.

(a) Representatives of agencies or interested governments,

(b) Persons receiving notice of the hearing.

(c) Neighborhood associations, organizations or other groups.

(d) Persons not entitled to receive notice of the hearing but who demonstrate to the Approval Authority that they have an interest in the action.

J. Provide opportunity for a representative of the Division of Planning and Development to add to or clarify the factual information presented.

K. Close the public portion of the hearing and accept requests for continuances and the opportunity to submit additional evidence as provided in ORS 197.763(4)(b) and (6).

SECTION 6. RECORD OF PROCEEDINGS

A. The proceedings of the Board and Planning Commission shall be electronically or stenographically recorded.

B. In the manner provided by ORS 192.105-192.170, the Division of Planning and Development may dispose of physical and documentary evidence not claimed by the person identified sixty days after notice that the evidence may be claimed has been mailed to such person.

SECTION 7. PUBLICATION OF RULES

These Rules shall be placed on record with the Division of Planning and Development and the Clerk of the Board of County Commissioners and copies shall be made available to the public at all joint hearings of the Board and Planning Commission.

SECTION 8. AMENDMENT AND SUSPENSION OF RULES

A. Any Rule of Procedure not required by law may be amended, suspended, or repealed at any hearing by majority of those present.

B. A procedural rule may be adopted to regulate a situation not provided for in these Rules or in County Ordinances.

SECTION 9. RELATIONSHIP WITH OTHER RULES

These Rules supercede other Board and Planning Commission rules.

SECTION 10. DECISIONS

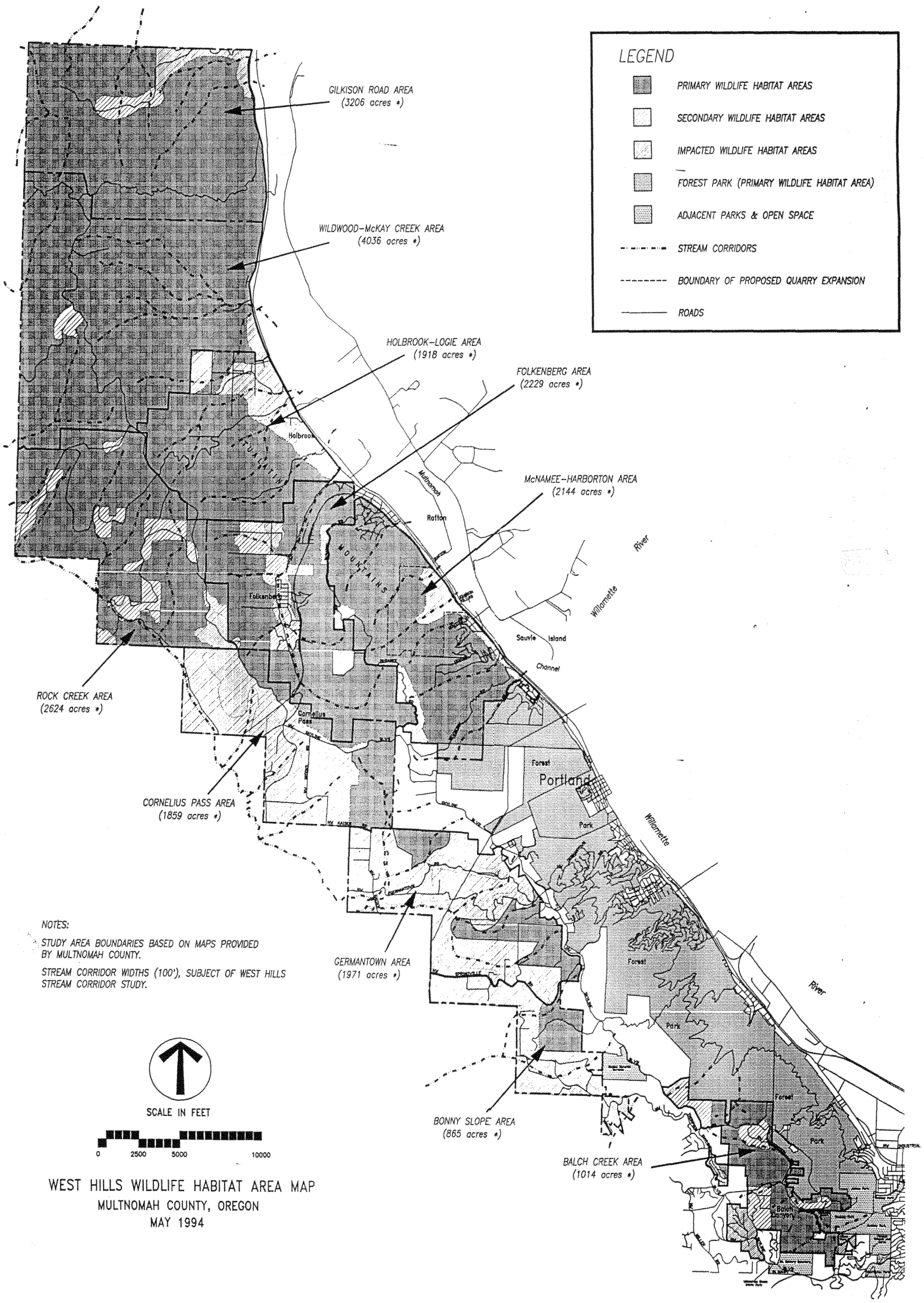
Following the joint hearing, the Planning Commission and Board of County Commissioners will make their separate decisions in accordance with MCC §11.05.300 through MCC §11.05.400.

MULTNOMAH COUNTY

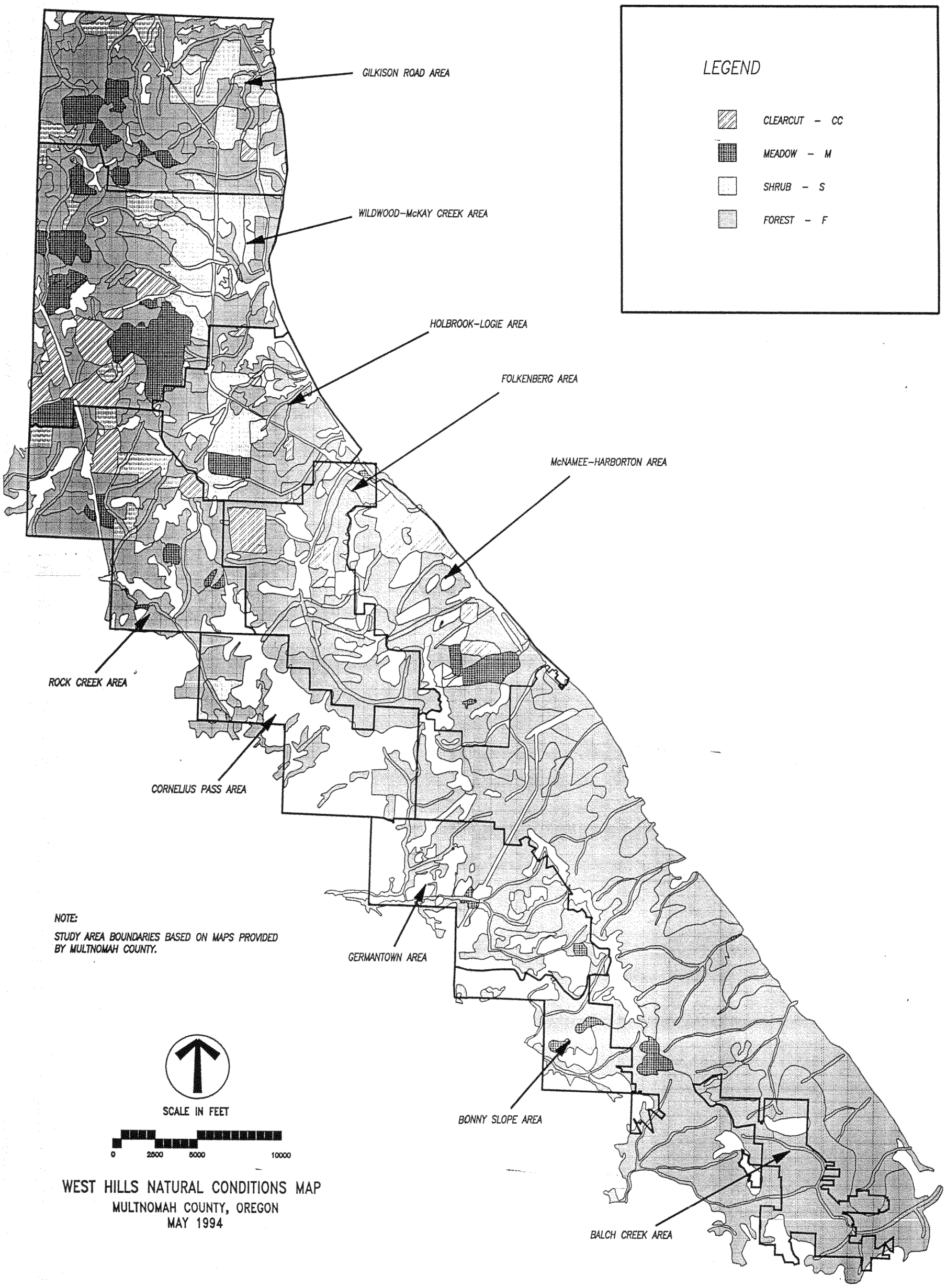
West Hills Reconciliation Report

(May 23, 1994)

Prepared by:
Multnomah County Planning Division



WEST HILLS WILDLIFE HABITAT AREA MAP
MULTNOMAH COUNTY, OREGON
MAY 1994



WEST HILLS NATURAL CONDITIONS MAP
MULTNOMAH COUNTY, OREGON
MAY 1994

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CHAPTER I

INTRODUCTION

ORS 197.628 requires cities and counties to review their comprehensive plans and land use regulations periodically and make changes necessary to keep plans and regulations up-to-date and in compliance with the statewide planning goals. If plans are found to be out-dated or not in compliance with statewide planning goals, local governments must adopt findings and enact measures to make their plan and regulations current.

On October 30, 1980, the Land Conservation and Development Commission acknowledged the Multnomah County Comprehensive Framework Plan and land use regulations to be in compliance with the statewide planning goals. Approximately seven years later, on August 27, 1987, the Department of Land Conservation and Development (DLCD) notified the county of requirements under the periodic review and initiated a periodic review process with the county. On February 22, 1989, Multnomah County submitted its proposed periodic review order to the DLCD, and the department subsequently directed the county to complete additional work on two aggregate sites. The additional work was completed and conveyed to the DLCD on June 27, 1990.

The Land Conservation and Development Commission on April 23, 1993 determined additional Goal 5 work needed to be completed on several aggregate sites, streams and West Hills wildlife and scenic views (Remand Order 93-RA-876). This Remand Order required Multnomah County to complete work by October 29, 1993. Several extensions have been granted by the Land Conservation and Development Commission, in part because additional work on streams needed to be completed which had not been anticipated in the Remand Order . Under the requirements of the Multnomah County Periodic Review Revised Work Program (WKPROG - 0038), adopted by the commission on March 4, 1994, all remaining work must be submitted to the DLCD by September 6, 1994.

The revised work program requires Multnomah County to complete a Goal 5 planning process that concludes with the adoption of "Reconciliation Reports" and protection measures which resolve (reconcile) stream, wildlife, scenic views and mineral/aggregate resource issues. Two "Reconciliation Reports" have been prepared, one for the West Hills rural area and the other for the east rural county area in the vicinity of Howard Canyon. The "West Hills Reconciliation Report" and the "Howard Canyon Area Reconciliation Report" focus on different Goal 5 issues.

Four Goal 5 resource issues exist in the rural West Hills of the county and two Goal 5 resource issues are analyzed in the Howard Canyon area. West Hills Goal 5 resource issues which are analyzed include wildlife, scenic views, streams and the Angell Brothers aggregate site. In the Howard Canyon area, three streams within the Howard Canyon drainage and the Howard Canyon aggregate site are the subject of the Reconciliation Report.

In general, the Reconciliation Reports record the County's effort to complete the Goal 5 process as outlined in OAR 660-16-000. The rule requires local governments to analyze the significance of Goal 5 resources, and, if deemed significant (designated "1-C"), determine the appropriate level of protection ("3-A", "3-B", and "3-C") and provide protection strategies. The process includes a number of steps intended to provide the basis for establishing a rationale for deciding which resources should be protected and what types of protection are required.

Specifically, the Goal 5 process begins with the local government determining significance based on an analysis of location, quality, and quantity. The local government is required to use the best available information to make determinations throughout the Goal 5 process. If the resource is deemed "significant" it is designated "1-C" and the process continues. Conversely, the process is concluded if the resource is determined to not be significant and designated "1-A". Significant resources must then be analyzed to determine the appropriate level of protection when compared to other resources and conflicting uses. This analysis compares the **E**conomic, **S**ocial, **E**nvironmental, and **E**nergy consequences of protecting the entire resource as compared to allowing conflicts to exist. This analysis is commonly referred to as the ESEE analysis. The last step in the Goal 5 process is the determination of the level of protection based on the rationale provided by the the ESEE analysis. At this final step, local governments are required to identify the "uses" that will be allowed on the resource site and vicinity, and explain programs deemed necessary to protect the resource.

The "Reconciliation Report" is organized in a manner that follows the Goal 5 process. The report consists of two major parts: "Resource" chapters for each Goal 5 resource under review (*i.e.,* streams, scenic view, wildlife, mineral/aggregate), followed by the "Conflict Resolution and Protection Program" chapter. Each "resource" chapter is broken down into three subsections. Subsection "A" explains the "significance" determination and includes a discussion of "location", "quantity", and "quality". Subsection "B" contains the ESEE analysis, including a description and rationale for the "Impact Area" and a listing and description of conflicting uses. Subsection "C" contains the appendixes, which include technical background information and responses to public comments received throughout the process. The public comment/response component of the of the appendix is intended to provide a quick reference of the primary issues identified by the public during draft report stages of the Reconciliation Report development.

The last chapter of the "Reconciliation Report" is the "Conflict Resolution and Protection Program". This chapter reconciles conflicts between each Goal 5 resource and other uses and/or other Goal 5 resources. The chapter also reaches conclusions concerning the appropriate level of protection and suggests specific protection strategies. Subsection "B" discusses previously identified ESEE consequences for each conflicting use and reconciles any differences to reach conclusions concerning whether conflicting uses should be allowed. Subsection "C", "Resource Protection", determines the level of protection and discusses a protection program for each of the Goal 5 resources.

The "Reconciliation Report" is considered an amendment to the Multnomah Comprehensive Framework Plan. The "Reconciliation Reports" include both findings and policy recommendations. Policy recommendations will be incorporated into the Comprehensive Framework Plan by separate actions by the Multnomah County Planning Commission and Board of County Commissioners pursuant to the Multnomah County Code and state statutes. Also, some subsequent Planning Commission and Board actions may be required to implement the full set of strategies outlined in the protection programs.

The "Reconciliation Report" is intended to satisfy in part the requirements of the Land Conservation and Development Commission's Remand Order 93-RA-876 and satisfies all other statewide goal requirements of the county's work program approved by the Commission, WKPROG - 0038.

CHAPTER II

SCENIC VIEWS of the WEST HILLS

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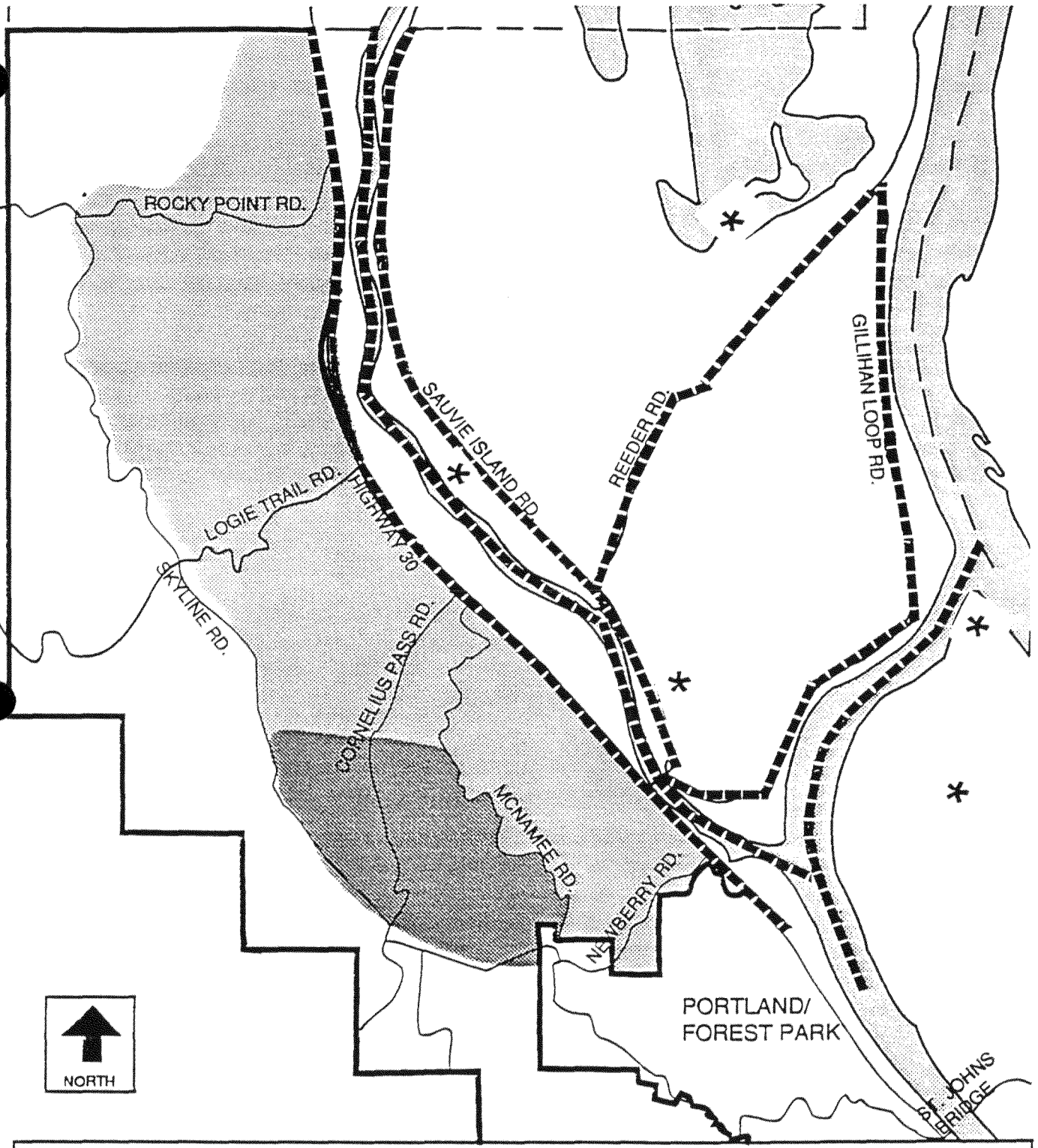

WEST HILLS SCENIC RESOURCES STUDY AREA

STUDY AREA

AREA REMOVED FROM STUDY

* KEY VIEWING AREA

KEY VIEWING CORRIDOR

A. SIGNIFICANCE DETERMINATION

1. BACKGROUND

"Scenic views of the West Hills" were designated a "1-B" (insufficient information to determine significance) resource in the Periodic Review Order reviewed by the Land Conservation and Development Commission on April 23, 1993. In Remand Order 93-RA-876 the Commission required the county to complete this Goal 5 work.

Goal 5 requires consideration of the location, quality and quantity of a resource, and analysis of whether a scenic area is "outstanding", pursuant to OAR 660-16-000. This item was considered at public hearings before the Planning Commission and Board of County Commissioners (Board) last year, and the Board determined that the east face of the West Hills are a significant scenic resource (Board Resolution 93-371).

2. LOCATION:

The scenic area consists of the northeast face of the West Hills (Tualatin Mountains), extending from the ridgeline (roughly corresponding to Skyline Boulevard) northeast to Highway 30. The Portland City Limits are the southern boundary, and the Columbia County line is the northern boundary (see attached map, page 4).

3. QUANTITY:

Only land outside the Urban Growth Boundary (UGB) has been considered in this analysis. While scenic views exist in urban areas, their focus is usually on the city or on distant mountains. Natural appearing scenic landscapes, such as the West Hills, are almost exclusively located in non-urban areas. Total non-urban area of the county is approximately 252 square miles.

Large areas of Multnomah County have already been designated as scenic resources. This includes the Columbia River Gorge National Scenic Area (NSA), the Sandy River Gorge, which is a designated state and federal scenic waterway, and the Willamette River Greenway. The following table compares the sizes of these scenic areas with the West Hills study area.

TABLE 1.
SCENIC RESOURCES IN MULTNOMAH COUNTY
SIZE AND PERCENT OF NON-URBAN AREA

SCENIC AREA	SIZE IN SQ. MILES	PERCENT OF NON-URBAN AREA
Columbia Gorge NSA	52	21
Sandy River	3	1
Willamette River Greenway	10	4
TOTAL	65	26
West Hills	20	8

QUANTITY SUMMARY:

While just over 1/4 of the non-urban area of Multnomah County has already been recognized and protected because of scenic value, the majority of these scenic resources are in the eastern portion of the county. The Willamette River Greenway, in the western portion of the county, is only 4 percent of total non-urban land. This lack of other scenic resources in western Multnomah County adds significance to the West Hills. In addition, the quantity of other scenic resources should not be a penalizing factor in considering whether the West Hills are significant.

4. QUALITY:

a. Quality Criteria

Determining whether a site has significant scenic qualities is a subjective decision, based on individual ideas of beauty and enjoyment. A view some find beautiful may be uninteresting to others. However, certain attributes, or qualities which make a scenic view interesting, have been identified and used to classify scenic importance. Methods used by the US Dept. of Transportation, the US Forest Service, the Columbia River Gorge Commission and the City of Portland to determine scenic significance were reviewed. There was a great deal of similarity in criteria used by the different agencies. The following list is a combination of these criteria, which can be used to both describe and compare the scenic value of the West Hills with the scenic value of the other identified scenic resources.

Variety: A variety of visual features like landforms, waterforms, rock formations, and/or vegetation patterns are included in the kind of landscape that people find most visually appealing and interesting. May include the expectation of more information to be extracted from the view with additional time spent looking at it, or the potential for more information when the viewpoint is changed. Includes distinctive or vivid visual patterns or dominant striking landmarks.

Intactness: The visual integrity of the landscape, or the degree of human modification that has occurred within the landscape. Major modifications may still rank high as long as the modifications fit into the context of the view.

Unity/Coherence: A view that appears to be part of a larger or extended landscape, exhibiting an internal unity that extends beyond the setting to imply continuity with other settings. The visual coherence and compositional harmony of the landscape. If the landscape is made up of different parts or patterns, they will appear to be linked forming one cohesive view. Transitions within the view will be harmonious and/or be expressed as patterns.

Viewing area importance/Accessibility: Viewed frequently and/or viewed by many people. Areas seen from well-travelled roads or places with high public use are more important than similar landscapes seen from less visited viewing areas. Ease of access, proximity. Viewing areas must be accessible to the public, and in the case of roads must have safe places to stop and enjoy the views.

b. Analysis of West Hills Scenic Qualities

Variety: The West Hills landform consists of the front of the Tualatin Mountains, a series of gentle mountains ranging in height from approximately 900' to 1500'. Various canyons bisect the face of the Hills, adding variety to the landform. Vegetation on the Hills is a mixture of coniferous and deciduous forest. Logging activity has created variety in the vegetation pattern, with different ages of regrowth appearing as different textures and shades of green. The Vine Maple and other early-succession species provide color variety in recently logged areas, especially in the fall.

Intactness: When viewed from a distance, such as from Gillihan Loop Road or the Sauvie Island Wildlife Refuge, the West Hills appear to be a velvety green background. While the results of logging are visible in places, this is a temporary activity and regrowth will occur. There is little housing or other development visible on the majority of the hillsides. Foreground views from along Highway 30 are limited in duration and vary as to intactness due to the interspersion of highly developed areas such as Burlington and south of Scappoose.

Unity/Coherence: The West Hills exhibit unity and coherence, being part of a forested ridge which extends in both directions beyond the study area, from the urban area of Portland to the Coast Range and beyond.

Viewing area Importance/Accessibility: While there are no developed public viewpoints, many places on Sauvie Island offer views of the West Hills, such as the Sauvie Island Wildlife Refuge, Bybee-Howell House, Virginia Lakes, and various roads on the Island, which are popular bicycle routes. The West Hills provide background scenery from these locations. The West Hills can also be viewed by recreational users of the

Multnomah Channel and Willamette River, and travellers along Highway 30 can obtain more limited glimpses and views. Reliable information is not available as to the actual numbers of visitors to any of these viewing areas or the importance of the West Hills scenery to their trip enjoyment. The proximity and easy accessibility to the large urban population of Portland also adds value to the scenic landscape.

c. Comparison to other scenic areas

The West Hills cannot be fairly compared to the other recognized scenic areas in the county. The Columbia River Gorge is a national scenic area, of such outstanding value and importance that any other scenery pales in comparison. The Sandy River and Willamette River Greenway are recognized on a state level. The Columbia River Gorge and Sandy River are also a different landscape character type than the West Hills. The intent of Goal 5 is to recognize resources that are important to the county, but which may not be significant if considered at a state or national level. The West Hills are significant when viewed alone.

d. Quality Summary

The West Hills exhibit unity and coherence, being part of a mountain Greenway extending from Portland to the Coast Range. The hills are an integral part of the scenic framework of Sauvie Island, the Multnomah Channel and the Willamette River, and provide an outstanding contrast between the developed urban areas of Portland and the natural beauty of the forested hills. Views of the Hills provide valuable scenery to travelers along Highway 30 and the roads on Sauvie Island.

5. SIGNIFICANCE CONCLUSIONS:

a. The location of the West Hills study area has been identified in this report and on the attached map.

b. Analysis of the quantity of scenic resources in the county shows that while 26 percent of the non-urban area of the county has significant scenic value, scenic resources are not abundant in the western part of the county. Additionally, the Board found that relative abundance of scenic resources should not be a penalizing factor in considering the significance of the West Hills.

c. Analysis of the quality of the West Hills scenery, based on a compilation of criteria used in other studies to determine quality of scenic views, shows that the West Hills exhibit variety, as evidenced by the landform which consists of a combination of hillside and ridge bisected by numerous canyons, and the vegetation pattern, which provides a blanket of various shades of green along with colorful fall foliage; intactness, or lack of development to disrupt the overall forested appearance; unity and coherence, since the

West Hills are part of the mountain chain extending from Portland to the Coast Range; easy accessibility and proximity to Portland, a major population center; and provide a valuable scenic view from many areas on and near Sauvie Island, including Highway 30, the Multnomah Channel, the Willamette River, Kelly Point Park, Smith and Bybee Lakes, Bybee-Howell House, Sauvie Island Wildlife Refuge, Virginia Lakes, and the roads around Sauvie Island.

d. Based on this consideration of the location, quantity and quality of the West Hills scenic landscape, the West Hills scenic resource is outstanding, and has been designated as a significant scenic resource (Board Resolution 93-371).

B. RESOURCE ANALYSIS

1. IMPACT AREA:

OAR 660-16-000 (2) requires identification of an impact area, where uses could occur that might adversely affect the scenic values of the West Hills. The potential impact area, in this case, is anyplace between a key viewing area and the face of the Hills. This includes the Multnomah Channel, the land between Highway 30 and the Channel, most of Sauvie Island, and certain areas near St. Johns within the Portland city limits. Construction of any large or tall structure in these areas could block portions of the view from a key viewing area. The county has no jurisdiction to limit development within the Portland city limits. The remainder of the potential impact area consists of predominantly agricultural zoning. Consequently, development that would block views is extremely unlikely. In addition, the vast extent of the West Hills landscape, combined with the large number of viewing areas, would still provide multiple opportunities for unobstructed views. Consequently, there will be no significant impacts to views of the West Hills from uses which may be established between the key viewing areas and the face of the hills. The ESEE analysis need only consider the significant resource area itself.

2. CONFLICTING USES:

a. Viewing Parameters

A number of places that provide views of the West Hills (also referred to as key viewing areas) were identified in the significance determination. All of these viewing areas place the viewer in an Observer below (also called Observer Inferior) position (see Diagram 1) because they are essentially looking up at the landscape. Some effects of the Observer below position are that visual blockage will occur because vegetative screening and topography hide certain features or surfaces (see Diagram 2). This is important for two reasons. First, it may be unnecessary to place any restrictions on development in areas that cannot be seen from identified key viewing areas. Second, it shows that screening may be a means of mitigating impacts to the scenic quality of the West Hills.

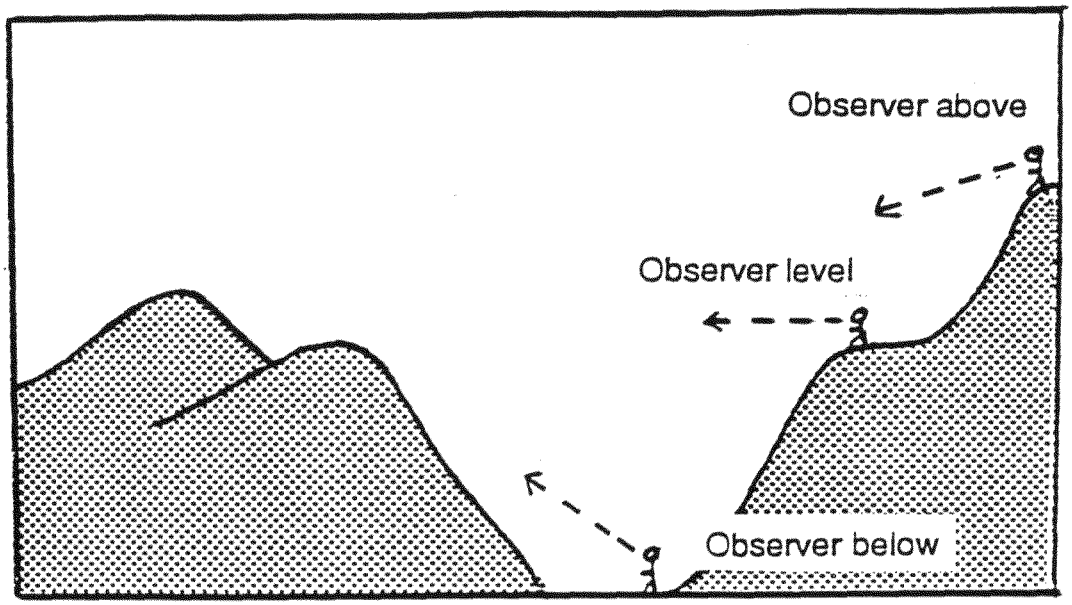

Diagram 1. Observer Positions[1]

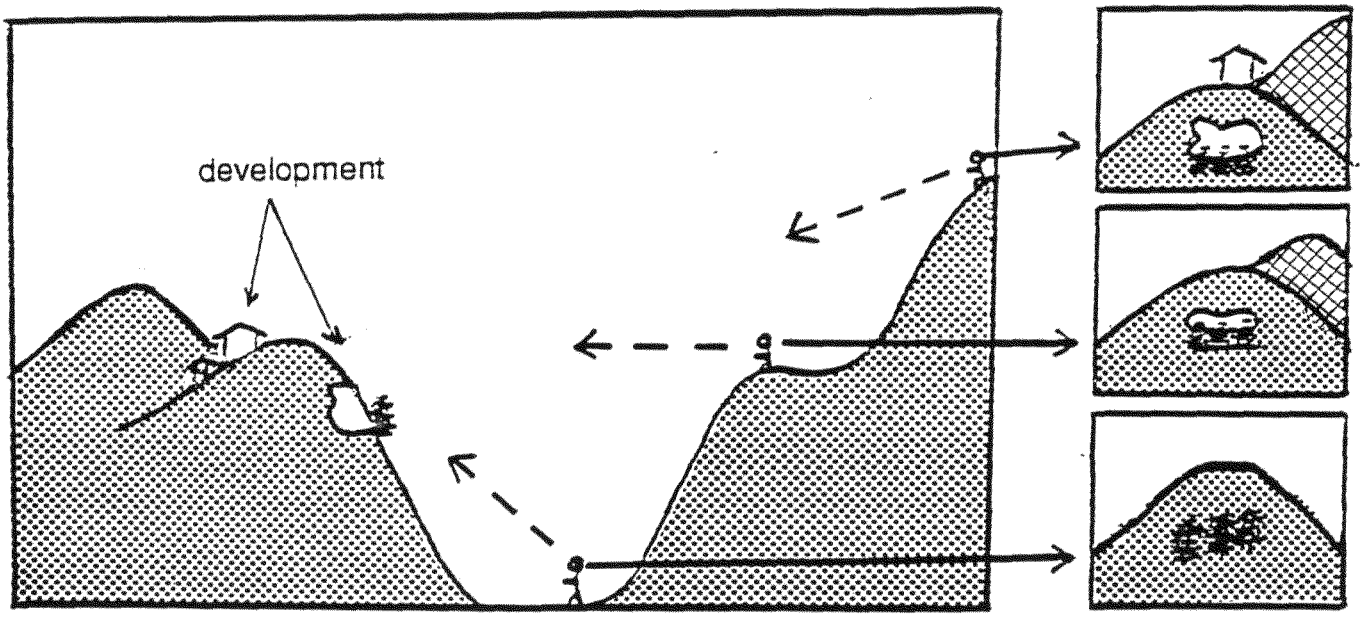

Diagram 2. Observer Position and Effect on Development

Observer position affects what can be seen. A screen or visual barrier will affect the view of development in the hills from the Observer below position. [2]

Views of the scenic resource vary according to the distance between the viewer and the resource. Views from Highway 30 and the Multnomah Channel are foreground views (seen from up to 1/2 mile away), where leaves, trunks and branches of individual trees are discernible. Views from Sauvie Island are middle ground views (1/2 to 5 miles distance), where details of individual trees are not visible but they provide a textured appearance to the forest. Views from the Columbia River and Washington see the West Hills as a background, where contours of treetops cannot be perceived and only major topographical features such as valleys and crests are visible. The effect of viewer distance relates to whether development is visible from a key viewing area. No definitive information could be found relating the size of an object or developed area to the distance from which it becomes visible, or at what size or percentage of the total area seen the development becomes obtrusive and disrupts the scenic quality of the view. However, it is logical to assume that almost any development will be visible from foreground views, while a larger area must be disturbed to be visible from middle or background views.

A third viewing parameter relates to the time span during which a specific view can be seen from key viewing corridors - Highway 30 in particular but also Sauvie Island Roads. It may not be important to protect views that are seen for only a few seconds from a passing car.

b. Visible Areas

The Observer Inferior position, along with the landform of the West Hills creates a number of areas that cannot be seen from any of the key viewing areas. "Not seen" areas include not only the back side of hills and ridges but also many of the intersecting canyons like McCarthy Creek / Cornelius Pass Road. A combination of analysis of topography, visual observation and mathematical computation were used to produce a "Seen Areas" map (Exhibit Map 2). The Seen Areas map is based solely on topography, and does not include areas blocked from view by vegetation, since vegetation can be changed or removed. The map illustrates which areas can be seen, and which areas are not visible. Because uses or structures built in "Not Seen" areas would not be visible from key viewing areas, there are no conflicting uses in these areas and no restrictions should be placed on development.

A large area in the southwest corner of the study area, between McNamee Road and Skyline Boulevard, is not visible from any key viewing area because the ridgeline along McNamee Road is several hundred feet higher than the ridgeline along Skyline Boulevard (see Map 1, page 4, and Seen Areas Exhibit Map 2). This area should not have been included as part of the original West Hills Scenic Study Area, and it is recommended that it be removed from the area designated as significant. Regardless of whether the Board determines that the area is not significant, since there are no conflicting uses the area will not be included in the remainder of the Goal 5 analysis.

c. Uses Allowed by Zoning

The West Hills significant scenic area contains approximately 8500 acres. The majority of the study area, approximately 94 percent, is zoned for Commercial Forest Use (CFU). The remainder is zoned Rural Residential (RR), with about 20 acres in Burlington zoned Rural Center (RC). Uses which may be allowed in these zoning districts which could conflict with protection of scenic attributes include:

Forestry: The primary use allowed in the CFU zone is forestry, including logging, road building, removal of slash and reforestation, often with a single species rather than mixed species and vegetation types. Each of these forestry activities can conflict with the existing scenic values of the West Hills, interrupting or causing changes to the overall forested appearance of the landscape.

Residential Use: Residential use is allowed in the RR and RC districts, and may be approved in the CFU district. Based on one house per parcel, including all potential new lots created through division of larger properties, there is the potential for around 100 new houses in the CFU zoned portion of the scenic area. An additional approximately 75 houses might be built on RR zoned land. This combined potential is about half the number of existing houses in the study area. The actual number of new houses that are built will likely be less than 175, taking into consideration that approximately 2000 acres of land is in large tracts owned by commercial timber companies and is unlikely to be divided and fully developed. Analysis of Exhibit Maps 1 and 2 shows that much of the potential buildable land is in "not-seen" areas. Existing vegetation would serve to screen many other potential building sites. Though the number of potential new houses that would be visible from key viewing areas is limited, some houses would be visible and would conflict with protection of scenic attributes in several ways. The location and design of a house may cause it to protrude above a ridgeline, making it visible against the skyline. Light colors and reflective materials such as metal roofs and windows cause buildings to be more visible because of the contrast with the surrounding darker vegetation. Driveways to building sites have the potential to be visually apparent based on their length and the amount of grading, cutting or filling that must be done to meet road grade and width requirements for emergency vehicle access. Most residences are also surrounded by lawns or other cleared areas. Such clearings would be visible from key viewing areas because of the contrast with the predominantly forested vegetation pattern. A house located in the center of a cleared area also has more visual prominence than if it were sited within the trees.

Mining: The Angell Brothers mine is an existing conflicting use. 114 acres of the site has been designated "3-C" and has received Conditional Use approval to be mined. The remaining 283 acres has been designated "1-C", significant because evidence has been provided that the quality and quantity of rock material is significant (ESEE work and determination of the appropriate level of protection is on-going). Another quarry, currently inactive, is located near Rocky Point Road. This site is owned by ODOT and was used for Highway 30 road work in the 1970s. A third quarry, Hidden Valley, is located directly north of Angell Brothers. The rock resource at that site appears to have been depleted and the quarry was converted to a landfill. The potential remains for

these, as well as other as yet unidentified sites, to be mined in the future, which could conflict with preservation of scenic attributes. Mining requires removal of vegetation, changes the landform, and exposed rock faces may create visible intrusions on the forested hillside. The size of the disturbed area, as well as the amount of screening vegetation and topography, affects the degree of visual conflict. Mining activities, like logging, can be considered temporary, and reclamation is required. Many people, however, have expressed concerns about the ability of reclaimed land to support forest growth and whether the reclaimed landform will blend in with the surrounding topography (reference file PR 7-92, Angell Brothers Goal 5 analysis).

Community Service and Conditional Uses: Rural service and tourist commercial uses such as local stores, offices, repair services, restaurants, gas stations, motels, and similar uses may be approved as conditional uses in the RR and RC districts. Community service uses such as transmission towers and solid waste facilities, and conditional uses such as forest or agricultural products processing industries and logging equipment repair could also be approved in all three zoning districts. Several businesses currently exist in Burlington and at the north end of the county just outside Scappoose. While some of the potential community service and conditional uses are unlikely to occur, and others are unlikely to conflict with protection of scenic values, consideration must still be given as to whether the ESEE impacts would be so great that the uses should be prohibited or regulated through the use of standards which would protect scenic qualities. The conflicts created by these miscellaneous uses would be the result of removal of vegetation, possible changes to landform, structure height, size, color and reflectivity.

Agriculture: Agricultural uses and buildings are allowed in all three zones within the West Hills. Conversion of large areas from forest to agriculture would create a patchwork appearance and detract from the integrity and unity of the forested hillsides. Analysis of soils in the study area, however, shows that very little of the area is made up of agricultural soils (SCS Class I - IV). Only a small area near the ridge along McNamee Road, and some land along Highway 30 in the Holbrook / Burlington area qualify as agricultural soils. Air photos show that much of this area is already cleared and in small-scale agricultural use, or is residentially developed. Steep slopes and soils with a much higher productivity for timber production will discourage further conversion of forested lands to agricultural use. Consequently, since agricultural use is unlikely to increase, it will not be considered a conflicting use.

3. ESEE ANALYSIS:

The economic, social, environmental and energy (ESEE) impacts that a conflicting use would have on the scenic landscape of the West Hills, and the impacts that preservation of scenic qualities would have on conflicting uses, forms the basis of the analysis which will be used to determine which conflicting uses should continue to be allowed, which should not be allowed, and which should be allowed only under specific conditions. The impacts of a conflicting use vary depending upon if the use would be prohibited entirely or if restrictions or design standards are placed on the development in order to lessen the impact of

the use on scenic attributes. Consequently, the ESEE impacts of both prohibition and the use of design standards will be considered. The following analysis will first examine the impacts on scenic qualities if conflicting uses are allowed fully, then examine the impacts on each identified conflicting use if the West Hills are protected for their scenic value. Since the impact to scenic quality will be similar, regardless of the specific conflicting use, the ESEE analysis of impacts on the scenic resource will be a combined analysis of all conflicting uses.

a. Impacts on the Scenic Attributes of the West Hills if Conflicting Uses are Allowed

Economic Consequences: There is no known way to place an economic value on scenic quality:

> *"The value of a mineral deposit or of a standing tree (as a lumber source) is typically determined by its price in some appropriate market....Esthetic resources, however, have not traditionally been part of the market system, and it has proven very difficult, if not impossible, to evaluate them in the same manner as market or commodity resources."* [3]

Consequently, there is no quantifiable way to measure economic impacts to scenic attributes if conflicting uses are allowed. There are few direct economic benefits of preserving the scenery of the West Hills - there are no businesses which depend solely upon the views to bring in customers. People would not stop going to Sauvie Island or driving Highway 30 if the scenic value of the Hills was lessened. However, scenic protection may provide some less direct economic benefits related to the quality of life in the county, which is an attraction to new business, conventions, and tourism.[4] These indirect economic benefits could be lessened if conflicting uses cause impacts to the scenic attributes.

Social Consequences: The West Hills provide aesthetic enjoyment to residents of the county and region. The scenic backdrop adds enjoyment to recreational activities on Sauvie Island and surrounding waterways. While the ability to pursue these recreational activities would not end if conflicting uses are allowed, the degree of enjoyment might be lessened. The West Hills also have a psychological value to some people, being perceived as an integral and important part of the forested landscape linking Forest Park to the Coast Range, and contributing to the image of a natural area on the outskirts of the city. Degradation of scenic qualities caused by a conflicting use would have a social/public impact if the degradation occurred over a large enough area to lessen the recreational enjoyment or psychological value currently provided by the landscape.

Environmental Consequences: Preservation of the natural features of the West Hills - the forests and undeveloped expanses - has environmental benefits to wildlife, water and air quality, streams and fish habitat. Several studies have been done showing the importance of the West Hills as a wildlife corridor allowing movement of animals between Forest Park and the Coast Range (Lev, Fugate and Sharpe, "A Study of Forest Wildlife Habitat in the West Hills; Houle, "Wild About the City"). There are sever-

al Class I streams within the study area, which benefit from retention of surrounding natural vegetation. Conflicting uses which remove vegetation or alter the topography that forms the scenic landscape also have an environmental impact on fish and wildlife habitat. Much of the study area is also subject to erosion hazards. Retention of natural vegetation decreases the potential for erosion related problems, landslides and runoff.

Energy Consequences: An increase in the number of residences, industry and businesses in the West Hills would result in an increase in energy use caused by additional transportation trip generation to and from the area.

b. Impacts on Forestry if the Scenic Resource is Protected

Economic Consequences: Almost the entire West Hills area contains soils which are highly productive for timber production, capable of producing well over 100 cubic feet of Douglas Fir timber per year. The forest resources are worth millions of dollars, providing jobs, taxes, and revenue from the sale of raw logs and lumber products. Restrictions on logging in order to protect scenic attributes would cause substantial economic losses.

Social Consequences: The timber industry and associated "timber town" lifestyle provides social links to a way of life important to many people in the state. The heritage of harvesting forest resources psychologically ties many families to the region. Restrictions on logging would impact these families.

Environmental Consequences: Logging is seldom considered to be environmentally beneficial. Management practices involving clear-cutting, slash burning, herbicide and pesticide application, and replanting with mono-species are all damaging to the natural environment. However, the Oregon Forest Practices Act (FPA) includes provisions to provide environmental protections, requires buffers along streams, and requires replanting of logged areas. The FPA Rule also contains provisions limiting logging within a 150 foot visual corridor adjacent to scenic highways, including Highway 30. Logging can be considered a temporary activity, with regrowth beginning within a few years. The textural and color variety provided by logged areas at different stages of regrowth even adds to the scenic quality of the West Hills. Environmental impacts if logging were curtailed in order to protect scenic qualities would be an older, less productive forest with a greater possibility of disease and insect infestation.

Energy Consequences: Curtailed logging would result in a decrease in energy used by logging operations and the transportation of logs to mills or shipping facilities. On a much larger scale, if curtailment of logging led to a shortage of lumber products for construction needs in the region, greater amounts of energy would be required to transport lumber from out-of-state or foreign markets or less energy efficient building materials might be required.

Statewide Planning Goals: Goal 4, Forest Lands, aims to conserve forest lands and protect the state's forest economy. Forest operations, practices and auxiliary uses are

subject only to such regulation of uses as are found in ORS 527.722, which states that

> *"no unit of local government shall adopt any rules, regulations or ordinances or take any other actions that prohibit, limit, regulate, subject to approval or in any other way affect forest practices on forestlands located outside of an acknowledged urban growth boundary."*

Consequently, regardless of any impacts forest practices may have on scenic qualities, the county cannot place restrictions on forest practices.

c. Impacts of Residential Uses if the Scenic Resource is Protected

Economic Consequences: There would be an economic impact to property owners in the West Hills if residential development is prohibited, since the purchase price and tax assessment of a lot is often based on the supposition that a residence will be allowed on the property. Prohibition of residential development would also lessen potential tax revenue to the county - forested parcels normally receive special tax deferrals, while residences are assessed at full value.

Regulations on location and/or design of houses in order to make them less visible from key viewing areas would have minimal economic impact on building costs. Potential value may be lessened on some view properties if a house is not allowed to be located in a position that provides the best views from the property.

Social Consequences: Rural residences are sought by many people for their privacy and natural values. Many people also feel they are better able to manage their property if they live on-site. Prohibition of development would prevent these social benefits. Another important social impact is the property rights issue. Prohibition of residential development in order to preserve scenic qualities would be considered by many to be a "taking" of private property for public benefit.

Allowing residential development but placing regulations on siting, screening and design in order to lessen the visual impact of the house would have a much less serious social impact.

Environmental Consequences: Residential use often causes environmental problems by destroying or interrupting wildlife habitat, causing erosion, runoff or drainage problems, introducing non-native plant species, and increasing fire hazards in forested areas. Often the most suitable building site on a property is near a ridgetop because it is the most level area, is the most suitable for a septic drainfield, and has the least slope hazard. This is also the area where a house is likely to be most visible if it is silhouetted against the skyline.

Siting standards which require building on less visible areas of a property could increase environmental impacts caused by erosion and drainage problems. Screening requirements in order to protect the forested appearance of the Hills could contribute to environmental impacts in the event of a fire. For instance, the existing CFU code

requires fire safety perimeters around dwellings to help prevent the spread of fire. These cleared areas may conflict with the desire to screen housing from key viewing areas.

Energy Consequences: Energy impacts related to transportation would be lessened if residential development were prohibited, because fewer trips would be made to and from shopping and employment.

Statewide Planning Goals: Goal 10, Housing, focuses on providing appropriate housing types to meet needs within urban growth boundaries. It indicates that ordinances and incentives should be used to increase population densities in urban areas rather than rural areas like the West Hills.

d. Impacts on Mining if the Scenic Resource is Protected

Economic Consequences: Mining provides economic benefits through jobs, tax revenue, and sale of rock resources. The rock material at the Angell Brother's Quarry is estimated to be worth $42 million, and the site provides a direct payroll of about $500,000, employing an average of 12 people, as well as an indirect payroll from others who work directly for customers of Angell Brothers.[5] The Angell Brother's quarry and other potential mining sites in the West Hills have the additional economic benefit of being located relatively close to areas of development, since transportation costs can result in up to 50 percent of the total consumer price of aggregate, increasing costs for homes, roads, sewers, and other construction projects.[6] Major projects, such as roads, benefit from having a rock source nearby. For instance, the ODOT quarry adjacent to Highway 30, near Rocky Point Road, provided the rock material for a project to realign and widen Highway 30 in the 1970s. Prohibition of mining activities in order to protect scenic resources would impact the cost of such projects.

Enactment of regulations or standards which would allow mining under specific conditions that are designed to protect scenic quality may cause some increased economic cost to the operator by limiting the size of the working face, requiring earlier reclamation, additional screening, etc.

Social Consequences: Mineral and aggregate resources are necessary for construction of streets, sewers and buildings. On the average, approximately 15 tons of aggregate materials are used annually for every person in the state.[7] Rock and aggregate supplies are limited and diminishing. Consequently, mining in the West Hills provides a social benefit by providing a needed supply of rock and aggregate material for private and public construction projects in the county and region. Prohibition of mining would have a social impact by removing access to a local source of a needed construction material.

Restrictions or standards which allow mining under conditions that also protect scenic values could cause a decreased availability of aggregate resources.

Environmental Consequences: Mining activities require removal of vegetation and top soil and may result in changes to the landform. Mining operations are regulated by the Department of Environmental Quality (DEQ), which requires screening, buffering and compliance with environmental standards, and the Oregon Department of Geology and Mineral Industries (DOGAMI), which regulates reclamation and issues permits. Additional environmental concerns are addressed through the existing county conditional use permitting process. Prohibition of mining will simply transfer environmental impacts to another site, since mineral and aggregate resources are a necessary construction material. Prohibition, however, will not have an environmental impact on the ability to use the rock resource at a later date - the resources would still be available for future extraction.

The environmental impacts on a mining operation if standards are enacted in order to preserve scenic qualities might include a loss of mineable area due to increased buffer or screening requirements, size limits on the exposed mining area, or more stringent reclamation requirements.

Energy Consequences: Energy used for transportation of rock material is a major consideration and factor in the cost of material. In 1987, the Portland area accounted for 35 percent of the State's annual aggregate demand.[8] Mineral and aggregate sources close to Portland result in less energy used for transportation. Prohibition of mining in the West Hills would have an energy impact by causing increased energy use to transport materials from more distant quarries to the Portland area.

Standards or restrictions on mining to protect scenic quality would have minimal energy impact to the mining operation.

Statewide Planning Goals: Mineral and aggregate resources are a Goal 5 resource. All Goal 5 significant resources must be given the same relative weight in the conflict resolution process. The county must attempt to protect all significant resources for their intended purposes. To date, the Hidden Valley quarry (now depleted and converted to another use) and the Angell Brothers site have been determined to be significant under the Goal 5 process. There is insufficient information to determine the significance of the ODOT quarry or other potential mineral and aggregate sites in the West Hills. Resources not yet determined to be significant need not be given special protection under Goal 5. Prohibition of mining would not comply with the purpose and intent of Goal 5, but standards and regulations to limit the impacts of mining on scenic qualities would conform with the Goal.

e. Impacts on Community Service and Conditional Uses if the Scenic Resource is Protected

Economic Consequences: Prohibition of business and industrial uses would prevent the creation of new jobs, income and taxes. However, the potential number of such uses is likely very small because of the rural nature of the area and the lack of utilities and other services. Since conditional use or community service use approval is required, there would be no effect on current property values if the uses were prohibit-

ed, since the assessed value is based on the existing rural zoning rather than these potential uses.

The likely location for new commercial and service businesses is along Highway 30, which would allow a business to profit from exposure to traffic. Regulations, such as screening, that would attempt to make the buildings less visible in order to protect scenery could have a negative economic impact on the business by limiting the "free advertising" provided by Highway frontage. The use of standards to mitigate the visibility of the would cause minimal economic impact.

Social Consequences: Community service uses are generally based on public need for services or facilities. Businesses that serve the local community provide a social benefit by providing needed goods and services in close proximity to area residents and, in the case of the Burlington area, contributing to a sense of community identity. Prohibition of these uses would have a social impact by causing area residents to drive to Portland or Scappoose for employment, shopping and services. Standards to regulate the visibility of the use would have little social impact.

Environmental Consequences: A few of the possible other uses, such as structures for protection of water, soil, open space, forest and wildlife resources, would have environmental benefits that would be lost if the use were prohibited. These environmental benefits might also improve scenic qualities. Environmental impacts to other uses would center around effects from locating the buildings on portions of a property that may be less suitable for development.

Energy Consequences: The purpose of many rural businesses and community service uses is to provide services to local residents. If these services are not available locally, energy used in travel increases. New business and industry would also provide local employment, decreasing transportation energy use.

Statewide Planning Goals: Goal 9, Economic Development, calls for adequate opportunities for a variety of economic activities in the state. The opportunity for local businesses and industries that process local resources and serve local residents should be provided.

4. RESOURCE ANALYSIS SUMMARY:

a. General Conclusions

1. The position of viewers of the West Hills, which is below the landscape, along with intervening topography cause many areas to not be visible from identified key viewing areas. The largest such area is between McNamee Road and Skyline Boulevard. This area should be removed from the designated scenic area. Other smaller areas, scattered throughout the scenic area, should be examined on a case by case basis when a development proposal is made. If either the property or the proposed development will not be visible from any key viewing area, no restrictions should be placed on the proposed use.

2. The size of a proposed development, the number and distance of key viewing areas that would see the development, and the length of time the development would be seen from a key viewing corridor, should be considered when determining whether the development is appropriate or what design and/or locational criteria should be applied.

3. The amount of new development that could occur in the scenic area is limited due to the large lot size and other restrictions on uses in the CFU zone, which occurs on 94 percent of the scenic area. Uses that would conflict with preservation of scenic qualities include forestry, residential development, mining, commercial business and industry, and various other community service and conditional uses which could be allowed by zoning.

4. The ESEE analysis shows that the benefits of protecting the scenic area are mostly aesthetic in nature, and in general, the impacts of not allowing a conflicting use are more severe than allowing the conflicting use in a limited manner. This leads to the conclusion that preservation of scenic qualities can be managed in a manner that allows conflicting uses under specific conditions. However, this conclusion must be examined in light of the other Goal 5 resources within the scenic area - wildlife habitat, streams and water resources, and the Angell Brothers mineral and aggregate resource site. Chapter VI, 'Conflict Resolution and Protection Program for West Hills Goal 5 Resources' will analyze the relative importance of each of these Goal 5 resources in relation to each other, as well as resolving conflicts between conflicting uses identified in Chapters I through V.

b. Synopsis of ESEE consequences

<u>Impacts if Forestry is not allowed</u>
Economic: Loss of jobs, taxes, and revenue from sales
Social: End to resource-based lifestyle/heritage for some families
Environmental: Older, less productive forest, possibility of disease and infestation
Energy: Possibility of greater energy expenditure to import wood products
Goal 4: County cannot prohibit forest practices

<u>Impacts if Forestry is allowed in a limited manner</u>
Economic: Possible loss of some jobs, taxes, and revenue from sales
Social: No impacts
Environmental: No impacts
Energy: No impacts
Goal 4: County cannot limit or regulate forest practices

<u>Impacts if Forestry is allowed fully</u>
Economic: Loss of indirect benefits related to quality of life
Social: Loss of aesthetic enjoyment
Environmental: Less protection of fish and wildlife habitat, water and air quality
Energy: No impact

Impacts if Residential Uses are not allowed

Economic: Lower property value, less tax revenue
Social: Loss to persons wishing to live on property, "takings" issue
Environmental: No impacts
Energy: No impacts

Impacts if Residential Uses are allowed in a limited manner

Economic: Possible partial loss of value if siting standards restrict views from property
Social: Additional layer of approvals needed prior to building
Environmental: Possible increase in erosion, drainage problems and fire hazards
Energy: No impacts

Impacts if Residential Uses are allowed fully

Economic: Loss of indirect benefits related to quality of life
Social: Loss of aesthetic enjoyment
Environmental: Less protection of fish and wildlife habitat, water and air quality
Energy: No impact

Impacts if Mining is not allowed

Economic: Loss of jobs, taxes, and revenue from sales; increased costs to consumers
Social: Loss of needed construction material
Environmental: No impacts
Energy: Increased transportation to import aggregate materials
Goal 5: Would require "3-B" designation of significant aggregate sites

Impacts if Mining is allowed in a limited manner

Economic: Possible loss of some jobs, taxes, and revenue from sales
Social: Less availability of needed construction material
Environmental: More stringent buffering and reclamation requirements
Energy: Some increase in transportation to import aggregate
Goal 5: Would require "3-C" designation of significant aggregate sites

Impacts if Mining is allowed fully

Economic: Loss of indirect benefits related to quality of life
Social: Loss of aesthetic enjoyment
Environmental: Less protection of fish and wildlife habitat, water and air quality
Energy: No impact

Impacts if Community Service and Conditional Uses are not allowed

Economic: No new jobs/income/taxes
Social: No new providers of local goods and services
Environmental: Insignificant
Energy: Continuing energy used for transportation to obtain goods, services, and employment outside area

Goal 9: Decreased opportunity for local economic development

Impacts if Community Service and Conditional Uses are allowed in a limited manner
Economic: No impacts
Social: No impacts
Environmental: Possible impacts related to siting
Energy: No impacts
Goal 9: Compatible with Goal

Impacts if Community Service and Conditional Uses are allowed fully
Economic: Loss of indirect benefits related to quality of life
Social: Loss of aesthetic enjoyment
Environmental: Less protection of fish and wildlife habitat, water and air quality
Energy: No impact

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1. Forest Landscape Description and Inventories, R. Burton Litton, Jr. USDA Forest Service Research Paper, PSW - 49, 1968.

2. U.S. Forest Service, National Forest Landscape Management, Volume 1, USDA Agricultural Handbook No. 434.

3. "Assessment of Esthetic Resources", Terry C. Daniel and Ervin H. Zube, in Assessing Amenity Resource Values, USDA General Technical Report, RM - 68, 1979.

4. Letter from Gretchen Kafoury, City of Portland Commissioner, regarding Angell Brothers expansion (CU 14-92), dated September 1, 1992.

5. Letter from Frank Parisi, regarding Angell Brothers expansion (file CU 14-92), dated October 12, 1992.

6. Multnomah County Comprehensive Framework Plan, Volume I (1989 Supplement). page 21.

7. OCAPA Handbook for Applying Goal 5 to Aggregate Resources, page 21.

8. Multnomah County Comprehensive Framework Plan, Volume I (1989 Supplement). page 21.

C. APPENDIX
RESPONSE TO PUBLIC COMMENTS

A. SIGNIFICANCE

Location:

1. Scenic drives not recognized as significant

ISSUE: Should various roads within the scenic area be designated as significant?

ISSUE RAISED BY: Arnold Rochlin/Friends of Forest Park

DISCUSSION: Testimony was received at previous hearings regarding the scenic nature of travel corridors in the West Hills, both roads and the Multnomah Channel. These were not included in the significance analysis because (as was explained at the previous hearings), time constraints limited the present study to consideration of the previously identified "1-B" resource - scenic views **of** the West Hills - rather than trying to identify new scenic resources. Both the Planning Commission and Board recognized that analysis of the scenic views of the West Hills was required as part of Periodic Review, and neither body indicated that this analysis should be expanded to include roads or other previously unidentified resources.

RESPONSE: Consideration of scenic corridors will not be part of the present Periodic Review work program due to time and staff constraints.

2. Removal of McNamee Road "not seen" area

ISSUE: Should the area between McNamee Road and Skyline Boulevard in the southwest corner of the study area be included or removed from the scenic area?

ISSUE RAISED BY: Arnold Rochlin/Friends of Forest Park, Michael Carlson/Audubon Society

DISCUSSION: The area in question had been included in the original study area which was designated as significant by the Board. Further analysis has shown that this area cannot be seen from any of the identified key viewing areas because the ridgeline along McNamee Road is higher that the ridgeline along Skyline Boulevard. Consequently, the current staff report recommends that this area not be included in the designated significant scenic resource area.

RESPONSE: The area has been recommended for removal from the scenic resource area. The Board will make the final decision to include or remove it. Meanwhile, the area has not been included in the ESEE analysis because there are no conflicting uses in the area (see Conflicting Use analysis, page 11).

Quality:

1. Scenic resources need to be "outstanding".

ISSUE: Do the West Hills need to be outstanding in order to be significant?

ISSUE RAISED BY: Richard Shepard

DISCUSSION: OAR 660-16-000(1) states that the significance analysis includes whether a scenic area is "outstanding", and Goal 5 states that the location, quality and quantity of "outstanding" scenic views and sites shall be inventoried. Board Resolution 93-371, which designated the West Hills as a significant scenic resource, included language recognizing that OAR 660-16 requires analysis of whether a scenic area is outstanding. However, the findings and conclusions adopted by the Board do not further mention the word.

RESPONSE: It is likely that by finding the West Hills to be a significant scenic resource, the Board felt that the location, quality, and quantity make it outstanding. In order to make the West Hills Reconciliation Report and final decision more legally defensible, Chapter II has been revised to include findings that the scenic resource is outstanding.

2. Number of viewers, static or mobile

ISSUE: How many people view the West Hills scenery, and how many of those viewers are driving?

ISSUE RAISED BY: Richard Shepard, Art Wagner/CAC, Chris Wrench/CAC

DISCUSSION: Comments focused on there being no definitive figures for the numbers of people viewing the West Hills landscape, how many are people driving by and so are only briefly exposed to various portions of the view, and how many are engaged in other recreational activities so are not paying attention to the views. The figure of 200,000 visitors to Sauvie Island annually was raised (comments received at previous hearings used figures of 750,000, 800,000 and double 800,000), but there has been no evidence submitted to verify the accuracy of this figure or how it was obtained. In addition, there is no way to determine how important viewing the West Hills scenery was to any of these visitors.

RESPONSE: The Staff Report has been revised to reflect that there are no definitive figures for how many people view the West Hills and from what specific places.

b. RESOURCE ANALYSIS

Conflicting Uses:

1. Viewing perspective, viewer distance, important viewing areas

ISSUE: Viewing perspective, distance from which the resource is viewed, and key viewing areas all need to be identified in order to facilitate the conflicting use analysis.

ISSUE RAISED BY: Steve Oulman/DLCD, Richard Shepard

DISCUSSION: Comments focus on the need to define more clearly the aspects of viewing the West Hills, such as how far away viewers will be and whether the viewer is travelling past at a high rate of speed on Highway 30 so is only briefly exposed to various views.

RESPONSE: These viewing parameters are discussed in the conflicting uses section of the Resource Analysis (pages 9 - 11).

2. Potential residential development

ISSUE: What is the potential for division of land and approval of dwellings in the CFU zoned areas of the scenic area?

ISSUE RAISED BY: Michael Carlson/Audubon, Arnold Rochlin/Friends of Forest Park

DISCUSSION: The original Staff Report indicated that land in large tracts owned by commercial timber companies was unlikely to be divided and developed, and that the 80 acre minimum lot size in the CFU district would allow a maximum of around 100 new houses. The 100 new houses figure applies to total potential, regardless of existing parcel size and includes the number of houses that could be built if the large commercial tracts are divided.

RESPONSE: Language in the report has been revised to be more explanatory (see page 12).

3. Description of mining conflicts

ISSUE: Is the Staff Report description of mining biased?

ISSUE RAISED BY: Richard Shepard

DISCUSSION: Commentor feel that language describing mining conflicts is emotionally-charged and biased when compared to language describing conflicts caused by forestry and residential development.

RESPONSE: Language has been modified to indicate that the conflicts are potential rather that certain to occur.

ESEE Analysis:

1. Mining impact

ISSUE: Is mining a temporary activity? Can a quarry be reclaimed in a manner that will blend with the surrounding forested landscape?

ISSUE RAISED BY: Michael Carlson/Audubon, Arnold Rochlin/Friends of Forest Park

DISCUSSION: Commentors take issue with the Staff Report statement that mining activities, like logging, are temporary in nature, asserting that the impacts of mining are not temporary. They also comment that evidence indicates reclamation in a manner that will blend with the surrounding forested landscape is not possible.

RESPONSE: The Staff Report does raise the issue of whether adequate reclamation is possible (pg. 13), but delays reaching a conclusion about the conflicts between mining and the preservation of scenic attributes until the reconciliation phase of this study. ESEE impacts of mining are adequately addressed.

Conflict Resolution:

1. Balancing Goal 5 resources

ISSUE: Are all Goal 5 resources required to be given equal weight?

ISSUE RAISED BY: Arnold Rochlin/Friends of Forest Park, Richard Shepard

DISCUSSION: The Staff Report states that the county is required to give equal weight to the protection of all Goal 5 resources, and that conflicts between those resouces will be resolved in the Reconciliation portion of this report. One commentor agrees with this statement, the other disagrees, stating that the county must determine the relative value of each resource.

RESPONSE: The county will determine the relative value of conflicting Goal 5 resources during the Reconciliation portions of the report. During the ESEE analysis, Goal 5 resources all have equal weight.

CHAPTER III

STREAM RESOURCES

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A. SIGNIFICANCE DETERMINATION

1. BACKGROUND

Multnomah County's Periodic Review Order was reviewed by the Land Conservation & Development Commission on April 23, 1993 (Remand Order 93-RA-876). Among the actions of the Commission was a finding that the Multnomah County Comprehensive Plan and land use regulations for significant streams do not comply with Goal 5 of the Oregon Statewide Planning Program and Oregon Administrative Rules (OAR) 660, Division 16, which implements the Statewide Planning Program. The Remand Order stated that the County must amend the comprehensive plan to map or identify significant streams.

To complete this work, the County must conduct an inventory of streams in order to determine which are significant. The procedure for determining significance is stated in OAR 660-16-000 (1) through (5). The rule directs the local government to determine whether there is sufficient information on the location, quality, and quantity of the resource at a particular site. The County has determined that the most efficient way to complete this work for the entire County is to conduct stream inventories concurrently with the Rural Area Planning Program, by which rural area plans will be adopted for the entire rural Multnomah County between now and 1998. Currently, the County is completing a rural area plan for the West Hills so a stream inventory is being conducted for this area.

This significance report is the second of two documents completed to date which discuss significance of streams in Multnomah County per the Remand Order. The first of these documents, Multnomah County Ordinance # 784, amends the Multnomah County Comprehensive Plan to provide specific criteria for judging the significance of streams, and adopts a map of streams which have already been determined to be significant pursuant to the criteria.

This significance report covers all of the West Hills Rural Area. This report includes profiles of the following streams:

GILKISON ROAD SUBAREA

Jackson Creek
Joy Creek
Jones Creek
"Rocky Point" Creek
Scappoose Creek

WILDWOOD-MCKAY SUBAREA

E. Fork McKay Creek

North Jackson Creek
"Wildwood" Creek
"North Wildwood" Creek
"Middle Wildwood" Creek
"South Wildwood" Creek

HOLBROOK-LOGIE SUBAREA

"North Rainbow" Creek
"South Rainbow" Creek
"Holbrook" Creek

UPPER ROCK CREEK SUBAREA

South Jackson Creek
Rock Creek (North Main Stem)

FOLKENBERG SUBAREA

McCarthy Creek

MCNAMEE-HARBORTON SUBAREA

"Burlington" Creek
"North Angell Bros." Creek
"Middle Angell Bros." Creek
"South Angell Bros." Creek
"Newberry" Creek
Miller Creek

CORNELIUS PASS SUBAREA

Rock Creek (Middle Main Stem)

GERMANTOWN SUBAREA

Rock Creek (South Main Stem)

BONNY SLOPE SUBAREA

North Bronson Creek
South Bronson Creek

BALCH CREEK SUBAREA

Balch Creek

Saltzman Creek

Maps of all inventoried streams are located at the back of the technical report.

2. LOCATION

The streams surveyed in this report are located within the West Hills Rural Area of Multnomah County. This area, currently subject to the preparation of a rural area plan my Multnomah County, consists of approximately 19,500 acres located in the northwest portion of Multnomah County, north and west of the City of Portland. A map of the West Hills is attached to the back of the technical report. The West Hills is characterized by a central "spine" known as the Tualatin Mountains, which runs parallel to Multnomah Channel to the west. Streams to the east of this "spine" flow into Multnomah Channel through severely steep terrain, while streams to the west are part of the Tualatin River basin and flow through moderately steep terrain.

3. QUANTITY

For a measurement of quantity, the length and drainage area of these streams is summarized in the following table:

TABLE A: MEASUREMENT OF QUANTITY

MCNAMEE-HARBORTON SUBAREA	LENGTH	DRAINAGE AREA
"BURLINGTON" CREEK	1.0 MI.	375 acres
"ANGELL BROS. NORTH" CREEK	0.9 MI.	350 acres
"ANGELL BROS. MIDDLE" CREEK	1.2 MI.	360 acres
"ANGELL BROS. SOUTH" CREEK	0.8 MI.	205 acres
"NEWBERRY" CREEK	1.2 MI.	470 acres
MILLER CREEK(portion in Mult. Co.)	0.3 MI.	200 acres
GILKISON ROAD SUBAREA		
JACKSON CREEK(portion in Mult. Co.)	3.3 MI.	900 acres
JOY CREEK(portion in Mult. Co.)	2.0 MI.	400 acres
JONES CREEK(portion in Mult. Co.)	1.6 MI.	705 acres
"ROCKY POINT" CREEK	1.0 MI.	445 acres
SCAPPOOSE CREEK(portion in Mult. Co.)	2.4 MI.	545 acres

	LENGTH	DRAINAGE
WILDWOOD-MCKAY SUBAREA		
EAST FORK MCKAY CREEK	1.8 MI.	735 acres
N. JACKSON CREEK(portion in Mult. Co.)	2.6 MI.	780 acres
WILDWOOD CREEK-MAIN STEM	0.2 MI.	90 acres
NORTH WILDWOOD CREEK	3.4 MI.	1,015 acres
MIDDLE WILDWOOD CREEK	2.0 MI.	645 acres
SOUTH WILDWOOD CREEK	2.7 MI.	600 acres
HOLBROOK-LOGIE SUBAREA		
NORTH "RAINBOW" CREEK	2.0 MI.	775 acres
SOUTH "RAINBOW" CREEK	1.8 MI.	510 acres
"HOLBROOK" CREEK	2.0 MI.	360 acres
UPPER ROCK CREEK AREA		
S. JACKSON CREEK(portion in Mult. Co.)	0.8 MI.	120 acres
NORTHERN REACH -- ROCK CREEK	5.4 MI.	2,190 acres
FOLKENBERG AREA		
MCCARTHY CREEK	7.5 MI.	2,100 acres
CORNELIUS PASS AREA		
MIDDLE REACH -- ROCK CREEK	3.0 MI.	1,260 acres
GERMANTOWN ROAD AREA		
SOUTH REACH -- ROCK CREEK	7.4 MI.	1,780 acres
BONNY SLOPE AREA		
N. BRONSON CREEK(portion in Mult. Co.)	1.0 MI.	210 acres
S. BRONSON CREEK(portion in Mult. Co.)	1.4 MI.	395 acres
BALCH CREEK AREA		
BALCH CREEK(portion in Mult.Co.)	2.8 MI.	700 acres
SALTZMAN CREEK(portion in Mult. Co.)	0.7 MI.	195 acres
TOTAL FOR WEST HILLS STREAMS	**64.2 MILES**	**19,425 acres**

This list is a compilation of all streams mapped on USGS 2000 scale maps of the West Hills Rural Area.

Precise comparisons with stream mileages and drainage areas for other areas of Multnomah County cannot be made due to lack of data on these areas. Following is a general description of stream resource quantity for other areas of Multnomah County.

a. Sauvie Island

Sauvie Island is approximately 26 square miles(16,600 acres) in size. Since the island is virtually flat, waterways on the island are of a much different nature than those of the West Hills, being best characterized as drainage ways for runoff from adjacent agricultural lands and as sloughs and wetlands.

b. Eastern Multnomah County Non-Urban Areas

Eastern Multnomah County Non-Urban areas are about 196 square miles (126,000 acres) in size. They contain a multitude of stream resources, including the Sandy River and its numerous tributaries (most notably the Bull Run River) and various streams which flow into the Columbia River in the Columbia Gorge. While the totality of these stream resources have not been specifically quantified, they are clearly more numerous in terms of both stream miles and drainage area than those of the West Hills.

Individually, none of the West Hills rural area streams is significant in terms of quantity when compared not only with the remainder of Multnomah County but also with the remainder of the West Hills rural area. As a whole, the West Hills quantity of streams is much less than that of Eastern Multnomah County. However, these two areas are not directly comparable, since they occupy opposite sides of Multnomah County and have quite different physical features and geographical contexts. When taken as a whole, the body of streams in the West Hills rural area is significant in terms of quantity.

4. QUALITY

The quality of the West Hills rural area streams is measured by the five criteria adopted by Multnomah County as part of Ordinance 784 discussed above and contained within Policy 1 6-G of the Multnomah County Comprehensive Framework Plan. These criteria, and the measurements used to judge these criteria, are discussed extensively in the Technical Appendix to this report.

Based upon the inventory of streams conducted by SRI/Shapiro and contained in the Appendix, all but two of the streams inventoried meet at least one of the criteria for significance stated in Policy 1 6-G of the Multnomah County Comprehensive Plan. The two streams which did not meet any of the criteria are the "Angell Bros. South" and "Newberry" Streams -- these streams are discussed in the separate report on McNamee-Harborton streams.

In terms of quality relative to other streams in the West Hills, the following table summarizes each West Hills Stream and ranks it according to quality with the other streams surveyed. The measurement used is number of Comprehensive Framework Plan criteria met by the stream (five criteria).

TABLE B -- STREAMS QUALITY RANKING

STREAM	CRITERIA MET
Rock Creek - North Reach	5
Rock Creek - Middle Reach	5
Rock Creek - South Reach	5
Balch Creek	5
South "Wildwood" Creek	4
Miller Creek	4
Jackson Creek	3
Joy Creek	3
Jones Creek	3
"Rocky Point" Creek	3
Scappoose Creek	3
North "Wildwood" Creek	3
Middle "Wildwood" Creek	3
South "Rainbow" Creek	3
North Bronson Creek	3
South Bronson Creek	3
"North Angell Bros." Creek	3
East Fork McKay Creek	2
North Jackson Creek	2
"Wildwood" Creek - Main Stem	2
North "Rainbow" Creek	2
"Holbrook" Creek	2
South Jackson Creek	2
McCarthy Creek	2
Saltzman Creek	1
"Burlington" Creek	1
"South Angell Bros." Creek	0
"Newberry" Creek	0

As with quantity, Multnomah County has yet obtained very limited information on the relative quality of the West Hills streams vs. other streams in Multnomah County. The following information relative to other areas of Multnomah County is available:

a. Sauvie Island

Sauvie Island contains numerous protected water resources. However, these resources are not directly comparable to the West Hills streams in that they are slow-moving drainages and sloughs on the island's flat terrain.

b. East Multnomah County Rural Area

The Eastern Multnomah County rural area contains numerous significant and high-quality water resources. These include the Sandy River, which is a protected water resource under the Multnomah County Comprehensive Framework Plan. This portion of the County contains a significantly greater number of Class I streams as determined by the Oregon Department of Forestry. Numerous streams in the Columbia Gorge are of high quality due to the undeveloped nature of the area. Streams within the Mt. Hood National Forest, such as the Bull Run River, are also of high quality. Although no comprehensive quantification of East Multnomah County rural area streams has been completed, these streams are undoubtedly of a higher overall quality than the West Hills rural area streams. However, these two areas are not directly comparable, since they occupy opposite sides of Multnomah County and have quite different physical features and geographical contexts.

5. CONCLUSION

All of the West Hills rural area streams inventoried, with two exceptions (see below) are significant streams based upon the above description of location, quantity, and quality and are designated "I-C".

"Angell Bros. South" Creek and "and "Newberry" Creek are not significant streams based upon the above description of location, quantity, and quality and are designated "1 -A".

B. RESOURCE ANALYSIS

1. INTRODUCTION

The analysis of significant streams is an element of the broader analysis of water resources as required by Goal 5. The stream analysis is focused on stream channels and the riparian zone along stream channels. This analysis does not directly address associated wetlands or the watershed outside the riparian zone. It is recognized that other Goal 5 studies including the Wildlife Habitat analysis and the analysis of Scenic Resources will address resource protection on a broad scale and will discuss impacts similar to those that will affect the watershed as a whole.

As part of the Goal 5 process, streams were inventoried to determine location, quantity, and quality. The qualitative aspect of each stream was examined using a modified "streamwalk" methodology and a wildlife habitat assessment process. Field inventory data sheets were prepared for two-tenths mile segments. The "streamwalk" data forms included the collection of information related to the stream channel, streambank stability, the width of the riparian corridor, streamside vegetation, stream conditions, and adjacent land use. The wildlife habitat assessment forms addressed habitat in terms of the presence of water, food, and cover. The inventory was valuable in assessing the significance of each stream. It was also valuable in providing information on riparian zone width, wetlands, and adjacent

uses. This data is important in addressing impact areas and conflicting uses.

The Goal 5 analysis is designed to meet the requirements of the Goal 5 Administrative Rule (OAR Chapter 660, Division 16). The report will address impact areas, conflicting uses, and the economic, social, environmental, and energy (ESEE) consequences of conflicting uses. Each component of the analysis is organized by county study area.

2. DESCRIPTION OF RESOURCE

This report discusses significant streams in ten sub-regions of the West Hills Rural Area. Most of the streams drain eastward to Multnomah Channel; some, such as Jackson and Rock Creeks, drain westward to the Tualatin River. The sub-regions lie generally between U.S. Highway 30 and the Multnomah/Washington County line in west Multnomah County. A map of the sites is contained within the Technical Appendix relating to significance at the back of this report.

The significant streams discussed in this Resource Analysis Report are shown in Table 1.

The rationale for determining that these streams are significant is contained within the attached Appendix relating to significance at the back of this report.

3. IMPACT AREAS

The impact area for this study is the riparian zone along each stream. The riparian zone influences the quality and health of the stream and varies in width. It is affected by adjacent slope and the size of the vegetation along the stream. Generally, wider riparian zones have steep slopes with large trees, which shade the stream and contribute woody debris to the stream channel.

For streams that flow through or contribute water to public parks or to recreation areas used by the public, the impact area includes the downstream park or recreational facility.

Each stream is examined in terms of the number of properties abutting the stream and the zoning of the adjacent properties. The property/land use data provided is based on County study area maps.

Streams in the West Hills Rural Area are listed by sub-region in Table 2. Streams listed met the County's significance criteria.

The impact area (width of riparian corridor) and the land use adjacent to streams within each sub-region are discussed in Table 3. The uses were noted by field survey teams during the inventory process.

TABLE 1. Significant Streams

Stream	Length (feet)	Length (miles)	Drainage Area (acres*)
GILKINSON ROAD AREA			
Jackson Creek	17,424	3.3	900
Joy Creek	12,280	2.3	400
Jones Creek	8,450	1.6	705
Rocky Point Creek	5,280	1.0	445
Scappoose Creek	12,660	2.4	545
WILDWOOD–MCKAY AREA			
East Fork McKay Creek	9,500	1.8	735
North Jackson Creek	13,730	2.6	780
Wildwood Creek	1,000	0.2	90
North Wildwood Creek	17,950	3.4	990
Middle Wildwood Creek	10,630	2.0	580
South Wildwood Creek	14,050	2.7	600
HOLBROOK–LOGIE AREA			
North Rainbow Creek	10,570	2.0	775
South Rainbow Creek	9,390	1.8	510
Holbrook Creek	10,560	2.0	360
UPPER ROCK CREEK AREA			
South Jackson Creek	4,220	0.8	120
North Rock Creek	28,510	5.4	2,190
FOLKENBERG AREA			
McCarthy Creek	39,490	7.5	2,100
CORNELIUS PASS AREA			
Middle Rock Creek	15,590	3.0	1,260
GERMANTOWN AREA			
South Rock Creek	39,010	7.4	1,780
BONNY SLOPE AREA			
North Bronson Creek	5,280	6.0	210
South Bronson Creek	7,390	1.4	395
BALCH CREEK AREA			
Balch Creek	14,100	2.8	700
Saltzman Creek	3,696	0.7	195

*Note: Acreage within individual study areas.

TABLE 1 CONTD.

Stream	Length		Drainage Area (acres)
	(feet)	(miles)	
MCNAMEE-HARBORTON AREA			
Burlington Creek	5,400	1.0	375
North Angell Brothers Creek	4,500	0.9	350
Miller Creek	1,700**	0.3	200***

** within Multnomah County jurisdiction, 10,204 feet total and 408 acre watershed for portion in County and City of Portland

TABLE 2. Land Use Data

Stream	No. of Adj. Properties	Zoning*				
		EFU	CFU	MUA	RR	R10
GILKINSON ROAD AREA						
Jackson Creek	14		12		2	
Joy Creek	25		17		8	
Jones Creek	14		14			
Rocky Point Creek	5		5			
Scappoose Creek	7		7			
WILDWOOD–MCKAY AREA						
East Fork McKay Creek	4		4			
North Jackson Creek	6		6			
Wildwood Creek	2		2			
North Wildwood Creek	8		8			
Middle Wildwood Creek	5		5			
South Wildwood Creek	14		14			
HOLBROOK–LOGIE AREA						
North Rainbow Creek	13		13			
South Rainbow Creek	12		4		8	
Holbrook Creek	12		11		1	
UPPER ROCK CREEK AREA						
South Jackson Creek	3		3			
North Rock Creek	65		59		6	
FOLKENBERG AREA						
McCarthy Creek	76		31		45	
CORNELIUS PASS AREA						
Middle Rock Creek	29	11	9	1	8	
GERMANTOWN AREA						
South Rock Creek	62	19	17	6	20	
BONNY SLOPE AREA						
North Bronson Creek	7		2		5	
South Bronson Creek	22				22	
BALCH CREEK AREA						
Balch Creek	34		32			2
Saltzman Creek	6		3		3	

***Note:**
EFU = Exclusive Farm Use
CFU = Commercial Forestry Use
MUA = Multiple Use Agriculture
RR = Rural Residential
R10 = Single Family Residential

TABLE 2 CONTD.

Stream	No. of Adj. Properties	Zoning				
		EFU	CFU	MUA	RR	R10
MCNAMEE-HARBORTON AREA						
Burlington Creek	8		8			
North Angell Brothers Creek	4		4			
Miller Creek	7		5		2	

TABLE 3. Impact Area and Adjacent Land Uses

Stream	Riparian Zone		Adjacent Land Uses:				
	Average Width	Range	Logging	Agriculture	Residential	Community Service (Recreation, Commercial)	Roads
GILKINSON ROAD AREA							
Jackson Creek	132	30–400	X	X	X		X
Joy Creek	86	50–150	X	X	X		X
Jones Creek	206	120–300	X		X		X
Rocky Point Creek	200	100–300	X				X
Scappoose Creek	198	40–400	X				X
WILDWOOD–MCKAY AREA							
East Fork McKay Creek	199	40–400	X	X			X
North Jackson Creek	202	20–400	X	X			X
Wildwood Creek	N/A	N/A	X			X	X
North Wildwood Creek	94	30–200	X				X
Middle Wildwood Creek	134	20–400	X				X
South Wildwood Creek	98	40–275	X		X		X
HOLBROOK–LOGIE AREA							
North Rainbow Creek	137	40–300	X		X		X
South Rainbow Creek	55	5–150	X		X		X
Holbrook Creek	157	30–300	X	X	X		X
UPPER ROCK CREEK AREA							
South Jackson Creek	350	300–400	X	X	X		X
North Rock Creek	194	100–400	X	X	X	X	X
FOLKENBERG AREA							
McCarthy Creek	119	20–300	X	X	X	X	X
CORNELIUS PASS AREA							
Middle Rock Creek	134	110–155		X	X		X
GERMANTOWN AREA							
South Rock Creek	69	10–300		X	X		X
BONNY SLOPE AREA							
North Bronson Creek	119	80–150	X	X	X		X
South Bronson Creek	94	40–200		X	X		X
BALCH CREEK AREA							
Balch Creek	98	10–160			X	X	X
Saltzman Creek	N/A	N/A			X		X

KEY:

X	=	Clearly Impacting Stream
X	=	Use Present
N/A	=	No Access

TABLE 3 CONTD.

Stream	Riparian Zone		Adjacent Land Uses				
	Avg. Width	Range	Logging	Agri-culture	Residen-tial	Comm. Service	Roads
MCNAMEE-HARBORTON AREA							
Burlington Creek	96	40-300	X		X		X
North Angell Brothers Creek	78	55-150	X				X
Miller Creek	142	90-200	X	X	X		X

4. CONFLICTING USE ANALYSIS

a. Planned Uses

Conflicting uses include those uses that conflict or interfere with the protection of the significant streams. To identify conflicting uses, the uses permitted under the zoning ordinance and comprehensive plan were examined. In addition, other known conflicts are noted.

The analysis is based primarily on uses outlined in the zoning ordinance. The zoning districts that affect the relevant sites include the following:

- Exclusive Farm Use - EFU
- Commercial Forestry Use - CFU
- Multiple Use Agriculture - MUA
- Rural Residential - RR
- Urban Residential - R10

Uses that represent potential conflicts with streams include any use that results in the removal of vegetation along the riparian zone. The removal of vegetation and trees will reduce shade along the stream, eliminate wildlife cover, and decrease the amount of woody debris that enters the stream channel. When this occurs, the stream will fail to provide economic, social and environmental benefits. When healthy, streams and the associated riparian zone provide water for domestic use and irrigation, fish and wildlife habitat, and flood storage capacity. A stream on which the riparian zone has been eliminated or severely damaged poses a threat by the increased amount of run-off and turbidity and by the increased potential for flooding.

The generic uses permitted in each zone are described in Table 4.

b. Conflicting Use impacts

For purposes of further analysis, uses are grouped into general categories. The categories and a brief discussion of the nature of the conflicts follow.

i. Forestry Use - Forestry uses have significant conflicts with stream resources. The standard process of clear cutting increases run-off and turbidity in the streams. This results in a reduction in water quality and a loss of fish habitat. Logging roads that cross streams result in extensive stream damage. Field teams conducting the stream survey in the west hills noted numerous instances where logging roads and clear cutting had significantly damaged the streams. Wood processing facilities and whole/retail sales of forest products will result in the increase in stormwater run-off from impervious surfaces. Housing in connection with forest use may be located near streams and have impacts similar to those listed below under residential use. Forestry use includes the following uses permitted under the zoning ordinance: forestry/timber; wood processing (limited); wood processing (sawmills, etc.); forest

TABLE 4. Use By Zoning District

Use	Zoning*				
	EFU	CFU	MUA	RR	R10
Forestry/Timber	P	P	P	P	NP
Wood Processing (limited)	CU	P/C	CU	NP	NP
Farm Use: Crops/livestock	P	P	P	P	P/C
Resource Conservation	P	P	P	P	P
Single Family Residential: Use on > 80 acres	P/C	CU	P	P	P
Single Family Residential: Use on < 80 acres in conjunction with a Farm/Forest Use	P/C	CU	P	P	P
Two–Family Dwelling	NP	NP	NP	NP	P/C
Farm/Forest Worker Housing	CU	NP	P/C	P/C	NP
Wholesale/Retail for Farm/Forest Products	CU	NP	CU	P/C	NP
Play Grounds, Churches and Schools	CU	NP	CU	CU	CU
Parks/Golf Course	CU	CU	CU	CU	CU
Other Community Service Uses	CU	CU	CU	CU	CU
Mining/Geothermal	CU	CU	CU	CU	NP
Agricultural Processing	NP	NP	CU	CU	NP
Wood Processing (sawmills, etc.)	CU	CU	CU	NP	NP
Fowl, Feed Lot, Swine, Fur Farming	P	CU	CU	CU	NP
Dog Kennels	CU	NP	CU	CU	NP
Aircraft Landing Area	CU	CU	NP	NP	NP
Single Family Residential Use (Non Farm/Forest)	CU	CU	P	P	P
Home Occupations	CU	P	P	P	P
Planned Developments	NP	NP	CU	CU	NP
Cottage Industries	NP	NP	CU	CU	NP
Rural Service/Commercial	NP	NP	CU	CU	NP

***Note:**
EFU = Exclusive Farm Use
CFU = Commercial Forestry Use
MUA = Multiple Use Agriculture
RR = Rural Residential
R10 = Single Family Residential

KEY: P = Permitted
P/C = Permitted with Conditions
CU = Conditional Use
NP = Not Permitted

worker housing; single family residential in conjunction with a forest use wholesale/retail for forest products.

ii. Agricultural Use - Agricultural use conflicts with stream resources in a variety of ways. Agricultural chemicals, including pesticides and fertilizers, may enter the stream and destroy or alter wildlife habitat. Farm livestock may graze near and enter the stream thereby destroying riparian vegetation and depositing excrement, which can affect water quality. Riparian vegetation may be removed to maximize cultivated area. Agricultural processing, housing, and wholesale/retail use will result in the increase of stormwater run-off from impervious surfaces. Housing will also have impacts similar to those listed below under residential use. Agricultural use includes the following uses permitted under the zoning ordinance: farm use crops/livestock; agricultural processing; fowl, feed lot, and swine for farming; farm worker housing; single family residential housing in conjunction with a farm use; wholesale/retail for farm products.

iii. Residential Use - Streams provide an amenity for a residential dwelling. According to Rick Walker, a residential appraiser with Palmer Groth and Pietka, a stream will generally increase the value of any nearby dwelling. For this reason, pressure exists for new dwellings to be located near streams. Riparian vegetation may need to be removed to site the dwelling near the stream. Often residents living along streams clear the native vegetation adjacent to the stream and install lawn up to the stream bank, which results in a significant loss of habitat. Residential development adjacent to the stream increases impervious surface, which can result in increased run-off to the stream. Residential use includes the following uses permitted under the zoning ordinance: single family residential on > 80 acres; two family dwellings; single family residential (non farm/forest); home occupations; and planned developments.

iv. Community Service Use/Commercial Use - Community service and commercial uses conflict with streams due to the potential for increased storm water run-off from structures and parking areas. The increase in storm water run-off from hard surfaces will increase the rate of flow and result in erosion and a deterioration of water quality. Parks or recreation facilities, including golf courses, may result in the removal of vegetation along the stream and the use of pesticides and fertilizer. Community service/commercial uses include the following uses from the zoning ordinance: play grounds, churches, schools; parks; other community service uses; dog kennels; cottage industries; and rural service/commercial.

v. Mining - Aggregate mining is a potential conflict for stream in the study areas. Aggregate mining will result in alteration of the land contours and the diversion of the stream. Until full restoration of the stream following the mining operation, the stream resource will be impacted. The time period of this impact will vary depending on the restoration plans filed with the Department of Geology and Mineral Industries (DOGAMI). Following restoration the stream may return to health, but it will no longer follow the original natural stream bed. Aggregate mining operations located away from the channel can have water quality impacts related to siltation and

increased turbidity from mine run-off. Mining uses include the following uses from the zoning ordinance: mining/geothermal.

For the proposed 283 acre expansion area at the existing Angell Brothers quarry, studies have been conducted to evaluate quantity and quality of the mineral aggregate resource. The location of the proposed expansion is adjacent to and contiguous with a 113 acre parcel which is currently operating. The site geology and potential as a mineral and aggregate resource was evaluated by Schlicker and Associates in 1989. Schlicker's work characterized the site through field and office mapping, two borings, eight seismic refraction profile lines, and laboratory tests on materials from the adjacent active quarry. Schlicker and Associates concluded that the proposed expansion area comprised a high quality aggregate resource and estimated that about 220 million cubic yards of aggregate was available, considering buffers and reclamation plans. In 1994, as part of the County's ESEE analysis, Squier Associates were hired as independent consulting geologists to review and verify information regarding quantity and quality of the resource. Squier Associates concluded that although the investigation at the Angell Brothers site could not be considered comprehensive or exhaustive, it was, in their opinion, prudent for the purposes intended.

Based upon Squier's review of available data and experience in Multnomah County, it was concluded that the Angell Brothers quarry contains a substantial aggregate resource. Considering the geological setting of the site, the potential exists for similar aggregate resource development at other locations along the east flank of the West Hills.

vi. Transportation/Public Improvements - Transportation systems create conflicts with streams. Fill is often necessary to cross a stream. Culverts generally increase erosion. Field teams found that private logging roads have severe impacts on streams in the West Hills. Public improvements, such as utility extensions, can result in alteration and conflict of streams. No planned public improvements were identified.

vii. Other Uses - Aircraft landing areas are likely to locate in this area due to topography constraints. If a landing area were to be sited, it would most likely be located away from a stream channel due to slope and vegetation constraints.

Resource conservation is a permitted use and does not present a conflict with the stream resource.

c. Conflicting Use By Study Area

Conflicting uses are examined by study area and stream. Known conflicts are described based on field observations.

i. Gilkison Road Area

- Jackson Creek: This watershed is affected by logging, a road crossing, and a concrete dam and wooden water wheel in the upper reaches of the mainstem, prior to its confluence with the west and east tributaries. The west tributary is affected by a road crossing and agricultural activity, while the east tributary is affected by road crossings and logging activity. The east and west tributaries flow into the mainstem approximately 3,000 feet north of Gilkison Road. Jackson Creek flows out of the study area, eventually crossing under U.S. Highway 30.

- Joy Creek: This watershed is affected by logging activity and rural residential development in the upper reaches of the north tributary, and by logging activity and a road crossing in the upper reaches of the south tributary. The mainstem of Joy Creek, below the confluence of the north and south tributaries, is affected by a road crossing and agricultural activity. Joy Creek flows under U.S. Highway 30, then into Multnomah Channel.

- Jones Creek: This watershed is affected by past logging activity along much of its length. Jones Creek flows under U.S. Highway 30 through a culvert, then flows into Multnomah Channel.

- Rocky Point Creek: This watershed is affected by past logging activity along much of its length. A road crossing is located on its lower reach. The creek crosses under U.S. Highway 30 through a culvert, then into Multnomah Channel.

- Scappoose Creek: This watershed is affected by past logging activity along both the west and east tributaries, as well as much of the mainstem. Scappoose Creek flows out of the study area approximately 4,000 feet north of the confluence of the east and west tributaries.

ii. Wildwood-McKay Area

- East Fork McKay Creek: This watershed is affected by logging activity along much of its length within the study area. This stream is the largest observed at the point at which it crosses the County line. East Fork McKay Creek flows west out of the study area into Washington County.

- North Jackson Creek: This watershed is affected by past logging activity along much of its length, including the north and south tributaries. North Jackson Creek flows west out of the study area into Washington County, joining with South Jackson Creek (see description under Upper Rock Creek study area) west of the study area boundary.

- Wildwood Creek: The mainstem of wildwood creek flows through Wildwood Golf Course. Three major tributaries, including North, Middle, and South Wildwood Creeks, combine to form the relatively short mainstem. After flowing through the golf course, this part of the creek flows under U.S. Highway 30 and into Multno-

mah Channel, east of the study area.

- North Wildwood Creek: This part of the watershed is affected by past logging activity, and road crossings along the north and south tributaries. The mainstem of North Wildwood Creek, which is a short segment, is affected by a road crossing and bordered by a meadow. This creek joins with Middle and South Wildwood Creeks prior to flowing through the Wildwood Golf Course as the creek mainstem.

- Middle Wildwood Creek: This part of the watershed is affected by past logging activity and road crossings along the north and south tributaries, as well as the mainstem. The creek joins with North and South Wildwood Creeks prior to flowing through the Wildwood Golf Course as the creek mainstem.

- South Wildwood Creek: This part of the watershed is affected by past logging activity and road crossings along the north and south tributaries; the north tributary also is affected by rural residential development. The mainstem of South Wildwood Creek is affected by a road crossing. The creek joins with North and Middle Wildwood Creeks prior to flowing through the Wildwood Golf Course as the creek mainstem.

iii. Holbrook-Logie Area

- North Rainbow Creek: This watershed is affected by past logging activity in the upper reaches of the north and south tributaries, as well as by a road crossing on the south tributary. The mainstem is affected by past logging activity, and a road crossing. North Rainbow Creek flows into "Rainbow" lake, then joins South Rainbow Creek east of U.S. Highway 30 prior to flowing into Multnomah Channel.

- South Rainbow Creek: This watershed is affected by past logging activity in the upper reaches of the north and south tributaries, and by rural residential development along the mainstem. South Rainbow Creek joins North Rainbow Creek east of U.S. Highway 30 prior to flowing into Multnomah Channel.

- Holbrook Creek: This watershed is affected by logging in its upper reach, a house and associated orchard along the stream, as well as a road crossing in its middle reach, and what appears to be a pump station in its lower reach. Holbrook Creek flows under U.S. Highway 30 through a culvert, then flows into Multnomah Channel.

iv. Upper Rock Creek Area

- South Jackson Creek: This watershed is affected by a road crossing and agricultural activity along its upper reach, which is within the study area. South Jackson Creek eventually joins with North Jackson Creek west of the study area boundary, then flows south toward Jackson Falls.

- North Rock Creek: This watershed is affected by a dam and agricultural activity (pasture) in the upper reaches of the mainstem, and a road crossing below Tributary I (Rock Creek Road). Tributary I is affected by logging activity, while Tributary II is affected by rural residential development and past logging activity. The north mainstem of Rock Creek flows into the middle mainstem (described under the Cornelius Pass Area, below), and eventually Washington County and Rock Creek Park. This park is used for the Green City Data Project, a high school educational program.

v. Folkenberg Area

- McCarthy Creek: This watershed is affected by logging and a railroad crossing in its upper reaches; rural residential development and associated clearing, and a mill and past timber production in its middle reaches; and past logging activity in its lower reaches. Tributary I is affected by rural residential development and a road crossing, rural residential development and road crossings affect Tributary II, and Tributary III is affected by logging and road crossings. Logging and a road crossing affect Tributary IV. McCarthy Creek crosses under U.S. Highway 30, then flows into Multnomah Channel.

vi. Cornelius Pass Area

- Middle Rock Creek: This watershed is affected by Rock Creek Road, which parallels the middle mainstem of Rock Creek on its east side. Tributary III is affected by agricultural activity (pasture), road crossings, and a railroad crossing. Tributary IV is affected by agricultural activity (pasture), rural residential development, and road crossings; while Tributary V is affected by rural residential development, agricultural use (pasture), and a road crossing. The middle mainstem of Rock Creek joins the south mainstem south of the Cornelius Pass Area boundary, forming the mainstem of Rock Creek. Rock Creek eventually flows into Washington County and Rock Creek Park, which is used for educational purposes (Green City Data Project)

vii. Germantown Area

- South Rock Creek: This part of the Rock Creek Watershed is affected primarily by rural residential development, agricultural use (pasture), and road crossings. The south mainstem of the creek flows west to join the middle mainstem, west of the study area boundary. Rock Creek eventually flows into Washington County and Rock Creek Park, which is used for educational purposes (Green City Data Project).

viii. Bonny Slope Area

- North Bronson Creek: This watershed is affected by logging activity and road crossings along most of its length. North Bronson Creek joins South Bronson

Creek west of the study area boundary; Bronson Creek mainstem flows southwest toward Beaverton.

- South Bronson Creek: This watershed is affected by a road crossing rural residential activity in its upper reach, and agricultural use (pasture) and logging along its lower reach, prior to its confluence with North Bronson Creek. The two streams join west of the study area boundary, forming the mainstem of the creek.

ix. Balch Creek Area

- Balch Creek: This watershed is affected primarily by rural residential development and road crossings. Tributary III of the creek flows through the Audubon Society's Collins Sanctuary, and much of the creek is within Forest Park. Balch Creek flows under U.S. Highway 30 and eventually into the Willamette River, east of the study area boundary.

- Saltzman Creek: This watershed is located within Forest Park and is not affected by past logging or rural residential activity. It flows under U.S. Highway 30 and eventually into Multnomah Channel, east of the study area boundary.

x. McNamee-Harborton Area

- Burlington Creek: This watershed as undergone extensive logging. Significant amounts of riparian vegetation along this creek have been removed. Water quality is significantly diminished by the logging and the removal of vegetation along this creek. Impacts of logging potentially extend beyond the creek since the creek flows into the Burlington Bottoms wetlands. It should be noted that the recently acquired (by METRO) 38-acre "old grove" site is within this watershed but not located along the main stem of the creek. It is located along a tributary to the south of the main stem.

- North Angell Brothers Creek: This watershed as undergone extensive logging. Significant amounts of riparian vegetation along this creek has been removed. Water quality is significantly diminished by the logging and the removal of vegetation along this creek. Impacts of logging potentially extend beyond the creek since the creek flows into the Burlington Bottoms wetlands. This creek would be impacted by expansion of the existing Angell Brothers aggregate operation.

- Miller Creek: Most of this watershed is preserved within the City of Portland's Forest Park; however the remainder has undergone extensive logging and significant amounts of riparian vegetation along this creek has been removed. This creek is also affected by grazing along its banks. Miller Creek has been found by the City of Portland to contain populations of coho salmon, cutthroat trout, and steelhead trout. These populations are threatened by the aforementioned activities.

5. ESEE ANALYSIS

The ESEE consequences analysis includes a general discussion of impacts by conflicting use category. The initial section examines impacts on the stream if the conflicting uses are allowed. The second section addresses impacts on the conflicting uses if the stream is protected. Each section includes a listing of impacts that are keyed to matrices that specifically tie the impacts to each stream. The matrices are organized by County study area.

a. ESEE Consequences of Allowing Conflicting Uses - Impacts on Streams

i. Economic Consequences of Allowing Conflicting Uses

Negative economic impacts result from conflicting uses which lower water quality and reduce the usefulness of water withdrawn from the stream. The reduction of water quality has a direct economic impact on those properties and streams where water rights exist for domestic and irrigation purposes. If water quality is lowered to a point that water is no longer useful, alternative sources will need to identified. An economic consequence is noted only in those instances where water rights exist along the stream. Conflicting uses that have the potential of lowering water quality include uses which increase run-off, erosion, turbidity, and pollutants.

A negative economic consequence also will result if water quantity is reduced or increased due to stream or riparian alteration. Streamside vegetation has the effect of moderating the flow and transport of water through the drainage. Removal of vegetation increases the rate of runoff and reduces water storage capacity. This results in higher peak flows and lower flows during drought periods.

Development of paved parking areas or roadways associated with transportation facilities, community service commercial uses, and residential uses will generally increase the rate of run-off and increase the potential for erosion unless storm water detention facilities are planned in conjunction with the improvement. Detention facilities or special designs are generally addressed on a case by case basis depending on the scale of the proposed development or improvement.

Forestry practices that result in clear cut areas near a stream will have the effect of increasing run-off, turbidity, and water temperature, thus lowering water quality and storage capacity. Logging roads and yarding disrupt the terrain and result in increased erosion. Field observation indicates that vegetation buffers in the West Hills are inconsistent and sometimes destroyed by roads and yarding.

Agricultural use adjacent to streams also may have the effect of lowering water quality due to uncontrolled use of fertilizers and pesticides. Livestock with access to stream banks have negative effects on the streams. Impacts included run-off due to overgrazing, increased turbidity from trampled streamside vegetation, and increased pollutants from animal excrement.

MATRIX KEY:

ECON 1: Negative economic impacts result from reduced water quality for domestic or irrigation use due to increased run-off, erosion, turbidity, water temperature, or pollutants.

- ECON 2: Negative economic impacts result from changes in water quantity that can affect availability for domestic or irrigation use due to loss of storage capacity and increased run-off.

ii. Social Consequences of Allowing Conflicting Uses

Conflicting uses adjacent to a stream may have a social impact if removal of riparian vegetation has occurred and there has been a significant loss of wildlife habitat. The social impact results in the loss of opportunities for nature study and recreational activities if vegetation and wildlife habitat are removed. Streams that flow through public parks or publicly-accessed recreation facilities have the greatest potential to be negatively affected in this manner.

Rock Creek flows through Rock Creek Park in Washington County. This park is used by the Green City Data Project for educational programs.

Social consequences also result from impacts on the aesthetic quality of a stream if riparian vegetation is removed and a stream is degraded. This has an overall impact on the livability of the area.

Portions of Miller Creek flow through Forest Park. Burlington Creek and North Angell Brothers Creek flow into Burlington Bottoms, a protected publicly-owned wetland habitat which is being studied for its passive recreational potential. If conflicting uses along these creeks result in the diminishment of water quality and connecting habitat, the loss of wildlife habitat will have a negative social benefit.

In the case of Burlington Creek and North Angell Brothers Creek, impacts to Burlington Bottoms may be minimized if the quality of water that is discharged to the area is maintained. Burlington Creek is primarily impacted by logging activity and little is being done to maintain water quality downstream. In the case of North Angell Brothers Creek, expansion of aggregate mining into this watershed threatens water quality. Depending on the design and monitoring of the mining operation, DEQ and DOGAMI requirements can be satisfied and the quality of water discharged to the Burlington Bottoms area can be maintained.

The removal of riparian vegetation also will reduce water storage capacity and increase the rate of run-off. This has the potential of increasing the capacity for flooding, especially where wetlands are associated with the stream. For those streams with wetlands, negative social consequences may occur if vegetation is removed and the wetlands flood storage capacity is reduced.

MATRIX KEY

SOC 1: Negative social impacts result from the loss of educational and recreational opportunities associated with wildlife habitat and riparian vegetation.

SOC 2: Negative social impacts result from the loss of flood storage capacity and
increases in the rate of run-off.

SOC 3: Negative social impacts result from a loss in aesthetic quality and livability.

iii. Environmental Consequences of Allowing Conflicting Uses

Environmental consequences of allowing conflicting uses vary by the type of conflicting use. As noted above, forestry practices that include clear cut areas result in increased run-off, turbidity, water temperature, and sedimentation. The removal of vegetation reduces food and cover for wildlife. The loss of wildlife habitat directly impacts wildlife diversity. During the stream inventory, field teams observed a wide range of wildlife from amphibians and rodents to elk and eagles. As one would expect, clear cut areas contained less habitat and less wildlife.

Consequences of agricultural use include water quality and wildlife habitat impacts. Agricultural use adjacent to the stream may result in damage to the stream through the use of chemical pesticides and fertilizers. Livestock along a stream will negatively impact the water quality by trampling streamside vegetation, overgrazing, and through the deposition of animal excrement. Removal of streamside vegetation either by livestock or to increase cultivated area will reduce wildlife cover and habitat. Pastures where streams are not fenced have the greatest potential for negative impact.

Residential, community service, and commercial uses negatively impact the environmental quality of streams. The primary impact is the loss of wildlife habitat that results from nearby human activity. For example, it is rare when elk wander into residentially developed areas. Domestic animals are a major source of conflict with wildlife and often drive animals from their natural habitat. New residential dwellings often include residential lawns which replace riparian vegetation along streams and the wildlife cover that it provides. As noted previously, parking areas associated with community service or commercial uses may increase run-off. These areas may also result in water quality deterioration due to oils and materials that are washed into the streams and drainageways.

Transportation and public improvements have negative environmental consequences. Road that cross streams often are culverted. Culverts increase the rate of flow and result in a narrowing of the stream channel. Culverts and roads also create a barrier for wildlife migration. Roads also result in wildlife mortality when animals

are hit by vehicles.

Allowing mining will result in temporary adverse stream impacts including rerouting and stream channel destruction. Reclamation would include stream channel restorations. Considering environmental compliance issues, regulated by the Oregon Department of Geology and Mineral Industries and the Oregon Department of Environmental Quality, environmental impacts outside the site during quarry operations can be minimized.

MATRIX KEY:

ENV 1: Negative environmental impacts result from the loss of wildlife habitat when riparian vegetation is removed or destroyed.

ENV 2: Negative environmental impacts result from deterioration in water quality due to increased run-off, turbidity, water temperature, and pollutants.

ENV 3: Negative environmental impacts result from increased disturbance or mortality of wildlife, or by limiting the mobility of wildlife.

iv. Energy Consequence of Allowing Conflicting Uses

Energy consequence of allowing conflicting uses are less clear than other impacts. When streams are used for small hydro-electric or mill purposes a negative impact may occur if the flow of the stream is interrupted. Jackson creek has a small water wheel which provides power for adjacent property.

MATRIX KEY

ENERGY 1: Negative energy impacts result from decreased water flow.

v. Summary of ESEE Consequences - Impacts on Streams

A summary of ESEE consequences describing impacts on streams is included in Table 5. The table lists ESEE impacts by stream and conflicting use category. Use categories are listed on the horizontal axis with the impact categories that apply generally to each stream. Streams are listed on the vertical axis. The matrix includes a letter code which further identified impacts which are dependent on the presence of unique attributes of individual streams. The matrix also provides information on whether the impacts exist presently, and whether they are potential impacts which could occur based on the uses permitted by the zoning ordinance.

b. ESEE Consequences of Prohibiting Conflicting Uses - Impacts on Uses

i. Economic Consequences of Prohibiting Conflicting Uses

TABLE 5.

ESEE CONSEQUENCES

Allowing Conflicting Uses – Impacts on Streams

Stream	Impacts by Conflicting Use Category					
	Forestry	Agriculture	Residential	Community Service	Mining	Transport./ Public Imp.
	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC e	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC 3
GILKINSON ROAD AREA						
Jackson Creek	X(G)	X(G)	X(G)	(G)	(G)	X(G)
Joy Creek	X(D)	X(D)	X(D)	(D)	(D)	X(D)
Jones Creek	X(F)	(F)	X(F)	(F)	(F)	X(F)
Rocky Point Creek	X(F)	(F)	(F)	(F)	(F)	X(F)
Scappoose Creek	X(F)	(F)	(F)	(F)	(F)	X(F)
WILDWOOD–MCKAY AREA						
East Fork McKay Creek	X(B)	X(B)	(B)	(B)	(B)	X(B)
North Jackson Creek	X(B)	X(B)	(B)	(B)	(B)	X(B)
Wildwood Creek	X			X		X
North Wildwood Creek	X(B)	(B)	(B)	(B)	(B)	X(B)
Middle Wildwood Creek	X(B)	(B)	(B)	(B)	(B)	X(B)
South Wildwood Creek	X(F)	(F)	X(F)	(F)	(F)	X(F)
HOLBROOK–LOGIE AREA						
North Rainbow Creek	X(B)	(B)	X(B)	(B)	(B)	X(B)
South Rainbow Creek	X(F)	(F)	X(F)	(F)	(F)	X(F)
Holbrook Creek	X(B)	X(B)	X(B)	(B)	(B)	X(B)
UPPER ROCK CREEK AREA						
South Jackson Creek	X	X	X			X
North Rock Creek	X(E)	X(E)	X(E)	X(E)	(E)	X(E)
FOLKENBERG AREA						
McCarthy Creek	X	X	X	X		X
CORNELIUS PASS AREA						
Middle Rock Creek	(A)	X(A)	X(A)	(A)	(A)	X(A)
GERMANTOWN AREA						
South Rock Creek	(C)	X(C)	X(C)	(C)	(C)	X(C)
BONNY SLOPE AREA						
North Bronson Creek	X	X	X			X
South Bronson Creek	(B)	X(B)	X(B)	(B)	(B)	X(B)
BALCH CREEK AREA						
Balch Creek	(A)	(A)	X(A)	X(A)	(A)	X(A)
Saltzman Creek	(A)	(A)	X(A)	X(A)	(A)	X(A)

KEY:

X	=	Clear Imact–Use existing
X	=	Minor Impact–Use existing
	=	Potential Impact–Use may be allowed under zoning

TABLE 5 CONTD.

Stream	FORESTRY	AGRICULTURE	RESIDENTIAL	COMM. SERV.	MINING	TRANS./ PUB. IMPROVMTS.
	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC 3	ENV 1,2,3 ECON 1 SOC 3
MCNAMEE-HARBORTON AREA						
BURLINGTON CREEK	X(A)		X			X(A)
NORTH ANGELL BROS. CREEK	X(A)				(A)	X(A)
MILLER CREEK	X(F)	X(D)	X			X(D)

TABLE 5. ESEE CONSEQUENCES
Allowing Conflicting Uses - Impacts on Streams
(continued)

KEY:

ECON 1: Reduced water quality for domestic or irrigation use.

ECON 2: Reduced or increased water quantity for domestic or irrigation use.

SOC 1: Loss of educational and recreational opportunities associated with the loss of wildlife habitat.

SOC 2: Loss of flood storage capacity.

SOC 3: Negative social impacts result from affecting or changing the way of life of families involved in natural resource based activities and industries.

ENV 1: Loss of wildlife habitat when riparian vegetation is removed or destroyed.

ENV 2: Deterioration of water quality.

ENV 3: Increased disturbance or mortality of wildlife, or limitation in the mobility of wildlife.

ENRGY 1: Decreased water flow for energy use.

ADDITIONAL IMPACTS:

Impacts common to all categories and streams are listed at the top of Table Impacts which are dependent on the presence of unique attributes of individual streams are coded below:

SOC 1:	(A)
SOC 2:	(B)
SOC 1,2:	(C)
ECON 2:	(D)
SOC 1,2 and ECON 2:	(E)
SOC 2 and ECON 2:	(F)
SOC 2 and ECON 2 and ENRGY 1:	(G)

Prohibiting natural resource based activities, including forestry, agriculture and mining, can result in substantial economic impacts by causing loss in jobs, preventing creation of new jobs, reducing tax revenues, and reducing revenues from the sale of raw materials or finished products.

The economic value of a resource-based operation is increased when it is located relatively close to markets or potential consumers, since the cost of transporting the raw materials is reduced. For example, construction projects benefit from having timber supply nearby and the cost of such projects can increase when nearby timber harvesting and processing is prohibited.

Similarly, prohibiting transportation or other public improvements projects, particularly utility projects, can increase the cost of providing a service to consumers. For example, if development of a electric substation is not allowed, it may cost more to provide electricity to residents in the county or region, because the power must be obtained from a more distant source or purchased from another utility with excess supply.

Prohibiting residential development to protect streams can negatively affect the value (purchase price and tax assessment) of a lot, thus affecting the property owner. A reduction in value can affect the potential tax revenue to the county.

With any use, the economic costs of carrying on an activity (whether extraction, construction, or residential development) can increase when regulations or standards are enacted to specify conditions under which the activity can occur. For example, regulations that specify the size of required buffer along a stream, or the type of harvesting that can occur can increase the economic cost to the operator of carrying on the timber harvesting operation.

MATRIX KEY:

ECON 1: Negative economic impacts result from lost jobs, reduced tax revenues, or reduced revenue from the sale of goods and services.

ECON 2: Negative economic impacts result from increased cost of transporting raw
materials to markets or consumers, and providing services.

ECON 3: Negative economic impacts result from decreased property value (for residential uses).

ECON 4: Negative economic impacts result from regulations and standards that specify conditions under which an activity or use can occur.

ECON 5: Negative economic impacts result from increased cost due to practices or construction techniques.

ii. Social Consequences of Prohibiting Conflicting Uses

Prohibiting natural resource based activities, such as forestry, agriculture and mining, can affect property owners who depend on revenue from the activity as an income source. Reduced income from prohibiting these activities can affect the way of life of families that may have carried on the operation (e.g., timber production, farming, or mining) for several generations. These families, who have a heritage of being involved with these activities, would consider a change in their way of life a negative social impact. In regard to quarry operations, once resources are depleted, social impacts result from attendant relocation or dislocation of employees.

Another social impact of prohibiting resource based activities is reducing or eliminating access to a local source of a needed material. For example, mining provides a social benefit by providing a needed supply of wood and wood products for construction projects in the county and region. This social benefit would be negatively affected by prohibiting harvesting because access to these materials would become more difficult. In addition, longer haul distances increase traffic loads with resultant social impacts.

Prohibiting certain uses can affect the amenities available to local residents, whether these are natural or man-made. For example, residential lots located along a stream often are sought by buyers, since the stream is considered a positive natural amenity. Not allowing residential development on lots with stream access would prevent this social benefit. Similarly, community services and commercial facilities provide a social benefit to local residents by providing needed goods and services near where they live and work. Prohibiting these uses would negatively affect this social benefit by causing residents to drive further to obtain the goods and services.

MATRIX KEY:

SOC 1: Negative social impacts result from reduced income (from natural resource based activities).

SOC 2: Negative social impacts result from affecting or changing the way of life of families involved in natural resource based activities and industries.

SOC 3: Negative social impacts result from reduced or eliminated access to local sources of needed materials.

SOC 4: Negative social impacts result from reduced availability of amenities (both natural and man-made).

iii. Environmental Consequences of Prohibiting Conflicting Uses

Not allowing uses that involve construction of buildings or public improvements can

result in the use occurring elsewhere. Transfer of the use to a new location can result in the same or even greater environmental impacts on site, depending on the natural features of the new site, its location, and the type of development or activity that is proposed. It is possible that the new site would require more infrastructure or improvements to service, thus resulting in greater impacts from construction of roads, utilities, and services.

MATRIX KEY:

ENV 1: Negative environmental impacts result from transferring development (and associated impacts) from a site where a conflicting use is prohibited to one where it is allowed.

iv. Energy Consequences of Prohibiting Conflicting Uses

One energy consequence of prohibiting natural resource based uses is increased use of energy for transporting raw materials to markets and consumers. For example, it requires less energy to transport logs from a harvesting site near a mill than from a site farther away. Similarly, transporting rock and aggregate materials to Portland from more distant locations requires more energy than from a source within the county.

Prohibiting resource based uses can result in a shortage of goods and services, such as lumber or produce, for construction or processing. Particularly with lumber and forestry products, limited availability can result in use of alternative, less energy-efficient building materials.

Prohibiting residential uses and development of community services and commercial areas can result in greater distances between local residents and the places where they work and purchase goods and services. If community services or commercial amenities are located farther from residents, they must drive greater distances to obtain these goods and services. Increased travel results in increased use of energy for transportation.

Greater distances between raw materials and processing, products and markets, and consumers and goods and services, can result in additional energy expenditure to construct needed roads, transportation facilities (such as transit centers), and infrastructure that may not be necessary if conflicting uses were allowed to occur.

MATRIX KEY:

ENERGY 1: Negative energy impacts result from increased use of energy for transporting raw materials to markets and consumers.

ENERGY 2: Negative energy impacts result from shortage of goods and services, such as lumber or produce, for construction or processing.

ENERGY 3: Negative energy impacts result from greater distances between local residents
and the places where they work and purchase goods and services.

ENERGY 4: Negative energy impacts result from increased energy expenditure to construct additional roads, transportation facilities, and infrastructure to accommodate greater distance between products and consumers.

v. Summary of ESEE Consequences - Impacts on Conflicting Uses

A summary of ESEE consequences describing impacts on conflicting uses is included in Table 6. The table lists ESEE impacts by stream and conflicting use category. Use categories are listed on the horizontal axis with the impact categories that apply to each use. Streams are listed on the vertical axis. The matrix identifies the consequences that are possible based on existing uses which are currently impacting the stream. Potential consequences are noted where the use is not currently present.

c. Other Applicable Statewide Planning Goals

OAR 660-16-005(2) states: "The applicability and requirements of other Statewide Planning Goals must also be considered, where appropriate, at this stage of the process." The following additional Statewide Planning Goals apply to this ESEE analysis:

i. Goal 3 - Agricultural Lands

Goal 3 applies to those lands designated and zoned for Exclusive Farm Use. Portions of the streams in the West Hills Rural Area run through lands designated and zoned for Exclusive Farm Use. This designation is intended to preserve and maintain agricultural lands. Limitations of agricultural uses in order to protect streams would result in a direct conflict between implementation of Goal 4 and Goal 5 of the Statewide Planning Program.

ii. Goal 4 - Forest Land

Goal 4 applies to those lands zoned Commercial Forest Use. Portions of the streams in the West Hills Rural Area run through lands designated and zoned as Commercial Forest Use lands. Forest operations, practices, and auxiliary uses are subject only to such regulation of uses as are found in ORS 527.722, which states that "no unit of local government shall adopt any rules, regulations, or ordinances or take any other actions that prohibit, limit, regulate, subject to approval or in any other way affect forest practices on forestlands located outside of an acknowledged urban growth boundary." Consequently, regardless of impacts forest practices may have on significant streams, the County cannot place restrictions on forest practices in areas designated and zoned as Commercial Forest Use lands.

TABLE 6.

ESEE CONSEQUENCES

Prohibiting Conflicting Uses – Impacts on Conflicting Uses

Stream	Forestry	Agriculture	Residential	Community Service	Mining	Transport./ Public Imp.
	SOC 1,2,3 ECON 1,2,4 ENRGY 1,2,4	SOC 1,2,3 ECON 1,2,4 ENRGY 1,2,4	SOC 4 ECON 3,4,5 ENRGY 3,4 ENV 1	SOC 4 ENV 1 ECON 4,5 ENRGY 3,4	SOC 1,2,3 ECON 1,2,4,5 ENRGY 1,2,4 ENV 1	SOC ECON 2,4,5 ENRGY 4 ENV 1
GILKINSON ROAD AREA						
Jackson Creek	X	X	X			X
Joy Creek	X	X	X			X
Jones Creek	X		X			X
Rocky Point Creek	X					X
Scappoose Creek	X					X
WILDWOOD–MCKAY AREA						
East Fork McKay Creek	X	X				X
North Jackson Creek	X	X				X
Wildwood Creek	X			X		X
North Wildwood Creek	X					X
Middle Wildwood Creek	X					X
South Wildwood Creek	X		X			X
HOLBROOK–LOGIE AREA						
North Rainbow Creek	X		X			X
South Rainbow Creek	X		X			X
Holbrook Creek	X	X	X			X
UPPER ROCK CREEK AREA						
South Jackson Creek	X	X	X			X
North Rock Creek	X	X	X	X		X
FOLKENBERG AREA						
McCarthy Creek	X	X	X	X		X
CORNELIUS PASS AREA						
Middle Rock Creek		X	X			X
GERMANTOWN AREA						
South Rock Creek		X	X			X
BONNY SLOPE AREA						
North Bronson Creek	X	X	X			X
South Bronson Creek		X	X			X
BALCH CREEK AREA						
Balch Creek			X	X		X
Saltzman Creek	X		X	X		X

KEY:

X = Consequences possible–Use exists and clearly impacts stream

X = Consequences Possible–Use is present near stream and has a minor impact.

= Potential Consequences–Uses not currently present near stream

TABLE 6 CONTD.

Stream	FORESTRY	AGRICULTURE	RESIDENTIAL	COMM. SERV.	MINING	TRANS/ PUB. IMPROVMTS.
	SOC 1,2,3 ECON 1,2,4 ENRG 1,2,4	SOC 1,2,3 ECON 1,2,4 ENRG 1,2,4	SOC 4 ECON 3,4,5 ENRG 3,4 ENV 1	SOC 4 ENV 1 ECON 4.5 ENRG 3,4	SOC 1,2,3 EC 1,2,4,5 ENRG 1,2,4 ENV 1	ECON 2,4,5 ENRG 4 ENV 1.
MCNAMEE-HARBORTON AREA						
BURLINGTON CREEK	X		X			X
NORTH ANGELL BROS. CREEK	X				X	X
MILLER CREEK	X	X	X			X

TABLE 6. ESEE CONSEQUENCES
Prohibiting Conflicting Uses - Impacts on Conflicting Uses (continued)

KEY:

ECON 1:	Lost jobs, reduced tax revenues, and reduced revenue from the sale of goods and services.
ECON 2:	Increased cost of transporting raw materials to markets or consumers, and providing services.
ECON 3:	Decreased property value (for residential uses).
ECON 4:	Increased cost resulting from regulations and standards that specify conditions under which an activity or use can occur.
ECON 5:	Increased cost due to changes in customary practices or construction techniques.
SOC 1:	Reduced income (from natural resource based activities) and possible "taking" of private property for public benefit.
SOC 2:	Affecting or changing the way of life of families involved in natural resource based activities and industries.
SOC 3:	Reduced or eliminated access to local sources of needed materials.
SOC 4:	Reduced availability of amenities (both natural and man-made).
ENV 1:	Transferring development (and associated impacts) from a site where a conflicting use is prohibited to one where it is allowed.
ENRGY 1:	Increased use of energy for transporting raw materials to markets and consumers.
ENRGY 2:	Shortage of goods and services, such as lumber or produce, for construction or processing.
ENRGY 3:	Greater distances between local residents and the places where they work and purchase goods and services.
ENRGY 4:	Increased energy expenditure to construct additional roads, transportation facilities, and infrastructure to accommodate greater distance between products and consumers.
Note:	For forestry, community service, and mining uses, the listed impacts represent potential for the impact to result. For Agriculture, Residential, and Transportation/Public Improvement uses, the listed impacts represent actual impacts that are currently occurring along the creek.

iii. Goal 5 - Open Spaces, Scenic and Historic Areas, and Natural Resources

Direction from the Department of Land Conservation and Development staff, as part of the Remand Order, requires that only those Goal 5 resources that have been inventoried and determined to be significant are appropriate to be included within the ESEE analysis. Of the three other identified significant Goal 5 resources in the West Hills (Scenic Views and Sites, Mineral & Aggregate Resources, Fish & Wildlife Habitat) only Mineral & Aggregate Resources have been deemed to be a use which conflicts with streams.

iv. Goal 6 - Air, Water, and Land Resources Quality

Goal 6 requires that, "All waste and process discharges from future development, when combined with such discharges...shall not (1) exceed the carrying capacity of such resources, considering long range needs; (2) degrade such resources; or (3) threaten the availability of such resources."

All of the impacts posed by various uses upon streams have a bearing on the water quality of such streams. To the extent that these conflicts can be resolved in a manner which preserves or enhances the existing water quality of these significant streams, such resolution would be in conformance with the requirements of Goal 6.

In addition, Clean Water Act requirements may affect proposed conflicting uses. As noted, Goal 6 requires that all waste and process discharges from future development, combined with those from existing development, not threaten to violate or violate state or federal environmental quality statutes.

v. Goal 7 - Areas Subject to Natural Disasters and Hazards

Goal 7 requires "Developments subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards." Pursuant to this Goal, the Multnomah County Comprehensive Framework Plan has identified areas of Natural Hazards in the West Hills which are the result of steep slopes, unstable geological and soil conditions, erosion potential and stream flooding.

Many of the impacts posed by various uses upon streams have a bearing on the capacity of these streams to instigate flooding and siltation problems to downstream areas. To the extent that these conflicts can be resolved in a manner which minimizes the flood and siltation hazard potential of streams, they would be in conformance with the requirements of Goal 7.

vi. Goal 9 - Economic Development

Goal 9 calls for adequate opportunities for a variety of economic activities in the state. Opportunities for local businesses and industries that process local resources

and serve local residents may be limited because of their conflicts with significant streams.

vii. Goal 10 - Housing

- Goal 10 focuses on providing housing types to meet needs within urban growth boundaries. It indicates that ordinances and incentives should be used to increase population densities in urban areas rather than rural areas such as the West Hills significant streams sites.

6. SUMMARY

a. The consequences of not protecting significant streams are primarily environmental in nature, while the consequences of prohibiting or limiting conflicting uses in order to preserve significant streams are primarily economic, social, and energy in nature.

b. Synopsis of Consequences

Consequences if Forestry is not allowed:
Economic: Lost jobs, reduced tax revenues, increased transport costs, regulatory burden
Social: Reduced property rights, end of "timber" lifestyle, no more local sources
Environmental: Insignificant
Energy: More energy use for transporting materials & building infrastructure, shortage of goods

Consequences if Forestry is allowed in a limited manner:
Economic: Regulatory burden, potential for some los jobs, tax revenues
Social: Reduced property rights, impact on "timber" lifestyle, reduced local sources
Environmental: Insignificant
Energy: Some increase in energy use for transporting materials to market, shortage of goods

Consequences if Forestry is fully allowed:
Economic: Reduced water quality for use, change in water quantity for use
Social: Loss of flood storage capacity
Environmental: Loss of riparian vegetation, reduced water quality
Energy: Decreased water flow for energy use

Consequences if Agriculture is not allowed:
Economic: Lost jobs, reduced tax revenues, increased transport costs, regulatory burden
Social: Reduced property rights, end of farm lifestyle, no more local sources
Environmental: Transferring environmental impacts to another site
Energy: More energy use for transporting materials & building infrastructure, shortage of goods

Consequences if Agriculture is allowed in a limited manner:
Economic: Regulatory burden, potential for some lost jobs, tax revenues
Social: Reduced property rights, impact on farm lifestyle, reduced local sources
Environmental: Transfer of some environmental impacts to another site
Energy: Some increase in energy use for transporting materials to market, shortage of goods

Consequences if Agriculture is fully allowed:
Economic: Reduced water quality for use, change in water quantity for use
Social: Insignificant
Environmental: Loss of riparian vegetation, reduced water quality, greater wildlife disturbance
Energy: Decreased water flow for energy use

Consequences if Residential Use is not allowed:
Economic: Decreased property value
Social: Reduced availability of amenities
Environmental: Insignificant
Energy: Greater distance between destinations, increased cost of infrastructure

Consequences if Residential Use is limited:
Economic: Regulatory burden, changes in customary practices
Social: Reduced availability of amenities
Environmental: Insignificant
Energy: Insignificant

Consequences if Residential Use is fully allowed:
Economic: Insignificant
Social: Insignificant
Environmental: Loss of riparian vegetation, loss of water quality, more disturbance of wildlife
Energy: Decreased water flow for energy use

Consequences if Community Service Uses are not allowed:
Economic: Regulatory burden, changes in customary practices
Social: Reduced availability of amenities
Environmental: Transferring environmental impacts to another site
Energy: Greater distance between destinations, increased cost of infrastructure

Consequences if Community Service Uses are limited:
Economic: Regulatory burden, changes in customary practices
Social: Reduced availability of amenities
Environmental: Transferring environmental impacts to another site
Energy: Insignificant

Consequences if Community Service Uses are fully allowed:
Economic: Insignificant
Social: Insignificant
Environmental: Deterioration of water quality, increased disturbance of wildlife
Energy: Decreased water flow for energy use

Consequences if Mining is not allowed:
Economic: Lost jobs, reduced tax revenues, increased transport costs, regulatory burden
Social: Reduced property rights, end of "timber" lifestyle, no more local sources
Environmental: Insignificant
Energy: More energy use for transporting materials & building infrastructure, shortage of goods

Consequences if Mining is allowed in a limited manner:
Economic: Regulatory burden, potential for some los jobs, tax revenues
Social: Reduced property rights, impact on "timber" lifestyle, reduced local sources
Environmental: Insignificant
Energy: Some increase in energy use for transporting materials to market, shortage of goods

Consequences if Mining is fully allowed:
Economic: Insignificant
Social: Insignificant
Environmental: Loss of riparian vegetation, deterioration of water quality
Energy: Insignificant

Consequences if Transportation/Public Improvements are not allowed:
Economic: Increased cost of material transport, regulatory burden, changes in practices
Social: Insignificant
Environmental: Insignificant
Energy: Increased energy expenditure on infrastructure

Consequences if Transportation/Public Improvements are allowed in a limited manner:
Economic: Increased cost of material transport, regulatory burden, changes in practices
Social: Insignificant
Environmental: Insignificant
Energy: Increased energy expenditure on infrastructure

Consequences if Transportation/Public Improvements are fully allowed:
Economic: Insignificant
Social: Loss of education & recreation associated with wildlife habitat
Environmental: Loss of riparian vegetation, loss of water quality, more disturbance of wildlife
Energy: Decreased water flow for energy use

APPENDIX A

RESPONSE TO COMMENTS

1. **ISSUE:** The Resource Analysis Report generalizes potential conflicts, but does not thoroughly relate these conflicts to conditions on the ground.

   ISSUE RAISED BY: Steve Oulman, Richard Shepard

   DISCUSSION:

   The West Hills Streams Resource Analysis Report contains summary information on each of the streams. Since a large number of streams are being inventoried and analyzed, the report creates summary tables which may give the appearance of over-generalization. In fact, the preparers of the report have determined that there differentiations between the conflicting uses on each particular stream are in fact minor or non-existent. Multnomah County is not required by Goal 5 to invent individuality for each stream if such individuality does not in fact exist.

   RESPONSE:

   Staff does not believe that the Resource Analysis Report needs significant revision in order to create more detail which in fact is not justified. Some minor revisions have been made to add needed detail to the report.

2. **ISSUE:** The baseline information collected in the inventory of significant streams was inadequate; much more information is required.

   ISSUE RAISED BY: Mark House

   DISCUSSION:

   The task of the streams contractor was to collect information in order to make a determination of significance for each inventoried stream. The criteria for significance are listed in the Multnomah County Comprehensive Plan. The contractor collected information necessary in order to complete the Wildlife Habitat Evaluation form noted in the Comprehensive Plan, and in addition performed EPA streamwalk evaluations of the streams. The detailed field notes of the contractor will be made available to any person wishing to review them.

   While additional information on each stream surveyed would have been desirable, it was not necessary in order to make a significance determination, and the time constraints imposed on the study by the Land Conservation and Development Commission made the collection of additional data infeasible.

RESPONSE:

Staff believes that the data collected is adequate and sufficient in order to make a determination of significance.

3. **ISSUE:** The inventory for Burlington Creek does not note the presence of the 38-acre "old growth grove" purchased by Friends of Forest Park in 1993, and does not note the presence of the huge trees in its discussion of the stream.

   ISSUE RAISED BY: Chris Wrench

   DISCUSSION:

   The 38-acre parcel purchased by the Friends of Forest Park and transferred to METRO is within the watershed of Burlington Creek. However, the tributary of Burlington Creek which goes through the parcel is not the main stem of the creek, according to USGS 2000' scale quadrangle maps which were used to determine the streams to be inventoried. Therefore, the large diameter trees were not found by the surveyors.

   RESPONSE:

   Staff believes that there is no need to amend the report regarding this issue.

4. **ISSUE:** Conservation easements recorded on hundreds of acres of the Burlington Creek, North Angell Brothers Creek, and Middle Angell Brothers Creek are not mentioned in the inventory for those streams.

   ISSUE RAISED BY: Chris Wrench

   DISCUSSION:

   Through efforts of the Friends of Forest Park, two recent land divisions on McNamee Road have recorded conservation easements on parts of the lots which are not to be developed. These easements allow only selective logging and restrict activities which would impact wildlife habitat in the area.

   RESPONSE:

   While this information is useful, it is not relevant to the consideration of the five criteria for determining significance of individual streams, and thus is not included in the report. However, since the significance of these three streams is subject to dispute by other parties, the fact that these conservation easements will not in the future allow the clear-cutting which has impacted these streams so tremendously is relevant.

relation to the others.

ISSUE RAISED BY: Dennis Creel, Richard Shepard

DISCUSSION:

The Multnomah County Comprehensive Framework Plan Policy 16 sets forth criteria for the determination of significant streams in the County. As a practical matter, application of these criteria in the West Hills results in all but three of the streams being considered significant. As a local jurisdictions, Multnomah County has a right to "set the goalposts" for determining significance, and these goal posts are such that virtually all inventoried streams qualify as significant.

RESPONSE:

Staff believes that the determination of significance for West Hills streams is valid.

6. **ISSUE:** The impact area for the streams in the West Hills does not include areas outside of the riparian zone.

ISSUE RAISED BY: Arnold Rochlin, Michael Carlson

DISCUSSION:

The impact area is defined as the riparian zone along each stream. The average, minimum, and maximum width of each stream's riparian zone is contained within the report. A discussion of the existing condition of the impact area/riparian zone is contained within the Stream Profile information in the Technical Report.

The impact area was limited to the riparian zones along each stream in order to make the report manageable in the time allotted for its completion. Impacts to streams beyond the riparian zone are much reduced, and unless practiced at a large scale are in fact negligible. The major issue regarding watersheds of streams is in relation to the issue of wildlife habitat -- streams are generally key portions of larger contiguous wildlife habitat areas. The one significant potential impact within any of the watershed of these streams (outside of the riparian zone) comes from the Angell Brothers Quarry proposal, which is discussed in a separate chapter of this Report. This report includes discussion of the consequences of protecting the mineral and aggregate site for the streams, and the consequences of protecting the streams upon the mineral and aggregate site. To include that information in this report as well is superfluous.

RESPONSE:

Staff believes that no revision to the Resource Analysis report is necessary to include entire watersheds as impact areas to the streams. Significant impacts that do exist are discussed in the Resource Analysis chapters on Wildlife Habitat and Mineral & Aggregate (Angell Bros.). These issues will be "reconciled" in the Reconciliation Report -- thus in a

sense the three chapters are in fact one report, and the request of the commentors will have been granted.

7. **ISSUE:** The Resource Analysis Report does not properly address the near total destruction of a watershed that will result from mining on the Angell Brothers site and incorrectly assumes that state agencies can regulate the quarry properly.

ISSUE RAISED BY: Arnold Rochlin

DISCUSSION:

The issue has often been raised in relation to the Angell Brothers quarry proposed expansion that reclamation is infeasible and will not work. Additionally, the state agencies which regulate the quality of runoff and the efficacy of a reclamation plan are alleged to be unable to properly fulfill their functions. The persons raising these issues are operating under the assumption that 1) past failed or non-existent reclamation efforts in other areas of Oregon were considered under the same regulatory framework as today's reclamation efforts, and 2) that State agencies that may have inadequately monitored compliance with environmental standards in the past are unable to change their policies and procedures in the future.

As for the actual reclamation plan, there is no doubt that even the best reclamation plan will not result in the return of a stream to the exact physical condition that existed prior to the quarrying that caused the need for reclamation. The goal of a reclamation plan is the return of the land to a condition that will cause negative impacts, be they to water resources, scenic qualities, wildlife habitat, or other attributes, that will affect the surrounding area.

The key question, therefore, is whether the condition of a stream to be impacted by mining is so unique that the existing condition of the stream must not be disturbed. This issue will be resolved in the Reconciliation Report for this process.

As for the issue of water quality, staff will make the assumption that the Oregon Department of Environmental Quality, which regulates the discharge from the Angell Brothers quarry operation, will be able to approve and monitor a plan which does not negatively impact surrounding waterways.

RESPONSE:

Staff does not believe that the Angell Brothers mining operation will necessarily lead to the permanent total destruction of any watershed in which they quarry. Staff believes that the regulatory state agencies are able to do their job to control impacts and require for a good reclamation plan for the Angell Brothers quarry. For staff to take a position based upon the opposite conclusion would be to take a cynical position on the issue which is not appropriate.

8. **ISSUE:** The Resource Analysis Report assumes economic impacts from restricting mining, but cites no evidence.

ISSUE RAISED BY: Arnold Rochlin

DISCUSSION:

This issue is discussed more extensively in the companion Resource Analysis Reports for Mineral and Aggregate Resources -- Angell Brothers, and Wildlife Habitat.

RESPONSE:

Information from these two other chapters will be amalgamated with the Streams Resource Analysis chapter into the final document. Therefore, no new additional information in the Streams Resource Analysis chapter is necessary.

9. **ISSUE:** The Resource Analysis Report fails to recognize that the aggregate resource is not confined to the site.

ISSUE RAISED BY: Arnold Rochlin

DISCUSSION:

The report does, in fact, state under Conflicting Use -- Mining, that, "Considering the geologic setting of the site and other quarries in the area, the potential exists for similar aggregate resource development at other locations along the east flank of the West Hills." Any further discussion of this issue as a conflicting use would be indulging in speculation. Since there are no other identified significant mining operations in the West Hills, mining does not impact streams outside of the Angell Brothers quarry site.

RESPONSE:

Staff believes that the report adequately addresses the issue of potential mining in the West Hills outside of the Angell Brothers quarry site.

10. **ISSUE:** Flows from the "Angell Brothers North" Stream into Burlington Bottoms are insignificant:

ISSUE RAISED BY: Richard Shepard

DISCUSSION:

The "Angell Brothers North" stream drains into Burlington Bottoms. Based on field observation with Oregon Department of Fish & Wildlife Staff, Department of Land Conservation and Development Staff, and Mr. Shepard on May 4, 1994, staff has determined that the flow from this stream enters a culvert to the west of a filled area which is related to PGE and BPA transmission lines and exits to the east of this filled area after commingling with

waters from undetermined locations within the fill area. This channel then flows through a culvert under two railroad lines and Highway 30 into Burlington Bottoms. When we observed the upper stream on May 4, it contained no water(however the ground was soaked), while the "exit" culvert below the filled area did have a flow -- which indicates the commingling of the flow from the watershed with other unknown sources.

The key issue is whether the flows from this channel into Burlington Bottoms "contributes water... and diversion or degradation of the resource would significantly diminish the recreational value of the facility." Staff has come to the conclusion that the flow from this watershed is of apparently marginal significance, but does barely meet the definition contained within the criteria

RESPONSE:

Staff does not believe that the significance finding for the "Angell Brothers North" stream relating to its flow into Burlington Bottoms should be altered. It should be noted however, that the significance involved in this case is admittedly not large.

11. **ISSUE:** Strategy "D" of Criterion 4 of Policy 16-G of the Multnomah County Comprehensive Plan does not address the issue of water potability, because the benefits to water quality from the presence of riparian vegetation do not have any relationship water potability.

ISSUE RAISED BY: Richard Shepard

DISCUSSION:

Strategy "D" states, "The riparian or watershed vegetation associated with a water resource shall be considered part of the water resource area if that vegetation substantially contributes to the protection of water quality by reducing sedimentation and erosion, removing nutrients, or lowering water temperature/increasing B.O.D." The commentor assumes that the purpose of maintaining water quality listed in this section, since it is under the sub-heading "Public Safety," refers to maintaining potable drinking water supplies. However, the "public safety" values to be maintained are much greater than those related just to a potable drinking water supply. The reduction in erosion and sedimentation has the effect of significantly reducing the impacts of flooding on downstream properties. "Public safety" also includes the maintenance of a high water quality for fish that are consumed by humans, which is achieved by lowering water temperature and increasing Biochemical Oxygen Demand (B.O.D.).

RESPONSE:

Staff believes that this criterion does not need to be altered -- that it is justified as a measure of public safety.

12. **ISSUE:** The Streams report does not adequately define what an "essential connection" in terms of the Comprehensive Framework Plan criteria regarding fish & wildlife habitat values.

ISSUE RAISED BY: Richard Shepard

DISCUSSION:

The original draft of the streams report did not define the term "essential connection." This term is used to justify a significance finding under the fish & wildlife criteria of Comprehensive Framework Plan Policy 16-G when the scored rating per the Wildlife Habitat Assessment form is between 35 and 44 (out of a possible 96 points).

RESPONSE:

The revised report does describe the "essential connection" for each stream in which this criteria is used to discuss significance. In most cases, the essential connection is within the watershed -- lower scoring areas of the stream connect with higher scoring areas in an essential way.

13. **ISSUE**: The Angell Brothers North and Angell Brothers Middle streams are not significant because of the issues raised in #10, #11, and #12 above.

ISSUE RAISED BY: Richard Shepard

DISCUSSION:

Because of the issues raised by the commentor, staff re-evaluated conclusions reached on these two streams. While the Angell Brothers North stream remains significant, the Angell Brothers Middle stream is not. A revised way of looking at the measure of canopy cover which does not take into account portions of the stream where surveys were not possible results in this criteria not being met for this stream. Additionally, there were no "essential" connections" as defined for this stream.

RESPONSE:

As a result, the Angell Brothers Middle Stream is not significant.

14. **ISSUE:** The purported reconciliation of conflicting uses is of very low quality in that it lumps all streams together. Additionally, some of its recommendations are thoughtless, such as requiring a minimum setback for streams which may actually result in more severe impacts.

ISSUE RAISED BY: Arnold Rochlin

DISCUSSION:

The "comment" is valid in that the reconciliation in the draft was general in nature.

RESPONSE:

The reconciliation has been removed from the streams report and a revised discussion is contained within the reconciliation section of the report. A detailed implementation program will await the implementation of the significant streams protection program, due to be completed in August.

15. **ISSUE**: The streams study reaches conclusions about property values which have a limited perspective -- restrictions upon one property may enhance values on surrounding properties.

ISSUE RAISED BY: Arnold Rochlin

DISCUSSION:

The comment is correct that zoning may in some cases enhance overall property values because of limitations placed on an individual property owner regarding an obnoxious use, such as a steel mill in a residential area. If a stream is degraded, then adjacent property values may indeed suffer. However, the issue in the West Hills does not concern steel mills -- the only comparable use would be the Angell Brothers quarry, and proper regulation of impacts along with the fact that very little exists in the vicinity to minimize would reduce negative economic benefits to surrounding property owners to a level which is not comparable with the economic loss to the Angell Brothers operation of not allowing mining on their property. As for other uses, the negative value on stream owners of allowing residential development on 5 to 80 acre size parcels is clearly minimal compared to the negative economic value of prohibiting residential development on a parcel in order to completely preserve streams, and also negative in terms of restricting the siting of a residence on the same parcel to the point where an inferior building site must be chosen for the residence.

RESPONSE:

Staff believes that no revision is necessary to the Resource Analysis report as regards this issue.

16. **ISSUE:** The Resource Analysis Report does not identify the Thompson, Cornell, and "South Audubon" forks of Balch Creek.

ISSUE RAISED BY: Arnold Rochlin

DISCUSSION:

The commentor is incorrect -- the report discusses four tributaries of Balch Creek, including all three of the forks named.

RESPONSE:

No revision to the report is necessary.

17. **ISSUE:** The Thompson Fork of Balch Creek is incorrectly identified as significant -- it is in fact a minor tributary.

ISSUE RAISED BY: James Bartels

DISCUSSION:

The lower portions of the Thompson Fork of Balch Creek were surveyed and found to meet several of the criteria for significance listed in the Comprehensive Framework Plan to be met. The commentor may have additional information in this regard -- however, since he refused access to his property in order to survey the creek on his property, the significance determination was made upon the information available.

RESPONSE:

No revision to the Resource Analysis Report is necessary regarding this issue.

18. **ISSUE:** The Resource Analysis Report incorrectly identifies riparian zones and drawn conclusions which cannot be supported scientifically. If the accepted definition of riparian zone is used, most of the streams would not have such a zone.

ISSUE RAISED BY: Richard Shepard

DISCUSSION:

The draft report contained no definition of "riparian zone" as used in the report. The revised report contains the following definition, on Page 4 of the Technical Appendix:

"A riparian area is comprised of an aquatic ecosystem and associated upland area. Water in the aquatic system influences upland vegetation and microclimate. Upland areas affect the aquatic ecosystem by providing thermal regulation, biomass, and structure."

RESPONSE:

Inclusion of this definition provides the definition of "riparian zone" used to prepare this report. The report was prepared by technical specialists in the field of Biology, and is technically defensible.

APPENDIX B

TECHNICAL REPORT

INVENTORY/SIGNIFICANCE ANALYSIS

PREPARED BY SRI/SHAPIRO

INVENTORY/SIGNIFICANCE ANALYSIS

INTRODUCTION

Inventories have been completed for streams in nine sub-regions of the West Hills Rural Area. The inventory profiles address location, quality, and quantity consistent with Statewide Planning Goal 5 requirements. The inventory is part of the Multnomah County Significant Streams study. Stream profiles are mapped and organized by study area. Maps indicate which stream reaches were inventoried.

Stream profile sheets include the location and the length of stream inventoried. The profiles provide information on economic use based on water rights data. The profiles address educational, recreational, and public safety issues. Natural resource values are addressed in terms of Stream Class, threatened and endangered species information, wildlife habitat assessment information and riparian vegetation. A qualitative description of each stream is also provided.

The significance criteria is addressed in a matrix format. If any one of the criteria is satisfied, the stream is considered significant and a Goal 5 analysis is conducted. If the stream does not meet the criteria, an ESEE analysis under Goal 5 is not prepared and no further action is required or appropriate under Goal 5. These streams are not included on the Plan Inventory for Goal 5 purposes.

The significance analysis is conducted on a stream by stream basis. Because a stream's tributaries contribute to the health, quality, and significance of the whole stream, individual tributaries are examined collectively. Field data was collected along individual stream segments but the data has been consolidated for purposes of this evaluation. The limitations of this process are that data is averaged and segments of exceptionally high quality or exceptionally low quality may be over looked. The advantage of this process is that streams are examined as a whole and are not fractured into small segments that may include highly conflicting data. It should be noted that water seasonality is based on USGS mapping. In areas with a deciduous overstory component, "summer canopy" cover has been estimated.

SIGNIFICANCE CRITERIA

Policy 16-G sets forth the criteria for determining significance of water resources and wetlands. The methodology followed for use of the criteria is described below.

A. Economic Value

Strategy A of Policy 16-G states that sites should be designated significant "if any use of the water resource can be shown to be feasible for use in significantly increasing a specified economic activity or function or substantially increasing the economic value of the land through which the waters flow".

To assess economic significance, surface water rights for properties along the streams were analyzed. A list of surface water rights was obtained from the Oregon Water Resources Department. The list of relevant permits is included as part of the stream profile. The rate or quantity of water being diverted and the use of the water is noted. All uses, including domestic use, are assumed to provide an economic benefit to the user.

B. Recreation Value

Strategy B of Policy 16-G states that a water resource should be designated significant if:

1. The resource lies within the boundaries of public park or recreation facility and the resource is an integral part of the facility's recreational activities; or

2. The resource contributes water to a park or recreation facility and diversion or degradation of the resource would significantly diminish the recreational value of the resource.

Park and recreation facilities along stream segments and downstream were documented. The role of the water resource in regard to the recreational activity was noted. For example, boating or fishing activities are water based and diversion and degradation of the water resource would clearly diminish the recreational quality of the resource.

C. Educational Value

Strategy C of Policy 16-G states that water resources should be designated significant if they have been identified as being ecologically or scientifically significant by the Oregon Natural Heritage Program or if the resource is used for public educational purposes.

Sue Vrilakas, botanist and data manager for the Oregon Natural Heritage Program conducted a data system search of the West Hills Rural Area for rare, threatened, and endangered plant and animal species. The search, completed on February 22, 1994, identified 34 records in the general vicinity but only four records were within the watersheds for the streams being studied. The existence of the significant sites is noted on the inventory profile sheets but detailed locations are not provided due to the confidential nature of the data.

Ron Klein of the Metro Greenspaces program was contacted regarding public educational activities. Ron provided information on streams that have been used for classes offered by the Portland Audubon Society and for public and private school classes sponsored through the Green City Data grants program.

D. Public Safety

Policy 16-G includes strategy D which states that sites and resources should be designated significant in the following cases:

1. The water resource is within the Watershed Management Unit of an existing or proposed municipal water source; or

2. The water resource is part of the groundwater area for a municipal water supply; or

3. The water resource and surrounding lands are flood storage areas which if altered would increase the frequency or height of floods downstream.

Strategy D also addresses water quality in terms of the significance of the riparian vegetation associated with the water resource.

To document water source information, the cities of Portland, Beaverton, Hillsboro, and Scappoose were contacted. Staff at each city indicated that the study area streams were not part of the respective municipal water supply systems.

In regard to flood storage, field inventories documented whether wetlands were associated with the streams. The number of wetlands and the approximate size of wetlands were noted. Depending on the size of the wetland and the form of the stream channel, wetlands may provide water storage capacity that will reduce the intensity of a storm event. When streams and wetlands provide this function, a determination of significance was made.

In regard to water quality and riparian vegetation, the width of the riparian corridor was documented in the field and canopy cover was noted. The inventory profiles provide the average maximum width of the corridor. If 75% of the stream length had canopy cover that was less than 25%, the riparian vegetation was determined to be insignificant and have little positive influence on water quality. If greater canopy cover was provided, the riparian area was considered significant. If field surveyors were unable to inventory at least two-thirds of the length of a stream within the county, the relationship of riparian vegetation and water quality could not be established with confidence. For this reason, if a stream appears to meet the canopy cover criteria, it is considered significant only if more than two-thirds of the stream was inventoried.

E. Natural Area Value

Strategy E of Policy 16-G addresses the natural area value of the resource. Sites are considered significant if they are designated Class 1 by the Oregon Department of Forestry, if the area is the habitat of a threatened or endangered species or if a Wildlife

Habitat Assessment form has been completed and the site scored 45 or more points. A site may also be considered significant if it scores between 35-44 and it provides an essential connection between or enhances adjoining higher rated areas.

As part of the inventory Class 1 waters were documented and noted on inventory forms. If any portion of the stream within the County is designated Class 1, the stream was considered significant. If field surveyors were unable to inventory at least two-thirds of the length of a stream within the county, the relationship of riparian vegetation and water quality could not be established with confidence. For this reason, if a stream appears to meet the canopy cover criteria, is is considered significant only if more than two-thirds of the stream was inventoried.

As noted under Educational Value, above, the Oregon Natural Heritage Program data base was searched for rare, threatened and endangered plant and animal species. Inventory forms identify whether sites were identified. Due to the confidential nature of the data, details are not provided.

Wildlife Habitat Assessment forms were completed for segments along each stream at two/tenths of a mile intervals. The data is summarized in a table following each of the profile forms. Streams averaging 45 points and above were considered significant resources. Sites with WHA scores between 35-44 points were designated significant if they function as "essential connections or demonstrably enhance higher rated adjacent areas." The scope of this study was limited to the stream channel area and only addresses connections and enhancement within a given stream channel. Connections or enhancement to upslope areas were not considered.

For the purposes of this report, a riparian area is comprised of an aquatic ecosystem and associated upland area. Water in the aquatic ecosystem influences upland vegetation and microclimate. Upland areas affect the aquatic ecosystem by providing thermal regulation, biomass, and structure.

SIGNIFICANCE MATRIX

The Significance Matrix summarizes the findings and research documented on the profile sheets. The matrix is designed so that a yes - no answer is provided when the county significance criteria are satisfied. The conclusion is based on whether the threshold for significance has been met.

SIGNIFICANCE MATRIX – Study Area: Gilkinson Road

CRITERIA:	STREAMS: Jackson	Joy	Jones	Rocky Point	Scappoose
ECONOMIC:					
Water Rights Permits	Y	Y	Y	Y	Y
RECREATION:					
Within Park/Rec. Facility	N	N	N	N	N
Contributes water to Park/Rec. Facility	N	N	N	N	N
EDUCATION:					
Designated significant by the Oregon Natural Heritage Program	N	N	N	N	N
Used for public education	N	N	N	N	N
PUBLIC SAFETY:					
Within Watershed Management Unit	N	N	N	N	N
Groundwater Recharge for Municipal Supply	N	N	N	N	N
Flood Storage Function	Y	N	Y	Y	Y
Riparian Zone Water Quality Benefits	Y	Y	Y	Y	Y
NATURAL AREA VALUE:					
Designated Class 1	N	Y	N	N	N
Habitat of an Endangered or Threatened Species	N	N	N	N	Y
Wildlife Habitat Assessment Score					
If > 44 points – considered significant	Y	Y	Y	N	Y
If 35–44 points, essential connections are provided	N/A	N/A	N/A	Y	N/A
CONCLUSION:					
Significant	Y	Y	Y	Y	Y

Key:	
Y – Yes	N/A – Not Applied
N – No	I – Incomplete

SIGNIFICANCE MATRIX – Study Area: Wildwood–McKay

CRITERIA:	STREAMS: E. Fork McKay	North Jackson	Wildwood	North Wildwood	Middle Wildwood	South Wildwood
ECONOMIC:						
Water Rights Permits	N	N	N	N	N	Y
RECREATION:						
Within Park/Rec. Facility	N	N	Y	N	N	N
Contributes water to Park/Rec. Facility	N	N	N	Y	Y	Y
EDUCATION:						
Designated significant by the Oregon Natural Heritage Program	N	N	N	N	N	N
Used for public education	N	N	N	N	N	N
PUBLIC SAFETY:						
Within Watershed Management Unit	N	N	N	N	N	N
Groundwater Recharge for Municipal Supply	N	N	N	N	N	N
Flood Storage Function	Y	Y	N	Y	Y	Y
Riparian Zone Water Quality Benefits	Y	Y	N/A	Y	Y	N/A
NATURAL AREA VALUE:						
Designated Class 1	Y	N	Y	Y	Y	Y
Habitat of an Endangered or Threatened Species	N	N	N	Y	N	N
Wildlife Habitat Assessment Score						
If > 44 points – considered significant	Y	N	I	Y	N	N
If 35–44 points, essential connections are provided	N/A	Y	I	N/A	Y	Y
CONCLUSION:						
Significant	Y	Y	Y	Y	Y	Y

Key:	
Y – Yes	I – Incomplete
N – No	N/A – Not Applied

SIGNIFICANCE MATRIX – Study Area: Holbrook – Logie

CRITERIA:	STREAMS: North Rainbow	South Rainbow	Holbrook
ECONOMIC:			
Water Rights Permits	N	Y	N
RECREATION:			
Within Park/Rec. Facility	N	N	N
Contributes water to Park/Rec. Facility	N	N	N
EDUCATION:			
Designated significant by the Oregon Natural Heritage Program	N	N	N
Used for public education	N	N	N
PUBLIC SAFETY:			
Within Watershed Management Unit	N	N	N
Groundwater Recharge for Municipal Supply	N	N	N
Flood Storage Function	Y	Y	Y
Riparian Zone Water Quality Benefits	Y	Y	Y
NATURAL AREA VALUE:			
Designated Class 1	N	Y	N
Habitat of an Endangered or Threatened Species	N	N	N
Wildlife Habitat Assessment Score			
If > 44 points – considered significant	Y	Y	N
If 35–44 points, essential connections are provided	N/A	N/A	Y
CONCLUSION:			
Significant	Y	Y	Y

Key:	
Y – Yes	N/A – Not Applied
N – No	I – Incomplete

SIGNIFICANCE MATRIX – Study Area: Upper Rock Creek

CRITERIA:	STREAMS: South Jackson	STREAMS: Rock (North Main Stem)
ECONOMIC:		
Water Rights Permits	N	Y
RECREATION:		
Within Park/Rec. Facility	N	N
Contributes water to Park/Rec. Facility	N	Y
EDUCATION:		
Designated significant by the Oregon Natural Heritage Program	N	N
Used for public education	N	Y
PUBLIC SAFETY:		
Within Watershed Management Unit	N	N
Groundwater Recharge for Municipal Supply	N	N
Flood Storage Function	N	Y
Riparian Zone Water Quality Benefits	Y	Y
NATURAL AREA VALUE:		
Designated Class 1	N	Y
Habitat of an Endangered or Threatened Species	N	N
Wildlife Habitat Assessment Score		
If > 44 points – considered significant	Y	Y
If 35–44 points, essential connections are provided	N/A	N/A
CONCLUSION:		
Significant	Y	Y

Key:	
Y – Yes	N/A – Not Applied
N – No	

SIGNIFICANCE MATRIX – Study Area: Folkenburg

CRITERIA:	STREAMS: McCarthy
ECONOMIC:	
Water Rights Permits	N
RECREATION:	
Within Park/Rec. Facility	N
Contributes water to Park/Rec. Facility	N
EDUCATION:	
Designated significant by the Oregon Natural Heritage Program	N
Used for public education	N
PUBLIC SAFETY:	
Within Watershed Management Unit	N
Groundwater Recharge for Municipal Supply	N
Flood Storage Function	N
Riparian Zone Water Quality Benefits	Y
NATURAL AREA VALUE:	
Designated Class 1	Y
Habitat of an Endangered or Threatened Species	N
Wildlife Habitat Assessment Score	
If > 44 points – considered significant	N
If 35–44 points, essential connections are provided	Y
CONCLUSION:	
Significant	Y

Key:
Y – Yes
N – No

SIGNIFICANCE MATRIX – Study Area: McNamee Harborton

CRITERIA:	STREAMS: Burlington	North Angell Bros.	Middle Angell Bros.	South Angell Bros.	Newberry	Miller
ECONOMIC:						
Water Rights Permits	N	N	N	N	N	Y
RECREATION:						
Within Park/Rec. Facility	N	N	N	N	N	N
Contributes water to Park/Rec. Facility	Y	Y	N	N	N	
EDUCATION:						
Designated significant by the Oregon Natural Heritage Program	N	N	N	N	N	N
Used for public education	N	N	N	N	N	N
PUBLIC SAFETY:						
Within Watershed Management Unit	N	N	N	N	N	N
Groundwater Recharge for Municipal Supply	N	N	N	N	N	N
Flood Storage Function	N	N	N	N	N	
Riparian Zone Water Quality Benefits	N	Y	N/A	N	N/A	
NATURAL AREA VALUE:						
Designated Class 1	N	N	N	N	N	N
Habitat of an Endangered or Threatened Species	N	N	N	N	N	N
Wildlife Habitat Assessment Score						
If > 44 points – considered significant	N	N	N	N	N	Y
If 35–44 points, essential connections are provided	N	Y	N	N	N	–
CONCLUSION: Significant	Y	Y	N	N	N	Y

Key:	
Y – Yes	I – Incomplete
N – No	NA – Not Applied

SIGNIFICANCE MATRIX – Study Area: Cornelius Pass

CRITERIA:	STREAMS: Rock (Middle Main Stem)
ECONOMIC:	
Water Rights Permits	Y
RECREATION:	
Within Park/Rec. Facility	N
Contributes water to Park/Rec. Facility	Y
EDUCATION:	
Designated significant by the Oregon Natural Heritage Program	N
Used for public education	Y
PUBLIC SAFETY:	
Within Watershed Management Unit	N
Groundwater Recharge for Municipal Supply	N
Flood Storage Function	N
Riparian Zone Water Quality Benefits	Y
NATURAL AREA VALUE:	
Designated Class 1	Y
Habitat of an Endangered or Threatened Species	N
Wildlife Habitat Assessment Score	
If > 44 points – considered significant	Y
If 35–44 points, essential connections are provided	N/A
CONCLUSION:	
Significant	Y

Key:	
Y – Yes	N/A – Not Applied
N – No	

SIGNIFICANCE MATRIX – Study Area: Germantown

CRITERIA:	STREAM: Rock (South Main Stem)
ECONOMIC:	
Water Rights Permits	Y
RECREATION:	
Within Park/Rec. Facility	N
Contributes water to Park/Rec. Facility	Y
EDUCATION:	
Designated significant by the Oregon Natural Heritage Program	N
Used for public education	Y
PUBLIC SAFETY:	
Within Watershed Management Unit	N
Groundwater Recharge for Municipal Supply	N
Flood Storage Function	Y
Riparian Zone Water Quality Benefits	N/A
NATURAL AREA VALUE:	
Designated Class 1	Y
Habitat of an Endangered or Threatened Species	N
Wildlife Habitat Assessment Score	
If > 44 points – considered significant	Y
If 35–44 points, essential connections are provided	N/A
CONCLUSION:	
Significant	Y

Key:	
Y – Yes	N/A – Not Applied
N – No	

SIGNIFICANCE MATRIX – Study Area: Bonny Slope

CRITERIA:	STREAMS: North Bronson	STREAMS: South Bronson
ECONOMIC:		
Water Rights Permits	Y	Y
RECREATION:		
Within Park/Rec. Facility	N	N
Contributes water to Park/Rec. Facility	N	N
EDUCATION:		
Designated significant by the Oregon Natural Heritage Program	N	N
Used for public education	N	N
PUBLIC SAFETY:		
Within Watershed Management Unit	N	N
Groundwater Recharge for Municipal Supply	N	N
Flood Storage Function	N	Y
Riparian Zone Water Quality Benefits	Y	Y
NATURAL AREA VALUE:		
Designated Class 1	N	N
Habitat of an Endangered or Threatened Species	N	N
Wildlife Habitat Assessment Score		
If > 44 points – considered significant	Y	N
If 35–44 points, essential connections are provided	N/A	Y
CONCLUSION:		
Significant	Y	Y

Key:	
Y – Yes	N/A – Not Applied
N – No	

SIGNIFICANCE MATRIX – Study Area: Balch Creek

CRITERIA:	STREAMS: Balch	Saltzman
ECONOMIC:		
Water Rights Permits	Y	N
RECREATION:		
Within Park/Rec. Facility	Y	Y
Contributes water to Park/Rec. Facility	N	N
EDUCATION:		
Designated significant by the Oregon Natural Heritage Program	N	N
Used for public education	Y	N
PUBLIC SAFETY:		
Within Watershed Management Unit	N	N
Groundwater Recharge for Municipal Supply	N	N
Flood Storage Function	N	I
Riparian Zone Water Quality Benefits	Y	I
NATURAL AREA VALUE:		
Designated Class 1		N
Habitat of an Endangered or Threatened Species	N	N
Wildlife Habitat Assessment Score		
If > 44 points – considered significant	Y	I
If 35–44 points, essential connections are provided	N/A	I
CONCLUSION:		
Significant	Y	Y

Key:	
Y – Yes	I – Incomplete
N – No	N/A – Not Applied

Gilkison Road Area

JACKSON CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Gilkison Road Area

Length Inventoried: 17,424 ft (3.3 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 17,424 ft (3.3 miles)

Area of Watershed in Multnomah County: 900 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Jackson		95%		5%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Jackson Creek - Main Stem

The stream originates in a small stand of mature conifer with scattered deciduous trees. The west bank of the stream has been harvested but some alder and small conifer were left in the riparian area and upslope. Five hundred feet downstream, both sides of the creek have been recently harvested for approximatly 1,200 feet. No vegetation is left in the riparian corridor. Two dirt skid roads cross the stream and run adjacent to it. In the middle section of the stream a dozer or skidder was driven down the stream with the blade down shoving debris and dirt into the stream channel and creating a cut bank that contributes an even greater amount of sediment to the stream than the roads and other harvest activity. The next 1,400 feet of stream flow through land managed by the Bureau of Land Mangement. Alder is dominant in the immediate stream channel but the upslope areas are dominated by mature Douglas fir, western hemlock, and western red cedar. The stand structure is starting to diversify with some fallen trees creating areas for sapling regeneration. The shrub layer density is low to moderate and composed of salmonberry, vine maple, and occasional huckleberry. Slopes in this area are 45 degrees or more. The stream flows down a steep gradient (20+ degrees) and into a 100 foot by 150 foot wetland area dominated by red alder with more conifer upslope. The shrub layer here is more diverse with elderberry and Oregon grape. The stream continues downstream through a

mixed deciduous stand to crossing with Gilkison Road. Snags are common in this upper section; some trees have a pileated woodpecker foraging holes. Several Pacific yew also were observed.

North of Gilkison Road, the stream flows through a steep draw (side slopes 65-70 degrees) with a flat 10-15 foot wide floodplain. A concrete dam and old wooden water wheel are located 100 feet downstream from Gilkison Road. The shrub layer is moderately dense and diverse including huckleberry, salal, salmonberry, vine maple, western wahoo, and Oregon grape. Historic logging removed most conifer from the riparian area and regeneration in some areas is not well established. The banks have failed in several areas. North of the powerline crossing further downstream, the floodplain widens to 200 - 300 feet. Alder is the dominant overstory and salmonberry and vine maple dominate the understory. The mainstem converges with the east and west tributaries here and flows out of the County.

The stream is of moderate size, varying from 3-6 feet wide and 8-12 inches deep. Gravel and sediment are the most common substrate in the higher reaches with cobbles and boulders becoming more common downstream. The stream is 90% riffle/run and 10% pools. Pools tend to be localized with long stretches of riffle/run between occurences.

Jackson Creek - West Fork

The stream originates from a small, 20-foot by 30-foot pond in a mature conifer stand and flows down a narrow, steep draw with 45 degee side slopes. The conifer overstory is made up of Douglas fir, western hemlock, and western red cedar, frequently 28 inches or greater in diameter. Downstream 1,500 feet, the stream channel widens and flattens out as it enters a 20-year-old Douglas fir plantation. Young alder dominates the stream bottom. A road crosses the stream and parallels it on the east bank. Severe erosion is occurring along it's entire length. As the stream approaches the powerline crossing, the alder overstory becomes larger and big-leaf maple becomes more common. At 3,000 feet from the origin a road crosses the stream and the culvert is high enough from the stream (by 4-5 feet) to be a barrier to fish passage. The stream enters a stand dominated by large red alder and big-leaf maple with occasional red cedar ranging in size from saplings to 30 inches in diameter. The shrub layer of vine maple, snowberry, huckleberry, and salmonberry, is dense. The stream bottom widens out to 100 - 200 feet across. The stream enters a fenced pasture where the stream channel is overgrown by Himalayan blackberry. It joins the mainstem 200 feet after entering the pasture.

The stream is three feet wide and one foot deep at it's confluence with the main stem. The substrate is dominated by clay and sediment with some gravel and cobbles. The stream is 10% pools and 90% riffle/run.

Jackson Creek - East Fork

The stream originates from a small narrow pond in the center of an extensively-managed stand of mixed conifer/deciduous trees. A buffer (25-30-foot) of young alder and occasional conifer was left around the stream. The stream flows under three gravel/dirt roads, with only the middle road having a visible culvert. Above the first road, the stream meanders and is more wetland than stream in character. Below the third road the stream enters a forested, steep draw with the powerline corridor 50 feet upslope to the east and a gravel road to the west. The stream passes under Gilkison Road and into an area that has been recently clearcut. There is house on the west bank and another upslope to the west. Large amounts of logging debris are in and around the stream. Four hundred feet downstream from Gilkison the stream enters a stand of 10-14-inch Douglas fir regeneration. The stream is ponded behind a logging road with the culvert removed. The pond is approximately 40 feet by 50 feet and appears to be quite deep. A large sediment deposit "plain" is at the head of the stream. After the road crossing, the road parallels the stream on the west bank for a short distance and has experienced a major failure. The floodplain widens downstream to 50-75 feet and is dominated by red alder. Several small wetlands are adjacent to the stream. Conifers become more prevalent upstream. The stream joins the mainstem approximately 3,000 feet from Gilkison Road.

The stream is three feet wide and averages six inches deep at it's confluence. The substrate is almost entirely clay and sediment with occasional cobble/boulder and gravel. The stream is virtually 100% riffle/run.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S37402	NWSE 26 3N 2W	Livestock	.0050 CFS
S37402	NWSE 26 3N 2W	Irrigation	.0200 CFS
S26316	NWSE 26 3N 2W	Domestic	.0100 CFS
S51319	SWSW 26 3N 2W	Domestic	.0050 CFS

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 132

Range of Width: 30-400

Benefit to Water Quality: The current moderately high level of canopy closure and width of riparian corridor should have a positive influence on water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 53

Range of scores: 35-76

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Jackson Creek (Main Stem)	1	4	3	2	2	3	2	3	2	2	2	1	2	3	2	33
Jackson Creek (Main Stem)	2	4	3	0	2	1	1	1	0	0	0	0	1	3	0	16
Jackson Creek (Main Stem)	3	8	6	4	2	4	6	2	5	5	3	4	4	3	4	60
Jackson Creek (Main Stem)	4	8	6	4	4	4	4	2	3	4	2	2	3	4	2	52
Jackson Creek (Main Stem)	5	8	6	4	2	4	3	2	5	4	2	3	2	2	0	47
Jackson Creek (Main Stem)	6	4	3	6	2	6	3	2	4	6	3	1	2	1	0	43
Jackson Creek (Main Stem)	7	4	3	6	2	6	4	2	4	6	3	2	4	3	0	49
Jackson Creek (Main Stem)	8	4	3	6	2	4	4	2	4	4	3	3	4	3	0	46
Jackson Creek (Main Stem)	9	4	3	6	2	4	6	2	4	2	2	4	4	3	0	46
AVERAGES		5.3	4.0	4.2	2.2	4.0	3.7	2.0	3.4	3.7	2.2	2.2	2.9	2.8	0.9	43.6

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Jackson Creek (Main Stem)	1	75	75		X		
Jackson Creek (Main Stem)	2	15	15	X			
Jackson Creek (Main Stem)	3	100	100			X	
Jackson Creek (Main Stem)	4	100	100				X
Jackson Creek (Main Stem)	5	60	60			X	
Jackson Creek (Main Stem)	6	30	60				X
Jackson Creek (Main Stem)	7	40	50				X
Jackson Creek (Main Stem)	8	80	60			X	
Jackson Creek (Main Stem)	9	100	80				X
AVERAGES		66.7	66.7	11%	11%	33%	44%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Jackson Creek Trib. I (West)	1	4	3	8	4	6	4	3	8	6	4	4	4	3	2	63
Jackson Creek Trib. I (West)	2	4	3	8	2	3	2	2	2	2	2	1	2	2	0	35
Jackson Creek Trib. I (West)	3	4	3	8	2	3	2	2	2	2	2	1	2	2	0	35
Jackson Creek Trib. I (West)	4	4	3	8	2	6	6	2	4	4	2	2	2	3	0	48
AVERAGES		4.0	3.0	8.0	2.5	4.5	3.5	2.3	4.0	3.5	2.5	2.0	2.5	2.5	0.5	45.3

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Jackson Creek Trib. I (West)	1	200	200			X	
Jackson Creek Trib. I (West)	2	20	20	X			
Jackson Creek Trib. I (West)	3	60	60				X
Jackson Creek Trib. I (West)	4	50	50			X	
AVERAGES		82.5	82.5	25%	0%	50%	25%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Jackson Creek Trib. II (East)	1	4	4	5	4	3	3	2	3	4	3	1	2	3	0	41
Jackson Creek Trib. II (East)	2	4	3	2	2	4	3	2	5	5	3	0	1	2	0	36
Jackson Creek Trib. II (East)	3	4	3	6	4	4	5	2	6	5	3	1	4	3	2	52
Jackson Creek Trib. II (East)	4	4	3	6	4	4	6	2	4	4	2	3	4	3	2	51
AVERAGES		4.0	3.3	4.8	3.5	3.8	4.3	2.0	4.5	4.5	2.8	1.3	2.8	2.8	1.0	45.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Jackson Creek Trib. II (East)	1	40	40	X			
Jackson Creek Trib. II (East)	2	20	15	X			
Jackson Creek Trib. II (East)	3	20	20			X	
Jackson Creek Trib. II (East)	4	15	20				X
AVERAGES		23.8	23.8	50%	0%	25%	25%

*Width of riparian corridor in feet (in segment) looking downstream.

JOY CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Gilkison Road Area

Length Inventoried: 10,540 ft (2.0 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 12,280 ft (2.3 miles)

Area of Watershed in Multnomah County: 400 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Joy		80%		20%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Joy Creek - Mainstem and North Tributary

The stream originates southeast of Gilkison Road. The south side of the stream has been clear cut and the west upper bank has been converted to houses and fields. A 30-50-foot buffer of mixed ovestory has been left. The density of the buffer is variable. One thousand feet downstream, the north side has been clearcut and the south side is mixed deciduous/conifer dominatd by red alder. The north side becomes a 12-14-inch Douglas fir plantation. Vegetation on the south side remains the same with the addition of occasional 24-28-inch Douglas fir. The stream then enters a clearcut area. The first 200 feet have no buffer. Downstream, a thin sparse buffer dominated by a few large Douglas fir with red alder and big-leaf maple filling in the understory is present. Upslope 1,000 feet to the south is a 10-15-year-old Douglas fir plantation. The south tributary joins in this area. An old road is on the north bank. The stream bottom is 20-30 feet wide and flat in this area. The stream continues under the powerlines to a fence. No access permission was granted for beyond the fence. What follows is a visual assessment from the fence line and aerial photo interpretaion. The stream flows through a pasture with dense salmonberry in the stream corridor. Upstream to the north is a mature Dougals fir stand with open understory. The south bank is primarily red alder and western red cedar.

Downstream the overstory becomes more deciduous. There is a wetland/pond area just before the stream crosses under U.S. Highway 30.

The stream is approximately three feet wide and 6-12 inches deep below the confluence of the two tributaries. The substrate is primarily gravel with sand and clay in the bottom sections; it becomes more sand/silt/mud in the upper reaches of the north tributary. The stream is predominatly riffle/run (90+%) with few pools.

Joy Creek - South Tributary

The stream originates in a clearcut, crosses a dirt road with log bunker type culvert, and enters a dense Douglas fir plantation (4-10 inches). The stream is deeply incised with no floodplain. Red alder is common in the first 10-20 feet upslope from the stream. Old logging debris is common in the stream. The shrub layer is dense and comprised of salmonberry, Himalayan blackberry, and elderberry. The stream remains in the plantation for approximately 2,500 feet and then enters a open stand of alder with a sparse shrub layer. The narrow stream channel opens up into a 50-75-foot-wide flood plain. The stream crosses under a road 500 feet further downstream and enters a shallow draw with 10-30-foot flat bottom. The side slopes are 45 degrees. The slope tops are either clearcut or in plantations. The slopes and the bottom are forested in red alder with some large Douglas fir. The stream flows another 1,000 feet down the draw on a moderate gradient, then joins the north tributary to form the mainstem.

The stream is three feet wide and 6-18 inches deep near the confluence. The substrate is predominatly clay with some sand and boulder/cobble component. The stream is 10% pools and 90% riffle/run. Most pools are concentrated in the lower sections.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S27915	NWSE 26 3N 2W	Domestic	.0050 CFS
S31305	NESW 26 3N 2W	Domestic	.0050 CFS
S23139	NWNE 25 3N 2W	Domestic (Inc. Lawn & Garden)	.0100 CFS

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: No

Flood storage limited to stream channel: Yes

Riparian Corridor - see attached table

Average Width: 86 ft

Range of Width: 50-150 ft

Benefit to Water Quality: The moderate level of overall canopy closure and width of the riparian area should mitigate for the head water areas where there are thin riparian corridors and low to moderate canopy cover and should have a positive influence on overall water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 24%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 46

Range of scores: 39-56

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Joy Creek (Main Stem)	1	8	6	4	2	5	6	3	6	4	3	1	2	6	0	56
AVERAGES		8.0	6.0	4.0	2.0	5.0	6.0	3.0	6.0	4.0	3.0	1.0	2.0	6.0	0.0	56.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Joy Creek (Main Stem)	1	30	75		X		
AVERAGES		30.0	75.0	0%	100%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Joy Creek Trib. I (North)	1	4	3	4	2	3	3	2	4	3	3	1	2	5	2	41
Joy Creek Trib. I (North)	2	4	3	6	2	4	3	2	4	4	3	2	2	4	2	45
Joy Creek Trib. I (North)	3	4	3	6	2	4	5	3	5	4	2	1	3	4	0	46
Joy Creek Trib. I (North)	4	8	6	1	2	4	6	2	2	4	3	0	2	4	0	44
AVERAGES		5.0	3.8	4.3	2.0	3.8	4.3	2.3	3.8	3.8	2.8	1.0	2.3	4.3	1.0	44.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Joy Creek Trib. I (North)	1	25	25		X		
Joy Creek Trib. I (North)	2	50	75			X	
Joy Creek Trib. I (North)	3	100	50				X
Joy Creek Trib. I (North)	4	50	50		X		
AVERAGES		56.3	50.0	0%	50%	25%	25%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Joy Creek Trib. II (South)	1	4	3	6	2	4	4	2	6	4	2	1	3	4	0	45
Joy Creek Trib. II (South)	2	4	3	8	2	6	7	2	6	4	2	2	4	6	0	56
Joy Creek Trib. II (South)	3	4	3	8	2	6	6	2	2	2	2	2	4	4	0	47
Joy Creek Trib. II (South)	4	4	3	8	2	3	2	2	2	1	4	2	4	2	0	39
Joy Creek Trib. II (South)	5	4	3	8	2	2	4	2	2	2	4	1	4	4	0	42
AVERAGES		4.0	3.0	7.6	2.0	4.2	4.6	2.0	3.6	2.6	2.8	1.6	3.8	4.0	0.0	45.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Joy Creek Trib. II (South)	1	40	40			X	
Joy Creek Trib. II (South)	2	30	30			X	
Joy Creek Trib. II (South)	3	25	25			X	
Joy Creek Trib. II (South)	4	40	40			X	
Joy Creek Trib. II (South)	5	30	30			X	
AVERAGES		33.0	33.0	0%	0%	100%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

JONES CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Gilkison Road Area

Length Inventoried: 8,450 ft (1.6 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 8,450 ft (1.6 miles)

Area of Watershed in Multnomah County: 705 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Jones		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Jones Creek originates in a pole-sized Douglas fir stand. The stream continues in the stand for approximately 2,700 feet where it enteres an conifer stand comprised of 30-40-inch Douglas fir and western hemlock. The understory is very sparse. The understory of huckleberry, vine maple, and salmonberry is of low density. The stream is in a narrow draw with steep side slopes (60-70 degrees). The stand continues for approximately 1,500 feet, then enters a pole-sized second growth Douglas fir stand, with red alder in the stream bottom. The stream then enters a young Douglas fir plantation and becomes more incised and channelized. Salmonberry and vine maple are dense within the riparian area. The overstory is sparse red alder and big-leaf maple. The stream runs into a small pond with associated wetlands behind a powerline access road. Downstream from the road, the stream becomes moderate to high gradient in a steep-sided draw. The stream bottom is flat and averages 10 feet wide. The overstory is mixed conifer/deciduous trees. The shrub layer is of low density. The stream flows under U.S. Highway 30 through a culvert.

The stream is three to five feet wide and averages one to three feet in depth at U.S. Highway 30. The substrate is dominated by boulders and cobbles in the lower sections; gravel and sediment are more common in the upper reaches. In some areas the stream is cut down to bedrock. The stream is 25% pools and 75% riffle/run.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S19204	NESW 25 3N 2W	Power	.0100 CFS
S19204	NESW 25 3N 2W	Domestic	.0100 CFS
S42119	NENW 36 3N 2W	Domestic (Inc. Lawn & Garden)	.0100 CFS
S6145	NWSE 25 3N 2W	Irrigation & Domestic	.1800 CFS
S6663	NWSE 25 3N 2W	Irrigation & Domestic	.1000 CFS

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 206 ft

Range of Width: 102-300 ft

Benefit to Water Quality: The current moderate level of canopy cover and width of riparian corridor should have a positive influence of water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 24%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 47

Range of scores: 41-58

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Jones Creek	1	8	6	4	2	4	3	2	5	6	2	1	3	2	0	48
Jones Creek	2	4	3	6	4	4	6	2	3	2	1	1	4	2	2	44
Jones Creek	3	4	3	6	2	4	4	2	4	4	2	2	2	2	0	41
Jones Creek	4	4	3	6	2	4	3	2	5	4	3	2	2	2	0	42
Jones Creek	5	4	3	6	2	4	5	3	6	6	3	4	4	3	5	58
Jones Creek	6	4	3	6	2	4	5	3	4	4	3	3	4	4	3	52
Jones Creek	7	4	3	6	2	4	4	3	4	4	3	3	4	3	0	47
Jones Creek	8	4	3	6	2	4	4	3	4	4	3	3	4	3	0	47
AVERAGES		4.5	3.4	5.8	2.3	4.0	4.3	2.5	4.4	4.3	2.5	2.4	3.4	2.6	1.3	47.4

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Jones Creek	1	50	80		X		
Jones Creek	2	100	100	X			
Jones Creek	3	100	100		X		
Jones Creek	4	60	60			X	
Jones Creek	5	150	150			X	
Jones Creek	6	150	150		X		
Jones Creek	7	100	100			X	
Jones Creek	8	100	100			X	
AVERAGES		101.3	105.0	13%	38%	50%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

ROCKY POINT CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Gilkison Road Area

Length Inventoried: 5,280 ft (1.0 mile)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 5,280 ft (1.0 mile)

Area of Watershed in Multnomah County: 445 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Rocky Point		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Rocky Point Creek

Rocky Point Creek flows through pole-sized conifer stands with red alder and big-leaf maple in the riparian area for the first 3,000 feet. Pileated woodpecker foraging holes and Pacific yew were observed in the upper sections. There also are abundant wetlands adjacent to the stream. The stream enters an area where the upslopes on the south side are in 10 -15 year old plantations with low stocking levels. The riparian buffer is 30-50 feet wide. The overstory is sparse and dominated by red-alder, big-leaf maple, and remnant western red cedar. The understory is dense salmonberry, Himalayan blackberry and vine maple. The stream flows through a culvert under an old road, then off the cutbank for U.S. Highway 30 into a culvert.

The stream is approximately five feet wide at the lower end and averages 19 inches deep. The substrate is dominated by boulders and gravel and in some areas is cut to bedrock. The stream is 40% pool and 60% riffle/run.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S39051	SESW 36 2N 2W	Domestic	.0050

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 200 ft

Range of Width: 100-300 ft

Benefit to Water Quality: The current moderately low level of canopy cover should maintain the current level of water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 43

Range of scores: 41-45

Essential Connections: The downstream segments with lower WHA scores provide potential travel corridors for movement to the upstream areas with higher WHA scores.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Rocky Point Creek	1	4	3	4	2	5	6	2	2	2	2	1	3	3	2	41
Rocky Point Creek	2	4	3	3	2	6	4	2	1	2	2	1	3	3	4	40
Rocky Point Creek	3	4	3	8	4	3	2	2	3	3	3	2	2	2	4	45
Rocky Point Creek	4	4	3	8	4	4	3	2	4	4	3	2	2	2	0	45
Rocky Point Creek	5	4	3	8	2	4	3	2	4	4	3	2	2	2	0	43
AVERAGES		4.0	3.0	6.2	2.8	4.4	3.6	2.0	2.8	3.0	2.6	1.6	2.4	2.4	2.0	42.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Rocky Point Creek	1	50	50	X			
Rocky Point Creek	2	75	75		X		
Rocky Point Creek	3	150	150			X	
Rocky Point Creek	4	150	75		X		
Rocky Point Creek	5	150	75		X		
AVERAGES		115.0	85.0	20%	60%	20%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

SCAPPOOSE CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Gilkison Road Area

Length Inventoried: 12,660 ft (2.4 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 12,660 ft (2.4 miles)

Area of Watershed in Multnomah County: 545 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Scappoose		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Scappose Creek - Main Stem

The main stem is in a 40-50-year-old Douglas fir plantation with alder dominant in the stream channel area. A large wetland complex associated with the stream begins approximately 500 feet from the confluence. At approximately 3,000 feet from the conflence, the east side has been clearcut for 700 feet. A 50-foot buffer was left. The stream leaves the County at approximately 4,000 feet.

The stream is six feet wide and one to three feet deep where it leaves the county. The stream bed is composed mostly of cobbles with gravel and boulders. The stream is 75% riffle/run and 25% pool.

Scappose Creek - East Fork

The first 4,000 feet of the stream have been harvest at varying times and little to no regeneration of overstory has occured. The stream enters an approximately 40-year-old Douglas fir plantation then enters an old-growth stand on Bureau of Land Management property. The overstory is composed of approximatly three-foot-diameter Douglas fir, western hemlock, and western red cedar. Pacific yew

also is present. The stream leaves the old-growth section and enters a 40-50-year old Douglas fir plantation where it joins the west fork to form the main stem in this section.

The stream is two feet wide and one foot deep at the confluence. The substrate is predominatly sand and gravel, with boulders more common in the lower section.

Scappose Creek - West Fork

The stream flows through 40-50-year old and second growth Douglas fir stands for it's entire length. It is in a steep draw with moderate gradient.

The stream is approximately two feet wide and six inches deep at the confluence. The substrate is cobble/gravel with more clay sediment in the upper reaches. The stream is almost entirely riffle with occasional (< 10%) pools.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S9234	NWNE 34 3N 2W	Irrigation & Domestic	.1500 CFS
S9234	NWNE 34 3N 2W	Aesthetic	.1500 CFS
S9234	NWNE 34 3N 2W	Fish	.1500 CFS
S12421	SWSE 27 3N 2W	Domestic	.0100 CFS
S12421	SWSE 27 3N 2W	Power	.0500 CFS

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 198 ft

Range of Width: 40-400 ft

Benefit to Water Quality: The current moderate to high level of canopy cover and width of riparian area along the majority of the stream should have a positive influence on water quality and mitigate for the lack of canopy along most of Tributary I

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: Bald eagles, Haliaeetus leucocephalus are present in the Scappoose Creek Area ONHP 2/22/94.

Wildlife Habitat Assessment - see attached table

Average score: 48

Range of scores: 24-60

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Scappoose Creek (Main Stem)	1	8	6	7	4	4	3	2	6	4	3	2	3	3	0	55
Scappoose Creek (Main Stem)	2	8	6	8	4	4	3	2	7	7	2	2	2	5	0	60
Scappoose Creek (Main Stem)	3	8	6	7	4	3	4	2	7	4	3	3	3	5	0	59
Scappoose Creek (Main Stem)	4	8	6	7	3	3	3	2	7	4	2	3	1	5	2	56
AVERAGES		8.0	6.0	7.3	3.8	3.5	3.3	2.0	6.8	4.8	2.5	2.5	2.3	4.5	0.5	57.5

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Scappoose Creek (Main Stem)	1	200	200				X
Scappoose Creek (Main Stem)	2	200	50				X
Scappoose Creek (Main Stem)	3	150	50				X
Scappoose Creek (Main Stem)	4	100	150				X
AVERAGES		162.5	112.5	0%	0%	0%	100%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: GILKISON ROAD

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Scappoose Creek Trib. I (East)	1	4	3	7	4	3	3	2	6	6	2	3	3	4	0	50
Scappoose Creek Trib. I (East)	2	4	3	1	2	2	2	2	2	2	2	2	0	0	0	24
Scappoose Creek Trib. I (East)	3	7	5	3	2	3	3	2	3	3	2	2	0	1	0	36
Scappoose Creek Trib. I (East)	4	7	5	3	2	4	3	2	3	3	2	2	0	1	0	37
Scappoose Creek Trib. I (East)	5	4	3	8	2	4	3	2	8	6	3	3	3	1	0	50
Scappoose Creek Trib. I (East)	6	4	3	7	2	4	4	2	7	4	3	3	4	2	5	54
AVERAGES		5.0	3.7	4.8	2.3	3.3	3.0	2.0	4.8	4.0	2.3	2.5	1.7	1.5	0.8	41.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Scappoose Creek Trib. I (East)	1	75	75			X	
Scappoose Creek Trib. I (East)	2	20	20	X			
Scappoose Creek Trib. I (East)	3	20	20	X			
Scappoose Creek Trib. I (East)	4	20	20	X			
Scappoose Creek Trib. I (East)	5	150	150				X
Scappoose Creek Trib. I (East)	6	150	150				X
AVERAGES		72.5	72.5	50%	0%	17%	33%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Scappoose Creek Trib. II (West)	1	4	3	7	2	3	3	2	4	4	2	3	4	2	1	44
Scappoose Creek Trib. II (West)	2	4	3	7	2	3	3	2	4	4	3	3	4	3	5	50
AVERAGES		4.0	3.0	7.0	2.0	3.0	3.0	2.0	4.0	4.0	2.5	3.0	4.0	2.5	3.0	47.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Scappoose Creek Trib. II (West)	1	100	100			X	
Scappoose Creek Trib. II (West)	2	100	100			X	
AVERAGES		100.0	100.0	0%	0%	100%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

Wildwood-McKay Area

EAST FORK MCKAY CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Wildwood-McKay Area

Length Inventoried: 9,500 FT (1.8 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 9,500 ft (1.8 miles)

Area of Watershed in Multnomah County: 735 acres

Abutting Land Use Designations (percent of study area stream length):

Creek R10	EFU	CFU	MUA	RR
East Fork McKay		100%		

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

The stream originates southwest of Dixie Mountain below Rocky Point Road. The west side of the stream has been clearcut and the east side is mature conifer stand. The stream area is dominated by a dense shrub layer of elderberry, willow, and salmonberry. Downstream there is a large wetland area. Both sides of the stream have been clearcut in this location. The shrub layer remains dense. At approximately 2,100 feet from the origin, the stream enters a closed canopy mixed conifer/deciduous stand with an open understory. The stream enters an area approximately 4,000 feet from the origin where some clearcutting has occurred on both sides of the stream. Patches of primarily deciduous overstory remain. The shrub layer becomes dense again. At approximately 9,000 feet, another wetland/pond complex, is associated with the stream. Many of these wetland areas surrounded by scrub/shrub type vegetation are a result of beaver dams. Conifer snags are moderately abundant along the stream; several showed signs of pileated woodpecker foraging. Elk and deer sign also were common.

The stream is the largest observed at the point it crosses the Multnomah County/Washington County line. It is approximately 20 feet wide and six feet deep at that point, although it is very slow moving. The substrate is predominantly clay/mud with some gravel and cobble in the middle sections. The stream is 90% pools in the lower reaches and 90% riffle/run in the upper reaches.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 199 ft

Range of Width: 40-400 ft

Benefit to Water Quality: The current moderate level of canopy closure and width of the riparian corridor should have a positive influence on water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 18%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 56

Range of scores: 41-82

Essential Connections: N/A

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
East Fork McKay Creek	1	4	3	7	2	4	4	2	5	2	1	2	3	2	0	41
East Fork McKay Creek	2	4	3	4	4	4	4	2	6	5	2	2	4	6	2	52
East Fork McKay Creek	3	6	6	6	2	4	5	3	3	5	2	4	4	3	0	53
East Fork McKay Creek	4	6	6	4	2	5	8	3	4	5	2	4	4	3	2	58
East Fork McKay Creek	5	8	6	7	2	3	4	2	3	3	2	0	4	2	1	47
East Fork McKay Creek	6	8	6	7	2	3	3	2	3	2	1	0	4	1	0	42
East Fork McKay Creek	7	8	6	8	2	3	4	2	3	4	2	1	4	2	0	49
East Fork McKay Creek	8	8	6	8	6	8	8	2	6	8	2	4	4	6	4	80
East Fork McKay Creek	9	8	6	8	8	8	8	2	6	8	2	4	4	6	4	82
AVERAGES		6.7	5.3	6.6	3.3	4.7	5.3	2.2	4.3	4.7	1.8	2.3	3.9	3.4	1.4	56.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
East Fork McKay Creek	1	80	10			X	
East Fork McKay Creek	2	20	20	X			
East Fork McKay Creek	3	100	100				X
East Fork McKay Creek	4	130	130		X		
East Fork McKay Creek	5	100	100		X		
East Fork McKay Creek	6	20	20		X		
East Fork McKay Creek	7	80	80			X	
East Fork McKay Creek	8	200	200		X		
East Fork McKay Creek	9	200	200	X			
AVERAGES		103.3	95.6	22%	44%	22%	11%

*Width of riparian corridor in feet (in segment) looking downstream.

NORTH JACKSON CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Wildwood-McKay Area

Length Inventoried: 13,730 ft (2.6 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 13,730 (2.6 miles)

Area of Watershed in Multnomah County: 780 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
North Jackson		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Jackson Creek - Main Stem

The description of the stream starts from the confluence of it's two tributaries. The east side of the stream has been recently clearcut. The west side is a mixed-age conifer/deciduous stand. A small wetland is located near the confluence of the tributaries. A beaver dam (recent) is located where the stream leaves the County. Cutthroat trout were observed all along the stream.

The stream is approximately 12 feet wide and ranges between one and four feet deep where it leaves the County. The substrate is primarily gravel/cobble/boulder with some silt/sediment deposits. The stream is approximately 70% riffle/run and 30% pool.

Jackson Creek - North Tributary 1A

The stream originates in a young deciduous stand with sparse understory. It then flows into a clear-cut area where small wetlands are associated with the stream. The clear-cut appears to be approximately two years old. The shrub layer is becoming re-established. Downstream approximately 3,000 feet the stream enters a mixed conifer/deciduous stand. It flows through the

stand for approximately another 3000 feet before the confluence. Cutthroat trout were seen in this lower section. Elk and deer sign were also seen all along the stream.

The stream is three feet wide and 6-24 inches deep at the confluence. The substrate is predominantly silt/sand at the confluence, gravel/cobble in the middle sections, and silt/clay at the headwaters. The stream is 90% riffle/run and 10% pool.

Jackson Creek - South Tributary 1B

The stream originates in a clear-cut and continues for most of it's length in clearcuts or young regeneration plantations. Coarse woody debris from past logging is common in the stream area.

The stream is often deeply incised. It is only one foot wide at the confluence and 6 - 12 inches deep. The stream bottom is predominantly silt and clay. It is 95% riffle/run and 5% pools.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 202 ft

Range of Width: 20-400 ft

Benefit to Water Quality: The current level of canopy closure and width of the riparian corridor should mitigate for the lack of canopy along sections of the tributaries and have a positive influence on overall stream water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 35

Range of scores: 13-72

Essential Connections: Wildlife habitat quality is directly related to water quality and seasonality. High water quality is essential for survival, growth, reproduction, and migration of species present in aquatic and riparian communities. Overstory removal and other activity can alter the amount and timing of streamflow by changing on-site hydrologic processes. This can result in increased sediment transport, higher peak flows and lower summer water levels, which would negatively influence the riparian habitat quality. The water quality created by upstream conditions should maintain the downstream areas at the current habitat quality.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
North Jackson Creek (Main Stem; Trib. I)	1	8	6	6	4	6	6	2	6	6	2	3	3	5	2	65
North Jackson Creek (Main Stem; Trib. I)	2	8	6	4	2	6	6	1	3	4	2	3	3	3	2	53
North Jackson Creek (Main Stem; Trib. I)	3	8	6	2	2	3	3	2	2	2	2	2	2	2	2	40
AVERAGES		8.0	6.0	4.0	2.7	5.0	5.0	1.7	3.7	4.0	2.0	2.7	2.7	3.3	2.0	52.7

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
North Jackson Creek (Main Stem; Trib. I)	1	20	200			X	
North Jackson Creek (Main Stem; Trib. I)	2	200	200			X	
North Jackson Creek (Main Stem; Trib. I)	3	100	100			X	
AVERAGES		106.7	166.7	0%	0%	100%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
North Jackson Creek Trib. IA (North)	1	6	6	8	2	5	5	2	5	5	2	4	4	5	0	59
North Jackson Creek Trib. IA (North)	2	6	6	8	2	6	8	3	8	8	3	4	4	6	0	72
North Jackson Creek Trib. IA (North)	3	6	6	0	2	1	1	1	0	0	0	0	0	0	0	17
North Jackson Creek Trib. IA (North)	4	4	3	0	2	2	2	2	0	0	0	0	0	0	0	15
North Jackson Creek Trib. IA (North)	5	4	3	1	3	2	2	1	0	0	0	0	0	0	0	16
North Jackson Creek Trib. IA (North)	6	4	3	2	2	2	2	1	1	2	2	2	2	0	0	25
AVERAGES		5.0	4.5	3.2	2.2	3.0	3.3	1.7	2.3	2.5	1.2	1.7	1.7	1.8	0.0	34.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
North Jackson Creek Trib. IA (North)	1	150	150				X
North Jackson Creek Trib. IA (North)	2	200	200				X
North Jackson Creek Trib. IA (North)	3	200	200			X	
North Jackson Creek Trib. IA (North)	4	10	10	X			
North Jackson Creek Trib. IA (North)	5	10	10	X			
North Jackson Creek Trib. IA (North)	6	100	100				X
AVERAGES		111.7	111.7	33%	0%	17%	50%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
North Jackson Creek Trib. IB (South)	1	4	3	4	2	3	3	2	4	3	2	1	1	1	0	33
North Jackson Creek Trib. IB (South)	2	4	3	4	2	4	3	2	3	3	2	1	1	1	0	33
North Jackson Creek Trib. IB (South)	3	4	3	0	2	1	1	0	1	1	0	0	0	0	0	13
North Jackson Creek Trib. IB (South)	4	4	3	1	2	1	1	0	1	1	0	0	0	0	0	14
AVERAGES		4.0	3.0	2.3	2.0	2.3	2.0	1.0	2.3	2.0	1.0	0.5	0.5	0.5	0.0	23.3

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
North Jackson Creek Trib. IB (South)	1	150	75			X	
North Jackson Creek Trib. IB (South)	2	150	50			X	
North Jackson Creek Trib. IB (South)	3	10	10	X			
North Jackson Creek Trib. IB (South)	4	10	10	X			
AVERAGES		80.0	36.3	50%	0%	50%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDWOOD CREEK (Main Stem)
Stream Profile

GENERAL INFORMATION

Location Study Area: Wildwood-McKay Area

Length Inventoried: 1,000 ft (0.2 mile)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 1,000 ft (0.2 mile)

Area of Watershed in Multnomah County: 90 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Wildwood (mainstem)		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Wildwood Creek is comprised of a short main stem and three forks, each of which have two major tributaries. The main stem flows through Wildwood Golf Course. Access permission to this area was denied. Aerial photo's and indirect observation indicate that most of the stream within the developed golf course has been altered or affected by the golf course. Vegetation on the south side of the stream is intact in some areas. The north side has been converted to maintain fairways to within 10 feet of the stream channel. While this area has been disturbed by human activity, regular human presence is seasonal and diurnal. The forage provided by the golf course and associated creek may be used by opportunistic species at times when human activity is limited. A black-tailed deer was seen leaving the golf course in the early morning.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: This part of the creek flows through Wildwood Golf Course. The creek contributes to the aesthetic character of the golf course. The water hazards associated with the stream are an impartant aspect in the play of the golf course, providing a water hazard on each hole in the course.

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Not surveyed

Flood storage limited to stream channel: Yes

Riparian Corridor - see attached table

Average Width: Not surveyed

Range of Width: Not surveyed

Benefit to Water Quality: Aerial photos indicate canopy cover and riparian buffer are insufficient to provide benefit to water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 100%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: Not surveyed

Range of scores: Not surveyed

NORTH WILDWOOD CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Wildwood-McKay Area

Length Inventoried: 17,950 ft (3.4 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 17,950 ft (3.4 miles)

Area of Watershed in Multnomah County: 1,015 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
North Wildwood		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

North Wildwood Creek - Main Stem

The main stem of the north fork flows through a meadow 100 - 300 feet wide before flowing into a culvert and entering the golf course. The main stem is approximately 1,200 feet long. At one time this area had at least a sparse overstory of red alder. Most of the overstory has been removed, and only occasional alder has been left in the stream area. The remaining vegetation is primarily reed canary grass, Himalayan blackberry, and salmonberry. The stream is crossed by a dirt road with no culvert that exhibits evidence of recent use. Gravel roads parallel the stream on both sides at the meadow's edge. An old beaver dam is present but has been breached. Fish (unknown species) were seen, and elk and deer tracks are abundant.

The stream is 8-10 feet wide and one-two feet deep where it enters the golf course. It's substrate is an even mix of cobble/gravel/sand and sediment with some boulders forming pools. The stream is 55% riffle/run and 45% pools.

North Wildwood Creek - Tributary IIA

The stream originates from a two-three acre beaver pond surrounded by 18-24-inch Douglas fir/western hemlock stand. The stream flows out of the pond and into a steep, narrow draw. The south bank is mixed stand dominated by 20-24-inch Douglas fir and the north is a 20-year-old Douglas fir plantation. The stream crosses under a road through a culvert approximately 1,500 feet from the origin. A small wetland is located just west of the road. East of the road the stream flows through areas harvested at various times. The south side is a four-five-year-old Douglas fir plantation and the north side is a 10-15-year-old plantation. The overstory is minimal and primarily red alder. The shrub layer is dense, with salmonberry, devils club and young red alder. Active beaver dams were observed approximately 1,500 feet from the road crossing. The stream continues to flow through a narrow draw with steep side slopes (45 degrees) and enters an area where a 50-foot buffer has been left on both sides of the stream. The shrub layer is dense salmonberry, vine maple, and occasional Himalayan blackberry thickets. Two Pacific yew trees were observed in this area. At approximately 7,500 feet from the origin the stream bottom widens to 30 feet and the buffer appears to be much wider due to older plantations upslope. The last 600 feet of the stream before the confluence is deeply incised (five-seven feet deep and four-six feet across). Overstory in this area is minimal, but the shrub layer remains dense. Six sub-adult bald eagles were seen in the upper reaches of this stream. Nineteen elk also were observed as were 15-20 waterfowl and numerous deer tracks. Several snags with pileated woodpecker foraging holes also were seen. Fish (unknown species) were seen in the lower reaches.

The stream is approximately five feet wide and one-two feet deep at the confluence. The substrate is predominantly cobble/gravel/boulder, with some sand and clay. Large amounts of sediment have been trapped behind the beaver dams. The stream is 80% riffle/run and 20% pool.

North Wildwood Creek - Tributary IIB

The stream originates from several small drainages in a mixed stand dominated by second growth conifers (14-18 inches). The shrub layer is moderate and composed of salmonberry, vine maple, huckleberry, and Oregon grape. Approximately 3,100 feet downstream, the stream crosses a road and enters a clearcut area. Sparse to moderate regeneration is 5-10-year-old Douglas fir. Immediately to the southeast of the crossing there is a 50 x 30 foot wetland area. The stream channel is dominated by a dense shrub layer of salmonberry and Himalayan blackberry. A 25-foot buffer of red alder/big-leaf maple overstory begins lower on the stream. Beaver dams are common throughout these lower reaches to the confluence, where the stream crosses under a road through a culvert.

The stream is two-three feet wide and one-two feet deep near the confluence. The substrate is predominantly gravel and cobble, with large amounts of sediment trapped by the beaver dams. The stream is approximately 35% pool and 65% riffle run. Most of the pools are also due to the beaver dams.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: The creek contributed water to the main stem of Wildwood Creek. Wildwood Creek flows through the Wildwood Golf Course. The water hazards associated with the stream are an impartant aspect in the play of the golf course, providing a water hazard on each hole in the course.

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 94 ft

Range of Width: 30-200 ft

Benefit to Water Quality: The current low to moderately low canopy cover and moderately narrow riparian corridor should maintain current levels of water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 22%

Threatened and Endangered Species data: Six sub-adult bald eagles, Haliaeetus leucocephalus were observed in close association with the stream (03/27/94).

Wildlife Habitat Assessment - see attached table

Average score: 53

Range of scores: 42-80

Essential Connections: N

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
North Wildwood Creek (Trib. II)	1	8	6	2	2	6	3	2	1	2	2	1	2	4	1	42
AVERAGES		8.0	6.0	2.0	2.0	6.0	3.0	2.0	1.0	2.0	2.0	1.0	2.0	4.0	1.0	42.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
North Wildwood Creek (Trib. II)	1	150	50	X			
AVERAGES		150.0	50.0	100%	0%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
North Wildwood Creek Trib. IIA (North)	1	8	6	8	2	7	6	3	7	6	3	3	3	6	0	68
North Wildwood Creek Trib. IIA (North)	2	8	6	8	2	6	6	3	6	5	3	1	4	5	0	63
North Wildwood Creek Trib. IIA (North)	3	8	6	7	4	4	6	2	3	4	2	1	4	3	0	54
North Wildwood Creek Trib. IIA (North)	4	4	3	6	2	4	6	2	3	3	2	1	4	3	2	45
North Wildwood Creek Trib. IIA (North)	5	4	3	6	2	4	6	2	3	3	2	1	4	3	2	45
North Wildwood Creek Trib. IIA (North)	6	4	3	4	2	8	6	3	7	7	3	3	4	4	0	58
North Wildwood Creek Trib. IIA (North)	7	4	3	4	4	4	4	2	2	3	3	1	3	4	1	42
North Wildwood Creek Trib. IIA (North)	8	4	3	8	8	4	4	2	7	7	3	3	3	5	0	61
North Wildwood Creek Trib. IIA (North)	9	8	3	8	4	8	6	4	8	7	4	4	4	6	6	80
AVERAGES		5.8	4.0	6.6	3.3	5.4	5.6	2.6	5.1	5.0	2.8	2.0	3.7	4.3	1.2	57.3

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
North Wildwood Creek Trib. IIA (North)	1	75	50			X	
North Wildwood Creek Trib. IIA (North)	2	50	30		X		
North Wildwood Creek Trib. IIA (North)	3	25	25	X			
North Wildwood Creek Trib. IIA (North)	4	25	25	X			
North Wildwood Creek Trib. IIA (North)	5	25	25	X			
North Wildwood Creek Trib. IIA (North)	6	85	90			X	
North Wildwood Creek Trib. IIA (North)	7	20	10	X			
North Wildwood Creek Trib. IIA (North)	8	20	75	X			
North Wildwood Creek Trib. IIA (North)	9	100	100				X
AVERAGES		47.2	47.8	56%	11%	22%	11%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
North Wildwood Creek Trib. IIB (South)	1	8	6	6	4	3	6	2	2	2	2	0	3	2	0	46
North Wildwood Creek Trib. IIB (South)	2	8	6	6	2	3	6	2	2	2	2	0	3	1	0	43
North Wildwood Creek Trib. IIB (South)	3	8	6	6	4	3	6	2	2	2	2	0	3	1	0	45
North Wildwood Creek Trib. IIB (South)	4	8	6	4	8	3	5	2	1	2	2	0	3	2	0	46
North Wildwood Creek Trib. IIB (South)	5	4	3	6	2	6	4	3	6	6	3	3	3	3	0	52
North Wildwood Creek Trib. IIB (South)	6	4	3	6	2	6	4	3	6	6	3	3	3	3	0	52
North Wildwood Creek Trib. IIB (South)	7	4	3	6	2	6	4	3	6	6	3	3	3	3	0	52
AVERAGES		6.3	4.7	5.7	3.4	4.3	5.0	2.4	3.6	3.7	2.4	1.3	3.0	2.1	0.0	48.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
North Wildwood Creek Trib. IIB (South)	1	20	20	X			
North Wildwood Creek Trib. IIB (South)	2	20	20	X			
North Wildwood Creek Trib. IIB (South)	3	20	20	X			
North Wildwood Creek Trib. IIB (South)	4	20	20	X			
North Wildwood Creek Trib. IIB (South)	5	65	65		X		
North Wildwood Creek Trib. IIB (South)	6	65	65		X		
North Wildwood Creek Trib. IIB (South)	7	65	65		X		
AVERAGES		39.3	39.3	57%	43%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MIDDLE WILDWOOD CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Wildwood-McKay Area

Length Inventoried: 10,630 ft (2.0 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 10,630 ft (2.0 miles)

Area of Watershed in Multnomah County: 645 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Middle Wildwood		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Middle Wildwood Creek - Main Stem

Approximately 1,000 feet of the stream are within the golf course and were not surveyed. The description is from the confluence of the two tributaries downstream. The area on both sides of the confluence has been clearcut and replanted on both sides. The regeneration (Douglas fir) appears to be 5-10 years old and has a moderate stocking level. Some overstory of red alder has been left in the stream channel although it is sparse. The shrub layer varies in density and is comprised of salmonberry, elderberry, vine maple, and Himalayan blackberry. The south slope is steep, often greater than 45 degrees and a large slump has occured approximately 500 feet from the confluence. Two thousand feet from the confluence, just east of the powerlines, there is a wetland/pond area created by a beaver dam. The stream then enters a mixed conifer/deciduous stand, the stream becomes sinuous and the floodplain widens to 200 feet. The shrub layer is similar. The stream flows into the stand for 1,000 feet then enters the golf course.

The stream is six feet wide and 6-24 inches deep near the golf course. It's substrate is a mix of silt, sand, gravel, cobbles and occasional boulders. It is approximately 15% pools and 85% riffle/run.

Middle Wildwood Creek - North Tributary

The stream originates from several small drainages in a mixed stand dominated by mature Douglas fir with occasioanal red alder and big-leaf maple. The shrub layer is salmonberry, huckleberry, vine maple, and Indian plum. The stream crosses under a gravel road and enters a harvested area. The south side was harvested within one year of this report and the north is a five-year-old Douglas fir plantation. Just north of the culvert and east of the road there is 50 by 100-foot wetland surrounded by big-leaf maple, red alder and occasional Douglas fir.

The stream banks are steep, the south is 85-90 degrees and the north side is 75 degrees. The south side has experienced multiple bank failures. The resulting debris torrents often cover the stream channel.

The stream is two feet wide and one foot deep at the confluence. The substrate, where it is visible, is dominated by gravel with some cobble, boulders and silt. Sediment is especially evident in the lower sections.

Middle Wildwood Creek - South Tributary IB

The stream originates from several small drainages in a mixed stand of moderate-size big-leaf maple, Douglas fir, and western red cedar with a sparse understory of huckleberry, and salmonberry. The stream then crosses under a road and enters a recent clearcut. The stream moves through the clear cut for approximately 1,400 feet, then crosses a road and enters a steep-sided draw with 45 degree slopes. The stream bottom is 10 feet wide. A thin buffer (30 feet) has been left. The buffer is primarily red alder with elderberry, salmonberry and Himalayan blackberry in the understory. Upslope is plantation to the south and a road to the north.

The stream is four feet wide and six inches deep at the confluence. The substrate is dominated by cobbles where visible. The stream is 95% riffle/run and 5% pool.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: The creek contributes water to the main stem of Wildwood Creek. Wildwood Creek flows through the Wildwood Golf Course. The water hazards associated with the stream are an impartant aspect in the play of the golf course, providing a water hazard on each hole in the course.

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 134 ft

Range of Width: 20-400 ft

Benefit to Water Quality: The low to moderately low level of canopy cover and relatively narrow riparian corridor are not sufficient to mitigate for the lack of canopy cover and narrow riparian buffer along the middle reaches of the stream. The canopy is sufficient to maintain the current water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 28%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 42

Range of scores: 12-57

Essential Connections: The middle segments with lower WHA scores provide potential travel corridors for movement and dispersal to the areas upstream and downstream with higher WHA scores.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Middle Wildwood Creek (Trib. I)	1	8	6	2	4	4	5	2	2	2	2	1	3	2	0	43
Middle Wildwood Creek (Trib. I)	2	8	6	8	2	4	6	2	5	4	2	2	2	3	0	54
AVERAGES		8.0	6.0	5.0	3.0	4.0	5.5	2.0	3.5	3.0	2.0	1.5	2.5	2.5	0.0	48.5

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Middle Wildwood Creek (Trib. I)	1	40	40			X	
Middle Wildwood Creek (Trib. I)	2	200	200				X
AVERAGES		120.0	120.0	0%	0%	50%	50%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Middle Wildwood Creek Trib. IA (North)	1	4	3	0	4	1	1	2	0	0	0	0	4	1	0	20
Middle Wildwood Creek Trib. IA (North)	2	4	3	6	2	8	4	3	6	6	3	3	4	3	2	57
Middle Wildwood Creek Trib. IA (North)	3	4	3	6	2	7	4	3	6	6	3	3	4	4	0	55
Middle Wildwood Creek Trib. IA (North)	4	4	3	6	2	6	4	3	6	6	3	4	4	3	0	54
AVERAGES		4.0	3.0	4.5	2.5	5.5	3.3	2.8	4.5	4.5	2.3	2.5	4.0	2.8	0.5	46.5

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Middle Wildwood Creek Trib. IA (North)	1	10	10	X			
Middle Wildwood Creek Trib. IA (North)	2	70	65		X		
Middle Wildwood Creek Trib. IA (North)	3	70	80		X		
Middle Wildwood Creek Trib. IA (North)	4	80	80			X	
AVERAGES		57.5	58.8	25%	50%	25%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Middle Wildwood Creek Trib. IB (South)	1	4	3	4	2	3	7	2	2	2	2	0	3	3	0	37
Middle Wildwood Creek Trib. IB (South)	2	4	3	4	2	4	5	2	2	1	2	1	3	2	0	35
Middle Wildwood Creek Trib. IB (South)	3	4	3	0	2	0	0	0	0	0	0	0	3	0	0	12
Middle Wildwood Creek Trib. IB (South)	4	4	3	5	2	4	3	2	6	6	3	4	4	2	0	48
AVERAGES		4.0	3.0	3.3	2.0	2.8	3.8	1.5	2.5	2.3	1.8	1.3	3.3	1.8	0.0	33.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Middle Wildwood Creek Trib. IB (South)	1	25	25		X		
Middle Wildwood Creek Trib. IB (South)	2	10	10	X			
Middle Wildwood Creek Trib. IB (South)	3	10	10	X			
Middle Wildwood Creek Trib. IB (South)	4	200	100			X	
AVERAGES		61.3	36.3	50%	25%	25%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

SOUTH WILDWOOD CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Wildwood-McKay Area

Length Inventoried: 9,506 ft (1.8 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 14,050 ft (2.7 miles)

Area of Watershed in Multnomah County: 600 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
South Wildwood		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

South Wildwood Creek - Main Stem

Access below the powerlines was denied. The stream is in a deep valley with moderate side slopes of 15-30 degrees. The flood plain is 20-30 feet wide. The overstory is red alder, big-leaf maple, western red cedar, Douglas fir, and western hemlock. The shrub layer is moderately dense salmonberry, vine maple, rose, and occasional huckleberry. Several small wetlands were observed adjacent to the stream. A dirt road crosses the stream and runs up the stream bed for 20-30 feet before heading up the north slope.

The stream is 6-10 feet wide and averages six inches deep. The substrate is cobble/boulder with gravel and silt common. The stream is 95% riffle/run and 5% pools.

The stream is three feet wide at the confluence and six inches deep. The substrate is gravel/cobble sand with some boulders and silt. The stream is 95% riffle/run and 5% pools

South Wildwood Creek - South Tributary IIIB

This stream also originates in a clear cut area that has been replanted in the last 10 years. The shrub layer is dominated by dense salmonberry and Himalayan blackberry. The stream crosses a road at 3,000 feet from the headwaters. It then enters a mixed stand of red alder, big-leaf maple, western red cedar, Douglas fir, and western hemlock. The shrub layer is dense salmonberry, vine maple, rose, and occasional huckleberry. The banks are often 50+ degrees. The channel is incised to bedrock in several places.

The stream is three feet wide and six inches deep at the confluence. The substrate is cobble/boulder with gravel and silt common and occasional bedrock in the lower reaches. The stream is 95% riffle/run and 5% pools.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S37398	SESW 12 2N 2W	Domestic (Inc. Lawn & Garden)	.0100CFS
S11017	SESW 12 2N 2W	Domestic (Inc. Lawn & Garden)	.0500 CFS
S44813	SWSE 11 2N 2W	Irrigation	.0090 CFS
S44813	SWSE 11 2N 2W	Domestic	.0050 CFS
S44737	SWSE 11 2N 2W	Domestic	.0050 CFS
S44737	SWSE 11 2N 2W	Irrigation	.0060 CFS
S44814	SWSE 11 2N 2W	Domestic	.0050 CFS
S44814	SWSE 11 2N 2W	Irrigation	.0050 CFS
S39317	SESW 12 2N 2W	Domestic	.0100 CFS
S39317	SESW 12 2N 2W	Irrigation	.0500 CFS

RECREATION

Park/Recreational Facility: The creek contributed water to the main stem of Wildwood Creek. Wildwood Creek flows through the Wildwood Golf Course. The middle segments with lower WHA scores provide potential travel corridors for movement and dispersal to the areas upstream and downstream with higher WHA scores.

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage:

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 98 ft

Range of Width: 40-275 ft

Benefit to Water Quality: The low level of canopy cover and narrow or non-existent riparian buffer on the stream length surveyed is not sufficient to maintain water quality and will have a negative effect on overall water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 39%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 37

Range of scores: 28-61

Essential Connections: Wildlife habitat quality is directly related to water quality and seasonality. High water quality is essential for survival, growth, reproduction, and migration of species present in aquatic and riparian communities. Overstory removal and other activity can alter the amount and timing of streamflow by changing on-site hydrologic processes. This can result in increased sediment transport, higher peak flows and lower summer water levels, which would negatively influence the riparian habitat quality. The water quality created by upstream conditions should maintain the downstream areas at the current habitat quality.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
South Wildwood Creek (Trib. III)	1	8	6	6	4	7	4	2	6	4	3	2	4	5	0	61
AVERAGES		8.0	6.0	6.0	4.0	7.0	4.0	2.0	6.0	4.0	3.0	2.0	4.0	5.0	0.0	61.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
South Wildwood Creek (Trib. III)	1	75	75				X
AVERAGES		75.0	75.0	0%	0%	0%	100%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
South Wildwood Creek Trib. IIIA (North)	1	4	3	3	2	2	4	2	1	1	2	0	3	1	0	28
South Wildwood Creek Trib. IIIA (North)	2	4	3	3	2	2	4	2	1	1	2	0	3	1	0	28
South Wildwood Creek Trib. IIIA (North)	3	4	3	4	2	3	5	2	2	1	2	0	3	1	0	32
South Wildwood Creek Trib. IIIA (North)	4	4	3	2	2	3	5	2	2	2	2	0	3	1	0	31
South Wildwood Creek Trib. IIIA (North)	5	4	3	4	2	6	4	2	7	4	3	2	2	5	0	48
AVERAGES		4.0	3.0	3.2	2.0	3.2	4.4	2.0	2.6	1.8	2.2	0.4	2.8	1.8	0.0	33.4

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
South Wildwood Creek Trib. IIIA (North)	1	20	20	X			
South Wildwood Creek Trib. IIIA (North)	2	20	20	X			
South Wildwood Creek Trib. IIIA (North)	3	20	20	X			
South Wildwood Creek Trib. IIIA (North)	4	20	20	X			
South Wildwood Creek Trib. IIIA (North)	5	200	75		X		
AVERAGES		56.0	31.0	80%	20%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
South Wildwood Creek Trib. IIIB (South)	1	4	3	7	2	6	4	2	7	4	3	3	4	5	0	54
South Wildwood Creek Trib. IIIB (South)	2	4	3	4	2	3	6	2	1	1	2	0	1	0	0	29
South Wildwood Creek Trib. IIIB (South)	3	4	3	4	2	3	6	2	1	1	2	0	2	0	0	30
South Wildwood Creek Trib. IIIB (South)	4	4	3	3	2	3	4	2	1	1	2	0	3	0	0	28
AVERAGES		4.0	3.0	4.5	2.0	3.8	5.0	2.0	2.5	1.8	2.3	0.8	2.5	1.3	0.0	35.3

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
South Wildwood Creek Trib. IIIB (South)	1	200	75		X		
South Wildwood Creek Trib. IIIB (South)	2	20	20	X			
South Wildwood Creek Trib. IIIB (South)	3	20	20	X			
South Wildwood Creek Trib. IIIB (South)	4	20	20	X			
AVERAGES		65.0	33.8	75%	25%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

Holbrook-Logie Area

NORTH RAINBOW CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Holbrook-Logie

Length Inventoried: 10,570 ft (2.0 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 10,570 ft (2.0 miles)

Area of Watershed in Multnomah County: 775 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
North Rainbow		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

North Rainbow Creek

Access was denied to the lower portion of North Rainbow Creek. Approximately 6,000 feet from U.S. Highway 30, it branches into north and south forks (Tributary I and Tributary II, respectively).

Main Stem

This part of the stream is from the confluence of the tributaries downstream. The stream flows through a clear cut with most of the overstory removed. The shrub layer is very dense salmonberry and Himalayan blackberry. Approximately 500 feet below the confluence, the stream flows under powerlines. The access road has been washed out at the culvert. The stream enters a mixed stand of red alder (8-12 inches) and western red cedar (20-30 inches). Canopy cover is highly variable. Near the middle of the main stem all overstory has been removed and the stream becomes very sinuous. The shrub layer becomes dense salmonberry and young alder in a 300-400-foot-wide floodplain. The

stream then enters a forest wetland area with an overstory of red-alder (12-24 inches), big-leaf maple (10-16 inches), and western red cedar (12-16 inches). Understory is salmonberry, vine maple, and elderberry. The ground cover is piggy back plant, skunk cabbage, nettle, reed-canary grass and cattails. The wetland area is approximately 1,000 feet long and 300 feet wide. Its east edge abuts Rainbow Lake. Access was denied to the lake area. The creek is primarily against the toe of the south slope.

The stream is low gradient in the lower sections below the confluence. The substrate is primarily silt with occasional areas of gravel/cobbles. Very few pools are present. Water temperature is 9.5 degrees Celsius.

North Fork (Tributary I)

This stream originates from several drainages downslope from the intersection of Skyline Boulevard and Logie Trail. The drainages collect and form the mainstem. Most of the area has been clear cut at some time in the past. Two houses are located to the west and southwest. The stream passes through a thin sparse buffer (300-foot-wide slope distance, 45-60 degree slope) of mixed conifer/deciduous stand. Overstory is red alder, Douglas fir, western red cedar, and western hemlock. Understory is made up of patches of very dense salmonberry and Himalayan blackberry with sword fern and Oregon grape upslope. Downstream the buffer thins and in places is lost. The shrub layer remains dense. A Pacific giant salamander was seen 200 feet upstream from the powerlines.

South Fork (Tributary II)

Access was denied to the stream above Logie Trail. East of Logie Trail, the overstory has been removed and is not yet re-established. The shrub layer is salmonberry, elderberry, and Himalayan blackberry, and is very dense. At approximately 1,500 feet from Logie Trail, a gravel road with culvert crosses the stream. It continues for 1,500 feet to the confluence.

The stream is fairly constrained and the flood plain channel is usually less than 10-15 feet wide. Stream substrate is predominantly cobble with areas of silt/sediment. It is almost entirely riffle/run. Stream temperature was 9.5 degrees Celsius.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 137 ft

Range of Width: 40-300 ft

Benefit to Water Quality: The moderate level of canopy cover on the mainstem will help mitigate any water temperature increases caused by the lack of canopy cover along the tributaries.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 47

Range of scores: 35-72

Essential Connections: N/A

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
North Rainbow Creek (Main Stem)	1	8	6	8	8	6	6	2	6	4	2	3	3	6	4	72
North Rainbow Creek (Main Stem)	2	8	6	8	4	4	8	2	1	2	2	2	2	4	0	53
North Rainbow Creek (Main Stem)	3	8	6	8	2	4	8	2	1	2	2	2	2	3	0	50
North Rainbow Creek (Main Stem)	4	8	6	8	2	6	4	2	5	5	3	3	2	4	3	61
North Rainbow Creek (Main Stem)	5	8	6	8	2	4	4	2	3	2	2	3	3	3	1	51
North Rainbow Creek (Main Stem)	6	4	3	8	2	3	6	2	2	2	2	1	4	2	1	42
AVERAGES		7.3	5.5	8.0	3.3	4.5	6.0	2.0	3.0	2.8	2.2	2.3	2.7	3.7	1.5	54.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
North Rainbow Creek (Main Stem)	1	200	100		X		
North Rainbow Creek (Main Stem)	2	150	150			X	
North Rainbow Creek (Main Stem)	3	60	60		X		
North Rainbow Creek (Main Stem)	4	100	150				X
North Rainbow Creek (Main Stem)	5	100	100			X	
North Rainbow Creek (Main Stem)	6	20	20	X			
AVERAGES		105.0	96.7	17%	33%	33%	17%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
North Rainbow Creek Trib. I (North)	1	4	3	6	2	3	5	2	2	2	3	1	1	1	0	35
AVERAGES		4.0	3.0	6.0	2.0	3.0	5.0	2.0	2.0	2.0	3.0	1.0	1.0	1.0	0.0	35.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
North Rainbow Creek Trib. I (North)	1	20	20	X			
AVERAGES		20.0	20.0	100%	0%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
North Rainbow Creek Trib. II (South)	1	4	3	6	2	4	6	2	2	2	2	0	1	3	0	37
North Rainbow Creek Trib. II (South)	2	4	3	6	2	4	6	2	2	2	2	0	1	1	0	35
North Rainbow Creek Trib. II (South)	3	4	3	6	2	4	6	2	2	2	2	0	1	2	0	36
AVERAGES		4.0	3.0	6.0	2.0	4.0	6.0	2.0	2.0	2.0	2.0	0.0	1.0	2.0	0.0	36.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
North Rainbow Creek Trib. II (South)	1	20	20	X			
North Rainbow Creek Trib. II (South)	2	20	20	X			
North Rainbow Creek Trib. II (South)	3	20	20	X			
AVERAGES		20.0	20.0	100%	0%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

SOUTH RAINBOW CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Holbrook-Logie

Length Inventoried: 8,450 ft (1.6 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 9,390 ft (1.8 miles)

Area of Watershed in Multnomah County: 510 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
South Rainbow		60%		40%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

South Rainbow Creek-Main Stem

Access was denied to the lower portion of South Rainbow Creek. At approximately 2,000 feet upslope from where U.S. Highway 30 crosses the stream it branches into north and south forks (Tributary I and Tributary II, respectively).

The main stem of South Rainbow Creek is low gradient with wide floodplain/bottom. The overstory is mixed deciduous/conifer with good canopy closure (50%). Dominant overstory tree is red alder and the dominant shrub is salmonberry. Pileated woodpecker foraging holes were observed. Small wetlands adjacent to the stream are common. Stream substrate is predominantly gravel and silt with some cobble and sand. Riffles and pools appear in about equal proportions.

South Fork (Tributary II)

The headwaters originate in a 50-year-old second growth mixed conifer/deciduous stand dominated in the stream channel by red alder with scattered Douglas fir, western hemlock, and western red cedar. The understory is dominated by salmonberry. Old logging roads are evident upslope. Downstream

approximately 1,000 feet the southeast side of the stream has been clear-cut three-five years prior to this survey. A 50-foot-wide buffer was left. The northwest side of the stream is similar to the upstream stand. Powerlines cross the stream approximately 4,000 feet west of U.S. Highway 30. A roadfill over a 36 inches culvert has been eroded but has not completely failed. Down stream from the powerlines, the stream enters a mixed conifer/deciduous stand similar to the headwaters area. A red-legged frog was seen here.

The upper portion of the stream is bounded by steep slopes with a narrow floodplain to more gentle slopes with 130-foot-wide floodplain. The stream is primarily riffle/run with more pools towards the confluence. Substrate is predominantly gravel and sand.

North Fork (Tributary I)

The headwaters of the north fork originate in a 5-10-year-old clear-cut, replanting success appears poor. Red alder has become established in the stream channel area and is the predominate overstory vegetation. The understory is elderberry, salmonberry, sword fern, and waterleaf. The stream crosses under powerlines and enters a 30-50-year-old mixed deciduous/conifer stand, overstory is primarily red alder and big-leaf maple, with western hemlock and Douglas fir. Understory is salmonberry, elderberry, and Himalayan blackberry. Downstream just prior to the confluence, wetlands are adjacent to the stream channel.

The upper reaches of the stream are constrained by steep slopes. As the stream proceeds east the floodplain widens. The substrate is a cobble, gravel, sand, and silt mix with gravel most prevalent. The stream is primarily riffle/run with few pools.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S12744	NWNW 18 2N 1W	Fish	.9500 CFS
S20782	NWNW 18 2N 1W	Irrigation	.0100 CFS
S12290	NWNW 18 2N 1W	Wildlife	1.000 CFS
S49479	SWNW 18 2N 1W	Domestic (Inc. Non-Commercial)	.0100 CFS

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 55 ft

Range of Width: 5-150 ft

Benefit to Water Quality: The current moderately high level of canopy cover but narrow riparian corridor should maintain water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 53%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 50

Range of scores: 37-59

Essential Connections: N/A

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
South Rainbow Creek (Main Stem)	1	8	6	6	5	4	4	2	6	4	2	4	3	2	2	58
AVERAGES		8.0	6.0	6.0	5.0	4.0	4.0	2.0	6.0	4.0	2.0	4.0	3.0	2.0	2.0	58.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
South Rainbow Creek (Main Stem)	1	75	75			X	
AVERAGES		75.0	75.0	0%	0%	100%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
South Rainbow Creek Trib. I (North)	1	6	4	7	4	4	4	2	6	5	2	4	4	4	0	56
South Rainbow Creek Trib. I (North)	2	5	3	6	3	4	4	2	4	4	2	4	3	3	0	47
South Rainbow Creek Trib. I (North)	3	4	2	6	3	4	4	2	4	4	2	4	2	3	0	44
South Rainbow Creek Trib. I (North)	4	4	2	7	2	4	4	2	4	4	2	4	4	4	2	49
AVERAGES		4.8	2.8	6.5	3.0	4.0	4.0	2.0	4.5	4.3	2.0	4.0	3.3	3.5	0.5	49.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
South Rainbow Creek Trib. I (North)	1	50	40			X	
South Rainbow Creek Trib. I (North)	2	30	10			X	
South Rainbow Creek Trib. I (North)	3	5	4			X	
South Rainbow Creek Trib. I (North)	4	30	30		X		
AVERAGES		28.8	21.0	0%	25%	75%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
South Rainbow Creek Trib. II (South)	1	8	6	7	5	4	4	2	4	5	2	4	4	4	0	59
South Rainbow Creek Trib. II (South)	2	5	3	8	2	4	4	3	3	4	4	3	4	4	0	51
South Rainbow Creek Trib. II (South)	3	4	2	2	2	4	7	2	3	4	2	2	1	2	0	37
AVERAGES		5.7	3.7	5.7	3.0	4.0	5.0	2.3	3.3	4.3	2.7	3.0	3.0	3.3	0.0	49.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
South Rainbow Creek Trib. II (South)	1	40	30				X
South Rainbow Creek Trib. II (South)	2	5	10			X	
South Rainbow Creek Trib. II (South)	3	3	2	X			
AVERAGES		16.0	14.0	33%	0%	33%	33%

*Width of riparian corridor in feet (in segment) looking downstream.

HOLBROOK CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Holbrook-Logie Area

Length Inventoried: 10,560 ft (2.0 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 10,560 ft (2.0 miles)

Area of Watershed in Multnomah County: 360 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Holbrook		95%		5%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

The stream's headwaters, immediately east of Skyline Boulevard, have been clearcut. No overstory remains. Small-diameter slash is abundant throughout the stream channel. A shrub layer of young red alder, salmonberry, salal, and snowberry is establishing itself. The area has been replanted with Douglas fir seedlings, however, the stocking levels appear low. Ground cover is made up of various grasses, swordfern, and trailing blackberry. The stream flows through the clear cut for approximately one-half mile where it enters a mixed deciduous/conifer stand. A road is on the south bank, approximatly 50 feet upslope. The road leads to a house on the southeast edge of the clearcut, 300 feet upslope from the stream. The overstory directly in the stream channel is predominatly red alder with occasion big-leaf maple, western red cedar, and Douglas fir. Downstream the western red cedar become more prevalent and larger (20-28 inches). The north side of the stream is a Douglas fir plantation (8-18 inches). The shrub layer is very diverse and moderate in density. It is made up of salmberry, snowberry, elderberry, huckleberry and vine maple. Ground cover is Oregon grape, sword fern, trailing blackberry, and trillium.

Appoximately 2,000 feet downstream from the edge of the clear cut the stream flows through a culvert under a new rock road. Portions of the stream channel and upslope areas to the north have been cleared and a young fruit orchard planted. The stream becomes deeply incised (six-seven feet) for 200-300 feet. The surrounding vegetation is primarly red alder with salmonberry/elderberry

understory. The stream then widens out into a wide floodplain with associated wetlands. What appears to be a pump station was being constructed on the south bank.

The stream reenters a mixed deciduous/conifer stand after 1,000 feet. The overstory and understory is similar in composition to the upstream stand; however, the trees are generally larger (alder 20 inches, and conifers 20-24 inches) and salmonberry is the most prevelant shrub. There are also patches of dense Himalayan blackberry.

As the stream approaches U.S. Highway 30 it enters a wetland area 75 feet by 150 feet. Several alder snags with pileated woodpecker foraging holes and a red-legged frog where seen here.

Morphology is varied throughout the streams length, from a deeply-incised channel with silt/clay substrate to a wide shallow flow with gravel/boulder substrate. The stream is almost entirely riffle/run with only occasional pools. The stream flows under U.S. Highway 30 through a culvert.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 157 ft

Range of Width: 30-300 ft

Benefit to Water Quality: The current moderate to high level of canopy cover and the moderate width of riparian corridor should mitigate for any water temperature increases caused by the lack of canopy in the head waters area and have a positive influence on the overall water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 43

Range of scores: 23-58

Essential Connections: Wildlife habitat quality is directly related to water quality and seasonality. High water quality is essential for survival, growth, reproduction, and migration of species present in aquatic and riparian communities. Overstory removal and other activity can alter the amount and timing of streamflow by changing on-site hydrologic processes. This can result in increased sediment transport, higher peak flows and lower summer water levels, which would negatively influence the riparian habitat quality. The water quality created by upstream conditions should maintain the downstream areas at the current habitat quality.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Holbrook Creek	1	4	3	7	4	4	6	2	4	3	2	3	3	3	4	52
Holbrook Creek	2	4	3	7	4	6	6	3	6	6	3	4	3	3	0	58
Holbrook Creek	3	4	3	6	2	5	4	3	6	6	3	4	3	3	0	52
Holbrook Creek	4	4	3	6	2	4	4	2	4	4	2	4	4	3	0	46
Holbrook Creek	5	4	3	6	2	4	4	2	5	4	2	3	4	3	0	46
Holbrook Creek	6	4	3	3	4	4	4	2	3	3	2	1	1	4	0	38
Holbrook Creek	7	4	3	5	2	5	4	2	5	4	2	2	1	3	0	42
Holbrook Creek	8	4	3	6	2	7	6	2	4	4	3	2	2	3	0	48
Holbrook Creek	9	4	3	2	2	2	2	2	1	1	2	0	3	2	0	26
Holbrook Creek	10	4	3	2	2	2	1	2	1	1	2	0	3	0	0	23
AVERAGES		4.0	3.0	5.0	2.6	4.3	4.1	2.2	3.9	3.6	2.3	2.3	2.7	2.7	0.4	43.1

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Holbrook Creek	1	150	75			X	
Holbrook Creek	2	75	100				X
Holbrook Creek	3	100	75				X
Holbrook Creek	4	75	75			X	
Holbrook Creek	5	150	75				X
Holbrook Creek	6	150	150			X	
Holbrook Creek	7	75	75			X	
Holbrook Creek	8	75	30			X	
Holbrook Creek	9	15	15	X			
Holbrook Creek	10	15	15	X			
AVERAGES		88.0	68.5	20%	0%	50%	30%

*Width of riparian corridor in feet (in segment) looking downstream.

Upper Rock Creek Area

SOUTH JACKSON CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Upper Rock Creek Area

Length Inventoried: 4,220 ft (0.8 mile)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 4,220 ft (0.8 mile)

Area of Watershed in Multnomah County: 120 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
South Jackson		100%			

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

South Jackson Creek

South Jackson originates southwest of the intersection of Johnson and Beck Roads. The upper reaches flow through a mixed conifer/deciduous forest with occasional large conifers (>28 inches) and abundant conifer snags, some with pileated woodpecker foraging holes. Coarse woody debris is abundant in the stream area. At approximately 2,000 feet from the origin, a dirt road crosses the stream over a stone culvert. The road shows recent use. A pasture is adjacent to the stream at approximately 2,200 feet, a 30-foot buffer has been maintained. Understory becomes sparse and overstory is primarily deciduous with occasional conifers. A one-half-acre pond (constructed) was observed approximately 3,300 feet from the start. The area around the pond is not well vegetated but west toward the county line the riparian vegetation density increases. Evidence of frequent deer use was common along the entire stream reach.

The stream is small (< 3 feet wide and 1 foot in depth) and has low flows. The higher reaches are intermittent even in the winter months, although the channel is well defined. The stream is low gradient, and side slopes are shallow. The stream bed is mostly clay and sediment until just prior to the County line where boulders become predominant. The stream is predominantly riffle/run with only 5% pool. Stream temperature averages 8.0 degrees Celsius.

ECONOMIC

DWR Water Rights Data: none

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: No

Flood storage limited to stream channel: Yes

Riparian Corridor - see attached table

Average Width: 350 ft

Range of Width: 300-400 ft

Benefit to Water Quality: The current high level of canopy cover and large riparian width will positively influence water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey

Wildlife Habitat Assessment - see attached table

Average score: 53

Range of scores: 38-70

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: UPPER ROCK CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
South Jackson Creek	1	4	3	8	2	8	8	3	8	7	3	4	4	6	2	70
South Jackson Creek	2	4	3	8	2	6	6	3	7	6	3	2	1	5	0	56
South Jackson Creek	3	4	3	5	2	4	4	2	2	3	2	2	1	4	0	38
South Jackson Creek	4	4	3	5	4	6	6	2	4	4	2	2	2	4	0	48
AVERAGES		4.0	3.0	6.5	2.5	6.0	6.0	2.5	5.3	5.0	2.5	2.5	2.0	4.8	0.5	53.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
South Jackson Creek	1	200	200				X
South Jackson Creek	2	200	200				X
South Jackson Creek	3	100	200			X	
South Jackson Creek	4	100	200			X	
AVERAGES		150.0	200.0	0%	0%	50%	50%

*Width of riparian corridor in feet (in segment) looking downstream.

NORTH ROCK CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Upper Rock Creek Area

Length Inventoried: 28,510 feet (5.4 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 28,510 feet (5.4 miles)

Area of Watershed in Multnomah County: 2,190 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
North Rock		95%		5%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

North Rock Creek

North Rock Creek originates southeast of the intersection of Johnson and Beck roads. The overstory around the stream is dominated by young deciduous trees with mature conifers upslope. Further downstream the riparian overstory is comprised of old growth conifers interspersed in a stand of large big-leaf maple and red alder. Two thousand feet downstream, the stream is bounded by a pasture for approximately 300 feet. The stream then re-enters a mixed conifer/deciduous stand and continues in it to the County line.

The stream is shallow (ave. 6 inches) and relatively wide for it's low flow. It is a low gradient stream for most of the surveyed length. The channel varies between deeply-incised and shallow. The stream bed is predominantly silt/clay with some gravel/cobble/boulder in the lower reaches. It is 95% riffle/run with 5% pool. Stream temperatures averages 8.0 degrees Celsius

Another segment of the mainstem begins at the County line below a dam (unsure of operator or purpose). The stream runs through pastures and fields for its first 3,000 feet. The overstory in many places has been removed and understory is sparse to nonexistent. Some areas in the upper reaches have a deciduous overstory with interspersed conifer. The stream crosses under Rock Creek Road at approximately 1,000 feet through a culvert. Rock Creek Road bounds the creek on the east side and often constrains the floodplain. In some areas livestock have access to the stream. At approximately 3,000 feet the stream enters a young, primarily deciduous forest with good understory. This continues to County line.

The stream is wide (6-10 feet) and relatively shallow (3-12 inches). It is low gradient and primarily riffle/run with occasional pools. Substrate is cobble/gravel/sand/clay-silt with sand and silt predominating in the upper reaches and cobble/gravel more prevalent in the lower reaches.

Rock Creek Tributary I

The description of this stream begins from confluence of Tributary IA and IB. The confluence is in an area that was harvested approximately 10 years ago. The overstory is predominantly 20-foot-tall red alder saplings. Himalayan blackberry and salmonberry dominate the shrub layer. A small wetland is located near the stream. One thousand feet below the confluence, the stream enters a mixed deciduous/conifer stand. The riparian area is dominated by red alder and maple with many saplings coming in. This stand continues until the stream joins the lake created by the dam on Rock Creek

The stream is wide (six feet wide and approximately three inches deep) and of low gradient. Near the confluence it becomes narrower and more channelized. Large woody debris is abundant in the lower reaches and provides good habitat diversity. Pools are common and equal the percentage of riffle/run. In the lower reaches, the substrate is dominated by cobbles and gravel. In the harvest section silt and sand are predominant.

Rock Creek Tributary IA

The headwaters of the stream are south of the intersection of Skyline Boulevard and Johnson Road. The majority of the stream above Beck Road has been recently harvested. No riparian overstory was left. The shrub layer is dense, however, and provides shade to the stream. Beck Road crosses the stream through a five-foot concrete culvert. After the culvert, the stream enters a grassy field with an overstory/shrub layer dominated by Indian plum, red alder, and mature western red cedar. In this section several plastic and metal drums stamped "Waste AP" were observed in the stream channel. Approximately 500 feet downstream from Beck Road the stream enters a mixed conifer/deciduous stand. The stream leaves the stand and enters a young stand of red alder with a shrub layer dominated by Himalayan blackberry and salmonberry. The confluence with Tributary IB is in this area.

The stream is small (< three feet wide and only two-three inches deep in most areas). Coarse woody debris is common only in the middle sections. The substrate is dominated by sand with some areas having pockets of gravel. The majority of the stream is riffle/run with some small pools.

Rock Creek Tributary IB

The south side of the stream's headwaters have been harvested recently and no riparian overstory wasleft. Thick stands of young alder with salmonberry are common in the riparian area; conifers are more common upslope to the north. Further downstream, the north bank is clearcut and selective logging is ongoing on the south bank in a stand of mature conifer. Bank vegetation remains dense, particularly the shrub layer. Approximately 2,000 feet downstream from the headwaters the stream enters a mature conifer forested area with some large deciduous trees, Indian plum is the dominant shrub. The stream continues through the stand for 1,000 feet where it enters a clearcut approximately 10 years old. In another 1,000 feet it joins Tributary IA. Just prior to the confluence a small beaver pond was observed.

The stream is three-five feet in width and three-four inches deep. The middle forested sections have a good large woody debris component. The stream substrate is dominated by gravel and sand in the upper sections and by silt/sand/gravel in the lower. Pools and riffles are equally common, but riffles tend to be long.

Rock Creek - Tributary II

The stream originates south of the intersection of Skyline Boulevard and Elliot Road in a small forested wetland. Residences border the area but a buffer zone has been maintained. Overstory is mixed conifer/deciduous. The shrub layer is moderately dense. At approximately 1,000 feet the stream crosses Rock Creek Road. The area on both sides of the road is dominated by Himalayan blackberry and salmonberry with scattered conifer and deciduous trees. Houses are located upslope on both sides of the stream. Five hundred feet below Rock Creek Road, a logging operation was ongoing. A narrow buffer strip of tree has been left. Below the logging (approximately 700 feet) the stream enters a mature mixed deciduous/conifer forest with a second story of predominantly deciduous saplings. The shrub layer is Indian plum and salmonberry. Six hundred feet prior to it's confluence with the main stem of Rock Creek, the stream channel is overgrown by Himalayan blackberry.

The stream is wide and shallow for most of its length (six feet deep and three-four inches deep. Abundant large woody debris and debris jams create numerous deep pools. Substrate is dominated by gravel with some cobble and silt.

ECONOMIC

DWR Water Rights Data (Permits for all of Rock Creek to include Middle and South Rock Creeks):

Permit Number	Location	Use	Rate/Quantity
S9254	NESE 23 2N 2W	Domestic (Inc. Stock)	.0100 CFS
S1260	SWNE 26 2N 2W	Livestock	1.1000 AFS
S20759	SWNE 26 2N 2W	Livestock	.0100 CFS
S37297	SWNW 26 2N 2W	Fish	.5000 CFS
S37297	SWNW 26 2N 2W	Recreation	.5000 CFS
S37847	SWNW 26 2N 2W	Recreation	.1000 CFS
S33476	NWSE 36 2N 2W	Fish	.0100 CFS

S16471	SESW 36 2N 2W	Domestic	.0100 CFS
S5469	NWNE 6 1N 1W	Irrigation	3.600 AF
S34283	NWNE 6 1N 1W	Irrigation	.5800 CFS
S35552	NWSW 6 1N 1W	Domestic (Inc. Lawn & Garden)	.0100 CFS
S35552	NWSW 6 1N 1W	Livestock	.0050 CFS
S42187	NWNE 6 1N 1W	Irrigation	.0900 CFS
S29283	SESE 8 1N 1W	Livestock	.0000 CFS
S29284	SESE 8 1N 1W	Domestic (Inc. Stock)	.0100 CFS
S29284	SESE 8 1N 1W	Livestock	.0100 CFS
S11285	SWSW 9 1N 1W	Domestic (Incl Lawn & Garden)	.0500 CFS
S15070	SESW 9 1N 1W	Irrigation	.0100 CFS
S44557	SESW 9 1N 1W	Domestic (Inc. Non-Commercial)	.0100 CFS
S43924	SESW 9 1N 1W	Domestic	.0050 CFS
S41182	NESE 9 1N 1W	Domestic	.0100 CFS
S41182	NESE 9 1N 1W	Livestock	.0200 CFS
S41182	NESE 9 1N 1W	Domestic (Inc. Livestock)	.0400 CFS
S27148	NESE 9 1N 1W	Domestic	.0100 CFS
S42705	NENW 9 1N 1W	Domestic (Inc. Lawn & Garden)	.0100 CFS
S12111	SENE 9 1N 1W	Domestic	.0100 CFS
S5283	SWNE 15 1N 1W	Livestock	.8000 AF

RECREATION

Park/Recreational Facility: Rock Creek flows to Rock Creek Park in Washington County along Highway 26. Rock Creek Park is a five acre park under the jurisdiction of the Tualatin Hills Parks and Recreation District. Approximately 2.5 acres of the park is in a natural state for passive recreation. A bark chip path has been provided along to the creek for access to the riparian area and wildlife observation.

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: Rock Creek Park is used by the Green CCity Data Project for High School educational programs. The creek flows through Rock Creek Park in Washington County.

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 194 ft

Range of Width: 100-400 ft

Benefit to Water Quality: The current moderatly high level of canopy cover and large riparian width will have positive influence on water quality

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 28%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 54

Range of scores: 35-76

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: UPPER ROCK CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Rock Creek – North Main Stem	1	6	5	8	2	5	5	2	4	3	2	3	3	4	0	52
Rock Creek – North Main Stem	2	8	6	7	2	5	6	2	4	4	2	2	2	5	0	55
Rock Creek – North Main Stem	3	6	6	8	2	5	6	2	6	6	2	3	2	5	0	59
Rock Creek – North Main Stem	4	6	6	8	2	5	6	2	6	6	2	3	2	5	0	59
Rock Creek – North Main Stem	5	5	4	7	2	4	4	2	4	3	2	2	1	4	0	44
Rock Creek – North Main Stem	6	5	2	4	2	4	4	2	2	3	2	3	3	5	0	41
Rock Creek – North Main Stem	7	4	3	6	2	4	4	2	5	5	2	4	2	4	0	47
AVERAGES		5.7	4.6	6.9	2.0	4.6	5.0	2.0	4.4	4.3	2.0	2.9	2.1	4.6	0.0	51.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Rock Creek – North Main Stem	1	100	100			X	
Rock Creek – North Main Stem	2	200	100			X	
Rock Creek – North Main Stem	3	200	200			X	
Rock Creek – North Main Stem	4	150	200			X	
Rock Creek – North Main Stem	5	100	100			X	
Rock Creek – North Main Stem	6	50	100			X	
Rock Creek – North Main Stem	7	75	75		X		
AVERAGES		125.0	125.0	0%	14%	86%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Rock Creek – Middle Main Stem	1	8	6	8	2	2	2	2	4	4	2	3	1	3	0	47
Rock Creek – Middle Main Stem	2	8	6	8	4	3	3	2	2	2	2	3	1	4	0	48
Rock Creek – Middle Main Stem	3	8	6	8	3	5	5	2	5	4	2	3	1	4	0	56
Rock Creek – Middle Main Stem	4	8	6	8	2	7	7	3	5	6	3	4	2	5	0	66
AVERAGES		8.0	6.0	8.0	2.8	4.3	4.3	2.3	4.0	4.0	2.3	3.3	1.3	4.0	0.0	54.3

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Rock Creek – Middle Main Stem	1	60	50	X			
Rock Creek – Middle Main Stem	2	50	50	X			
Rock Creek – Middle Main Stem	3	50	50	X			
Rock Creek – Middle Main Stem	4	75	30		X		
AVERAGES		58.8	45.0	75%	25%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: UPPER ROCK CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Rock Creek – South Main Stem	1	8	6	4	2	6	6	3	6	6	3	0	1	6	0	57
AVERAGES		8.0	6.0	4.0	2.0	6.0	6.0	3.0	6.0	6.0	3.0	0.0	1.0	6.0	0.0	57.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Rock Creek – South Main Stem	1	30	100			X	
AVERAGES		30.0	100.0	0%	0%	100%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: UPPER ROCK CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Rock Creek Trib. I (North; Main Stem)	1	8	6	8	4	8	7	3	8	6	2	4	4	6	2	76
Rock Creek Trib. I (North; Main Stem)	2	8	6	8	3	8	8	4	7	7	3	4	4	6	0	76
Rock Creek Trib. I (North; Main Stem)	3	8	6	7	4	8	8	3	4	5	2	2	1	4	0	62
AVERAGES		8.0	6.0	7.7	3.7	8.0	7.7	3.3	6.3	6.0	2.3	3.3	3.0	5.3	0.7	71.3

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. I (North; Main Stem)	1	100	100			X	
Rock Creek Trib. I (North; Main Stem)	2	100	100			X	
Rock Creek Trib. I (North; Main Stem)	3	100	100		X		
AVERAGES		100.0	100.0	0%	33%	67%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Rock Creek Trib. IA (North)	1	8	6	6	4	6	6	2	3	3	2	2	1	3	0	52
Rock Creek Trib. IA (North)	2	8	6	8	2	4	4	2	4	4	2	3	2	2	0	51
Rock Creek Trib. IA (North)	3	8	6	6	4	6	6	2	3	3	2	2	1	3	0	52
Rock Creek Trib. IA (North)	4	8	6	8	2	4	4	2	5	5	2	3	1	3	0	53
Rock Creek Trib. IA (North)	5	4	3	8	2	6	4	2	2	1	2	0	2	3	0	39
Rock Creek Trib. IA (North)	6	4	3	8	2	6	4	2	2	1	2	0	3	3	0	40
AVERAGES		6.7	5.0	7.3	2.7	5.3	4.7	2.0	3.2	2.8	2.0	1.7	1.7	2.8	0.0	47.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. IA (North)	1	100	100		X		
Rock Creek Trib. IA (North)	2	100	100			X	
Rock Creek Trib. IA (North)	3	75	30		X		
Rock Creek Trib. IA (North)	4	100	100			X	
Rock Creek Trib. IA (North)	5	100	100				X
Rock Creek Trib. IA (North)	6	100	100				X
AVERAGES		95.8	88.3	0%	33%	33%	33%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: UPPER ROCK CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Rock Creek Trib. IB (South)	1	4	3	8	2	5	7	2	4	4	2	2	1	3	0	47
Rock Creek Trib. IB (South)	2	4	3	8	2	5	5	2	1	3	2	2	0	2	0	39
Rock Creek Trib. IB (South)	3	4	3	8	2	6	6	3	5	3	3	3	3	5	0	54
Rock Creek Trib. IB (South)	4	8	6	8	4	8	8	3	4	5	2	2	1	4	0	63
AVERAGES		5.0	3.8	8.0	2.5	6.0	6.5	2.5	3.5	3.8	2.3	2.3	1.3	3.5	0.0	50.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. IB (South)	1	75	100		X		
Rock Creek Trib. IB (South)	2	75	100		X		
Rock Creek Trib. IB (South)	3	100	100		X		
Rock Creek Trib. IB (South)	4	100	100		X		
AVERAGES		87.5	100.0	0%	100%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Rock Creek Trib II (South)	1	8	6	6	2	6	6	2	4	4	2	2	1	3	0	52
Rock Creek Trib II (South)	2	8	6	8	2	6	6	2	7	6	2	4	3	4	0	64
Rock Creek Trib II (South)	3	8	6	8	2	6	6	3	7	7	3	4	4	5	0	69
Rock Creek Trib II (South)	4	8	6	8	2	7	7	3	7	7	3	4	4	5	0	71
Rock Creek Trib II (South)	5	8	6	4	2	6	6	2	6	6	2	2	2	0	0	52
Rock Creek Trib II (South)	6	8	6	2	2	3	3	2	3	3	2	2	1	2	0	39
Rock Creek Trib II (South)	7	4	3	6	3	3	3	2	2	2	2	2	1	2	0	35
AVERAGES		7.4	5.6	6.0	2.1	5.3	5.3	2.3	5.1	5.0	2.3	2.9	2.3	3.0	0.0	54.6

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Rock Creek Trib II (South)	1	100	100		X		
Rock Creek Trib II (South)	2	100	100		X		
Rock Creek Trib II (South)	3	100	100		X		
Rock Creek Trib II (South)	4	100	100		X		
Rock Creek Trib II (South)	5	100	100		X		
Rock Creek Trib II (South)	6	100	100		X		
Rock Creek Trib II (South)	7	100	100		X		
AVERAGES		100.0	100.0	0%	100%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

Folkenberg Area

MCCARTHY CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Folkenberg Area

Length Inventoried: 38,490 ft (7.3 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 39,490 ft (7.5 miles)

Area of Watershed in Multnomah County Study Area: 2,100 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
McCarthy		70%		30%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

McCarthy Creek-Main Stem

The headwaters of McCarthy Creek are south of McNamee road. The upper parts of the stream have been clearcut. The first 500 feet is in a five-year-old cut and the next 1,500 feet was harvested in the year prior to this report. The stream then enters a second growth stand (50-70 years old) just starting to achieve structural diversity. A gravel/rock road crosses the stream and has a 36-inch culvert. In some areas the upslope areas have been logged. Downstream where the stream begins to turn north the area becomes a patch work of clearcuts and forest stands. In most areas a thin buffer of riparian vegetation was left. The stream passes under railroad tracks through a rectangular concrete culvert approximately seven feet high by 12 feet wide. It then enters a stand of mature conifer (Douglas fir, western red cedar) and deciduous trees (big-leaf maple, red alder). The shrub layer is salmonberry, Indian plum, and Himalayan blackberry. As the stream proceeds north it flows into a residential area where houses and associated landscaping as well as clear cut areas are common down to the banks of the stream. Cornelius Pass Road often delineates the west bank. The floodplain/surrounding area is fairly flat although the stream is usually very channelized. A mill (unknown if it is active) is located along the stream and it's parking lot/loading yard constrain the stream into a narrow channel with no real floodplain. It continues to be bordered by Cornelius Pass and flows into a narrow canyon with a mixed deciduous/conifer overstory and moderately dense shrub layer of Indian plum and salmonberry.

Two thousand feet before the stream flows under U.S. Highway 30 the canyon widens out and the floodplain is often 100-200 feet or more across. The overstory becomes predominantly deciduous and scattered. Several small open areas are interspersed.

The lower portions of the stream are six-eight feet wide and frequently one-two feet deep; occasional pools are substantially deeper. Coarse woody debris is only occasional in the stream. The substrate is equally divided between cobbles, gravel, sand, and silt with occasional boulders forming pools. The stream is 90-95% riffle run.

McCarthy Creek Tributary I

The stream originates in a clearcut area east of Skyline Boulevard. After approximately 2,000 feet the stream enters a stand dominated by red alder and western red cedar. The understory is predominantly salmonberry and vine maple. Near the middle of the stream two houses and associated human activity have removed some of the riparian vegetation. Where Sheltered Nook Road is adjacent to the stream on the north side the overstory is predominantly deciduous and salmonberry is dense. Some garbage and other debris have been dumped into the stream channel. Sheltered Nook Road constrains the stream in the lower reaches.

The stream is two-four feet wide and rarely more than eight inches deep. It is predominantly riffle with only 25% pool. The substrate is predominantly silt with some cobbles and boulders and infrequent gravel.

McCarthy Creek Tributary II

The headwaters originate in a mixed deciduous/conifer stand dominated by red alder, (4-14 inches) with occasional Douglas fir (20 inches+) and rare western red cedar up to 40 inches. The shrub layer is salmonberry, vine maple, and huckleberry. Downstream the vegetation becomes more diverse with big-leaf maple (8-10 inches) and Oregon grape. A large slide on the north bank is located near the middle of the stream. Old roads, debris, trailers and other garbage are on the north bank. Himalayan blackberry begins to dominate the riparian shrub layer as the stream approaches Cornelius Pass. A red-legged frog was seen in the middle section of the stream.

The stream is two-three feet wide and six-eight inches deep. The substrate is predominantly gravel and silt with some cobble and sand component. There are 90% riffle/runs and 10% pool.

McCarthy Creek Tributary III

The stream originates in a sparse, primarily deciduous stand (red alder) with conifer upslope. Downstream the riparian vegetation becomes more diverse but is still fairly open. The overstory includes big-leaf maple, red alder, Douglas fir, western hemlock, and western red cedar. The shrub layer is dominated by salmonberry, elderberry, and huckleberry. In the lower reaches three alder

snags with pileated woodpecker foraging holes were seen and a red-legged frog observed. The conifer overstory in the last 800 feet of stream before Cornelius Pass had been removed recently.

The stream averages 12-18 inches wide and three-eight inches deep. Near Cornelius Pass it is incised three-four feet and disconnected from it's flood plain, further upstream the channel becomes shallower, however, it is in a steep sided draw. The substrate is predominantly silt and cobbles with some gravel and boulder component. The stream is 70% riffle/run and 30% pools.

McCarthy Creek Tributary IV

The stream originates at the fill slope for McNamee Road in a stand of red alder, big-leaf maple, and western red cedar. A gravel road is on it's west side. The stream flows through a narrow canyon with steep side slopes (45 degrees) for approximately 1,000 feet, then enters a recent clearcut and turns to the west. It then crosses a gravel road, a dense stand of young conifer (< 12 inches) borders the steam on the north and a clear cut with 50-75-foot sparse buffer borders it on the south. The shrub layer is dense salmonberry and Himalayan blackberry. Further downstream, the north side becomes a mixed deciduous/conifer stand that has been partially cut. The stream then enters a primarily deciduous stand with conifers more prevalent upslope. The stream passes under a railroad bridge and continues downslope another 1,000 feet before it joins the mainstem.

The stream flows through a draw with 35 degree side slopes and 10-20-foot-wide floodplain. It is one-two feet wide and 6-12 inches deep. Logging debris is common in the stream. The substrate is predominantly gravel and cobbles. It is 60% riffle/run and 40% pool.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: No

Flood storage limited to stream channel: Yes

Riparian Corridor - see attached table

Average Width: 119 ft

Range of Width: 20-300 ft

Benefit to Water Quality: The current low level of canopy cover and narrow riparian corridor found along the majority of the mainstem will have a negative impact on water quality by allowing summer heating of the stream and causing increased peak flow levels. The current moderate/moderately high level of canopy cover and wide riparian areas associated with the tributaries will have a positive influence on individual tributary and overall stream water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 37%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 41 (n=35)

Range of scores: 23-52

Essential Connections: Wildlife habitat quality is directly related to water quality and seasonality. High water quality is essential for survival, growth, reproduction, and migration of species present in aquatic and riparian communities. Overstory removal and other activity can alter the amount and timing of streamflow by changing on-site hydrologic processes. This can result in increased sediment transport, higher peak flows and lower summer water levels, which would negatively influence the riparian habitat quality. The water quality created by upstream conditions should maintain the downstream areas at the current habitat quality.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: FOLKENBERG

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
McCarthy Creek (Main Stem)	1	8	6	3	2	2	6	2	3	4	2	1	1	3	0	43
McCarthy Creek (Main Stem)	2	8	6	5	4	4	2	2	4	4	2	2	1	5	0	49
McCarthy Creek (Main Stem)	3	8	6	4	2	4	3	2	4	4	2	1	1	3	0	44
McCarthy Creek (Main Stem)	4	8	6	4	2	4	2	2	4	4	2	1	1	2	0	42
McCarthy Creek (Main Stem)	5	8	6	3	2	4	2	2	4	4	2	1	1	2	0	41
McCarthy Creek (Main Stem)	6	8	6	1	2	4	1	2	1	1	2	0	0	2	0	30
McCarthy Creek (Main Stem)	7	8	6	0	2	4	2	2	1	2	2	0	0	3	0	32
McCarthy Creek (Main Stem)	8	8	6	0	2	4	1	2	1	1	2	0	0	1	0	28
McCarthy Creek (Main Stem)	9	8	6	1	2	4	1	2	1	2	2	0	0	1	0	30
McCarthy Creek (Main Stem)	10	8	6	4	2	4	4	2	4	4	3	2	2	4	0	49
McCarthy Creek (Main Stem)	11	8	6	8	3	4	3	2	6	5	3	4	1	4	0	57
McCarthy Creek (Main Stem)	12	8	6	2	3	3	3	2	5	3	1	2	0	3	0	41
McCarthy Creek (Main Stem)	13	8	6	6	3	3	3	2	5	4	2	2	0	2	0	46
McCarthy Creek (Main Stem)	14	8	6	6	3	3	3	2	5	4	2	2	0	1	0	45
McCarthy Creek (Main Stem)	15	8	6	6	3	3	3	2	5	4	2	2	1	2	0	47
McCarthy Creek (Main Stem)	16	8	6	8	3	4	3	2	4	4	4	1	3	2	0	52
McCarthy Creek (Main Stem)	17	6	4	1	2	2	3	2	1	1	1	1	0	1	0	25
McCarthy Creek (Main Stem)	18	4	3	1	2	2	3	2	2	3	2	2	0	1	0	27
AVERAGES		7.7	5.7	3.5	2.4	3.4	2.7	2.0	3.3	3.2	2.1	1.3	0.7	2.3	0.0	40.4

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: FOLKENBERG

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
McCarthy Creek (Main Stem)	1	100	100	X			
McCarthy Creek (Main Stem)	2	100	100	X			
McCarthy Creek (Main Stem)	3	50	50	X			
McCarthy Creek (Main Stem)	4	50	50	X			
McCarthy Creek (Main Stem)	5	30	75	X			
McCarthy Creek (Main Stem)	6	40	75	X			
McCarthy Creek (Main Stem)	7	30	30	X			
McCarthy Creek (Main Stem)	8	60	30	X			
McCarthy Creek (Main Stem)	9	60	30	X			
McCarthy Creek (Main Stem)	10	75	65		X		
McCarthy Creek (Main Stem)	11	75	75		X		
McCarthy Creek (Main Stem)	12	100	100	X			
McCarthy Creek (Main Stem)	13	20	20	X			
McCarthy Creek (Main Stem)	14	25	80	X			
McCarthy Creek (Main Stem)	15	150	150			X	
McCarthy Creek (Main Stem)	16	75	75				X
McCarthy Creek (Main Stem)	17	25	20	X			
McCarthy Creek (Main Stem)	18	30	30	X			
AVERAGES		60.8	64.2	78%	11%	6%	6%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: FOLKENBERG

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
McCarthy Creek Trib. I (North)	1	4	3	8	2	4	4	2	4	4	2	3	2	2	0	44
McCarthy Creek Trib. I (North)	2	4	3	7	3	4	4	2	5	5	3	3	2	3	0	48
McCarthy Creek Trib. I (North)	3	4	3	7	2	4	3	2	4	4	2	4	2	4	0	45
McCarthy Creek Trib. I (North)	4	4	3	7	2	4	4	2	5	5	2	4	4	3	0	49
McCarthy Creek Trib. I (North)	5	4	3	1	2	3	3	2	1	1	1	2	0	0	0	23
McCarthy Creek Trib. I (North)	6	4	3	4	2	3	3	2	4	3	2	2	0	3	0	35
AVERAGES		4.0	3.0	5.7	2.2	3.7	3.5	2.0	3.8	3.7	2.0	3.0	1.7	2.5	0.0	40.7

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
McCarthy Creek Trib. I (North)	1	50	50			X	
McCarthy Creek Trib. I (North)	2	40	40		X		
McCarthy Creek Trib. I (North)	3	100	100			X	
McCarthy Creek Trib. I (North)	4	100	100			X	
McCarthy Creek Trib. I (North)	5	10	10	X			
McCarthy Creek Trib. I (North)	6	50	50			X	
AVERAGES		58.3	58.3	17%	17%	67%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: FOLKENBERG

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
McCarthy Creek Trib. II (Middle)	1	4	3	2	2	3	6	2	2	4	2	1	1	3	0	35
McCarthy Creek Trib. II (Middle)	2	4	3	4	2	4	4	2	3	2	2	1	1	3	2	37
McCarthy Creek Trib. II (Middle)	3	4	3	2	2	3	2	2	2	2	2	2	2	3	0	31
McCarthy Creek Trib. II (Middle)	4	4	3	4	2	4	3	2	3	4	2	2	4	3	0	40
AVERAGES		4.0	3.0	3.0	2.0	3.5	3.8	2.0	2.5	3.0	2.0	1.5	2.0	3.0	0.5	35.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
McCarthy Creek Trib. II (Middle)	1	35	30		X		
McCarthy Creek Trib. II (Middle)	2	30	30			X	
McCarthy Creek Trib. II (Middle)	3	50	50	X			
McCarthy Creek Trib. II (Middle)	4	50	50			X	
AVERAGES		41.3	40.0	25%	25%	50%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: FOLKENBERG

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
McCarthy Creek Trib. III (Southwest)	1	4	3	4	2	3	6	2	4	6	3	1	1	3	4	46
McCarthy Creek Trib. III (Southwest)	2	4	3	6	2	5	6	3	6	6	3	2	3	3	0	52
McCarthy Creek Trib. III (Southwest)	3	4	3	4	2	4	4	3	4	4	2	2	3	3	0	42
AVERAGES		4.0	3.0	4.7	2.0	4.0	5.3	2.7	4.7	5.3	2.7	1.7	2.3	3.0	1.3	46.7

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
McCarthy Creek Trib. III (Southwest)	1	75	60		X		
McCarthy Creek Trib. III (Southwest)	2	75	75			X	
McCarthy Creek Trib. III (Southwest)	3	50	50			X	
AVERAGES		66.7	61.7	0%	33%	67%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: FOLKENBERG

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
McCarthy Creek Trib. IV (Southeast)	1	4	3	8	2	3	3	2	4	3	2	2	2	2	0	40
McCarthy Creek Trib. IV (Southeast)	2	4	3	6	2	3	5	2	2	4	3	1	3	3	0	41
McCarthy Creek Trib. IV (Southeast)	3	4	3	8	2	3	5	2	2	4	3	1	3	3	0	43
McCarthy Creek Trib. IV (Southeast)	4	4	3	6	2	3	6	2	5	5	3	2	3	5	0	49
AVERAGES		4.0	3.0	7.0	2.0	3.0	4.8	2.0	3.3	4.0	2.8	1.5	2.8	3.3	0.0	43.3

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
McCarthy Creek Trib. IV (Southeast)	1	60	60			X	
McCarthy Creek Trib. IV (Southeast)	2	50	70	X			
McCarthy Creek Trib. IV (Southeast)	3	50	70	X			
McCarthy Creek Trib. IV (Southeast)	4	65	65		X		
AVERAGES		56.3	66.3	50%	25%	25%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

McNamee-Harborton Area

BURLINGTON CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: McNamee Harborton

Length Inventoried: 5,400 ft

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 5,400 ft

Area of Watershed in Multnomah County: 375 acres

Abutting Land Use Designations (percent of study area stream length):

Rural Residential	Urban Residential R-20	Urban Residential R-10	Commercial Forest	Other
0%	0%	0%	100%	0%

Stream Description:

The headwaters of Burlington Creek have been partially cut and a canopy cover of approximately 30% remains. Overstory is comprised of Douglas fir, Western hemlock, and red alder, the understory is predominantly viney maple with occasional salmonberry. The stream crosses a skid trail and a road (culvert removed, banks planted with willow), both of which appear to be contributing sediment to the stream. Logging slash often covers the stream channel. At 700 feet from its origin the stream flows through a clear cut. No overstory remains in the riparian area, though some shrubs are present, predominantly viney maple with occasional elderberry and salmonberry. The stream then enters a mature conifer stand of Douglas fir and western hemlock (20-30 inch Dbh). Canopy closure is 65-70% and a well established understory. No snags were observed in this section and coarse woody debris was present in low amounts. The stream continues through the forested section for approximately 750 feet. It then passes through a culvert under a road and flows into another clear cut. No overstory remains. Shrub layer is often dense salmonberry and Himalayan blackberry. Logging slash often covers the stream channel. As the stream proceeds east the banks become steep, often in excess of 45 degrees. Numerous slope failures are evident and the stream has large sediment deposits. Just west of the powerline the stream flows through a 48 inch culvert under a road. The fill for the crossing is approximately 200 feet wide and 100 feet high. The stream passes under a train trestle and enters a wide, flat bottom area (approximately 100 feet by 300 feet). The overstory is predominantly red alder with a few small red cedar. The shrub layer is salmonberry and Himalayan blackberry. The stream becomes braided in this area with the main channel against the north slope. A house sits atop the north bank and a dirt road has been cut down the south. The stream then enters a culvert and flows under Highway 30.

The stream is 85% riffle and 15% pool. Its substrate is a combination of silt, sand, gravel, cobbles, boulders, with silt and cobbles being predominant. Evidence of recent scouring and sediment transport and deposit was observed. Bank failures where frequently observed and the upper two road crossing appeared to have substantial erosion. The channel is incised for most of its length. Water temperature was 8.5 degrees Celsius.

ECONOMIC

DWR Water Rights Data: No recorded permits as of 2/16/94

RECREATION

Park/Recreational Facility: None adjacent to stream. Stream discharges to Burlington Bottoms, a publicly-owned parcel managed by Oregon Department of Fish and Wildlife, purchased for wildlife mitigation by Bonneville Power Administration. The hydrology and hydraulics of Burlington Bottoms was the subject of an August 27, 1993 report by WH Pacific for the Oregon Department of Fish and Wildlife. The report examined hydrology of the 417 acre wildlife habitat mitigation site and the influence of streams and the relationship to the Columbia River. The watershed studied is approximately 900 acres in size. Streams studied as part of this analysis include, McCarthy Creek, Burlington Creek, North Angell Brothers Creek and Middle Angell Brothers Creek. Based on the WH Pacific report, McCarthy Creek and Middle Angell Brothers Creek do not contribute to flows to Burlington Bottoms. McCarthy flows directly to the Multnomah Channel and Middle Angell Brothers Creek has been diverted south through United Junction. Burlington Creek and North Angell Brothers Creek both drain into Burlington Bottoms.

The importance of Burlington Bottoms as a wetland resource would be compromised by any reduction in water quality of quantity, therefore, Burlington Creek is significant in terms of recreation values

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: None recorded as of 2/2/94

Public Educational Use: None identified

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage Area:

Number of wetlands/ approximate size: One small wetland at lower end of stream at Highway 30.

Flood Storage Capacity: Limited to stream channel generally steeply incised with limited widening of channel.

Riparian Corridor: see attached table

Average Width: 96

Range of Width: 40-300

Benefit to Water Quality: Based on low canopy cover, the riparian corridor has little benefit to water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94

Wildlife Habitat Assessment: see attached table

Average score: 33.4 (n=5)

Range of scores: 24-57

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: McNamee Harborton

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Burlington Creek	1	4	3	3	2	4	6	2	1	1	2	0	2	2	0	32
Burlington Creek	2	4	3	0	2	3	3	1	1	2	1	0	4	0	0	24
Burlington Creek	3	4	3	0	2	3	3	1	1	2	1	0	4	0	0	24
Burlington Creek	4	4	3	7	2	7	5	2	8	6	4	2	3	4	0	57
Burlington Creek	5	4	3	2	2	4	2	2	2	3	2	0	0	4	0	30
AVERAGES		4.0	3.0	2.4	2.0	4.2	3.8	1.6	2.6	2.8	2.0	0.4	2.6	2.0	0.0	33.4

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Burlington Creek	1	20	20	X			
Burlington Creek	2	30	30	X			
Burlington Creek	3	20	20	X			
Burlington Creek	4	150	150			X	
Burlington Creek	5	20	20	X			
AVERAGES		48	48	80%	0%	20%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

NORTH ANGELL BROS. CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: McNamee Harborton

Length Inventoried: 4,500 ft

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 4,500 ft

Area of Watershed in Multnomah County: 350 acres

Abutting Land Use Designations (percent of study area stream length):

Rural Residential	Urban Residential R-20	Urban Residential R-10	Commercial Forest	Other
0%	0%	0%	100%	0%

Stream Description:

Its origin has been clear cut on the south side and a mixed conifer deciduous forest is on the North. It then flows into an area where both sides of the stream have been clear cut and only a few overstory trees remain; however in several areas buffer strips up to 100 feet wide have been maintained. The buffers are primarily red alder but some Douglas fir and western red cedar are also present. These buffers are very open and many of the conifers have been removed. Dense salmonberry and himalayan blackberry are in the stream channel. At 4/10's of a mile from the headwaters the stream goes under ground and flows under a road (culvert has been removed, re-surfaces and enters another mixed conifer/deciduous forest). Overstory is primarily red alder and big-leaf maple with western red cedar, western hemlock, and Douglas fir becoming more common upslope. The stream is joined by a second stream from the south and forms a delta of transported sediment and debris against the embankment of a powerline access road. Water is ponded in this area and drains subsurface under and through a grated culvert that is 90% blocked by silt and debris. According to County Planning Staff, the culvert's outlet is immediately east of the Burlington Northern's Cornelius Pass railroad grade.unknown. Immediately east of the road is a channel overgrown with himalayan blackberry but no water was flowing at the time of observation.

The stream is 70% riffle and 30% pool. Its substrate is a combination of silt, sand, gravel, cobbles, boulders, and bedrock. Evidence of recent scouring and sediment transport and deposit was observed. Several small debris torrents were also observed. The channel is incised for most of its length.

ECONOMIC

DWR Water Rights Data: No recorded permits as of 2/16/94

RECREATION

Park/Recreational Facility:

None adjacent to stream. Stream discharges to Burlington Bottoms, a publicly-owned parcel managed by Oregon Department of Fish and Wildlife, purchased for wildlife mitigation by Bonneville Power Administration. The hydrology and hydraulics of Burlington Bottoms was the subject of an August 27, 1993 report by WH Pacific for the Oregon Department of Fish and Wildlife. The report examined hydrology of the 417 acre wildlife habitat mitigation site and the influence of streams and the relationship to the Columbia River. The watershed studied is approximately 900 acres in size. Streams studied as part of this analysis include, McCarthy Creek, Burlington Creek, North Angell Brothers Creek and Middle Angell Brothers Creek. Based on the WH Pacific report, McCarthy Creek and Middle Angell Brothers Creek do not contribute to flows to Burlington Bottoms. McCarthy flows directly to the Multnomah Channel and Middle Angell Brothers Creek has been diverted south through United Junction. Burlington Creek and North Angell Brothers Creek both drain into Burlington Bottoms.

The importance of Burlington Bottoms as a wetland resource would be compromised by any reduction in water quality or quantity, therefore, Burlington Creek is significant in terms of recreation values.

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: No recorded observations as of 2/22/94

Public Educational Use: None identified

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage Area:

Number of wetlands/ approximate size: None

Flood Storage Capacity: limited to stream channel and area immediately adjacent to channel

Riparian Corridor: see attached table

Average Width: 78

Range of Width: 55-150

Benefit to Water Quality: There exists sufficient canopy cover and woody debris in stream to improve water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94

Wildlife Habitat Assessment: see attached table

Average score: 41.5 (n=4)

Range of scores: 35-53

Essential Connections: Wildlife habitat quality is directly related to water quality and seasonality. High water quality is essential for survival, growth, reproduction, and migration of species present in aquatic and riparian communities. Overstory removal and other activity can alter the amount and timing of streamflow by changing on-site hydrologic processes. This can result in increased sediment transport, higher peak flows and lower summer water levels, which would negatively influence the riparian habitat quality. The water quality created by upstream conditions should maintain the downstream areas at the current habitat quality.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: McNamee Harborton

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
"Angell Brothers" – north	1	6	3	8	2	6	6	2	6	4	3	2	2	3	0	53
"Angell Brothers" – north	2	4	3	3	2	4	7	2	4	4	1	1	3	4	0	42
"Angell Brothers" – north	3	4	3	3	2	4	6	2	2	2	2	0	2	3	0	35
"Angell Brothers" – north	4	4	3	4	2	4	6	2	2	2	2	0	2	3	0	36
AVERAGES		4.5	3.0	4.5	2.0	4.5	6.3	2.0	3.5	3.0	2.0	0.8	2.3	3.3	0.0	41.5

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
"Angell Brothers" – north	1	75	75			X	
"Angell Brothers" – north	2	30	25		X		
"Angell Brothers" – north	3	40	20		X		
"Angell Brothers" – north	4	40	20		X		
AVERAGES		46	35	0%	75%	25%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MIDDLE ANGELL BROS. CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: McNamee Harborton

Length Inventoried: 2,000 ft

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): ~ 6,000 ft

Area of Watershed in Multnomah County: 360 acres

Abutting Land Use Designations (percent of study area stream length):

Rural Residential	Urban Residential R-20	Urban Residential R-10	Commercial Forest	Other
0%	0%	0%	100%	0%

Stream Description:

The creek originates in a mixed conifer/deciduous forest from several small drainages. It consolidates into one channel and flows through the forested area for 2/10's of a mile when it enters a 3-5 year old clear-cut. The majority of the overstory in the riparian area was removed. Several red alder and big-leaf maple remain. Dense salmonberry and vine maple line the channel. Logging debris is common in the narrow floodplain and in the channel. At approximately 6/10's of a mile the stream enters another mixed conifer/deciduous forest. Activity at the Angell Brothers gravel pit prevented this section from being surveyed due to liability concerns. The stream leaves the forested area and flows off a vertical cut wall into a culvert below and is then transported via a culvert to a settling pond. It is again culverted and flows under Highway 30.

ECONOMIC

DWR Water Rights Data: No recorded permits as of 2/16/94

RECREATION

Park/Recreational Facility:

None adjacent to stream and according to a 1993 report this stream has been diverted south away from Burlington Bottoms. The hydrology and hydraulics of Burlington Bottoms was the subject of an August 27, 1993 report by WH Pacific for the Oregon Department of Fish and Wildlife. The report examined hydrology of the 417 acre wildlife habitat mitigation site and the influence of streams and the relationship to the Columbia River. The watershed studied is approximately 900 acres in size. Streams studied as part of this analysis include, McCarthy Creek, Burlington Creek, North Angell

Brothers Creek and Middle Angell Brothers Creek. Based on the WH Pacific report, McCarthy Creek and Middle Angell Brothers Creek do not contribute to flows to Burlington Bottoms. McCarthy flows directly to the Multnomah Channel and Middle Angell Brothers Creek has been diverted south through United Junction. Burlington Creek and North Angell Brothers Creek both drain into Burlington Bottoms.

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: No recorded observations as of 2/22/94

Public Educational Use: None identified

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage Area:

Number of wetlands/ approximate size: None

Flood Storage Capacity: Limited to stream channel and area immediately adjacent to channel

Riparian Corridor: see attached table

Average Width: 80

Range of Width: 80-80

Benefit to Water Quality: Riparian vegetation remaining from clear cut appears insufficient to maintain the current water quality level.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: None recorded as of 2/22/94

Wildlife Habitat Assessment: see attached table

Average score: 37.5 (n=2)

Range of scores: 31-44

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: McNamee Harborton

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
"Angell Brothers" – middle	1	4	3	2	2	4	5	2	2	1	2	0	2	2	0	31
"Angell Brothers" – middle	2	4	3	4	2	4	4	3	4	4	3	3	3	3	0	44
AVERAGES		4.0	3.0	3.0	2.0	4.0	4.5	2.5	3.0	2.5	2.5	1.5	2.5	2.5	0.0	37.5

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
"Angell Brothers" – middle	1	40	40		X		
"Angell Brothers" – middle	2	40	40		X		
AVERAGES		40	40	0%	100%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

SOUTH ANGELL BROS. CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: McNamee Harborton

Length Inventoried: ~4,000 ft

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): ~4,100 ft

Area of Watershed in Multnomah County: 205 acres

Abutting Land Use Designations (percent of study area stream length):

Rural Residential	Urban Residential R-20	Urban Residential R-10	Commercial Forest	Other
0%	0%	0%	100%	0%

Stream Description:

The headwaters and approximately 6/10's of a mile along the upper stream have been clear cut in the last 5 years. Logging slash and material from slope failures almost entirely cover the stream channel. Slopes in this area are 25-35 degrees. No overstory remains in the riparian area. Salmonberry, Himalayan blackberry, and trailing blackberry are the dominant vegetation. At approximately 4/10 of a mile from the headwaters a recent clear cut has no vegetation regeneration. At approximately 6/10 of a mile the stream flows into a mixed conifer/deciduous forested area. This area has not been recently disturbed and has a developing understory and groundcover layer. Canopy cover is approximately 45%. The stream crosses under the powerline corridor and then passes under a road through a culvert. The stream flows off a cliff at highway 30 and is culverted.

The stream is 95% riffle and 5% pool although direct observation in the upper section was difficult due to the amount of debris in and covering the channel. Stream bottom is primarily silt with some gravel, cobbles and boulders present, and subject to repeated flushing. Cobbles and gravel make up a larger part of the substrate in the lower reaches. The channel in the upper reaches is incised and undercutting the bank.

ECONOMIC

DWR Water Rights Data: No recorded permits as of 2/16/94

RECREATION

Park/Recreational Facility: None adjacent to stream or downstream

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: No recorded observations as of 2/22/94

Public Educational Use: None identified

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage Area:

Number of wetlands/ approximate size: None

Flood Storage Capacity: Limited to stream channel and adjacent steeply sloped banks.

Riparian Corridor: see attached table

Average Width: 52

Range of Width: 20-150

Benefit to Water Quality: Insufficient canopy cover and riparian width to positively influence water quality

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data:

Wildlife Habitat Assessment: see attached table

Average score: 24 (n=4)

Range of scores: 9-46

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: McNamee Harborton

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
"Angell Brothers" – south	1	4	3	0	2	3	4	2	0	0	0	0	2	1	0	21
"Angell Brothers" – south	2	4	3	0	2	3	4	2	0	0	0	0	2	1	0	21
"Angell Brothers" – south	3	4	3	0	2	0	0	0	0	0	0	0	0	0	0	9
"Angell Brothers" – south	4	4	3	5	2	4	5	2	6	6	2	2	2	3	0	46
AVERAGES		4.0	3.0	1.3	2.0	2.5	3.3	1.5	1.5	1.5	0.5	0.5	1.5	1.3	0.0	24.3

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
"Angell Brothers" – south	1	10	10	X			
"Angell Brothers" – south	2	10	10	X			
"Angell Brothers" – south	3	10	10	X			
"Angell Brothers" – south	4	75	75			X	
AVERAGES		26	26	75%	0%	25%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

NEWBERRY CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: McNamee Harborton

Length Inventoried: 3,000 ft (The lower 3,000 feet of the creek was not surveyed due to lack of access permission)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 6,000 ft

Area of Watershed in Multnomah County: 470 acres

Abutting Land Use Designations (percent of study area stream length):

Rural Residential	Urban Residential R-20	Urban Residential R-10	Commercial Forest	Other
0%	0%	0%	100%	0%

Stream Description:

The headwaters of Newberry Creek were clear-cut approximately 10 years prior to this report. No overstory remains except for scattered red alder and western red cedar. The area was replanted and is low to moderately stocked with 7-8 year old Douglas fir saplings. Other vegetation includes small, 2-4 inch, clumps of big-leaf maple, 1-2 inch alder, Himalayan blackberry, trailing blackberry and various grasses. Coarse woody debris is scarce. Two roads cross the creek with intact culvert systems. At approximately 2000 feet from the headwalls is a new clear-cut (sometime in the two years prior to this report). Access permission for this section was denied. What follows is a visual estimation from upslope. No overstory remains, and re-growth of other vegetation has not occurred. Coarse woody debris is low to moderate. Occasional snags where left upslope, a pileated woodpecker was observed using one. The stream leaves the clear cut and flows through an second growth stand of medium saw timber (18-24 inches Dbh) composed of Douglas fir and Western hemlock. The lower 1000 feet of the stream also was not surveyed due to access restraints.

Several drainages combine to form the main channel. These small drainages have predominantly clay substrate and a narrow 1-2 foot wide channel 1-2 feet deep. At their confluence the channel is more defined although often covered with logging slash. Channel substrate has more gravel and occasional cobbles, however; several large deposits of silt were observed. The stream is almost 100% riffle/run.

ECONOMIC

DWR Water Rights Data: No recorded permits as of 2/16/94

RECREATION

Park/Recreational Facility: The stream does not flow through or into any park or recreational facility

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: None recorded as of 2/22/94

Public Educational Use: None identified

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage Area:

Number of wetlands / approximate size: None

Flood Storage Capacity: Limited to stream channel and area immediately adjacent to channel.

Riparian Corridor: see attached table

Average Width: 20 ft

Range of Width: 20 ft

Benefit to Water Quality: The lack of overhead canopy can cause increased stream temperature and peak flows which increase sediment flow into the stream.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94

Wildlife Habitat Assessment: see attached table

Average score: 28 (n=3)

Range of scores: 25-30

Essential Connections: None

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Newberry Creek	1	4	3	2	2	3	4	2	2	3	2	2	0	1	0	30
Newberry Creek	2	5	3	1	2	4	4	2	1	3	1	2	0	1	0	29
Newberry Creek	3	6	3	1	2	3	2	1	1	2	1	2	0	1	0	25
AVERAGES		5.0	3.0	1.3	2.0	3.3	3.3	1.7	1.3	2.7	1.3	2.0	0.0	1.0	0.0	28.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Newberry Creek	1	20	20	X			
Newberry Creek	2	20	20	X			
Newberry Creek	3	20	20	X			
AVERAGES		20.0	20.0	100%	0%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MILLER CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: McNamee Harborton

Length Inventoried: 10,200 ft (includes portions of Forest Park)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 10,200 ft, but only 1700 feet are under county jurisdiction

Area of Watershed in Multnomah County: 408 acres, but only 200 acres are under County jurisdiction

Abutting Land Use Designations (percent of study area stream length):

Rural Residential	Urban Residential R-20	Urban Residential R-10	Commercial Forest	Other
10%	0%	0%	90%	0%

Stream Description:

Miller Creek runs adjacent to and through Forest Park. Only 1700 feet are under the jurisdiction of Multnomah County and include two reaches which are not contiguous. This made it impractical to survey only individual segments so the entire stream was surveyed. Habitat and stream morphology are similar throughout.

The headwaters of Miller creek are located just east and south of the Newberry road - Skyline drive intersection. The creek flows through a fenced pasture for the first 500 feet in a 10-20 foot deep canyon. The stream then flows into a mixed conifer/deciduous forest. Canopy closure is currently 30% (canopy cover would be significantly higher during full leaf-out) and species include western red cedar, Douglas fir, and red alder. The shrub layer is moderate and is made up of salmonberry and vine maple. As the stream flows east it is joined by several tributaries and the overstory composition changes to predominantly deciduous (red alder and big-leaf maple). The tree density varies from sparse to moderately dense. Conifers become more prevalent upslope to the south. The shrub layer becomes denser. At approximately 4000 feet the shrub layer has been cleared on the north bank. Coarse woody debris is relatively abundant in the stream channel but lacking upslope and no snags were observed.

The steam flows through a canyon of changing topography, in some areas it has a wide flat flood plain with braided side channels and in others it is a narrow steep walled gorge. The middle of the stream experienced multiple bank failures predominantly on the south side, some very recent and others several years old. The substrate is clay/silt at the headwaters and becomes gravel/cobble with boulders downstream. The stream is approximately 30% pool and 75% riffle. It flows under highway 30 through a square concrete tunnel.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S10604	SWNE 33 2N1W	Power (PW)	.2500 CFS
S1060	SWNE 33 2N1W	Domestic (DO)	.2500 CFS
S15929	NWNW 4 1N1W	Domestic (DI) (Inc. Lawn & Garden)	.0100 CFS

RECREATION

Park/Recreational Facility: The majority of the stream flows through Forest Park.

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: None recorded as of 2/22/94

Public Educational Use: None identified, but the stream flows through Forest Park, so educational opportunities are available for that portion.

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage Area:

Number of wetlands / approximate size: Multiple small seeps.

Flood Storage Capacity: Flood storage is limited to stream channel and area immediately adjacent to the channel. The stream does have side channels in some areas that would store some quantity of main channel overflow.

Riparian Corridor: see attached table

Average Width: 142 ft

Range of Width: 90-200 ft

Benefit to Water Quality: There appears to be sufficient canopy cover and woody debris in the stream to maintain current water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94

Wildlife Habitat Assessment: see attached table

Average score: 51 (n=10)

Range of scores: 41-59

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: McNamee Harborton

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Miller Creek	1	8	6	8	3	4	4	2	5	4	4	4	3	4	0	59
Miller Creek	2	8	6	8	3	4	4	2	4	4	3	4	4	3	0	57
Miller Creek	3	8	6	8	4	4	4	2	4	4	2	3	4	2	0	55
Miller Creek	4	8	6	8	3	4	4	2	4	4	2	3	4	3	0	55
Miller Creek	5	8	6	8	3	4	4	2	4	4	2	3	4	3	0	55
Miller Creek	6	4	3	8	3	4	4	2	3	4	2	4	4	3	0	48
Miller Creek	7	4	3	8	3	4	4	2	4	4	2	4	4	3	0	49
Miller Creek	8	4	3	8	3	4	4	2	4	4	2	4	4	3	0	49
Miller Creek	9	4	3	8	2	4	4	2	3	3	3	2	2	3	0	43
Miller Creek	10	4	3	8	2	3	3	2	3	3	4	2	2	2	0	41
AVERAGES		6.0	4.5	8.0	2.9	3.9	3.9	2.0	3.8	3.8	2.6	3.3	3.5	2.9	0.0	51.1

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Miller Creek	1	75	100	X			
Miller Creek	2	70	75	X			
Miller Creek	3	50	70	X			
Miller Creek	4	75	75	X			
Miller Creek	5	50	60	X			
Miller Creek	6	50	40	X			
Miller Creek	7	65	50	X			
Miller Creek	8	65	50	X			
Miller Creek	9	100	100		X		
Miller Creek	10	100	100		X		
AVERAGES		70.0	72.0	80%	20%		

*Width of riparian corridor in feet (in segment) looking downstream.

Cornelius Pass Area

MIDDLE ROCK CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Cornelius Pass Area

Length Inventoried: 10,590 ft (2.1 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 15, 590 ft (3.0 miles)

Area of Watershed in Multnomah County Study Area: 1,260 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Middle Rock	50%	30%	5%	15%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Rock Creek Main Stem - South

The stream is constrained on the east by Rock Creek road. The stream runs in a shallow channel with a 20-50 foot flood plain for about half this segment then becomes more channelized. Houses are common and landscaping and the houses themselves all impact the stream and surrounding habitat. The overstory is mixed conifer/deciduous where it is intact. The west slope has been clear cut down to the toe of the slope (20-30 feet away from the stream) in the middle section. The south end of the segment to the county line runs through a grass field with no overstory.

The stream is 6-10 feet wide and varies in depth from 1 - 2 feet. It is 30% pool and 75% riffle/run. Substrate is predominantly gravel/cobble/boulder.

Rock Creek Tributary III

Tributary III originates at the base of skyline road and flows in a southwesterly direction. It is in moderately deep draw (30 - 40 degree side slopes) and the upper slopes have been cleared for pastures/fields. A vegetation buffer of 50-250 feet or more has been left on both sides of the stream. The overstory is mixed conifer/deciduous and is comprised of red alder (4-20 inches) big-leaf maple

(4-20 inches), Douglas fir (12-26 inches), and western red cedar (12-26 inches). The canopy cover is 30-50%. The shrub layer varies from vary dense to sparse and is made up of salmonberry, Himalayan blackberry, vine maple, and Indian plum. The stream is crossed by three roads, the second has no culvert, and the upstream road has a large pond behind it. As the stream nears the County line it becomes deeply incised (six feet), then flows down a steep slope into a culvert under the railroad tracks out of the County.

The stream is usually small, one-two feet wide and between three and 12 inches deep, and of moderate gradient. The lower portion has a very diverse substrate including some bedrock but is dominated by gravel and sand/sediment. The upper reaches are primarily mud/clay/sediment with some gravel/cobble.

Rock Creek Tributary IV

Tributary IV begins as a drainage ditch south of the Brooks Road/Skyline Road intersection. The portion above Brooks Road recently had the vegetation around the channel (predominantly Himalayan blackberry) cleared and burned. There are fields to both sides. After it crosses Brooks Road, the stream has a mixed conifer deciduous stand to the south and a 25-foot buffer between it and a field upslope. The overstory is comprised of big-leaf maple (8-12 inches) red alder (10-18 inches) and Douglas fir (12-18 inches). The canopy cover is 30% or greater. The shrub layer is moderate to dense salmonberry, Himalayan blackberry, Indian plum, elderberry and occasional huckleberry. Cornelius Pass Road crosses the stream approximately 500 feet from Brooks Road. The overstory and shrub layer remain similar and there is another field to the north. At approximately 2,000 feet from Brooks Road the stream flows through a pasture with adjacent barns and two houses. Downstream the stream again enters a mixed conifer/deciduous stand. It crosses Rock Creek Road twice in 200 feet and leaves the County. There are three houses near the stream in this lower section.

The stream is small one-two feet across and three-eight inches deep on average. Substrate is dominated by cobbles and silt. The stream is 70% riffle/run and 30% pool.

Rock Creek Tributary IV

Much of the stream was not directly observed due to lack of access permission. However, much of the stream channel and vegetation can be observed from Kaiser Road. Within the County the stream flows through a draw with a thin buffer 100 -200 feet wide with sparse to moderate overstory. Overstory is primarily Douglas fir, red alder, and occasional black cottonwood. The shrub layer is elderberry, salmonberry, and in disturbed sites dense Himalayan blackberry. At least four houses are located on the north upper slope before the steam crosses Kaiser Road. In many places home construction, landscaping, and other human activity have removed or altered vegetation on the upper slopes. Just prior to the Kaiser Road crossing the stream flows through a pasture for approximately 500 feet. All overstory has been removed and only grasses and shrubs (Himalayan blackberry and elderberry) are present. The stream flows under Kaiser Road into a small stand (< eight acres) of 20-26-inch Douglas fir. A driveway crosses the stream with a culvert approximately 50 feet from Kaiser Road. The north and south sides of the stand are bounded by fields.

The stream is small, usually less than one foot wide and two-six inches deep. Where the stream crosses Kaiser Road it is reduced to a trickle (eight inches wide and two-three inches deep) Substrate in the higher reaches is predominantly clay with some boulders and cobbles. Lower down it appears

to become more diverse and contains some gravels, although sediment loading appears to be high. The stream is 25% pools and 75% riffle.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S9254	NESE 23 2N 2W	Domestic (Inc. Stock)	.0100 CFS
S1260	SWNE 26 2N 2W	Livestock	1.1000 AFS
S20759	SWNE 26 2N 2W	Livestock	.0100 CFS
S37297	SWNW 26 2N 2W	Fish	.5000 CFS
S37297	SWNW 26 2N 2W	Recreation	.5000 CFS
S37847	SWNW 26 2N 2W	Recreation	.1000 CFS
S33476	NWSE 36 2N 2W	Fish	.0100 CFS
S16471	SESW 36 2N 2W	Domestic	.0100 CFS
S5469	NWNE 6 1N 1W	Irrigation	3.600 AF
S34283	NWNE 6 1N 1W	Irrigation	.5800 CFS
S35552	NWSW 6 1N 1W	Domestic (Inc. Lawn & Garden)	.0100 CFS
S35552	NWSW 6 1N 1W	Livestock	.0050 CFS
S42187	NWNE 6 1N 1W	Irrigation	.0900 CFS
S29283	SESE 8 1N 1W	Livestock	.0000 CFS
S29284	SESE 8 1N 1W	Domestic (Inc. Stock)	.0100 CFS
S29284	SESE 8 1N 1W	Livestock	.0100 CFS
S11285	SWSW 9 1N 1W	Domestic (Incl Lawn & Garden)	.0500 CFS
S15070	SESW 9 1N 1W	Irrigation	.0100 CFS
S44557	SESW 9 1N 1W	Domestic (Inc. Non-Commercial)	.0100 CFS
S43924	SESW 9 1N 1W	Domestic	.0050 CFS
S41182	NESE 9 1N 1W	Domestic	.0100 CFS
S41182	NESE 9 1N 1W	Livestock	.0200 CFS
S41182	NESE 9 1N 1W	Domestic (Inc. Livestock)	.0400 CFS
S27148	NESE 9 1N 1W	Domestic	.0100 CFS
S42705	NENW 9 1N 1W	Domestic (Inc. Lawn & Garden)	.0100 CFS
S12111	SENE 9 1N 1W	Domestic	.0100 CFS
S5283	SWNE 15 1N 1W	Livestock	.8000 AF

RECREATION

Park/Recreational Facility: Rock Creek flows to Rock Creek Park in Washington County along Highway 26. Rock Creek Park is a five acre park under the jurisdiction of the Tualatin Hills Parks

and Recreation District. Approximately 2.5 acres of the park is in a natural state for passive recreation. A bark chip path has been provided along to the creek for access to the riparian area and wildlife observation.

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: Rock Creek Park is used by the Green City Data project for high school educational programs. The Creek flows through Rock Creek Park in Washington County.

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: No

Flood storage limited to stream channel: Yes

Riparian Corridor - see attached table

Average Width: 134 ft

Range of Width: 110-155 ft

Benefit to Water Quality: The current moderate level of canopy closure and the width of the riparian corridor on the main stem and tributaries III and IV will mitigate for any increased stream temperature caused by the low level of canopy cover present along tributary V and have a positive influence on overall stream water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 27%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 49

Range of scores: 36-57

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: CORNELIUS PASS

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Rock Creek Trib. III (North)	1	4	3	6	2	4	4	3	5	6	3	2	2	3	0	47
Rock Creek Trib. III (North)	2	4	3	6	4	6	4	2	6	6	3	2	2	3	0	51
Rock Creek Trib. III (North)	3	4	3	6	2	6	4	2	6	6	3	2	2	3	0	49
AVERAGES		4.0	3.0	6.0	2.7	5.3	4.0	2.3	5.7	6.0	3.0	2.0	2.0	3.0	0.0	49.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. III (North)	1	60	70		X		
Rock Creek Trib. III (North)	2	75	75		X		
Rock Creek Trib. III (North)	3	75	60		X		
AVERAGES		70.0	68.3	0%	100%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: CORNELIUS PASS

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Rock Creek Trib. IV (Middle)	1	4	3	6	2	8	6	2	6	6	3	2	2	6	0	56
Rock Creek Trib. IV (Middle)	2	4	3	8	2	6	4	3	6	6	3	2	2	4	2	55
Rock Creek Trib. IV (Middle)	3	4	3	6	2	6	4	2	4	4	3	1	1	4	0	44
AVERAGES		4.0	3.0	6.7	2.0	6.7	4.7	2.3	5.3	5.3	3.0	1.7	1.7	4.7	0.7	51.7

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. IV (Middle)	1	50	60	X			
Rock Creek Trib. IV (Middle)	2	80	75	X			
Rock Creek Trib. IV (Middle)	3	75	65	X			
AVERAGES		68.3	66.7	100%	0%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: CORNELIUS PASS

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Rock Creek Trib. V (South)	1	4	3	2	2	6	2	2	4	4	3	0	1	3	0	36
AVERAGES		4.0	3.0	2.0	2.0	6.0	2.0	2.0	4.0	4.0	3.0	0.0	1.0	3.0	0.0	36.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. V (South)	1	60	65	X			
AVERAGES		60.0	65.0	100%	0%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

Germantown Area

SOUTH ROCK CREEK
(Tributaries VI-VII)
Stream Profile

GENERAL INFORMATION

Location Study Area: Germantown Area

Length Inventoried: 39, 010 ft (7.4 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 39,010 ft (7.4 miles)

Area of Watershed in Multnomah County Study Area: 1,780 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
South Rock	55%	25%	5%	15%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Much of Rock Creek in Germantown Road Area was not surveyed due to lack of access permission. What follows is extrapolation from aerial photo interpretation and individual site visits to varying lengths of streams.

Rock Creek Tributary VI

East of the Multnomah County/Washington County line the stream is low gradient and surrounding topography is relatively flat. The entire length of the stream has been impacted by past human activity and much of the land has been converted to pasture. The overstory is primarily deciduous, composed of red alder, ash, willow, and big-leaf maple. It is intermittent and often sparse, with a canopy cover of less than 25%. The shrub layer, where intact, is composed of the non-native Himalayan blackberry, rose, Indian plum, and salmonberry. A small wetland is located just east and south of where Kaiser Road crosses the stream. The stream continues east-west for approximately 200 feet then becomes north-south. Most of the stream length between Kaiser Road and Germantown Road has a virtually impenetrable buffer dominated by Himalayan blackberry 25 feet wide on both

sides. The stream crosses Germantown Road 1,050 feet from where it crosses Kaiser Road. North of Germantown Road the stream enters a mixed deciduous/conifer forest (from this point upstream no access permission was granted) and continues in the mixed stand to it's headwaters. The stand is limited to the stream corridor and lower slopes, and is 400-1,000 feet wide in most places. Upslope areas often have been converted to pasture or home sites. Immediately north of Germantown Road a dirt road crosses the stream and it vegetation has been cleared apparently for a home site. Vegetation becomes more diverse. Western red cedar, western hemlock, and Douglas fir are included in the overstory and snowberry, and elderberry are added to the shrub layer. A red-legged frog was caught south of German Road.

The USGS map shows two arms of Rock Creek crossing under Kaiser Road. Only one stream channel was observed crossing the road. The stream splits approximately 200 feet east of Kaiser Road. The stream is low gradient (less than 5%). The stream is four-six feet wide and often one-two feet in depth in the lower reaches. It is joined by several tributaries upstream from Germantown Road. The substrate is predominantly silt/clay in the lower reaches, with more cobble/gravel upstream. It is approximately 25% pool and 75% riffle/run.

Rock Creek Tributary VII

The stream splits from Tributary VI 200 feet east of Kaiser Road. The overstory in the stream channel is primarily deciduous. For approximately the first 200 feet, upslope of the stream to the south is a small stand of mixed conifer/deciduous trees. The north side has a 20-25-foot buffer and then pasture upslope. The stream often has just a thin buffer and then a pasture or field to one side or the other. Overstory remains predominantly deciduous. The shrub layer is usually dense and dominated by Himalayan blackberry. Just west of the powerline crossing are several beaver dams. The bottom lands are 200 - 300 feet wide and relatively flat. These areas are probably seasonally innudated. In this area most overstory has been removed or is dead or dying due to innundation. After the powerlines, the stream turns and runs north - south, and the overstory is primarily deciduous (alder and big-leaf maple with occasional western red cedar). In some areas cattle are allowed access to the stream and stream banks have little vegetation. The stream turns east - west again 9,000 feet from Kaiser Road. The banks become steeper and the floodplain narrows. Cattle access is limited by fencing. Further to the east the stream is forested on both sides with multiple home sites along the upper slopes. It's headwaters are just west of Skyline Boulevard.

The stream is low gradient with a wide floodplain for much of its length. It is fairly large, three-six feet across and one-two feet deep until east of the powerlines where it becomes shallower. The primary substrate is silt with more gravel and cobble in the far upstream reaches. It is 85% riffle/run and 15% pools.

Rock Creek Tributary VIIA

Observations were made from north of old Germantown Road. The overstory in the riparian area is red alder, big-leaf maple and western red cedar with salmonberry and Indian plum dominating the shrub layer. The stream bottom is relatively flat and 15-20 feet wide with 30-40 degree slopes. This vegetation type continues upstream until just prior to New Germantown Road where most of the vegetation has been altered by human activity, primarily houses and landscaping. Downstream, three houses have backyards/pastures adjacent to the stream channel, otherwise vegetation remains similar

until the powerline corridor where vegetation is controlled. The confluence with Rock Creek Tributary II is just prior to the powerlines.

The stream is fairly wide and shallow (three feet wide and four inches deep) with substrate of dominated by cobble/gravel with good boulder component and relatively low sediment load. The pool to riffle/run ratio is approximately one-four.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S9254	NESE 23 2N 2W	Domestic (Inc. Stock)	.0100 CFS
S1260	SWNE 26 2N 2W	Livestock	1.1000 AFS
S20759	SWNE 26 2N 2W	Livestock	.0100 CFS
S37297	SWNW 26 2N 2W	Fish	.5000 CFS
S37297	SWNW 26 2N 2W	Recreation	.5000 CFS
S37847	SWNW 26 2N 2W	Recreation	.1000 CFS
S33476	NWSE 36 2N 2W	Fish	.0100 CFS
S16471	SESW 36 2N 2W	Domestic	.0100 CFS
S5469	NWNE 6 1N 1W	Irrigation	3.600 AF
S34283	NWNE 6 1N 1W	Irrigation	.5800 CFS
S35552	NWSW 6 1N 1W	Domestic (Inc. Lawn & Garden)	.0100 CFS
S35552	NWSW 6 1N 1W	Livestock	.0050 CFS
S42187	NWNE 6 1N 1W	Irrigation	.0900 CFS
S29283	SESE 8 1N 1W	Livestock	.0000 CFS
S29284	SESE 8 1N 1W	Domestic (Inc. Stock)	.0100 CFS
S29284	SESE 8 1N 1W	Livestock	.0100 CFS
S11285	SWSW 9 1N 1W	Domestic (Incl Lawn & Garden)	.0500 CFS
S15070	SESW 9 1N 1W	Irrigation	.0100 CFS
S44557	SESW 9 1N 1W	Domestic (Inc. Non-Commercial)	.0100 CFS
S43924	SESW 9 1N 1W	Domestic	.0050 CFS
S41182	NESE 9 1N 1W	Domestic	.0100 CFS
S41182	NESE 9 1N 1W	Livestock	.0200 CFS
S41182	NESE 9 1N 1W	Domestic (Inc. Livestock)	.0400 CFS
S27148	NESE 9 1N 1W	Domestic	.0100 CFS
S42705	NENW 9 1N 1W	Domestic (Inc. Lawn & Garden)	.0100 CFS
S12111	SENE 9 1N 1W	Domestic	.0100 CFS
S5283	SWNE 15 1N 1W	Livestock	.8000 AF

RECREATION

Park/Recreational Facility: Rock Creek flows to Rock Creek Park in Washington County along Highway 26. Rock Creek Park is a five acre park under the jurisdiction of the Tualatin Hills Parks and Recreation District. Approximately 2.5 acres of the park is in a natural state for passive recreation. A bark chip path has been provided along to the creek for access to the riparian area and wildlife observation.

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: Rock Creek Park is used by the Green City Data Project for high school educational programs. The Creek flows through Rock Creek Park in Washington County.

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 69 ft

Range of Width: 10-300 ft

Benefit to Water Quality: The current canopy cover and width of the riparian area in the upper reaches are sufficient to have a positive influence to water quality. The downstream segments have been subject to variable levels of disturbance causing a reduced level of canopy closure and reduction of vegetation in the riparian corridor. The areas will have a negative influence on water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 22%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 47

Range of scores: 43-51

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: GERMANTOWN

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Rock Creek Trib. VI (North)	1	8	6	7	2	2	6	2	2	2	2	1	1	2	0	43
Rock Creek Trib. VI (North)	2	8	6	6	4	3	6	2	4	4	2	1	1	2	2	51
Rock Creek Trib. VI (North)	3	8	6	3	2	4	4	2	5	4	3	1	2	3	0	47
AVERAGES		8.0	6.0	5.3	2.7	3.0	5.3	2.0	3.7	3.3	2.3	1.0	1.3	2.3	0.7	47.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. VI (North)	1	20	30	X			
Rock Creek Trib. VI (North)	2	30	30	X			
Rock Creek Trib. VI (North)	3	60	60	X			
AVERAGES		36.7	40.0	100%	0%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: GERMANTOWN

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Rock Creek Trib. VII (South; Main Stem)	1	6	3	4	8	4	4	2	3	3	2	2	2	2	2	47
Rock Creek Trib. VII (South; Main Stem)	2	4	3	4	3	4	4	2	4	4	2	2	2	4	0	42
Rock Creek Trib. VII (South; Main Stem)	3	4	2	8	2	4	4	4	6	4	2	2	2	5	0	49
Rock Creek Trib. VII (South; Main Stem)	4	4	3	6	3	4	4	2	6	4	2	2	2	4	0	46
Rock Creek Trib. VII (South; Main Stem)	5	4	3	5	3	4	4	2	4	5	2	3	2	4	0	45
AVERAGES		4.4	2.8	5.4	3.8	4.0	4.0	2.4	4.6	4.0	2.0	2.2	2.0	3.8	0.4	45.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. VII (South; Main Stem)	1	150	150			X	
Rock Creek Trib. VII (South; Main Stem)	2	20	20			X	
Rock Creek Trib. VII (South; Main Stem)	3	10	8				X
Rock Creek Trib. VII (South; Main Stem)	4	10	10				X
Rock Creek Trib. VII (South; Main Stem)	5	6	4				X
AVERAGES		39.2	38.4	0%	0%	40%	60%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: GERMANTOWN

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Rock Creek Trib. VIIA (North)	1	4	3	7	2	4	4	2	4	4	3	4	3	3	0	47
AVERAGES		4.0	3.0	7.0	2.0	4.0	4.0	2.0	4.0	4.0	3.0	4.0	3.0	3.0	0.0	47.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. VIIA (North)	1	10	10				X
AVERAGES		10.0	10.0	0%	0%	0%	100%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: GERMANTOWN

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Rock Creek Trib. VIIB (North)	1	4	3	5	4	4	4	2	5	5	2	3	2	3	3	49
AVERAGES		4.0	3.0	5.0	4.0	4.0	4.0	2.0	5.0	5.0	2.0	3.0	2.0	3.0	3.0	49.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Rock Creek Trib. VIIB (North)	1	20	30				X
AVERAGES		20.0	30.0	0%	0%	0%	100%

*Width of riparian corridor in feet (in segment) looking downstream.

Bonny Slope Area

NORTH BRONSON CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Bonny Slope Area

Length Inventoried: 5,280 ft (1.0 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 5,280 ft (1.0 miles)

Area of Watershed in Multnomah County: 210 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
North Bronson		60%		40%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

North Bronson Creek

The headwaters of North Bronson begin at the intersection of Northwest Springville Road and Skyline Boulevard. Riparian overstory is open and primarily red alder, big leaf maple and occasional western red cedar. Canopy cover is approximately 50%. The understory is variable in density and primarily salmonberry and vine maple. The stream bottom is 5-10 feet wide, the northwest slope is 45 degrees and southeast 25-30 degrees. The stream passes under powerlines with associated construction; some overstory has been removed for guyline corridors. After the powerlines the east side is dominated by 8-12 inches Douglas fir and the west side is dominated by 4-8 inches red alder. The slope to the west is approximately 12 degrees. Salmonberry becomes very dense and the flood plain widens to 20 - 30 feet. The stream turns west approximately 3,000 feet from the headwaters. The north side is still dominated by alder, the south is more diverse with alder, big-leaf maple, western red cedar and occasional Douglas fir (24 inches). In this portion of the stream coarse woody debris (old logging debris) is common in the stream channel and is 20 inches or larger in most cases. The stream passes through a culvert under a gravel road and then leaves the County.

The stream is of moderate gradient. The substrate is dominated by gravel with boulders and cobbles common in the lower reaches. Higher up the substrate becomes more silt/clay. The stream is 20% pool and 80% riffle run. The average stream temperature was 7.0 degrees Celsius.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S39760	NWNW 22 1N 1W	Irrigation	.0300 CFS
S14655	NWSW 22 1N 1W	Recreation	.0200 CFS
S14655	NWSW 22 1N 1W	Domestic	.0100 CFS

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: No

Flood storage limited to stream channel: Yes

Riparian Corridor - see attached table

Average Width: 119 ft

Range of Width: 80-150 ft

Benefit to Water Quality: The current moderately high level of canopy closure and the width of the riparian corridor will have a positive influence on water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 53

Range of scores: 35-76

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: BONNY SLOPE

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Bronson Creek – North Fork	1	8	6	4	2	6	5	3	6	6	3	3	4	3	0	59
Bronson Creek – North Fork	2	4	3	6	2	5	4	2	4	4	2	4	4	5	0	49
Bronson Creek – North Fork	3	4	3	6	2	6	6	2	4	4	3	3	4	5	0	52
Bronson Creek – North Fork	4	4	3	2	2	3	4	2	2	4	2	2	4	3	0	37
Bronson Creek – North Fork	5	4	3	4	2	3	3	2	3	3	2	2	3	3	0	37
AVERAGES		4.8	3.6	4.4	2.0	4.6	4.4	2.2	3.8	4.2	2.4	2.8	3.8	3.8	0.0	46.8

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Bronson Creek – North Fork	1	75	75			X	
Bronson Creek – North Fork	2	40	40			X	
Bronson Creek – North Fork	3	100	50			X	
Bronson Creek – North Fork	4	75	40			X	
Bronson Creek – North Fork	5	50	50			X	
AVERAGES		68.0	51.0	0%	0%	100%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

SOUTH BRONSON CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Bonny Slope Area

Length Inventoried: 7,390 ft (1.4 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 7,390 ft (1.4 miles)

Area of Watershed in Multnomah County Study Area: 395 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
North Bronson		60%		40%	
South Bronson				100%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

South Bronson Creek

The headwaters of South Bronson Creek begin just west of Skyline Boulevard in a shallow draw with a open mixed deciduous/conifer overstory. The draw rapidly becomes steeper with side slopes of 30 - 45 degrees. The shrub layer is dense and composed of vine maple, elderberry, huckleberry, rose, and Himalayan blackberry. At approximately 2,000 feet from Skyline Boulevard a new dirt road has been put in. Debris from the construction was pushed over the embankment towards the stream. The road affects the stream for 1,000 feet or more. Three conifer snags were seen in this area with pileated woodpecker foraging holes. Houses become more prevalent on the upper slopes in the lower reaches. Just prior to Laidlaw Road the understory vegetation has been scraped away. Two human-made ponds have also been constructed here. Downstream from Laidlaw Road the floodplain widens to 100-200 feet. A small natural pond is north of the stream. The overstory is made up of larger trees including alder, big-leaf maple, Douglas fir, and western hemlock. Four larger conifer snags are in this area, at least two have been used by pileated woodpeckers. At approximately 7,000 feet from the start, the stream flows through a cow pasture. Most of the overstory has been removed and riparian

vegetation is dominated by Himalayan blackberry. Cows have access to the stream. Approximately one-half or more of the remaining Douglas fir overstory had been recently cut.

In the upper reaches the substrate is predominantly clay and boulders. Lower down it becomes silt/gravel/cobble/boulder, with silt the most prevalent. The stream is 85% riffle/run and 15% pool. Average stream temperature was 8.5 degrees Celsius.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S9808	SWSE 22 1N 1W	Fish	.2500 CFS
S9808	SWSE 22 1N 1W	Domestic (Inc. Lawn & Garden)	.2500 CFS

RECREATION

Park/Recreational Facility: None

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: None

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: Yes

Flood storage limited to stream channel: No

Riparian Corridor - see attached table

Average Width: 94 ft

Range of Width: 40-200 ft

Benefit to Water Quality: The current moderately high level of canopy cover and the width of the riparian area will have a positive influence on water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 42

Range of scores: 32-52

Essential Connections: The downstream segments with lower WHA scores provide potential travel corridors for movement to the upstream areas with higher WHA scores.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: BONNY SLOPE

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Bronson Creek – South Fork	1	4	3	8	2	6	3	2	4	4	2	3	3	4	0	48
Bronson Creek – South Fork	2	4	3	8	2	6	3	2	4	4	2	0	0	2	2	42
Bronson Creek – South Fork	3	4	3	8	2	6	3	2	6	2	2	1	2	2	0	43
Bronson Creek – South Fork	4	4	3	6	4	6	3	2	6	3	2	1	1	3	0	44
Bronson Creek – South Fork	5	4	3	8	4	6	4	2	6	5	2	2	0	4	2	52
Bronson Creek – South Fork	6	4	3	1	2	2	8	4	1	2	2	0	0	3	0	32
Bronson Creek – South Fork	7	8	6	1	2	2	8	1	1	2	2	0	0	3	0	36
AVERAGES		4.6	3.4	5.7	2.6	4.9	4.6	2.1	4.0	3.1	2.0	1.0	0.9	3.0	0.6	42.4

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Bronson Creek – South Fork	1	30	30				X
Bronson Creek – South Fork	2	20	50		X		
Bronson Creek – South Fork	3	50	100				X
Bronson Creek – South Fork	4	50	50			X	
Bronson Creek – South Fork	5	100	100				X
Bronson Creek – South Fork	6	20	20	X			
Bronson Creek – South Fork	7	20	20		X		
AVERAGES		41.4	52.9	14%	29%	14%	43%

*Width of riparian corridor in feet (in segment) looking downstream.

Balch Creek Area

BALCH CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Balch Creek Area

Length Inventoried: 14,100 ft (2.8 miles)

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 14,100 ft (2.8 miles)

Area of Watershed in Multnomah County: 700 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Balch		95%			5%

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Balch Creek - Main Stem

The headwaters of of Balch Creek are southeast of the intersection of Skyline Bouldevard and Thompson Road. Access to the headwaters and upper reachs of of Balch Creek was denied. Lower down the stream is bordered on the east by Thompson Road. The stream bottom and lower slopes are sparsely forested with mature red alder, big-leaf maple, Douglas fir, western red cedar, and western hemlock. The shrub layer is moderately dense and comprised of Indian plum, elderberry, salmonberry, vine maple, and Himalayan blackberry. A gravel road parallels the stream on the west side for a short distance. The stream crosses Thompson Road approximately 800 feet from the Cornell Road intersection. Two houses with associated lawns and clearing are immediately adjacent to the stream. After crossing under Cornell Road, Balch Creek enters a steep-sided draw (35 degrees). Cornell Road borders the creek on the east. The riparian vegetation is similar to the, forested portions upstream. Several houses are adjacent to the stream on the east side and one driveway crosses it. The stream then crosses under Cornell Road and turns east as it enters Macleay Park.

The stream is six feet wide and average six inches in depth. Coarse woody debris is common in the stream and forms some deeper pools. The substrate is predominatly cobbles with gravel and boulders. The stream is 65% riffle/run and 35% pools

Balch Creek - Tributary I

The stream originates east of the Skyline Boulevard/Cornell Road intersection. Cornell Road parallels the stream on the north. The stream flows through a mixed deciduous/conifer stand of red alder, big-leaf maple, occasional Douglas fir and western red cedar. Upslope adjacent to Cornell Road are three Douglas fir that range in size from 38-50 inches. The shrub layer in the riparian area is moderately dense and comprised of Indian plum, salmonberry, snowberry, and Himalayan blackberry. In the bottom sections, near the confluence with the main stem there are houses on the north and south banks; landscaping associated with the house on the south has removed most of the native vegetation for approximately 200 feet.

The stream width is varied, it is often incised two-three feet and two-three feet deep or 8-12 feet wide with a 200-foot-wide floodplain. The upper slopes are relatively steep (45 degrees). The stream substrate is dominated by gravel and cobbles with some of the upper reaches in clay/mud. The stream is 70% riffle/run and 30% pool.

Balch Creek - Tributary II

This small stream flows through a moderately shallow draw. The original conifer overstory was removed and now a young alder stand has established itself with occasional big-leaf maple and scattered small western hemlock and western red cedar. The understory in the steam area is diverse and very dense and compriesed of Indian plum, vine maple, salmonberry, Himalayan blackberry , rose, snowberry, and elderberry. Several structures, apparently used for erosion control, are in the stream.

The stream is small, only one-two feet wide and less than six inches deep at the confluence with the main stem. It flows through a narrow bottom with 35 degee side slopes. The substrate is primarliy cobble with a light to moderate sediment load.

Balch Creek - Tributary III

The stream flows through the Collins Sanctuary (managed by the Audubon Society). A trail runs upslope to the north of the stream for most of it's length. The overstory is primarily red alder and big-leaf maple with some Douglas fir and western red cedar. The shrub layer is moderate to dense and comprised of salmonberry, vine maple, elderberry, and occasional Himalayan blackberry.

The stream is deeply incised prior to crossing Cornell Road and, then flows in a shallow channel further upstream. The stream is small, only one-two feet wide and less than six inches deep at the confluence with the main stem. The substrate is evenly distributed between cobbles, gravel, sand, and sediment. The stream is 35% pool and 65% riffle/runs.

Balch Creek - Tributary IV (Audubon or Bones Creek)

The stream originates in a stand of large conifers north of Burnside Road. Downstream 300 feet, the stream enters a open stand of red alder with occasional small big-leaf maple, western red cedar and western hemlock. Two Pacific yew trees were seen in the upper reach. The stream flows under a foot bridge and enters a mixed conifer/deciduous stand. The understory/shrub layer varies from sparse to dense but is consistent in compostition all along the stream. Shrubs include salmonberry, currant, vine maple, elderberry, and Indian Plum. Two hemlock snags (30-40 inches) with pileated woodpecker holes are in the lower reach. A small pond is located south of, and probably was formed by, Cornell Road. A house and barn are located on the east upper bank near Cornell Road. The Audubon House is immediately north of Cornell Road and the stream flows just west of it to the main stem.

The stream is in a draw with a 10-20-foot-wide bottom and side slopes of 35-45 degrees. The channel morphology varies from a 6-8-foot-wide channel to a one-three-foot-wide and one-three-foot-deep incised channel with a 15-20 foot wide flood plain. The stream itself is small, one-two feet wide and eight inches or less deep. The substrate is predominatly gravel and cobble. Coarse woody debris is common especially in the upper reaches. The stream is 40% pools and 60% riffle/run.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S7023	SWNE 31 1N 1E	Recreation	2.000 AF
S42851	SWNE 31 1N 1E	Recreation	.0200 CFS

RECREATION

Park/Recreational Facility: Balch Creek is located within Forest Park. Tributary III flows through the Collins Sanctuary (managed by the Audubon Society).

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: Balch Creek is used by the Audubon Society for educational purposes.

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: No

Flood storage limited to stream channel: Yes

Riparian Corridor - see attached table

Average Width: 98

Range of Width: 10-160

Benefit to Water Quality: The current moderately low level of canopy cover and width of the riparian corridor should have a positive influence on overall water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 25%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: 52

Range of scores: 48-61

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: BALCH CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Balch Creek (Main Stem)	1	8	6	6	2	6	4	3	6	6	2	2	2	3	0	56
Balch Creek (Main Stem)	2	8	6	6	2	4	4	2	5	3	2	2	2	3	0	49
Balch Creek (Main Stem)	3	8	6	4	2	4	4	2	4	4	3	2	2	3	0	48
Balch Creek (Main Stem)	4	8	6	6	2	4	3	2	4	3	2	3	2	3	3	51
AVERAGES		8.0	6.0	5.5	2.0	4.5	3.8	2.3	4.8	4.0	2.3	2.3	2.0	3.0	0.8	51.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Balch Creek (Main Stem)	1	70	65		X		
Balch Creek (Main Stem)	2	8	30			X	
Balch Creek (Main Stem)	3	30	20			X	
Balch Creek (Main Stem)	4	5	5				X
AVERAGES		28.3	30.0	0%	33%	67%	33%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: BALCH CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Balch Creek Trib. I (North)	1	8	6	6	2	6	4	3	4	6	3	2	2	3	0	55
AVERAGES		8.0	6.0	6.0	2.0	6.0	4.0	3.0	4.0	6.0	3.0	2.0	2.0	3.0	0.0	55.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Balch Creek Trib. I (North)	1	60	70			X	
AVERAGES		60.0	70.0	0%	0%	100%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: BALCH CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Balch Creek Trib. II (Middle North)	1	4	3	8	2	6	7	2	3	3	2	3	3	3	0	49
AVERAGES		4.0	3.0	8.0	2.0	6.0	7.0	2.0	3.0	3.0	2.0	3.0	3.0	3.0	0.0	49.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Balch Creek Trib. II (Middle North)	1	50	50		X		
AVERAGES		50.0	50.0	0%	100%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: BALCH CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Balch Creek Trib. III (Middle)	1	4	3	5	2	6	5	3	6	4	3	3	1	3	0	48
AVERAGES		4.0	3.0	5.0	2.0	6.0	5.0	3.0	6.0	4.0	3.0	3.0	1.0	3.0	0.0	48.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Balch Creek Trib. III (Middle)	1	80	80		X		
AVERAGES		80.0	80.0	0%	100%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: BALCH CREEK

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Balch Creek Trib. IV (Middle South)	1	4	3	6	4	6	6	3	7	8	3	2	2	5	2	61
Balch Creek Trib. IV (Middle South)	1	4	3	4	2	8	4	3	3	4	2	3	2	5	2	49
AVERAGES		4.0	3.0	5.0	3.0	7.0	5.0	3.0	5.0	6.0	2.5	2.5	2.0	5.0	2.0	55.0

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Balch Creek Trib. IV (Middle South)	1	75	70		X		
Balch Creek Trib. IV (Middle South)	2	55	55	X			
AVERAGES		65.0	62.5	50%	50%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

SALTZMAN CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Balch Creek Area

Length Inventoried: Not surveyed

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): Not surveyed

Area of Watershed in Multnomah County: 195 acres

Abutting Land Use Designations (percent of study area stream length):

Creek	EFU	CFU	MUA	RR	R10
Saltzman		70%		30%	

Key:

EFU: Exclusive Farm Use
CFU: Commercial Forestry Use
MUA: Multiple Use Agriculture
RR: Rural Residential
R10: Urban Residential

Stream Description:

Lack of access permission prevented on-site observation of the upper Saltzman Creek tributaries. Only a small portion of the stream's three upper tributaries (0.7 miles total) is outside of Forest Park. All three are small intermittent streams. The overstory is mixed conifer/deciduous and the dominant species is red alder in these upper sections. Summer canopy cover during full leaf-out approaches 100%. The understory is most likely dominated by salmonberry. The proximity to Forest Park and the current lack of surrounding development make it very likely that this area receives regular wildlife use.

ECONOMIC

DWR Water Rights Data: None

RECREATION

Park/Recreational Facility: Yes. Much of Saltzman Creek is located within Forest Park. This park is unique in the Portland area because of its passive recreation facilities. Local streams such as Saltzman Creek are an integral part of this recreational experience.

EDUCATIONAL

Oregon Natural Heritage Program (ONHP) - significance designation: As of 2/22/94, no area along surveyed stream segments have been identified by ONHP as ecologically or scientifically significant.

Public Educational Use: Yes. Forest Park is used for public education programs.

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage

Wetlands provide additional flood storage capacity: No

Flood storage limited to stream channel: Yes

Riparian Corridor - see attached table

Average Width: Not surveyed

Range of Width: Not surveyed

Benefit to Water Quality: Aerial photo's indicate that there is sufficient summer canopy cover and riparian buffer width to have a positive influence on water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 0%

Threatened and Endangered Species data: No recorded observations as of 2/22/94 and none observed during survey.

Wildlife Habitat Assessment - see attached table

Average score: Not surveyed

Range of scores: Not surveyed

Essential Connections: Not Surveyed.

List of Common and Scientific Names

Mammals

Bald eagle	*Haliaeetus leucocephalus*
Beaver	*Castor canadensis*
Black-tailed deer	*Odocoileus hemionus*
Elk	*Cerus elaphus*
Pileated woodpecker	*Dryocopus pileatus*

Herptiles

Pacific giant salamander	*Dicamptodon tenebrosus*
red-legged frog	*Rana aurora aurora*

Fish

Cutthroat trout	*Oncorhynchus clarki*

Plants

ash	*Fraxinus* sp.
big-leaf maple	*Acer macrophyllum*
black cottonwood	*Populus trichocarpa*
Douglas fir	*Pseudotsuga menziesii*
Pacific yew	*Taxus brevifolia*
red alder	*Alnus rubra*
western hemlock	*Tsuga heterophylla*
western red cedar	*Thuja plicata*
willow	*Salix* sp.
elderberry	*Sambucus* sp.

cattail	*Typha* sp.
currant	*Ribes* sp.
Devil's club	*Oplopanax horridum*
Himalayan blackberry	*Rubus discolor*
huckleberry	*Vaccinium* sp.
Indian plum	*Oemleria cerasiformis*
Oregon grape	*Berberis nervosa*
Pacific trillium	*Trillium ovatum*
piggy back plant	*Tolmiea menziesii*
reed canary grass	*Phalaris arundinacea*
rose	*Rosa* sp.
salal	*Gaultheria shallon*
salmonberry	*Rubus spectabilis*
skunk cabbage	*Lysichitum americanum*
snowberry	*Symphoricarpos albus*
stinging nettle	*Urtica dioica*
sword fern	*Polystichum munitum*
trailing blackberry	*Rubus ursinus*
viny maple	*Acer circinatum*
waterleaf	*Hydrophyllum* sp.
Western wahoo	*Euonymus occidentalis*

APPENDIX C

SAMPLE WILDIFE HABITAT ASSESSMENT FORM

MULTNOMAH COUNTY SIGNIFICANT STREAMS
SRI/SHAPIRO
RIPARIAN WILDLIFE HABITAT ASSESSMENT*

SITE NUMBER 2	TOTAL HABITAT SCORE AS EXISTING 24	POTENTIAL HABITAT SCORE IF ENHANCED	TOTAL ACRES
SITE LOCATION Burlington	FIELD DATES 03/09/94	FIELD OBSERVERS BSH ADL	

GENERAL COMMENTS Continues through clear cut. Stream slopes become less steep. Stream bed widens - Road crosses stream 48-52" culvert. Fill 100-200' wide & 100' high

Tree Ø

Shrubs - Salmonberry, vine maple, occ. Willow and red osier dogwood

g.c. Rushes

CWD - small diameter 2-6" abundant. 1 Lg Douglas fir snag >8" low upslope

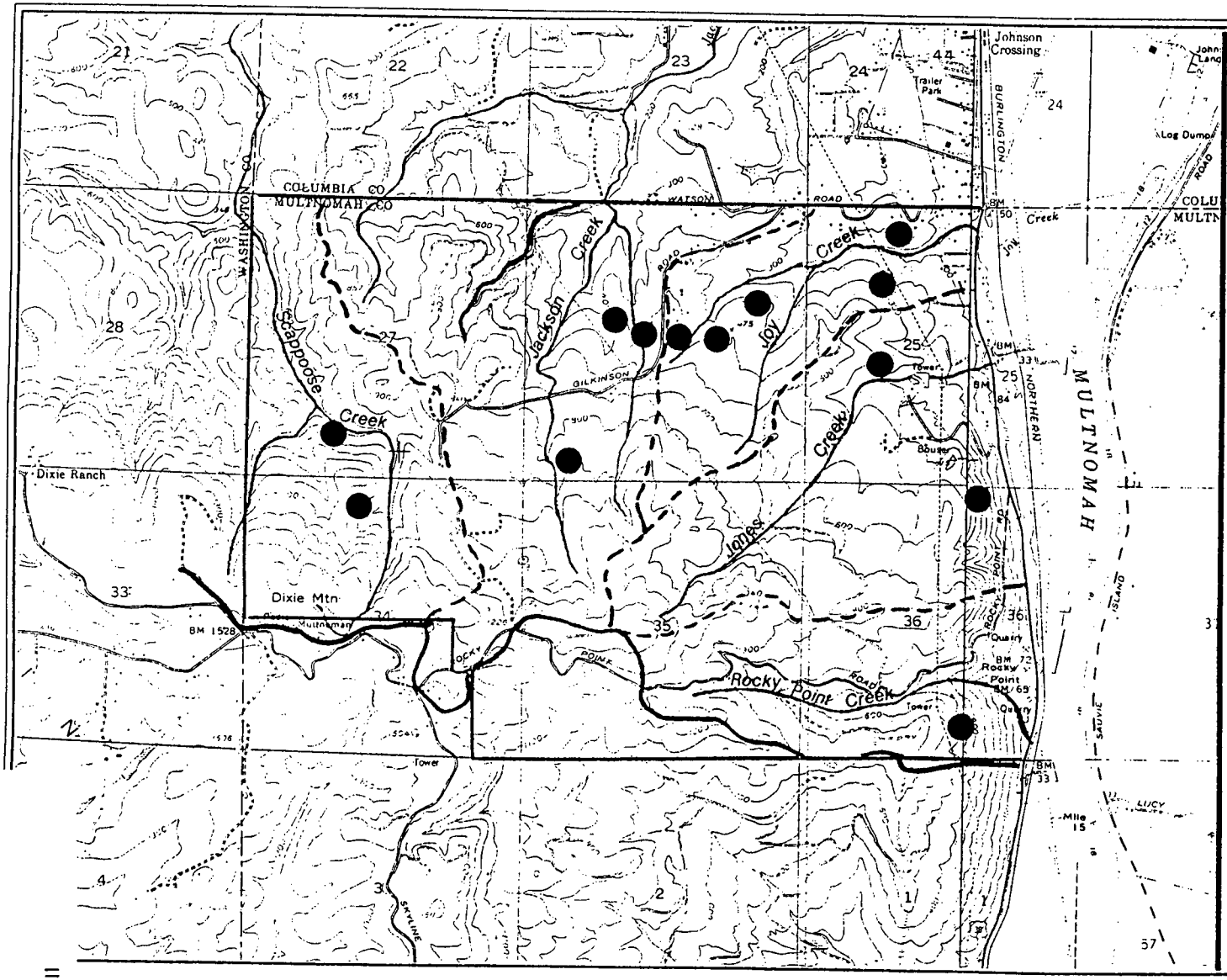
Pair of red tails seen hunting

	COMPONENT	DEGREE	SCORE	COMMENTS
WATER	Seasonality	Seasonal 4 — Perennial 8	4	U.S.G.S
	Quality	Stagnant 0 — Seasonally Flooded 3 — Continually Flushed 6	3	
	Proximity to Cover	None 0 — Nearby 4 — Immediately Adjacent 8	Ø	
	Diversity (Streams, Ponds Wetlands	One Present 2 — Two Present 4 — Three Present 8	2	
FOOD	Variety	Low 0 — Medium 4 — High 8	3	
	Quantity	Low 0 — Medium 4 — High 8	3	
	Seasonality	None 0 — Limited 2 — Year Round 4	1	
COVER	Structural Diversity	Low 0 — Medium 4 — High 8	1	
	Variety	Low 0 — Medium 4 — High 8	2	
	Seasonality	None 0 — Limited 2 — Year Round 4	1	

ADDITIONAL VALUES

Disturbance	Physical	High 0 — Medium 2 — Low 4	0	CC Power line, Road's
	Human	High 0 — Medium 2 — Low 4	4	
Interspersion		Low 0 — Medium 3 — High 6	0	
Unique Features 1-4 points each		Wildlife ____ Flora ____ Rarity of Habitat Type	0	

*Developed with the assi ... ety, Ralph Rogers U.S.E.P.A., Dennis Peters & Diana H ... Oregon Dept. of Fish & Wildlife, Esther Lev, Biological Cc



Significant Streams Study
for
Multnomah County

GILKISON ROAD AREA

LEGEND

- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

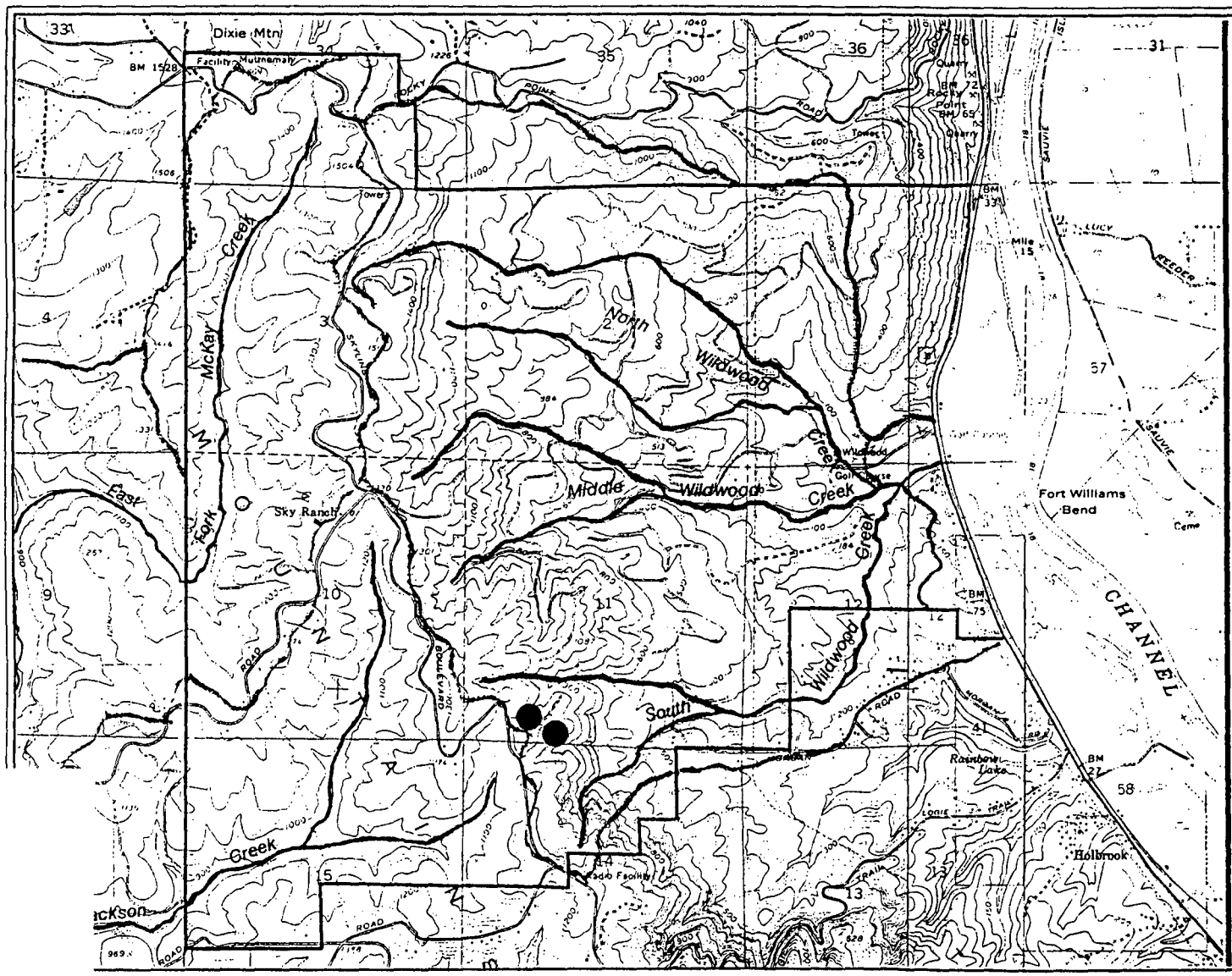
0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 April 1994

FIGURE

SHAPIRO



Significant Streams Study
for
Multnomah County

WILDWOOD–McKAY CREEK AREA

LEGEND

- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

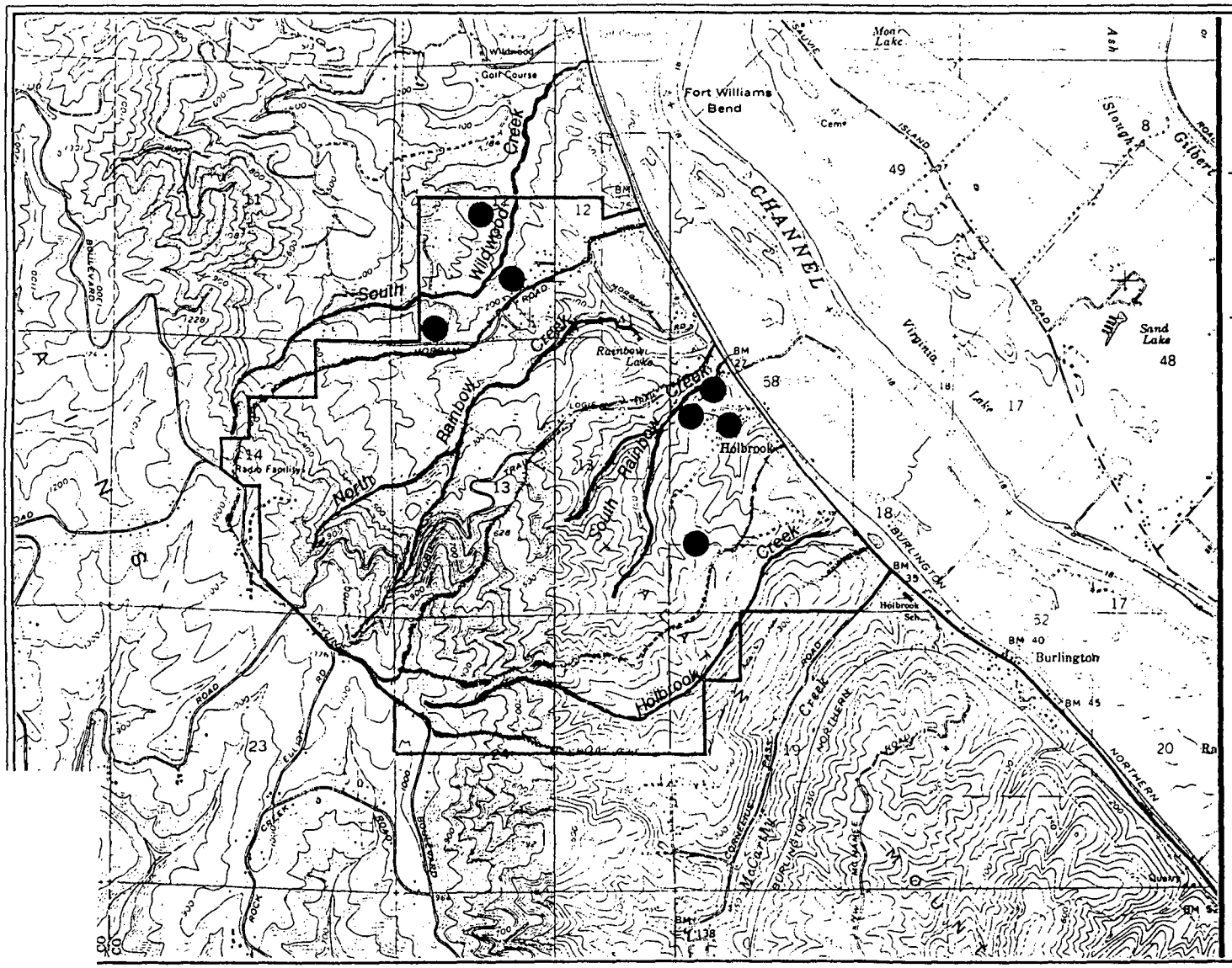
0 2000 4000
FEET

Base map from U.S.G.S. 7.5–minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 April 1994

FIGURE

SHAPIRO



Significant Streams Study
for
Multnomah County

HOLBROOK–LOGIE AREA

LEGEND

- ● Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

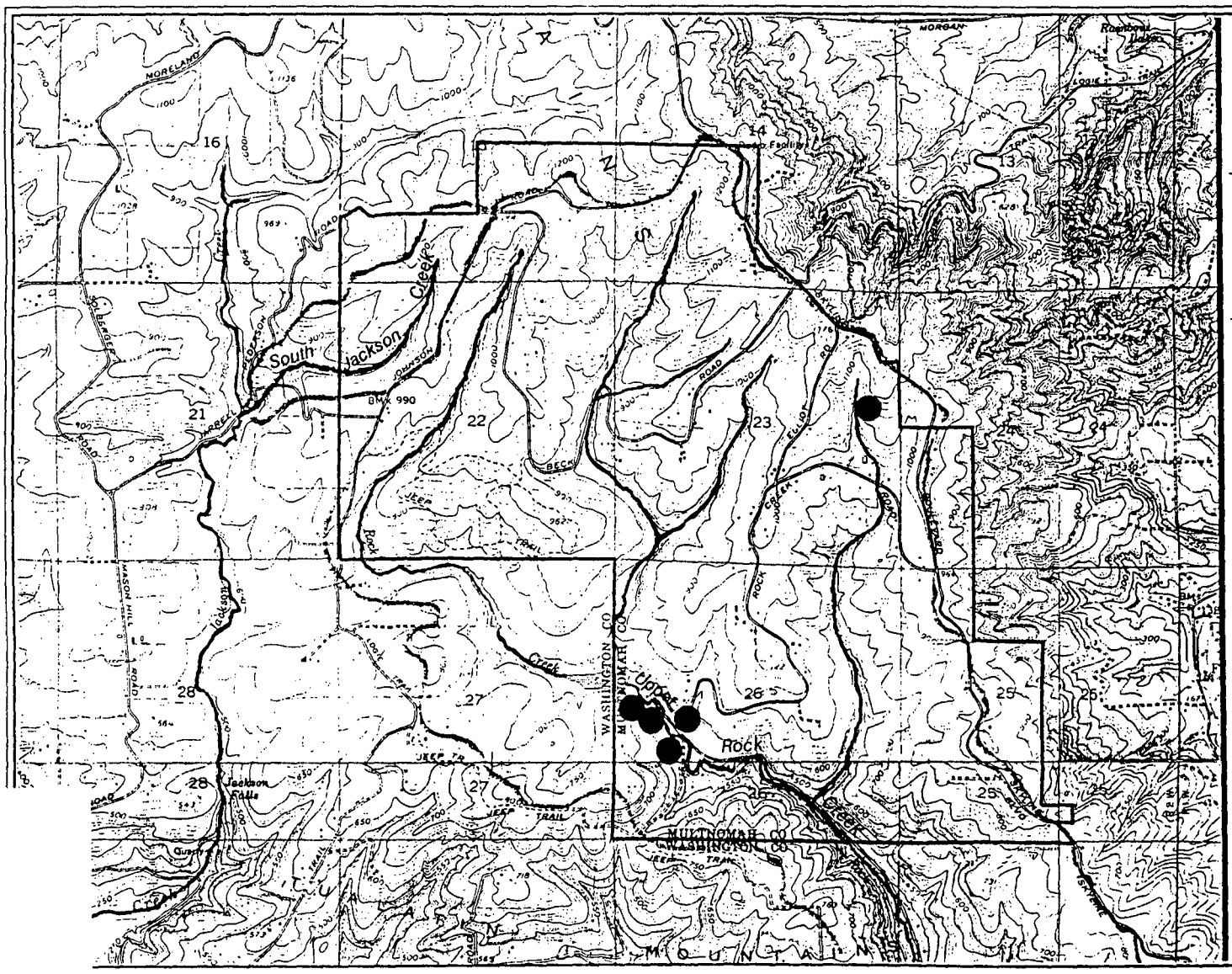
0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 April 1994

FIGURE

/SHAPIRO



Significant Streams Study
for
Multnomah County

UPPER ROCK CREEK AREA

LEGEND

- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

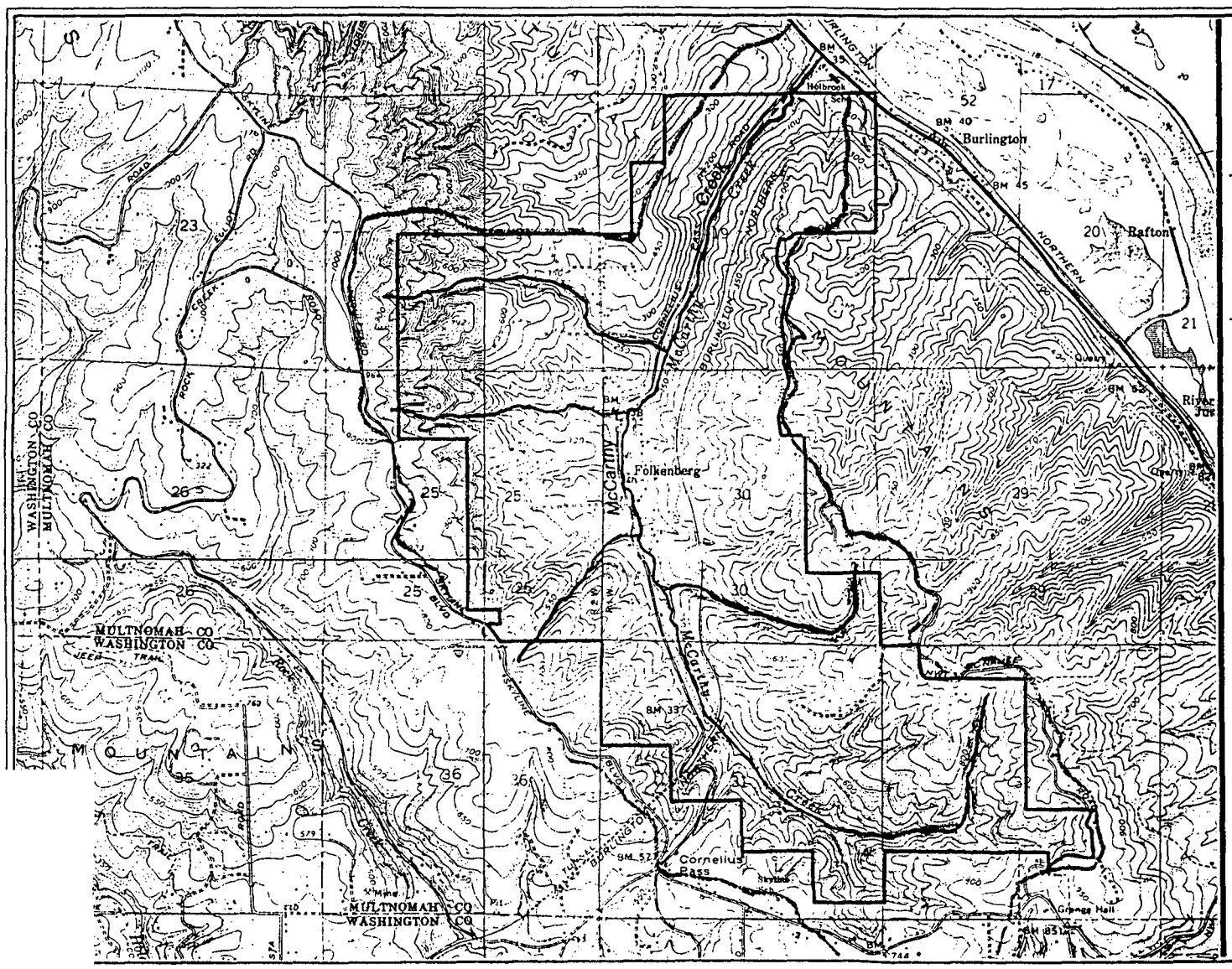
0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 April 1994

FIGURE

SHAPIRO



Significant Streams Study
for
Multnomah County

FOLKENBERG
AREA

LEGEND

- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

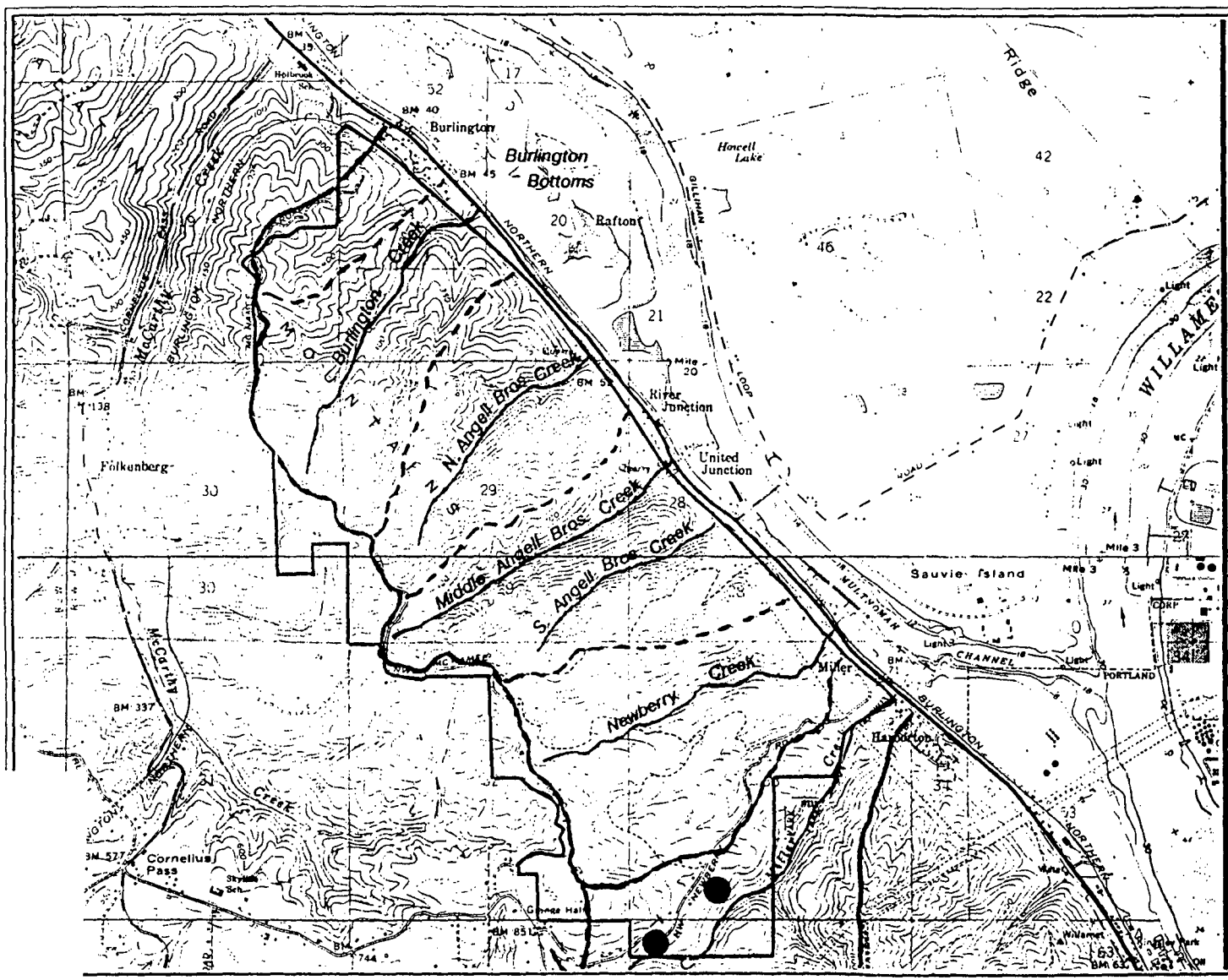
0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 April 1994

FIGURE

SAI/SHAPIRO



Significant Streams Study
for
Multnomah County

McNAMEE–HARBORTON AREA

LEGEND

- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

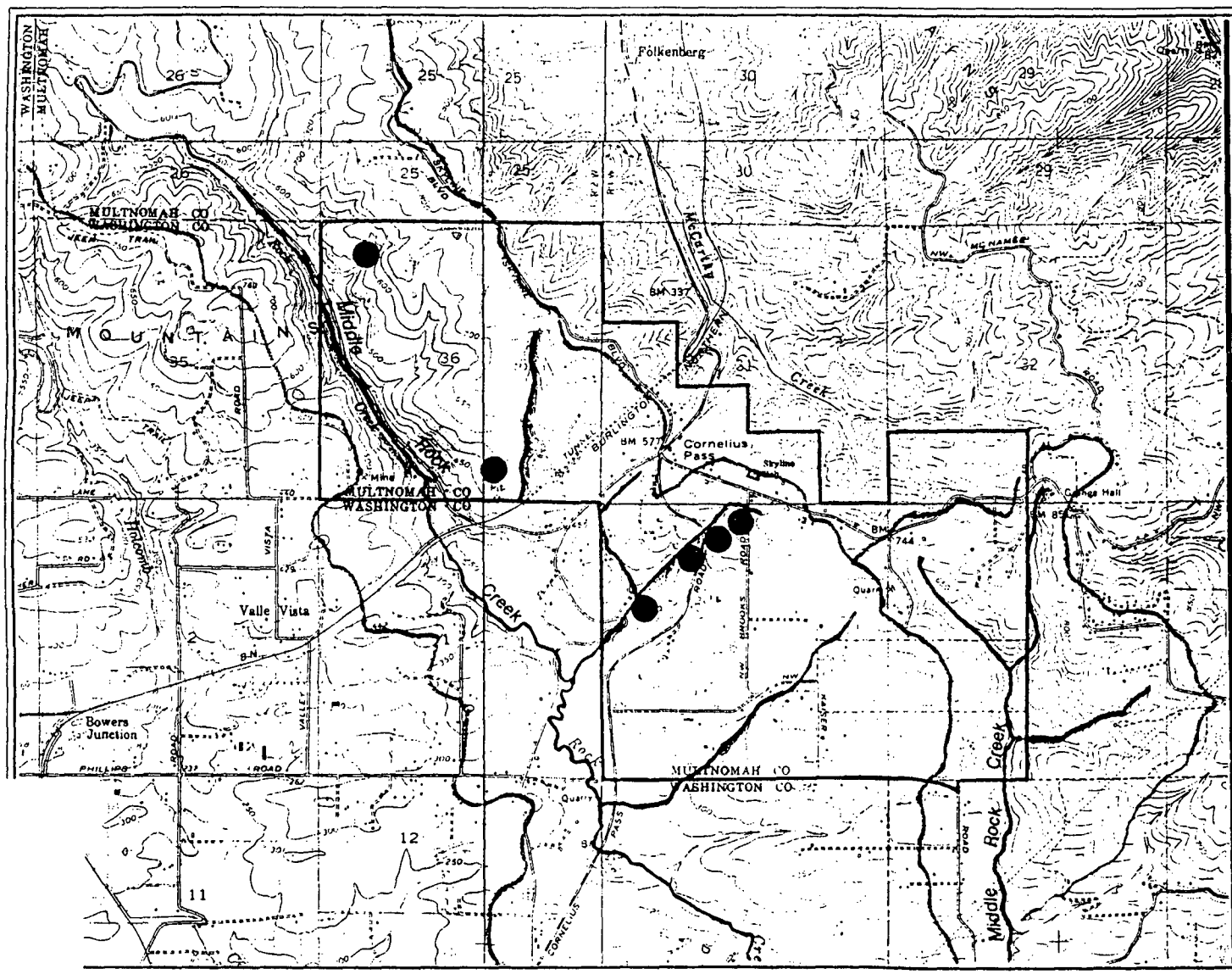
0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 March 1994

FIGURE

SWI/SHAPIRO



Significant Streams Study
for
Multnomah County

CORNELIUS PASS AREA

LEGEND

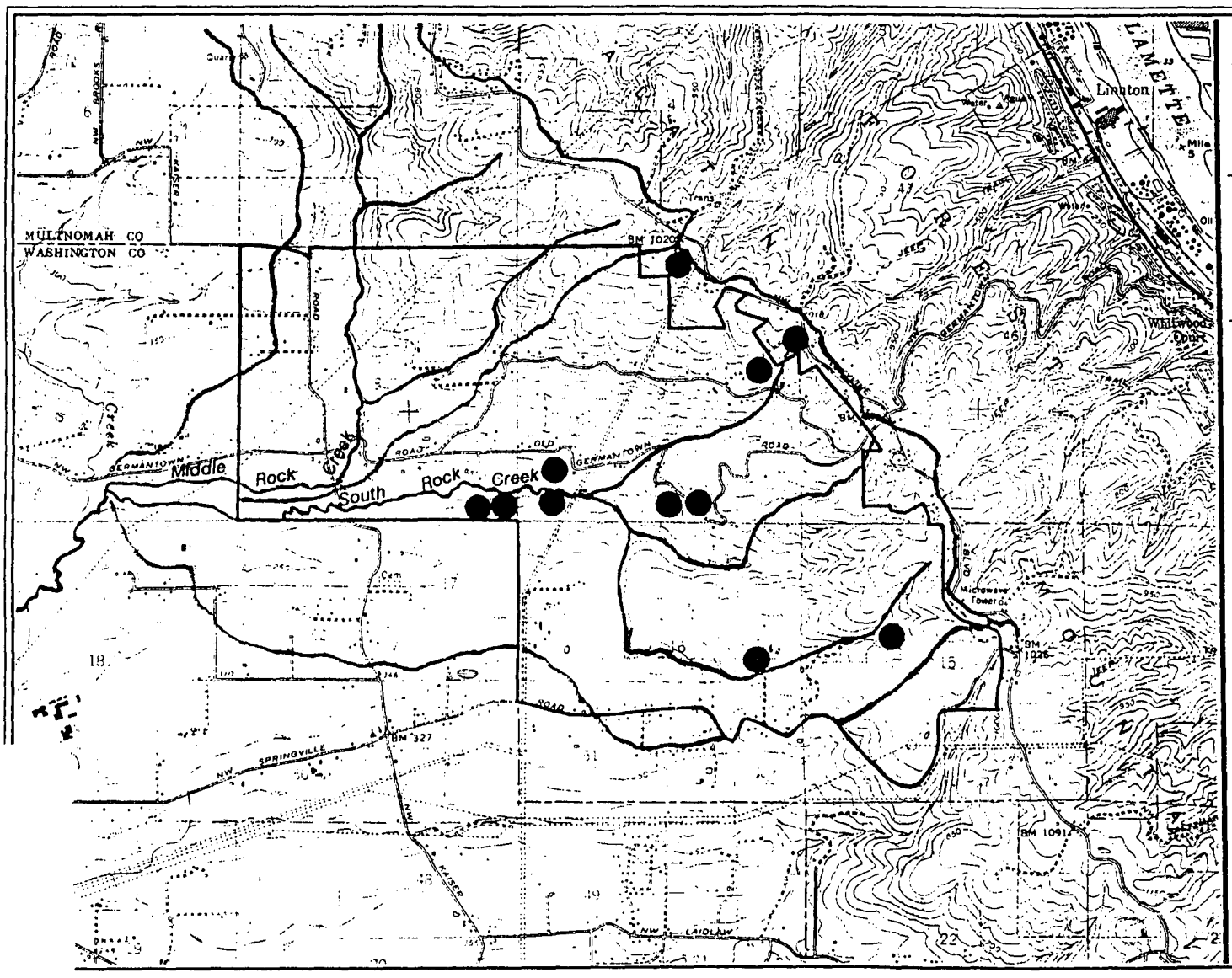
- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 March 1994

FIGURE

SHAPIRO



Significant Streams Study
for
Multnomah County

GERMANTOWN ROAD
AREA

LEGEND

- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

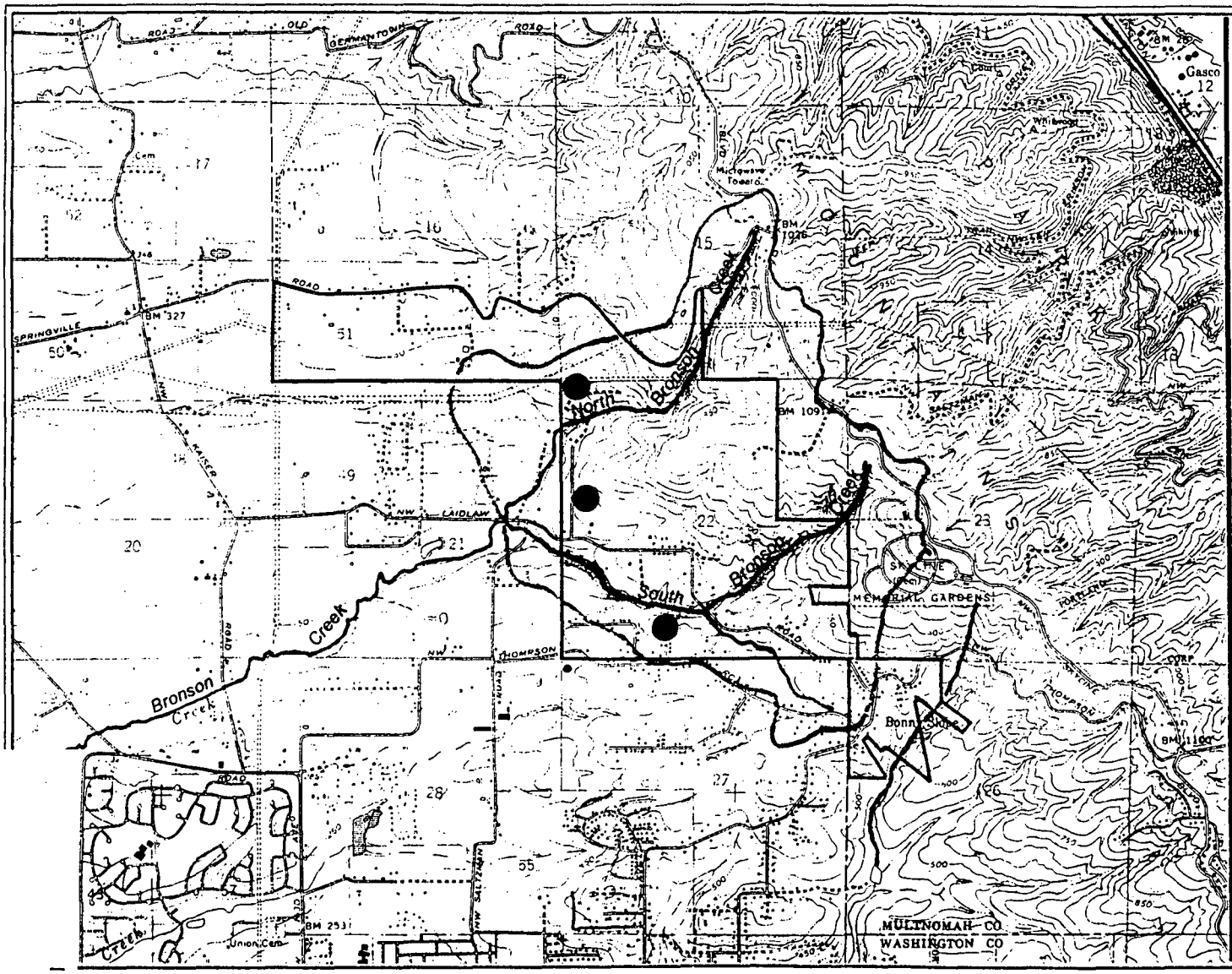
0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 March 1994

FIGURE

SHAPIRO



Significant Streams Study
for
Multnomah County

BONNY SLOPE AREA

LEGEND

- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

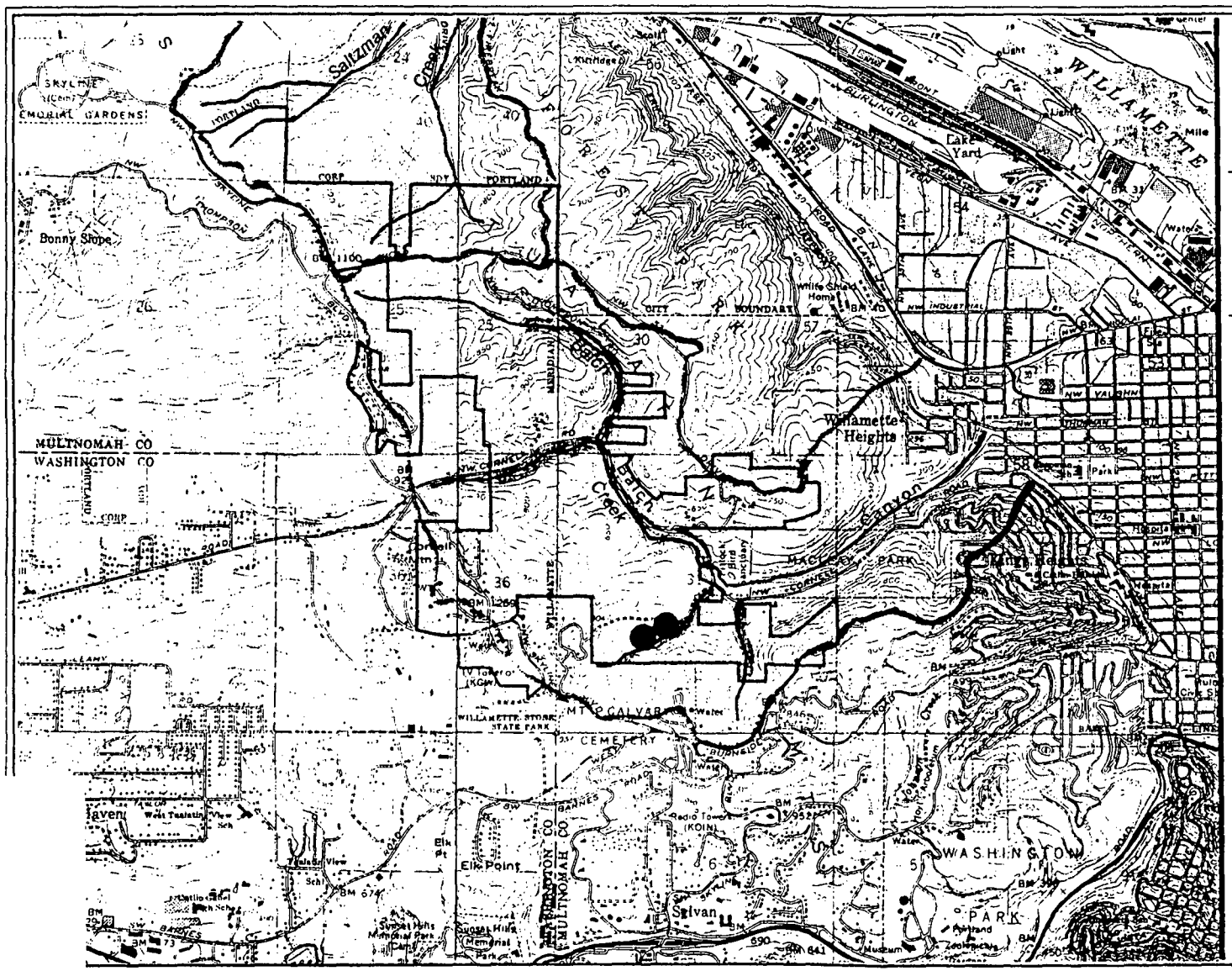
0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 April 1994

FIGURE

SDI/SHAPIRO



Significant Streams Study for Multnomah County

BALCH CREEK AREA
(Saltzman Creek & Balch Creek Watersheds)

LEGEND

● Water rights permit

— Study area boundary

— Watershed boundary

~ Stream segment inventoried

NORTH

0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 April 1994

FIGURE

CHAPTER IV

ANGELL BROTHERS MINERAL AND AGGREGATE

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A. SIGNIFICANCE DETERMINATION

1. BACKGROUND

This first portion of an ESEE analysis is the determination of significance. The procedure for that determination is given in OAR 660-16-000 (1) through (5). The rule directs the local government to determine whether there is sufficient information on the location, quality and quantity of the resource at a particular site. Then, based on that evidence, the local government must decide if the site is significant. The County's Comprehensive Plan will then reflect that conclusion. A prior determination of significance for this site was adopted on April 24, 1990 and concluded that the Angell Brothers' site was significant and the site was included in the significant (important) site inventory. The following significance determination incorporates currently available information on location, quantity and quality as required by the administrative rule.

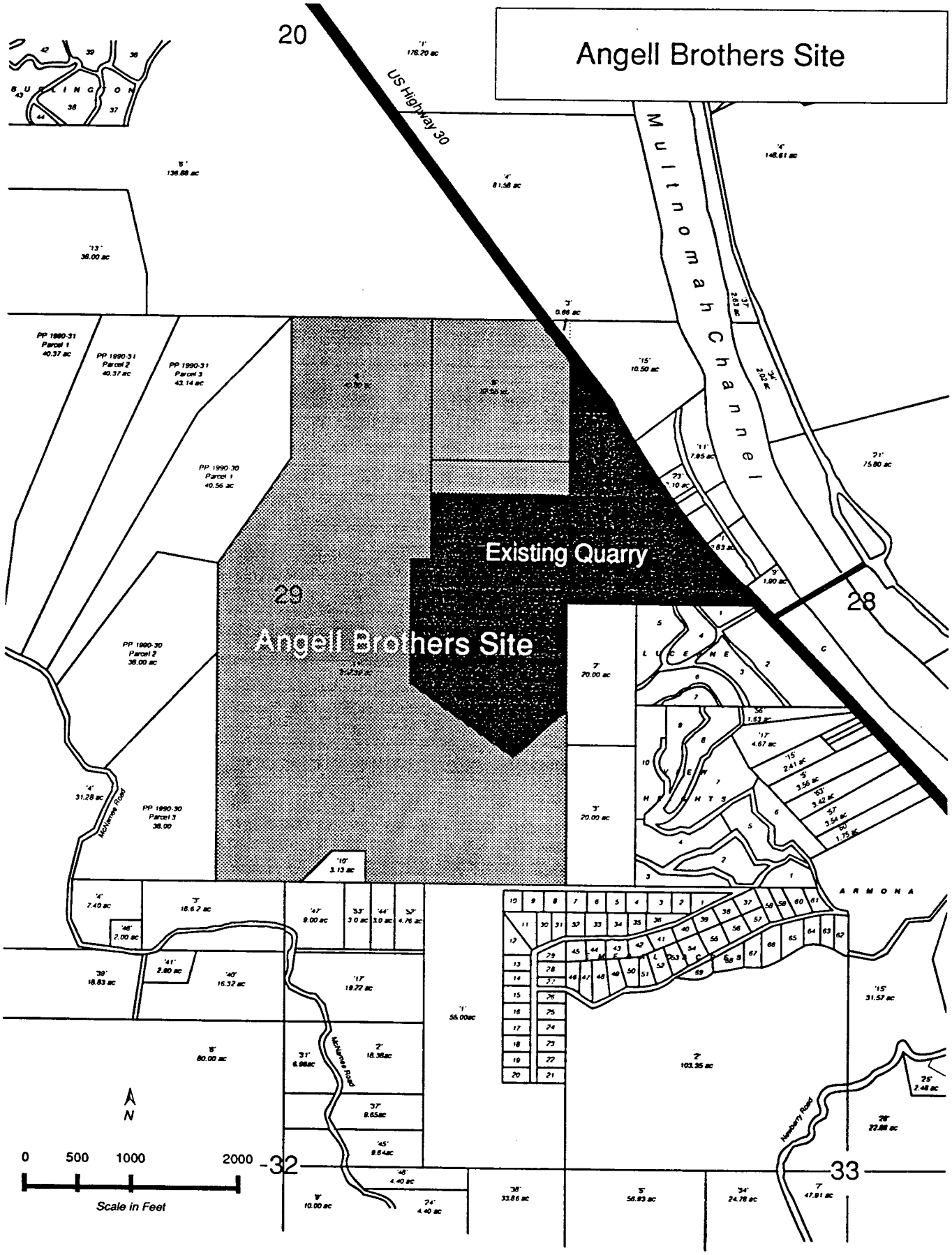
2. LOCATION:

The Angell Brothers site is approximately two miles north of the city limits of Portland, with direct access to US Highway 30, and less than ¼ mile north of the Sauvie Island Bridge. Access to the site is by way of Highway 30 onto a paved access road. The legal description of the property is Tax Lot 12, in the NW ¼ of Section 28, T2N, RIW, Willamette Meridian; and Tax Lots 2, 6, 8 and 11 in the E ½ of Section 29, T2N, RIW, Willamette Meridian, 1993 Assessor's Map.

A 114 acre portion of this site is an operating rock quarry. The operation consists of mining, crushing, stockpiling, and transport of various forms of aggregate material throughout the Portland Metropolitan Area.

The Oregon Department of Geology and Mineral Industries indicates that there are five other fully operating mineral extraction operations within Multnomah County. Those include Gresham Sand & Gravel, Multnomah County Vance, Roger's Construction, Oregon Asphaltic Paving, Portland Sand and Gravel, and Yett. With the exception of the Portland Sand and Gravel and Yett operations which are located at 107th and SE Division Street and 5949 NE Cully Boulevard respectively (in Portland), all of those operations are located in the vicinity of SE 190th Avenue between SE Division and SE Yamhill streets (in Gresham). An additional production site, Ross Island Sand and Gravel which is regulated by the Division of State Lands, is located at 4315 SE McLoughlin Blvd. There is an additional mineral resource site on the Multnomah County plan inventory that is identified as being significant and capable of future production. That is the Howard Canyon site on SE Howard Road approximately ¾ of a mile east of NE Littlepage Road in Section 36, T1N, R4E. The City of Portland plan inventory contains no additional significant sites.

All of these sites, with the exception of the Howard Canyon site (local road access only),


Angell Brothers Site
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US Highway 30
Multnomah Channel
Existing Quarry
29
Angell Brothers Site
28
32
33
McNamee Road
Newberry Road
N
0 500 1000 2000
Scale in Feet

have direct access to a least a major arterial within the metropolitan area. The Angell Brothers site is the only operating site within Multnomah County that can serve the western portion of the metropolitan area without crossing a Willamette River bridge. The Angell Brothers site, then, when considering road access and proximity to the metropolitan area, is similar to all but one (Howard Canyon) of the other operating and inventoried mineral and aggregate sites within Multnomah County.

3. QUANTITY:

A study by H. G. Schlicker and Associates, submitted in August, 1989, analyzed the geologic characteristics of the entire 397 acre site (Exhibits E, F & L contained in case file CU 17–90 which is incorporated by reference). That report indicates that the rock material consists of a series of Tertiary Columbia River Basalt flows stacked one upon another, some as much as 70 feet thick. Those flows are overlain in many places by Quaternary loess which the Schlicker report found to range up to 70 feet thick on one ridge top. That report concluded that, based upon their materials tests, borings, and seismic studies, this site most likely contains approximately 220 million cubic yards of very good aggregate material.

The geology of this resource site is indicated to be comparable to a majority of the central portion of the Tualatin Mountains extending from the Dunthorpe area to beyond the northwesterly corner of Multnomah County (Trimble, 1963 – *Geology of Portland, Oregon and Adjacent Areas*, which is incorporated by reference). There is, however, no available quantitative quality or quantity information for other properties within that geologic unit. The most recent information is a *Mineral and Aggregate Resources Inventory* (incorporated by reference) by the Portland Bureau of Planning (August, 1988) which discusses the following sites within that unit:

- Cornell #9 – an inactive site with about half of its excavation potential remaining;
- Forest Park #10 – a currently inactive, but potential future small-scale extraction site with ninety percent of the resource available; and
- Rivergate #11 – an inactive site with a large reserve which was closed due to conflicts with potential redevelopment of the surrounding area.

The study makes no mention of the original quantity of the resource at any of these sites, nor does it discuss quality and concludes that all three should be designated 1–A.

The Schlicker report has been faulted for having considered only two test borings. Additional support of resource quantity in the form of well logs from surrounding properties was introduced during the hearings on PR 7–92. At the hearing of October 5, 1992, Dr. Marvin Beeson, a professional geologist, indicated that such well log information was not reliable. He indicated that, "They are done by drillers. They are not either engineers nor geologists and I have a lot of experience with them. They should be used with great great caution in any case." The Schlicker report remains the only available information regarding resource quantity at this resource site.

The only other mineral and aggregate resource site within the county for which there is any available quantity and quality information is the Howard Canyon site in east Multnomah County. That site contains 2.2 million cubic yards of available resource (see Resource Significance Determination, Chapter II Howard Canyon Reconciliation Report).

Multnomah County Comprehensive Framework Plan Policy 16–B states, "Determination that a particular mineral and aggregate site is both *Important* and should be included in the plan inventory is to be based on the site's proven ability to yield more than 25,000 cubic yards of resource." Exhibit L of CU 17–90 indicates that this resource site normally produces up to 810,000 tons of aggregate material per year, which converts to a minimum of 401,000 cubic yards (using the specific gravity of 2.5 indicated in the Schlicker report and ignoring interstitial spaces within the crushed material). This site, therefore, is significant because it has a demonstrated production capability in excess of 25,000 cubic yards. It is also significant with respect to other mineral and aggregate resource sites in the county for which quantity information is available, having a reserve of 100 times that of the Howard Canyon site.

4. QUALITY:

Appendix D of the Schlicker report contains laboratory analyzes indicating that the material meets Oregon State Highway Department specifications for base rock. The samples tested exceeded the other standards in the *Test Standards by Usage* matrix contained in Table 1. of that same report.

The Schlicker report indicates that "...the processed rock at the site easily passes all common specifications." The report concludes that, "The rock is well suited for use as aggregate in asphaltic concrete and as base, subbase, topping, riprap and embankments. The rock is also suitable for use as aggregate in cement concrete under certain conditions. The overburden is satisfactory for embankment landscaping and landfill operations as well as reclamation of the site."

The laboratory studies presented in the Schlicker report consist of a number of various tests for both hardness and particle size. The only available information with which to compare the material from this site to other resource sites is also from the Howard Canyon site. The only comparable test conducted at both sites is a Los Angeles Abrasion test. The percent loss or wear results of that test must be less than 35 percent to meet Oregon State Highway Department specifications. The percent loss or wear of the material tested from the Angell Brothers resource site was 12.2% and 15.0%, while that of the material tested from the Howard Canyon resource site was 32.7%. The Angell Brothers mineral and aggregate resource site, therefore, is also significant in terms of the quality of the material when considering available information from other resource sites within Multnomah County.

5. CONCLUSION:

The entire 397 acre property remains a significant Goal 5 Mineral and Aggregate site

based on the above description of location, quantity and quality.

B. RESOURCE ANALYSIS

This section addresses the part of the administrative rule which directs the local government to: (1) identify land uses which would conflict with the resource,and (2) analyze the economic, social, environmental, and energy consequences allowing, limiting or prohibiting the mining and the conflicting uses. The last task, (3) determination of the level of protection for the resource, will be considered in Chapter VI.

1. IMPACT AREA

The Goal 5 Rule requires identification of an impact area surrounding the resource site if different from the resource site itself [OAR 660-16-000(2)]. The impact area for a mineral and aggregate site must be the area which includes uses that could adversely affect utilization of the resource, plus the area that includes those uses which could be affected by a mineral and aggregate operation.

On December 29, 1992, The Board of County Commissioners adopted an ESEE analysis for a proposed 283 acre expansion area of this resource site (Final Order PR 7–92). The impact area identified in that decision included:

> "...the site itself; property adjoining the site located west of State Highway 30; the City of Portland's Forest Park; a peninsula of land between Portland's Forest Park and the forests of Oregon's coast range, popularly known as a "wildlife corridor"; downstream areas, located east of State Highway 30, including a small wetland to the east, the 430 acre Rafton-Burlington Bottoms wetland to the northeast, and Multnomah Channel; residences adjoining the Channel and houseboats on the Channel; and Sauvie Island."

Findings #3-11 of the Board's Final Order identify conflicts between extraction of the mineral resource and forestry uses, wildlife habitat, streams and wetlands, residential uses, and scenic resources. Of these, only residential uses and streams and wetlands have the potential of adversely affecting a future mining operation. Residential complaints regarding noise and dust could potentially restrict areas and methods of operation. Regulatory controls limiting the type and amount of discharge into streams and wetlands could also place limitations on an operation.

The Board's 1992 decision identified a large impact area because no analysis had been completed on the identified conflicting Goal 5 resources (wildlife habitat, streams and wetlands, and scenic resources). Consequently, the entire area of those resources was included in the impact area of this site. Each of those resources, however, has subsequently been evaluated by a separate ESEE analysis, each with their individual impact area. The

impact areas of each of those resources includes this resource site and considers the potential impact of mining on the resource being considered; conversely, the impact area for this resource site should be large enough to include a portion of each of the resource areas for wildlife habitat, streams and wetlands, and scenic resources so that potential conflicts with those resources can be considered.

The two remaining conflict issues identified by the Board are forestry and residential uses. The finding regarding impacts on forestry uses is limited to the site of the mineral and aggregate resource. Therefore, the entire site should be included in the impact area.

With respect to residential issues, the Board relied on three items of written testimony [Sauvie Island Conservancy Letter, Linnton Letter, and Bellant Letter (see Appendix)] and the oral testimony of Darlene Wruble (see Appendix) to establish the area of conflict with residential uses. With respect to residential impacts, the Sauvie Island Conservancy Letter states, "... excessive dust and noise from the quarry's present operation have been common occurrences for nearby residents..." Therefore, existing and potential nearby residences should be included in the impact area. The Linnton Letter is concerned with truck traffic on US Highway 30, wildlife, and site reclamation. Portions of US Highway 30, adjacent wildlife habitat, and the resource site should be included in the impact area. The Bellant Letter (undated, but received July 2, 1992) addresses impact on neighboring homes, property and roads, scenic, wildlife and water resources, and site rehabilitation. The impact area should include neighboring homes, property and roads, areas of conflict with the scenic, wildlife and water resources previously mentioned, and the site itself. The Wruble testimony concerns noise and dust problems associated with the existing operation encountered by an adjacent property owner. Therefore, the Wruble property should be included in the impact area.

Of the various issues identified, complaints regarding noise, blasting and dust, and traffic could adversely affect utilization of the resource. Conversely, utilization of the resource may adversely affect wildlife habitat, streams and wetlands, and scenic resources, all of which are Goal 5 resources.

A study by Daly, Standlee & Associates dated September 25, 1992 (contained in case file PR 7–92) to evaluate compliance of DEQ noise regulations of a proposed mining expansion with respect to surrounding residences indicted there would be no violation of the DEQ standards during phases I and II of the operation proposed at that time. The study also indicated that there would be violations of those standards without mitigation measures during phases III and IV. The nearest residence to phases I and II (no noise impact) is located 1,200 feet away from that proposed operation area, and residence located most distant from phases III and IV (noise impact) is 600 feet away. The point at which DEQ noise standards are exceeded, therefore, is somewhere between 1,200 and 600 feet from the active mining site. Lacking information regarding the exact distance of that point, a 1,200 foot impact area is appropriate to consider noise issues.

A letter dated May 24, 1992 from Steve Harris of Austin Powder Company (see Appendix) states that, based on seismic measurements taken at a number of locations including at

least four properties in the surrounding area, "...vibrations...were significantly below the accepted particle velocity limit..." as determined by the US Bureau of Mines and other State and Federal agencies. The letter indicates that, "As an example of the level of vibrations produced from the shots at the quarry, we recorded higher vibrations from trains going through the tunnel than we did from a shot." That tunnel is located on property adjacent to the northeast of this resource site. Therefore, only adjacent properties, at most, need be included in the impact area to consider blast impact issues.

Location specific dust problems were raised as an issue in the Bellant Letter. Ms. Bellant resides at Bridgeview Moorage located in Multnomah Channel adjacent to Tax Lot '11', Section 28, T2N, R1W. That moorage is approximately 800 feet from this resource site. All properties within 800 of the resource site should be included in the impact area to consider dust issues.

Increased mine truck traffic on US Highway 30 has been identified as a concern relative to any expanded activity at this site (Linnton Letter).

The structural cross section of US Highway 30 is designed to accommodate truck traffic. This includes the type of traffic that is generated by the quarry. Therefore, the estimated maximum of 250 truck trips per day (estimated by applicant's submittal in PR 7–92) will not adversely effect the normal life cycle of the structural cross section of the roadway.

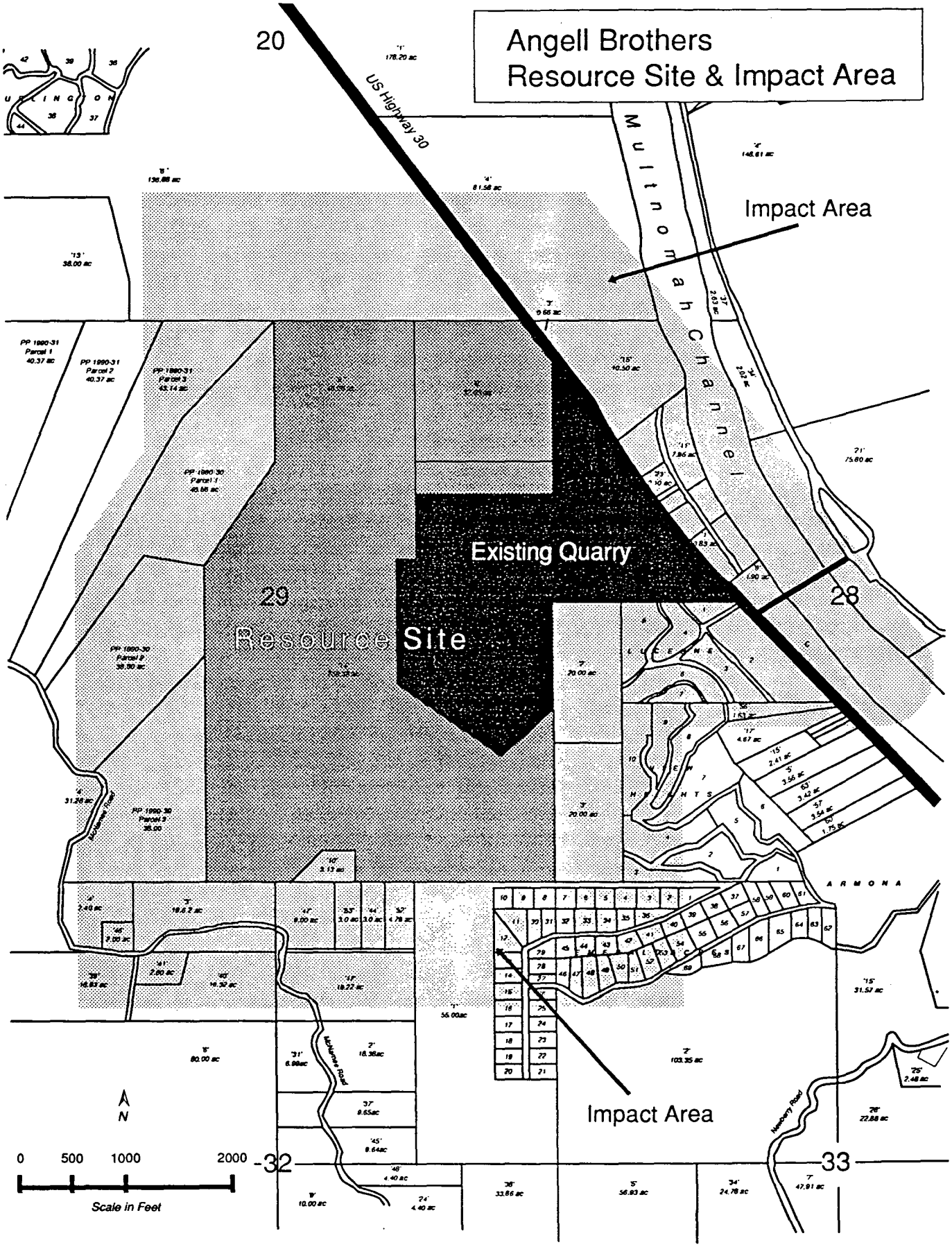
The "1992 Oregon Department of Transportation Traffic Volume Tables" indicate the section of Highway 30 north of the Sauvie Island Bridge has an average daily trip (ADT) count of 16,000, and the portion south of the bridge 20,000 ADT. Using those 1992 tables, ODOT staff computed the peak hour peak direction traffic volume at 1,200 vehicles. Given the four travel lanes with center left configuration, ODOT staff estimates the 1992 Level of Service to be "B". Consequently, Highway 30 has sufficient capacity to accommodate increased truck volume in the vicinity of the Sauvie Island Bridge.

Since ODOT indicates that US Highway 30 has sufficient capacity and structural capability to safely handle the traffic generated by the quarry operation, traffic on Highway 30 will not be considered a conflicting use.

An impact area of 1,200 feet from the perimeter of the resource site would also include resource areas of all of the potentially conflicting Goal 5 resources. The site itself is within the West Hills Scenic Area, the West Hills Wildlife Habitat Area, and the Water Resource and Wetland Sites. Therefore, an impact area including this resource site plus that area 1,200 feet in all directions from the perimeter of this resource site (see Map on next page) is selected since it will include all known conflict issues.

2. CONFLICTING USES

The Goal 5 Rule requires identification of conflicting uses. A conflicting use is one which, if allowed, could adversely affect a Goal 5 resource site. Identifying conflicting uses is primar-


Angell Brothers
Resource Site & Impact Area
20
US Highway 30
Multnomah Channel
Impact Area
Existing Quarry
29
Resource Site
28
Impact Area
32
33
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0 500 1000 2000
Scale in Feet

ily done by examining uses authorized by zoning districts within the impact area.

a. Zoning Districts and Resources Within the Impact Area

The majority of the property within the impact area (the resource site plus a 1,200 foot perimeter area) is zoned Commercial Forest Use (CFU). Exceptions to this include that area 2,200 feet north of the Sauvie Island Bridge, east of US Highway 30 and west of Multnomah Channel which is designated Multiple Use Agriculture (MUA–20), and an area on the westerly edge of Sauvie Island in the vicinity of the Sauvie Island Bridge which is designated Exclusive Farm Use (EFU). There is a small portion of one lot (Tax Lots '27' & '56', Section 28, T2N, R1W, 2.00 acres) to the south of the easternmost tip of the site designated Rural Residential (RR) within the impact area.

The Multiple Use Agriculture area is in the ownership of the Bonneville Power Administra-tion and serves as a wetland mitigation area for which a management plan is being developed. That plan calls for the area to be maintained in a natural state, with no development of any kind allowed. Since there is no development potential within that portion of the impact area designated MUA–20, MUA–20 uses other than the conservation use will be excluded from the following analysis of conflicting uses allowed by zoning district. The conservation use is considered in discussions of the Rafton/Burlington Bottoms.

The Rural Residential lot is developed with a single family residence located 150 feet outside of the impact area. The portion of the lot within the impact area consists mainly of Bonneville Power Administration right-of-way. Since the lot is committed to residential use and no development is allowed within the BPA right-of-way, there is no other category of use that could be made of of that portion of the lot within the impact area. Rural Residential uses, therefore, will not be considered in the conflict analysis.

Also, the Exclusive Farm Use area will not be considered in this analysis since the portion of the impact area designated EFU consists entirely of property developed with a portion of the dike which protects Sauvie Island. With the exception of occasional grazing, no use is allowed of the dike.

There are two overlay zoning districts within the impact area, the Willamette River Greenway (WRG) and Flood Hazard (FF) & (FW). With the exception of the FW overlay which limits uses allowed by the base zone, those overlay districts do not identify allowed uses, rather, they place design restrictions on uses allowed by the base zone. Therefore, they will not be considered in the conflicting use analysis.

There are three Goal 5 resources which have been identified within the impact area. Those include wildlife habitat, streams and wetlands, and scenic resources.

b. Uses Allowed by Zoning

Multnomah County is required to allow only those uses allowed by new requirements of

Goal 4–Forest Lands and the Goal 4 Rule, even though they have not yet been incorporated into the CFU section of the Zoning Code. Therefore, the items i.–iv. of the following analysis only consider uses allowed by the Goal 4 Rule and the potential conflicts between allowing those uses and protection of the mineral resource.

i. Allowed Uses Not Applicable to the Analysis

The following uses allowed in the Commercial Forest Use district are not applicable to the analysis:

- Exploration for mineral and aggregate resources as defined in ORS Chapter 517

- Widening of roads within existing rights-of-way in conformance with the transportation element of acknowledged comprehensive plans including public road and highway projects as described in ORS 215.213(1)(m) through (p) and ORS 215.283(1)(k) through (n)

- Exploration for and production of geothermal, gas, oil, and other associated hydrocarbons, including the placement and operation of compressors, separators and other customary production equipment for an individual well adjacent to the well head

- Mining and processing of oil, gas, or other subsurface resources as defined in ORS Chapter 520, and not otherwise permitted under OAR 660-06-025(3)(m) (e.g., compressors, separators and storage serving multiple wells), and mining and processing of aggregate and mineral resources as defined in ORS Chapter 517

- Temporary asphalt and concrete batch plants as accessory uses to specific highway projects

- Public road and highway projects as described in ORS 215.(1,(2)(q) through (s), 215.213(10), 215.283(2)(p) through (r) and 215.283(3)

  Activities involving utilization of a mineral resource cannot conflict with mineral and aggregate resource protection since the purpose of protecting a mineral resource is for its eventual use.

- Expansion of existing airports

  There are no airports within the impact area.

- Destination resorts reviewed and approved pursuant to ORS 197.435 to ORS 197.465 and Goal 8

  Destination resorts are not allowed on sites of less than 160 acres. There are no

sites of that size within the impact area.

ii. Allowed Uses that Will Not Conflict With the Aggregate Resource

The following uses allowed by the Commercial Forest Use district within the impact area would not conflict with, or be impacted by, protection or utilization of the significant resource:

- Forest operations or forest practices including, but not limited to, reforestation of forest land, road construction and maintenance, harvesting of a forest tree species, application of chemicals, and disposal of slash (on properties within the impact area other than the site itself)

- Temporary on-site structures which are auxiliary to and used during the term of a particular forest operation (on properties within the impact area other than the site itself)

- Physical alterations to the land auxiliary to forest practices including, but not limited to, those made for purposes of exploration, mining, commercial gravel extraction and processing, landfills, dams, reservoirs, road construction or recreational facilities (on properties within the impact area other than the site itself)

- Farm use as defined in ORS 215.203

- Local distribution lines (e.g., electric, telephone, natural gas) and accessory equipment (e.g., electric distribution transformers, poles, meter cabinets, terminal boxes, pedestals), or equipment which provides service hookups, including water service hookups

- New electric transmission lines with right of way widths of up to 100 feet as specified in ORS 772.210. New distribution lines (e.g., gas, oil, geothermal) with rights-of-way 50 feet or less in width

- Temporary portable facility for the primary processing of forest products

- Towers and fire stations for forest fire protection

- Water intake facilities, canals and distribution lines for farm irrigation and ponds

- Uninhabitable structures accessory to fish and wildlife enhancement

- Permanent facility for the primary processing of forest products

- Permanent logging equipment repair and storage

- Log scaling and weigh stations

- Disposal site for solid waste that has been ordered established by the Environmental Quality Commission under ORS 459.049, together with the equipment, facilities or buildings necessary for its operation

- Disposal site for solid waste approved by the governing body of a city or county or both and for which the Oregon Department of Environmental Quality has granted a permit under ORS 459.245, together with equipment, facilities or buildings necessary for its operation

- Television, microwave and radio communication facilities and transmission towers

- Fire stations for rural fire protection

- Utility facilities for the purpose of generating power

- Aids to navigation and aviation

- Cemeteries

These uses do not satisfy the DEQ definition of noise sensitive property. There is no available information that they would be impacted by potential dust or traffic resulting from mining activity. These uses, if allowed within the impact area, would pose no threat to quarry operations or force a significant change in current or future mining activities.

iii. Allowed Uses that May Conflict, but Unlikely to Occur

The following uses allowed by the Commercial Forest Use district within the impact area either meet the DEQ definition of noise sensitive property, or are uses that could be adversely affected by dust or traffic resulting from mining activities.They could conflict with, or be impacted by mining activities, but are unlikely to be sited within the impact area.

- Temporary forest labor camps

- Caretaker residences for public parks and fish hatcheries

- Private seasonal accommodations for fee hunting operations

- Private accommodations for fishing occupied on a temporary basis

The locational requirements for the above uses are not present within the impact area. Proximity to the Portland Metropolitan Area and relatively small ownerships eliminate the possibility of forest labor camps and hunting lodges. All of theses uses, however, are residential in nature, and that land use category will be consid-

ered in section D below.

- Water intake facilities, related treatment facilities, pumping stations, and distribution lines

- Reservoirs and water impoundments

  These two uses are uses which would provide an urban service. Such uses are not encouraged outside of the Urban Growth Boundary. Further, the three streams within the impact area are unlikely to be dammed, and Multnomah Channel is incapable of being impounded.

- Forest management research and experimentation facilities accessory to forest operations

- Private hunting and fishing operations without any lodging accommodations

- Parks and campgrounds

  These are land extensive uses that are categorized by the Comprehensive Plan as Minor Community Facilities (Plan Policy #31) and considered Conditional Uses by zone. Minor Community Facilities require direct access to at least a collector street. All of the roads in the impact area are local with the exception of US Highway 30 which is a major arterial. There are no large ownerships within the impact area with direct access to Highway 30.

These uses will not be treated as conflicting uses to utilization of the aggregate resource at this site.

iv. Allowed Uses that May Conflict

The following uses allowed by the Commercial Forest Use district within the impact area may conflict with or be impacted by mining activities on the resource site:

- Forestland dwellings

- Alteration, restoration or replacement of a lawfully established dwelling

- A mobile home in conjunction with an existing dwelling as a temporary use for the term of a hardship suffered by the existing resident or a relative

The above uses satisfy the DEQ definition of noise sensitive property. Noise sensitive property is defined by OAR 340–35–015(38) as:

> ...real property normally used for sleeping, or normally used as schools, churches, hospitals, or public libraries. Property used in industrial or agricul-

tural activities is not noise sensitive property unless it meets the above criteria in more than an incidental manner.

There are 15 residences on land and two existing houseboat moorages with a total of 38 houseboats and one moorage under development with 19 houseboats and a caretakers residence within the impact area. All of the land-based residences are sited on parcels zoned Commercial Forest Use. The nearest residence to the resource site is approximately 400 feet to the south.

The potential for additional dwellings in the impact area is relatively low. Houseboat moorages are not an allowed use under the new Goal 4 rule. Therefore, there is no potential for new moorages or expansion of existing moorages. There are three subdivisions which were created in 1909 and 1911 and eight vacant Lots of Record within the impact area. The subdivisions are held in large private, public, and semi-public ownerships. Due to the new forest goal rules, topography and access problems, it is unlikely that any of those subdivided properties would be developed for residential use. The existing and eight potential residential uses, however, both impact and are impacted by mineral extraction. They will be considered conflicting uses.

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources do, and will continue to occur in the impact area. While they do not impact mineral extraction, they could be adversely impacted by mining. They will be considered as conflicting uses, but limited to soil, air and water quality uses. Uses to provide for wildlife and fisheries resources will be considered along with the West Hills Wildlife Habitat Area and West Hills Water Resource and Wetlands.

- Forest operations or forest practices including, but not limited to, reforestation of forest land, road construction and maintenance, harvesting of a forest tree species, application of chemicals, and disposal of slash (on the resource site).

  Permanent management of the resource site for forest operations or forest practices would prohibit the short-term mineral and aggregate use of the resource site itself. The site, however, has been proposed to be reclaimed for forest purposes after mining. Mining would preclude the immediate management of the site for forest purposes, while reclamation could provide for future forest management. The Forest Goal and Rule designate mining and processing of mineral and aggregate resources as locationally dependent uses. Such uses may be allowed when it is found that:

  - The proposed use will not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands;

- The proposed use will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel; and

- A written statement recorded with the deed or written contract with the county or its equivalent is obtained from the land owner which recognizes the rights of adjacent and nearby land owners to conduct forest operations consistent with the Forest Practices Act and Rules for uses authorized in OAR 660-06-025(4)(e), (l), (r), (s) and (v).

Since utilization of the resource site for mineral and aggregate use requires evaluation against the above criteria, forestry on the site itself will be considered a conflicting use.

c. Other Goal 5 Resources

i. West Hills Scenic Area

The West Hills Scenic Area has been identified as consisting "...of the east face of the West Hills (Tualatin Mountains) between the ridgeline and Highway 30, extending from the Portland City Limits to the Columbia County line. The attributes of the resource which make it significant are the landform, consisting of a combination of hillside and ridge bisected by numerous canyons; the vegetation pattern, which provides a blanket of various shades of green along with colorful fall foliage; the intactness, or lack of development to disrupt the overall forested appearance; and unity, because the West Hills are part of the mountain chain extending from Portland to the Coast Range."

The Angell Brothers mine has been identified as an existing conflicting use to the scenic resource. "Mining requires removal of vegetation, changes the landform, and the exposed rock face creates a highly visible intrusion on the forested hillside. The size of the disturbed area, as well as the amount of screening vegetation and topography, affects the degree of visual conflict. Mining activities, like logging, can be considered temporary, and reclamation is required. Many people, however, have expressed concerns about the ability of reclaimed land to support forest growth and whether the reclaimed landform will blend in with the surrounding topography (reference file PR 7-92, Angell Brothers Goal 5 analysis)."

The West Hills Scenic Area, therefore, is a conflicting Goal 5 resource.

ii. West Hills Wildlife Habitat Area

The West Hills Wildlife Habitat area has been identified as the entirety of Multnomah County north of the City of Portland and west of US Highway 30. This resource site is within that habitat area; therefore, wildlife is a potential conflicting Goal 5 resource.

iii. Water Resource and Wetland Sites

There are three streams which flow through this site. The northerly stream (Angel Brothers North) has been identified as being a significant Goal 5 resource and designated "1C" and will be considered potential conflicting uses. The other two streams (Angel Brothers Middle and South) are not significant and are designated "1A". The Rafton/Burlington Bottoms and the east bank of Multnomah Channel have been designated "3–C" and are within the impact area of the Angell Brothers resource site. Consequently, the Rafton/Burlington Bottoms and the east bank of Multnomah Channel will be considered potential conflicting uses.

3. ESEE ANALYSIS

The Goal 5 rule requires that if conflicting uses to the resource are identified, the economic, social, environmental, and energy (ESEE) consequences of the conflicts must be identified. Both the impacts on the resource site and on conflicting use must be considered in analyzing the ESEE consequences. The applicability and requirements of other Statewide Planning Goals must also be considered, where appropriate at this stage of the process.

The ESEE consequences will be analyzed by examining, (1) the effect on use of the aggregate resource if conflicting uses are allowed fully without restriction, and (2) the effect on conflicting uses if development of the aggregate resource is allowed fully without restriction. The conflicting uses to be considered include:

- Residential Uses
- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources
- Forest operations or forest practices on the resource site
- West Hills Scenic Area
- West Hills Wildlife Habitat Area
- Water Resource and Wetland Sites

a. Economic Effects

i. Economic Effect on Use of the Aggregate Resource if Conflicting Uses are Fully Allowed

- Residential Uses

There is no available information regarding the economic effect of residential uses

on mining. Such uses may generate complaints which, in turn, may result in changes in operational methods with possible additional production expense and increased end product costs. Residential use of the site itself would prevent any expansion of the mining activity.

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  The development of these uses within the impact area would have no economic impact on the aggregate resource. Any mining operation would have to be conducted within environmental control standards insuring compliance with air and water quality standards, and possible permit conditions to conserve soil resources and provide for wildlife and fishery resources. Satisfaction of those standards and conditions represent operational expenses that would be incurred at any time mining occurred.

- Forest operations or forest practices on the resource site

  Use of the site solely for forestry purposes would prevent mining. A letter from Frank Parisi, Angell Brothers representative (see Appendix), indicates that the rock material at this resource site is worth 42 million dollars, and the site provides a payroll of about $500,000.

- West Hills Scenic Area

  Full protection of identified scenic resources would prevent mining expansion. That would result in the loss of the value of the resource at this site.

- West Hills Wildlife Habitat Area

  Full protection of identified wildlife resources would prevent mining expansion. That would result in the loss of the value of the resource at this site.

- Water Resource and Wetland Sites

  The Rafton/Burlington Bottoms is a "3C" Goal 5 resource site. The existing mining operation is conducted in compliance with state regulations that insure minimal adverse impact on that site, as would be the case for any expanded operation. Compliance with those regulations represents an operational expense. The form of mine expansion would be limited if the significant stream on the site is fully protected.

ii. Economic Effect on Conflicting Uses if Development of the Resource is Allowed

- Residential Uses

  Mining would have an effect of reducing construction and maintenance costs for residential development within the impact area due to reduced hauling costs. Each hour of hauling aggregate material adds at least $4.60 to the cost per ton of material [1990 ODOT letter to DLCD (see Appendix)]. There has been no information submitted regarding the effect of mining on property values.

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  Any mining operation would be conducted within environmental control standards insuring compliance with air and water quality standards, and possible permit conditions to conserve soil resources and provide for wildlife and fishery resources. Satisfaction of those standards and conditions would have no economic impact on conservation uses within the impact area.

- Forest operations or forest practices on the resource site

  The Board has previously found that the 283 acre proposed expansion area is capable of producing timber resources worth over six million dollars. That potential would be lost on mined portions of the site until they were reclaimed for forestry purposes if mining occurred. Testimony at previous hearings has questioned the viability of reclamation for commercial forestry purposes.

- West Hills Scenic Area

  There are no quantifiable measures of economic impact of mineral extraction operations on scenic resources. A possible impact is a reduction of the value of the conservation easements that exist in the surrounding area.

- West Hills Wildlife Habitat Area

  There are no quantifiable measures of economic impact of mineral extraction operations on wildlife resources. A possible impact is a reduction of the value of the conservation easements that exist in the surrounding area.

- Water Resource and Wetland Sites

  There would be no adverse economic impact of a mineral extraction operation at this site on water and wetland sites since the operation would have to be conducted in accordance with DEQ standards that are intended to minimize conflicts with the recognized 3C resource of the Rafton/Burlington Bottoms. Available information indicates that the significant stream on the site has no economic value

(SRI/Shapiro, 1994).

b. Social Effects

i. Social Effect on Use of the Aggregate Resource if Conflicting Uses are Fully Allowed

- Residential Uses

  The addition of approximately eight new residences in the impact area would increase the potential for complaints regarding noise, dust, vibration, etc.; thereby, potentially limiting the extent of an expanded mining operation (Final Order PR 7–92 § 22).

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  There have been no adverse social impacts on mining identified that would result with respect to conservation activities on properties in the impact area.

- Forest operations or forest practices on the resource site

  Use of the site solely for forestry purposes would prevent mining. The social impact of that would be the conscious elimination of the production of one construction material in favor of the production of another.

- West Hills Scenic Area

  Prohibition of mining to preserve the scenic resource would have the social impact of limiting the availability of a needed construction material.

- West Hills Wildlife Habitat Area

  Preservation of the site for wildlife habitat would prevent mining expansion. That would also have the social effect of limiting the availability of a needed construction material.

- Water Resource and Wetland Sites

  Any mining expansion would have to be conducted in a manner that minimizes impact on the "3C" Rafton/Burlington Bottoms. The impact on North Angell Brothers Creek would be considered a limitation on an expanded operation since it has been found to contribute to the park/recreation facility of Burlington Bottoms. Middle Angell Brothers Creek has been found not to contribute flow to Burlington Bottoms.

ii. Social Effect on Conflicting Uses if Development of the Resource is Allowed

- Residential Uses

  Increased mining would not prevent additional residential uses on legal Lots of Record within the impact area. Mining, crushing, and trucking could add to the noise and dust experienced by residents within the impact area.

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  There are several conservation easements within the impact area intended to maintain natural habitat areas in the West Hills. Their utility would be diminished by mining activities. Also, mining would fragment the "peninsula" of open space that connects Forest Park with the forests of the coast (Final Order PR 7–92 § 20 and 21).

- Forest operations or forest practices on the resource site

  Use of the site solely for mining purposes would prevent its immediate use for forestry purposes. Reclamation could allow for its future utilization for forestry. The social impact of that would be the conscious acceptance of the short-term production of one construction material versus the long-term production of another.

- West Hills Scenic Area

  Mining requires removal of vegetation, changes the landform, and the exposed rock face creates a highly visible intrusion on the forested hillside. The size of the disturbed area, as well as the amount of screening, vegetation and topography, affects the degree of visual conflict.

- West Hills Wildlife Habitat Area

  It has been indicated that there would be social impacts of expanded mining on wildlife habitat, but they were not identified (Final Order PR 7–92 § 19).

- Water Resource and Wetland Sites

  It has been indicated that there would be social impacts of expanded mining on wetland resources, but they were not identified (Final Order PR 7–92 § 19).

c. Environmental Effects

i. Environmental Effect on Use of the Aggregate Resource if Conflicting Uses are Fully Allowed

- Residential Uses

  The only identified environmental effect of residential uses on the aggregate resource is the required compliance with environmental control standards which regulate impact on residential uses.

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  Mining conducted in compliance with environmental control standards would have no identified effect on conservation activities on properties within the impact area.

- Forest operations or forest practices on the resource site

  Use of the site solely for forestry purposes would prevent mining. That would result in no environmental effect on the aggregate resource.

- West Hills Scenic Area

  Total preservation of the site for scenic purposes would prevent mining.

- West Hills Wildlife Habitat Area

  Mining within an existing contiguous half-mile band of forest habitat between the existing quarry and McNamee Road would reduce that minimum width necessary to prevent isolation of Forest Park wildlife from the forests of the Coast Range (Final Order PR 7–92 § 25). Expansion of the mining activity within that area would not be allowed if the wildlife habitat is fully allowed.

- Water Resource and Wetland Sites

  The Rafton/Burlington Bottoms is a "3C" resource site. Mining must be conducted in a manner that minimizes any environmental impacts on that resource. The significant stream on the site has been found to have wildlife habitat in the upper portions of the watershed. Total preservation of that habitat would prevent mining adjacent to those streams; thereby, limiting the extent of mining expansion.

ii. Environmental Effect on Conflicting Uses if Development of the Resource is Allowed

- Residential Uses

  Expanded development of the mineral resource could result in increased noise, dust and vibration. Such development, however, would have to be conducted in compliance with environmental control standards. Compliance with those standards could still result in complaints, but would have no adverse environmental impact on residential uses.

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  An expanded mining operation would have no identified environmental conflict with conservation activities on properties in the impact area.

- Forest operations or forest practices on the resource site

  It has previously been found that allowing mining would have a devastating environmental consequence on the site's forest habitat (Final Order PR 7–92 § 24). Use of the site solely for mining purposes would prevent its immediate use for forestry purposes. Reclamation would allow for its future utilization for forestry. The Board has indicated that they are not convinced that attempts to reclaim the site would succeed in enabling the forest habitat to function again (Final Order PR 7–92 § 24). An inability to reclaim the site as a functioning forest habitat would be an adverse environmental effect on the forest resource of the site.

- West Hills Scenic Area

  Expanded mining would reduce the scenic environment of the West Hills to a degree proportionate with the size of the exposed face with respect to that of the total seen area from any key viewing area.

- West Hills Wildlife Habitat Area

  Expansion of mining activity within an existing contiguous half-mile band of forest habitat between the existing quarry and McNamee Road would reduce that minimum width necessary to prevent isolation of Forest Park wildlife from the forests of the Coast Range (Final Order PR 7–92 § 25).

- Water Resource and Wetland Sites

  There would be minimal environmental effect on the Rafton/Burlington Bottoms by an expanded mining activity since any expansion would have to be conducted under environmental control measures that balance conflicts with that identified wetland resource. The effect on the significant stream would be the possible elimination of wildlife habitat and a reduction of water quality due to loss of riparian vegetation.

d. Energy Effects

i. Energy Effect on Use of the Aggregate Resource if Conflicting Uses are Fully Allowed

- Residential Uses

There is no identified energy effect on the aggregate resource if residences are fully allowed.

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  There is no identified energy effect on the aggregate resource if conservation practices are fully allowed within the impact area.

- Forest operations or forest practices on the resource site

  There would be less energy expended for aggregate production on this site if forestry uses are fully allowed since the energy expended to harvest the forest resource is less than that of extracting the mineral resource.

- West Hills Scenic Area

  If scenic resources are fully allowed, no mining expansion would occur. The energy effect of that would be to reduce the amount of energy expended for extraction activities at this site.

- West Hills Wildlife Habitat Area

  There would be less energy expended for aggregate production on this site due to reduced expansion potential if the wildlife habitat use is fully allowed.

- Water Resource and Wetland Sites

  The Rafton/Burlington Bottoms wetland area must be protected by limiting conflicting uses. Any expanded aggregate production, therefore, must minimize conflict with that use. The energy effect on the aggregate use could be either positive or negative depending on whether the conflict resolution was to limit extraction activity, or to impose additional water control and treatment measures. Full preservation of the essential corridors associated with North Angell Brothers Creek would reduce energy consumed by the aggregate use due to a reduction in mineable area.

ii. Energy Effect on Conflicting Uses if Development of the Resource is Allowed

- Residential Uses

  There would be a reduction of the energy expended in delivering aggregate products for residential uses within the impact area due to reduced delivery distance if expansion of the mining activity is allowed.

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

  There is no identified energy effect on conservation uses within the impact area if expansion of the mining activity is allowed.

- Forest operations or forest practices on the resource site

  There would be no short-term forest operations on the site if mining expansion occurred; therefore, there would be no energy effect during the period of mining. There would possibly be an increase in energy consumption relative to forest management of the site in the long-term as a result of the added management requirement of reclamation.

- West Hills Scenic Area

  There is no identified energy effect on the West Hills Scenic Area if expansion of the mining activity is allowed.

- West Hills Wildlife Habitat Area

  There is no identified energy effect on West Hills Wildlife Habitat Area if expansion of the mining activity is allowed.

- Water Resource and Wetland Sites

  There will be no energy effect on water resource and wetland sites within the impact area if expansion of the mining activity is allowed.

e. Other Applicable Statewide Planning Goals

The following additional Statewide Planning Goals have been found to apply to the ESEE analysis of the Angell Brothers resource site (Final Order PR 7–92 § 16, 26, 27, 28 and 29).

i. Goal 4–Forest Lands

The Forest Goal and Rule designate mining and processing of mineral and aggregate resources as locationally dependent uses. Such uses may be allowed when it is found that:

- The proposed use will not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands;

- The proposed use will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression

personnel; and

- A written statement recorded with the deed or written contract with the county or its equivalent is obtained from the land owner which recognizes the rights of adjacent and nearby land owners to conduct forest operations consistent with the Forest Practices Act and Rules for uses authorized in OAR 660-06-025(4)(e), (l), (r), (s) and (v).

There is no indication that expanded mining at this site would force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands. Several properties surrounding the existing operation are used for primary resource production without recorded adverse impact. An expanded operation should similarly have no impact. Also, there is no indication that an expanded mining operation would increase fire hazard or the costs and risks associated with fire suppression.

The third Rule criteria is not applicable to aggregate resources. It applies only to parks and campgrounds, reservoirs and water impoundments, home occupations, health hardship mobile homes, and temporarily occupied accommodations for fishing.

ii. Goal 6–Air, Water and Land Resources

Goal 6 requires "All waste and process discharges from future development, when combined with such discharges from existing developments shall not threaten to violate, or violate applicable state or federal environmental quality statutes, rules or standards." The existing operation is conducted in compliance with all applicable state and federal regulations. Any expansion would also be required to satisfy those regulations.

iii. Goal 7–Areas Subject to Natural Disasters and Hazards

Goal 7 requires "Developments subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards." The majority of this resource site has been identified as having slope hazard potential (Shannon & Wilson, 1978) and the conduct of a mining operation is defined in the Statewide Planning Goals as a development. The existing operation is conducted in compliance with all applicable mine safety regulations. Any expansion would also be required to comply with those safety regulations.

iv. Goal 15–Willamette River Greenway

While none of the resource site is within the Willamette River Greenway, that portion of the impact area east of US Highway 30 is within the Greenway. An expanded operation should be conducted in a manner that conserves the scenic quality of

lands within the Greenway.

4. RESOURCE ANALYSIS SUMMARY

a. General Conclusions

i. The preceding Section A *Significance Determination* confirmed that the Angell Brothers site is a significant Goal 5 resource.

ii. The discussion in Section B *Resource Analysis* identifies several conflicts between expansion of an aggregate production operation on this resource site and identified conflicting uses within a 1,200 foot impact area surrounding the resource site.

iii. The list of land uses under the heading of allowed uses not applicable to the analysis" (section B.3.a.) are determined to not conflict with protection (for extraction) of the aggregate resource.

iv. The list of conflicting uses that are described as "allowed uses that may conflict, but are unlikely to occur" (section B.3.c.) should not be included in the list of allowed uses in the mapped impact that may be made part of any subsequent aggregate resource protection program; thereby, assuring that there will be no conflict.

v. Within the impact area there is an inventoried significant Goal 5 stream and a 3–C wetland that are found to be potential conflicts with the aggregate resource.

vi. Within the impact area there are Goal 5 scenic resources that are found to be potential conflicts with the aggregate resource.

vii. Within the impact area there are Goal 5 wildlife habitat resources that are found to be potential conflicts with the aggregate resource.

viii. Within the impact area there are residential, forest and conservation uses that are found to be potential conflicts with the aggregate resource.

ix For the area of the aggregate resource site subject to any future Oregon Department of Geology and Mineral Industries (DOGAMI) operational permit, Multnomah County deems Oregon Department of Environmental Quality (DEQ) standards for noise levels, air quality, and water quality to be appropriate to protect the health, safety and welfare of citizens and to be appropriate to protect the land and water resources within the impact area. The County requests participation by DEQ and the Oregon Department of Fish and Wildlife in the review of any new DOGAMI operational mining permit at this site.

(b) Synopsis of ESEE Consequences

i. Residential

Consequences if Residential Uses are not allowed (in impact area)

Economic: Lower property values; protection of aggregate resource
Social: Loss of opportunity for rural homesites and lifestyle; takings issue
Environmental: Insignificant
Energy: Insignificant

Consequences if Residential Uses are allowed in a limited manner (in impact area)

Economic: Development standards may require homebuilder to mitigate conflicts with potential mining operation
Social: Development standards may limit location of residence on property; potential additional complaints of mining operation
Environmental: Insignificant
Energy: Increased energy consumption in home construction to provide mitigating measures from mining

Consequences if Residential Uses are allowed fully (in impact area)

Economic: Retention of property values; possible modification of mineable area and/or operational methods
Social: More opportunity for rural homesites and lifestyle; increase in complaints regarding aspects of mining operation
Environmental: New homes could be located in a manner that could place an aggregate operation in violation of DEQ environmental standards
Energy: Insignificant

ii. Uses to Conserve Soil, Air and Water Quality and to Provide for Wildlife and Fisheries Resources

Consequences if Uses to Conserve Soil, Air and Water Quality and to Provide for Wildlife and Fisheries Resources are not allowed

Economic: Reduction of mining operation expense
Social: Loss of habitat and passive recreation opportunities
Environmental: Reduction of environmental quality and habitat within impact area
Energy: Reduction of energy expended for environmental quality control measures

Consequences if Uses to Conserve Soil, Air and Water Quality and to Provide for Wildlife and Fisheries Resources are allowed in a limited manner

Economic: No increase over existing mining expense for environmental quality control measures; reduction of possible expansion areas
Social: Provision of passive recreation opportunities
Environmental: Maintenance of resource quality and habitat areas
Energy: No increase over existing energy expended for environmental quality control measures

Consequences if Uses to Conserve Soil, Air and Water Quality and to Provide for Wildlife and Fisheries Resources are allowed fully

Economic: No, or slight, increase over existing mining expense for environmental quality control measures; reduction of possible expansion areas
Social: Provision of passive recreation opportunities
Environmental: Maintenance of resource quality and habitat areas
Energy: No increase over existing energy expended for environmental quality control measures

iii. Forest Operations or Forest Practices on the Resource Site

Consequences if Forest Operations or Forest Practices are not allowed

Economic: Loss of the value of the forest products
Social: Production of mineral instead of wood construction material
Environmental: Loss of forest resource
Energy: No energy expended to reclaim site for forestry purposes

Consequences if Forest Operations or Forest Practices are allowed in a limited manner

Economic: Increased mine operation expense for reclamation for forest purposes; full realization of the income potential of the primary resources of the site
Social: Production of both wood fiber and aggregate material
Environmental: Incremental modification of the topography and reclamation for forest purposes
Energy: Increased energy used for reclamation of site for forest use

Consequences if Forest Operations or Forest Practices are allowed fully

Economic: Retention of the value of the forest products; loss of utilization of the mineral resource
Social: Production of wood fiber vs aggregate material
Environmental: Retention of existing forest resource base

Energy: No energy expended for mineral production at this site, but probable transfer of energy expenditure to an alternative site; less energy expended for forestry than mining

iv. West Hills Scenic Area

Consequences if West Hills Scenic Area is not allowed

Economic: No operational expenses for buffering, screening or phasing
Social: Loss of aesthetic enjoyment
Environmental: Loss of the scenic environment
Energy: No identified impact

Consequences if West Hills Scenic Area is allowed in a limited manner

Economic: Increased operational expenses for buffering, screening and phasing
Social: Increased availability of aggregate material
Environmental: Modification of this portion of the viewshed over time
Energy: Increased energy expenditure for buffering, screening and phasing

Consequences if West Hills Scenic Area is allowed fully

Economic: Loss of the value of the aggregate material
Social: Retention of aesthetic enjoyment; limitation of the availability of aggregate material
Environmental: Retention of existing natural environment
Energy: No energy expended for mineral production at this site, but probable transfer of energy expenditure to an alternative site

v. West Hills Wildlife Habitat Area

Consequences if West Hills Wildlife Habitat Area is not allowed

Economic: Full utilization of the aggregate resource
Social: Loss of educational and recreational activities
Environmental: Loss of habitat area; isolation of Forest Park species
Energy: None identified

Consequences if West Hills Wildlife Habitat Area is allowed in a limited manner

Economic: Increased operational expenses resulting from reclamation; reduction of supply due to limitation of expansion areas
Social: Continued wildlife migration; provision of a necessary construction material
Environmental: Retention of habitat area necessary for migration and modification of habitat in mined areas

Energy: Insignificant

Consequences if West Hills Wildlife Habitat Area is allowed fully

Economic: Loss of potential expansion area
Social: Retention of existing educational and recreational activities
Environmental: Retention of all existing habitat areas
Energy: Reduction of energy expended for aggregate production at this site

vi. West Hills Water Resource and Wetland Sites Area

Consequences if Water Resource and Wetland Sites are not allowed

Economic: Reduction of mining operation expenses
Social: Loss of educational and recreational activities and aesthetic quality
Environmental: Reduction of water resources and water quality
Energy: Reduction of energy expended for water quality control

Consequences if Water Resource and Wetland Sites are allowed in a limited manner

Economic: Increased mining operation expense to protect water quality and to avoid water resource areas
Social: Provision of aggregate material within the limitation of environmental quality control standards
Environmental: Retention of existing level of water quality
Energy: Increased energy expended for water quality control

Consequences if Water Resource and Wetland Sites are allowed fully

Economic: Increased mining operation expense to protect water quality and to avoid water resource areas
Social: Retention of existing educational and recreational activities and aesthetic quality
Environmental: Retention of existing level of water quality
Energy: Increased energy expended for water quality control

C. Appendix

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SAUVIE ISLAND Conservancy

Dedicated to the preservation of island rural life, wildlife & natural recreation areas

P.O Box 83873
Portland, OR 97283
August 8, 1992

Multnomah County Planning Commission
2115 SE Morrison St.
Portland, OR 97214

To the Commissioners:

Angell Brothers proposes a Comprehensive Plan Amendment and a Conditional Use Permit for an expansion of their quarry which, at its present size, already looms over the view from Sauvie Island as a grim reminder of planning gone awry. The Sauvie Island Conservancy opposes this expansion, and would like to emphasize the most critical issues raised by this proposal for residents and visitors to Sauvie Island:

1. SCENIC IMPACTS

Sauvie Island is considered by many to be the scenic jewel of Multnomah County. Island wildlife areas alone accounted for nearly 800,000 visitors last year. The Angell Brothers quarry is located by the Sauvie Island Bridge, the island's sole access and exit point, where it is overwhelmingly visible to every island visitor. The scar carved by this invasive excavation can be seen from the entire southern end of the island, and over much of Gillihan Road, including the popular Pumpkin Patch farm market and U-Pick. It is also prominently viewed from the Bybee-Howell Territorial Park, where a potential interpretive center would draw an even higher concentration of visitors encouraged to congregate in that area to better protect the island's wildlife areas. The Burlington Bottoms natural area would also be invaded by the view of an expanding quarry operation.

2. THE QUARRY SCAR

The present size of this quarry already represents an unsettling industrial patch in the once thickly-wooded hillside. The proposal indicates there will be speedy reclamation of the hillsides, using successions of 12-foot terraced benches with a soil depth of 2 feet for tree replanting, guaranteed by a bond. There has been no history of reclamation at the site, though the

bond is an encouraging addition. But many say a 2-foot soil depth in a 12-foot bench is nowhere near adequate to replant trees in an area known to be susceptible to landslides. Nor is there any evidence that this kind of reclamation has been successful on comparable slopes. Oregon's coastal mountains are dotted with replanted clearcuts where the seedlings have slid away in the soggy terrain. This proposal needs to be on firmer ground to merit any confidence.

3. FUTURE NEED FOR AGGREGATE

Recent advances in technology, such as the reuse of other materials such as asphalt from older roads, could create a decreasing demand for aggregate. Further, this pit is not the only place this kind of aggregate can be mined. Hard basalt is said to be generously distributed from West Linn to St Helens. Local residents fear a 100-year commitment for such a physically disruptive operation if demand for the product declines and the company's commitment to thorough reclamation declines correspondingly.

4. AIR AND WATER QUALITY AND OTHER NEIGHBORHOOD EFFECTS

Runoff from this project is not permitted to drain into the sensitive Multnomah Channel. But plans include a settling pond, on a hillside, to capture drainage from 600 acres. There may be no effective way to contain the enormous downfall of water from entering the channel during heavy rains. The defunct Wildwood landfill site proved to be extremely susceptible to landslides; the quarry is merely five miles from that site, with the potential to damage houseboats and natural areas below. Considerable dirt will have to be mined to reach the aggregate. This overburden will either have to be piled on site, threatening landslides in a wet winter, or hauled away, meaning more traffic. Overflow would have to enter the newly-protected area at Burlington Bottoms, and there are no provisions to protect the water quality of that drainage. In addition, excessive dust and noise from the quarry's present operation have been common occurrences for nearby residents, likely even more so from expanded mining activities. There have also been numerous accidents involved with quarry trucks on highway 30, and the danger could increase with expanded quarry activity.

5. WILDLIFE CORRIDOR

Angell Brothers' proposed 200-meter wildlife corridor is probably the most controversial issue in an area already being threatened by extensive construction. Angell Brothers officials have made serious attempts to reach an accord with the Oregon Department of Fish And Wildlife over this narrow patch of hilltop. But this planning effort has seemingly not taken into account the surrounding land use which could rapidly destroy the existing wildlife corridor. Many lots which could -- and likely will -- receive building permits ring the proposed corridor. What will that corridor mean if ultimately there is no way for wildlife to reach it?

The Sauvie Island Conservancy asks that the Plan Amendment and Conditional Use Permit be denied. The Angell Brothers' scope of work should be limited to their permitted site until the already-funded comprehensive zoning and natural resources review of Multnomah County's Northwest Hills and Sauvie Island has been completed. This unique natural area is much too sensitive to be condemned prematurely to such an invasive activity as an expanded rock quarry without considerably more study.

Yours truly,

Donna Matrazzo
Stuart Sandler
Representing the Sauvie Island Conservancy

LINNTON
Community Center
10614 N.W. St. Helens Rd.
Portland, Oregon 97231
1-503-286-1344

Sept. 18,1992

Multnomah County Planning Commission
2115 SE Morrison St.
Portland, OR 97214

RE: Angell Bros. Quarry Expansion
PR 7-92, #66 , CU 14-92, #66

Dear Commissioners,

The Linnton Neighborhood Association is very concerned with the planned expansion of the Angell Bros. quarry.

We are concerned that truck traffic will increase over time as stated on page 7 of the Comprehensive Plan Revision CU 14-92. Nearly all traffic from the quarry passes through Linnton on highway 30. We already have considerable problems with noise, pollution, and safety due to excessive truck traffic. In addition, ge numbers of trucks from the quarry pass over the St Johns Bridge daily, of them loaded with topsoil bound for the St Johns landfill. Topsoil om the expansion is destined for the landfill as well. The bridge is deteriorating and is not adequate to support this continued or expanded use. The bridge is a scenic and historic structure and should be protected. Alternate routes, although longer, should be used.

Also, Linnton residents are concerned about the continued viability of wildlife in Forest Park if the wildlife corridor is disrupted in this way. Nearly all residences in Linnton border the Park or are a few hundred feet away. We think the wildlife corridor does exist even if the time and money have not been spent to prove it. We believe the reclamation plan will be inadequate to restore the integrity of the forest for timber, scenic, or wildlife values. Even with a financial bond it would be extremely difficult to try and fix problems if it is not done right the first time. Trying to establish a healthy conifer forest on one foot of topsoil over bedrock does not sound promising.

For these reasons, we oppose the expansion plan, and request that you deny the permit.

Sincerely,

Julie Winslow

Julie Winslow,
Linnton Neighborhood Association

Jodeanne Bellant M.D.
14956 N.W. Mill Road
Portland, Oregon 97231

PR 7-92
CU 14-92

Multnomah County Planning Commission
2115 SE Morrison
Portland, Oregon 97214

Dear Commissioners:

I am writing to oppose the Comprehensive Plan Amendment and Conditional Use Permit for Angell Brothers Quarry on Highway 30 near the Sauvies Island Bridge. I oppose this expansion for a number of important reasons, which I will outline below.

1. Detrimental Impact on Neighboring Homes, Property and Roads:

   I live on a houseboat below the existing quarry. We suffer from diminished air quality and dust pollution from the existing operations, and the noise generated from blasting activities are considerable. Currently, our moorage residents must wash their cars on a daily basis if they wish them to stay clean due to dust buildup from quarry activities. Our homes, our lungs and our property will be subject to many times the current air pollution levels should the quarry be enlarged and more land become de-forested. To allow such a massive expansion of activities at this site would sharply amplify our existing problems.

   Additionally, I have personally witnessed several fatal and near fatal accidents involving trucks exiting the Angell Brothers facility, and I was once nearly rear-ended and side-swiped on Highway 30 by a fully loaded runaway truck leaving their steep access road. Increasing the truck traffic on and off Highway 30 to this expanded facility will dramatically increase the risk to the public using Highway 30, secondary to the poor visibility and steep slope of the Angell Brothers access road.

2. Scenic Degradation of the West Hills Corridor:

   Among the most painful sights along the West Hills Corridor is the current devastation of forested habitat by wanton clear cutting along the hills, and the current scar imposed by the existing Angell Brothers Quarry. These blights are visible for many miles along Highway 30, on Sauvies Island and from Washington State. The West Hills are immediately adjacent to some of the most scenic areas in Multnomah County and should be preserved as such for future generations. The expansion of Angell Brothers would have devastating effects on the scenic values so honored by the residents of Multnomah County and should not be allowed. The so-called buffer zones currently do not buffer the visual blight caused by the existing quarry; to think that they would buffer an operation 4-5 times the size is ludicrous.

3. Environmental Impacts:

There has been substantial citizen and county work aimed at preserving the integrity of the Wildlife Corridor between the Coast Range and Forest Park. The West Hills are an important link in this ecologically and scientifically established significant natural area. We cannot rehabilitate this important natural area 100 years from now when all the biodiversity of flora and fauna have disappeared. We must steward these lands today, and the Angell Brothers expansion will devastate the integrity of the West Hills Corridor and significantly reduce the habitat available for use by many species of animals that currently live and forage in Forest Park. Allowing this expansion to proceed would be to ignore and trivialize the will and hard work of so many citizens and officials who understand the importance of land use stewardship and who wish to safeguard Multnomah County's special urban wilderness system.

Water quality would also suffer as a result of the proposed expansion. My moorage property receives the runoff from the creek that flows through the existing quarry site. We have experienced an increase in the past 10 years of silt runoff from quarry operations, which is building up in our backwater area. If the riparian zone of this stream is devegetated, as stated in the Angell Brothers application, water pollution and erosion will surely increase, having a detrimental effect on the water quality of Multnomah Channel. The build up of silt in our backwater will force us to eventually dredge our backwater, which is a direct negative impact on our property and on Multnomah Channel due to quarry operations. I am very concerned that the settling ponds which are currently in place at the Angell Brothers site are not working adequately even now, and certainly would not adequately control the runoff from a completely devegetated stream (which would, for all purposes, be sacrificed to this proposal).

4. Rehabilitation:

The Angell Brothers Application addresses the concept of "rehabilitation" of quarry operations after cessation of activities. This term deserves some elucidation. It is my firm belief that quarry activities that denude and degrade forest habitat and create steep rock slopes cannot be rehabilitated. For example, please consider the old rock quarry at the site just east of the St. John's bridge. This "rehabilitated" site is still an eyesore many years after its shut down. No significant vegetation has been able to thrive on the steep denuded slopes, or at the base of the quarry. The site has recently been turned into some sort of large and barren parking lot. The physical scar into the hillside is visible from land and air. Likewise, enlarging the current Angell Brothers quarry to 4-5 times its current size will leave that much larger of a blighted eyesore in the West Hills for hundreds of years to come.

In sum, for the various reasons elucidated above, I urge you to conduct an ESEE analysis and to deny this permit application. This proposed expansion of quarry operations is not in the public's best interest.

estimated to last 30 years at most would be most short sited. Lets protect the continued life and flexibility of wildlife species of Forest Park intrigal parts of a significant echo system valued by Oregonians state wide. Thank you.

Chairman: Questions? Next speaker please.

Dar Wruble: My name is Darlene Wruble and I live at 13162 NW McNamee, Portland, 97231. My main concern is that I live on that 3.12 acres that's the little glitch that you'll see on the map. My main concern is regarding the expansion of Angell Bros. quarry have to do with the noise level. As the present time who lives at my home and he works evenings and they do hear the noise during the day time of what the existing quarry and so if it comes within 625 feet of my property line it basically is going to be much louder as well as the dust level. One of the things that I would like to also clarify while I'm here, there was a statement by Angell Bros.'s attorney last time regarding an easement that I had agreed to an easement for the Friends of Forest Park or for whatever. - I have agreed to no easement whatsoever on my property. Anybody have a map, on the big one. I'm in that little notch. My home is about 150 feet from the back property line and so of course I am very concerned. I'm also concerned regarding the water. I have a well that is 730 feet deep and so what is this rock quarry going to do to the existing wells that are up there. Everyone of these people on these new proposed 38 acres will have a well that will be approximately that deep, probably in the 600 feet maybe 500 feet and so will there be contamination to our water. This is something that no one has brought up at all before. Being here and listening to the people regarding the having the places for them to have the guns and so forth basically I am concerned because of all the noise level.

Hunt: Can you clarify one thing for me? You live on McNamey Road.

Dar Wruble: Yes I do.

Hunt: Is there a lot of houses being built currently on that road.

Dar Wruble: There have been a few, yes I've been there since 1985.

Hunt: So in your opinion is there more houses affected currently then. Is there more houses going to be affected by the quarry then there was a couple years ago?

Dar Wruble: Of course, yes.

Hunt: Thank you.

Chairman: Commissioner Douglas.

Douglas: You were there when the well was drilled for your homesite.

Dar Wruble: Yes I was.

Douglas: Do you have knowledge of what it went through, whether it was rock all the way down, what was it.

Dar Wruble: I don't know but I do have what they hit, how many feet down, yes. I really couldn't tell you that.

Douglas: How exten...in that, what the formation was underneath it.

Other Voice: Just by answering the dialogue between the opponent and the chair the rules do provide an opportunity to the opposition to respond to the rebuttle and the extend of that respond and to the rebuttle was determined by the board but by the planning commission and that's stated in these rules for conducted hearings section 6 subsection N and the sub one is the provision for allowing you to determine the extent of the rebuttle.

Other Voice: I have a question, says allowing any part of ..... application about testimony and evidence.

Other Voice: And provide opportunity for the opposition to respond.

Chairman: The rules are a little...because felt that it states that the opposition is entitled to submit...you the commission must consider those findings...whether in fact .....we can determine that at the next meeting.

Other Voice: There is an opportunity for the opposition to provide you questions and that you're for you to ask those of the...

Neil Kagen: Excuse me, Mr. Chair if you make that decision next

AUSTIN POWDER COMPANY

CHEHALIS, WASHINGTON 98532

Mr. Skip Anderson
Angell Bros., Inc.
P.O. Box 03449
Portland, OR 97203

May 24, 1992

Dear Skip,

Per your request, the following is a discussion of the blasting practices currently in use at the Angell Bros. quarry.

Austin Powder Co. has been supplying explosives and providing technical assistance at this quarry for about five years. During this time, we have performed vibration and air blast measurements on various shots. The seismographs used have been placed in a number of different locations, including a residence on Sauvie Island, adjacent to the railroad tunnel, on a houseboat at the mooring, and at a residence on the ridge south of the quarry.

In all instances, the vibrations recorded on the seismograph were significantly below the accepted particle velocity limit of 1.75 inches per second. This limit has been determined by the U.S. Bureau of Mines and other State and Federal agencies as being the point at which possible minor structural damage could occur to wood framed structures. Possible damage at this level would include cracks in plaster walls. As the particle velocity at the structure increased over 2.50 inches per second, evidence of separation between ceilings and walls, as well as cracks in foundations could occur.

As an example of the level of vibrations produced from the shots at the quarry, we recorded higher vibrations from trains going through the tunnel than we did from a shot.

Along with concerns of structural damage, the possibility of damage to domestic water wells also should be addressed. Obviously, the closest well to the areas where the blasting occurs is in the quarry itself. We have not seen any evidence of reduced flow rates or even any cloudiness in the water from this well during the time we have been involved in the blasting. Studies on the effects on wells from blasting indicate that unless the shot is in very close proximity to the well, there is little probability of causing damage. In my opinion, there are no wells that I am aware of close enough to be affected by the blasting operations.

1306 N.W. Maryland · PO Box 1223 · Chehalis, WA 98532 · Phone: (206) 748-4800 · Fax: (206) 748-4877

Typical shots at the quarry consist of approximately 100 holes, 3 1/2" diameter on either an 8' x 8' or a 9' x 9' pattern. Depending on the area being blasted, the holes will range from 20' to 80' in depth. Normally, holes are loaded to within 8' of the top, that space being backfilled with crushed rock. This loading process typically results in a powder factor of around 0.85 lbs. of explosives per cubic yard of rock. Because of the basalt formation in the quarry, this relatively light powder factor is sufficient to produce excellent results with minimal vibration and noise effects.

As in the past, the blasting program at Angell Bros. Quarry will continue to include periodic use of blasting seismographs to monitor ground vibrations and air blast. By doing this, we will be able to fine tune the blasting program as we move into different areas of the quarry.

Hopefully, this brief summary is sufficient. Please call if I can be of further assistance.

Sincerely,
AUSTIN POWDER COMPANY

Steve Harris

LANE
POWELL
SPEARS
LUBERSKY

Frank H. Parisi
(503) 778-2116

October 12, 1992

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Corporations

Multnomah County Planning Commission
2115 SE Morrison
Portland, OR 97214

Re: Angell Bros. Rock
Our File No. 701062-1

Dear Commissioners:

In response to the various issues that were raised at last Monday's hearing, Angell Bros. submits the following information:

1. For purposes of comparison, the economic value of the mineral and aggregate resource may be estimated as follows: Assuming that Angell Bros. is able to achieve similar rates of recovery of useable material in the expansion area as it does in the existing area, and assuming also that the proposed buffer and wildlife conservation easement areas are not mined, Angell Bros. can expect to produce approximately 84,000,000 cubic yards of aggregate material from the expansion area. The average royalty paid by the Oregon Department of Transportation for material of this type is presently $.50 per cubic yard. This would mean that the Angell Bros.' resource has a value of $42 million.

It is easy to throw around big numbers like this, but some caution is probably in order. The $42 million figure has not been reduced to present value, even though the potential stream of income from the resource would be received over the life of the mine. The life of the mine depends on the market, and what economies of scale can be realized from the expansion area. If the current robust market continues, the mine could be played out in approximately 30 years.

Another component of the economic value of the site is employment. The present employment at the site averages about 12 persons, with peak employment at approximately 17 persons. Wages average $12-13 per hour. The total direct payroll generated by the Angell Bros. site is about $500,000, and to this should be added another $500,000 for the employees, such as truck drivers, who work directly for customers of Angell Bros. who haul material in their own trucks.

...nchorage, AK
...les, CA
...mon, WA
...a, WA
...ortland, OR
...eattle, WA
London, England
Tokyo, Japan

As I recall, the figure proposed by one of the objectors for the supposedly "lost" value of the forestry resource was $2 million (I don't recall if this was gross or net), and this was based upon prices for timber cut from a tract approximately 140 acres in size that had soil similar to the soil on the Angell Bros. site. If this figure is used for comparison, it too would have to be reduced to its present value on the assumption that the $2 million would not be realized for 60 years, since all of the timber on the portions of the Angell Bros. site that are within the proposed expansion area were logged in 1990 and could not be logged for another 60 years. The employment value of the timber would be negligible, since all of it would be cut in a few months.

Probably the most important point in making your economic comparison is that mining is a transitional land use. It does not permanently displace any other use. Thus, timber receipts or residential housing values, or other potentially valuable uses of the site, should not be viewed as items that are "lost", but rather as items that are delayed until the site is reclaimed.

2. I believe one Commissioner had a question about the noise test data I submitted and whether there were tests for blasting activity. I had lost my copy of the May 8, 1992 letter from Mr. Harris and could not respond at the hearing. I now enclose a copy of Mr. Harris's May 8, 1992 letter. As we explained at the hearing, we did not blast this year, and do not presently see a need to blast in 1993. However, blasting has occurred from time to time in the past and could conceivably occur on one or two days in future years. I asked Mr. Standlee to provide the attached letter regarding compliance with DEQ blasting standards.

3. Commissioner Yoon asked a question about a statement I made to the effect that rebuilding habitat was the only way of enhancing environmental values, since prohibiting all activities in the site was no longer an option. My point may not have been clearly expressed. My point was this: the Tualatin Ridge is not a wilderness area. Many activities are allowed in the area and will be pursued by private landowners. Prohibiting all use of the site is not an option for the County, unless the County is willing to acquire all of the expansion site.

The current owners are willing to agree to a reasonable compromise, but they are not willing to give up all use of the site, nor is Angell Bros. willing to permit its leasehold interest in the property to sit idle. If the expansion area permit is not granted, the owner of the property, Linnton Rock Corporation, will undoubtedly harvest timber on the property in all of the buffer areas that were proposed to shield the expansion area from Sauvie Island and other areas. (I enclose the statement from Linnton

Rock to this effect.) In addition, both Angell Bros. and Linnton Rock will have to put the property to some economically viable use if they are not permitted to engage in mining. The only such use that makes economic sense is housing. I believe a number of the Commission members understand that this is the only realistic alternative, and that none of the environmental advantages that Angell Bros. is willing to grant in conjunction with mining would be available if mining is prohibited.

Very truly yours,

Frank M. Parisi

Enclosure
cc (w/enc): Skip Anderson
Neil S. Kagan, Esq.

J:\CG1\FMP\10706FMP.LTR

NEIL GOLDSCHMIDT
GOVERNOR

Department of Transportation

HIGHWAY DIVISION

TRANSPORTATION BUILDING, SALEM, OREGON 97310

In Reply Refer to
File No.:

DATE: February 22, 1990 INT

TO: Susan Brody, Director
Department of Land Conservation and Development

FROM: Donald E. Forbes, P.E.
State Highway Engineer

SUBJECT: Oregon Land Use Planning Goal
Resource Planning

The Highway Division requires quality mineral aggregates for road and bridge construction. If Oregon's Highway System is to continue to be maintained and expanded, the State's mineral aggregate resources must be inventoried and protected for future use.

Aggregates which do not meet our requirements for quality cannot be used for construction of bridges and highways. Collectively, Oregon has a lot of rock but it is poorly distributed. For example, quality rock from which to make aggregates is extremely scarce in Multnomah, Clatsop, Tillamook and Lincoln counties. In some locations the importing of aggregates requires a 75-mile round trip.

During the 1988-1989 fiscal period the Division used approximately 6,000,000 tons of aggregates in various forms in its Construction and Maintenance Programs. This represents an expenditure of some $45,600,000.

Many more miles of highway are scheduled to be improved or repaved in the future through our Access Oregon Highways and Surface Preservation Programs. Repaving projects require between 4,000 and 5,000 tons of quality aggregate per mile of two-lane highway.

Cities and counties also depend on a steady supply of quality aggregates for their road construction and maintenance programs. The recent increases in gasoline tax revenues have allowed these agencies to begin to expand their programs to stay abreast of their roadway transportation needs.

Some of the criteria for mineral aggregates to be used in road construction and maintenance are:

> Quality - The aggregates must be of a sufficiently high quality to provide the necessary strength and durability for highway and bridge construction.
>
> Quantity - To make an aggregate source economically feasible there must be a sufficient quantity of materials available for use over a period of several years.
>
> Availability - The materials must be as close as possible to the construction site to reduce transportation costs.

This third criterion is especially important. The cost of hauling aggregates by truck is currently $46 per hour, so any haul distance requiring an extra hour per trip would add $4.60 per ton to the cost.

The hauling costs start to add up in Multnomah County, where half of the high quality aggregate must be imported from sources outside the county. Even with the economics of barge and freeway transport we pay an extra $1.50 to $2.75 to haul each ton of aggregate. Last year, projects in Multnomah County used some 375,000 tons of aggregate for which we paid $796,875 in added transportation costs.

The Highway Division feels the need to help protect sources of quality aggregates to assure that we are able to get the most value from our gasoline tax revenues. If you feel we can be of assistance in this endeavor, please do not hesitate to call on us.

bc Robert N. Bothman
Bill Anhorn
Duane Christensen
Bill Penhollow
Ken Husby
Jack Bryan
Don Hull
Dick Angstrom

JB:sl

1. PUBLIC COMMENTS ON SIGNIFICANCE (CHAPTER IV.A):

a. ISSUE: Location should be compared against other known resource sites.

ISSUE RAISED BY: LCDC Staff and Arnold Rocklin

RESPONSE: Information from the DOGAMI and City of Portland was included for all known sites within Multnomah County.

b. ISSUE: Quantity should be compared against other known resource sites.

ISSUE RAISED BY: LCDC Staff, Friends of Retaining Channel Environment, Inc. and Arnold Rocklin

RESPONSE: Information of quantity was included for all known sites within Multnomah County.

c. ISSUE: Quality should be compared against other known resource sites.

ISSUE RAISED BY: LCDC Staff, Friends of Retaining Channel Environment, Inc. and Arnold Rocklin

RESPONSE: Information of quality was included for all known sites within Multnomah County and testimony regarding well logs was added.

d. ISSUE: Impact area not defined.

ISSUE RAISED BY: Arnold Rocklin

RESPONSE: Identification of the impact area is discussed in Chapter IVB.1.

e. ISSUE: Slope stability of overburden.

ISSUE RAISED BY: Arnold Rocklin

RESPONSE: The ODOGAMI requires and oversees maintenance overburden material as a part of their annual operating permits.

f. ISSUE: Impacts of mining on water and wildlife resources.

ISSUE RAISED BY: Friends of Retaining Channel Environment, Inc.

RESPONSE: The impacts of mining on water and wildlife resources are discussed in Chapters III, IV.B.3, V, and VI.

g. ISSUE: Mining should be allowed to expand and produce a needed resource.

ISSUE RAISED BY: Sauvie Island Grange

RESPONSE: The ESEE analysis will determine if expansion of the mining operation is appropriate.

2. PUBLIC COMMENTS ON RESOURCE ANALYSIS (CHAPTER IV.B):

a. ISSUE: Impact area should include the entire area of all other conflicting uses and resources.

ISSUE RAISED BY: Neil Kagan and Arnold Rocklin

RESPONSE: The impacts of noise and dust on residences have been found to decrease with distance from the mining operation. The visual impact of the operation decreases with distance. The impacts on streams, wetlands and wildlife habitat are greatest near the mine operation. Distance alone can mitigate adverse impacts. It is appropriate to consider an impact area where there is a question as to whether adverse impacts can be mitigated.

b. ISSUE: Traffic impacts not considered.

ISSUE RAISED BY: Arnold Rocklin

RESPONSE: Traffic impacts were considered and determined not to a conflict based on information received from the Oregon Department of Transportation.

c. ISSUE: Public and private conservation areas not considered in the MUA–20 portion of the impact area.

ISSUE RAISED BY: Arnold Rocklin

RESPONSE: The Rafton/Burlington Bottoms are the only portion of the impact area that is zoned MUA–20. The BPA wetland mitigation plan for that area is considered.

d. ISSUE: The Rafton/Burlington Bottoms incorrectly identified as having to be fully protected.

ISSUE RAISED BY: LCDC Staff, Richard Shepard and Arnold Rocklin

RESPONSE: Reference corrected.

e. ISSUE: Agency responsibility and coordination.

ISSUE RAISED BY: LCDC Staff

RESPONSE: The report recognizes the responsibility of DEQ and ODOGAMI with respect to environmental quality and natural hazards. County staff acts as a coordinator between those agencies and conditionally approved mining operations.

f. ISSUE: Regulation of forestry uses by the Board of County Commissioners.

ISSUE RAISED BY: Richard Shepard

RESPONSE: The resource analysis did not intend to imply that the Board does or would regulate forestry uses beyond that authorized by the Goal 4 Rule.

g. ISSUE: Viability of reclamation

ISSUE RAISED BY: Arnold Rocklin

RESPONSE: Reclamation is appropriately considered under a program to protect the resource if it is deemed worthy of protection. The timing, type and amount of reclamation depends on the size of an expansion area. Any reclamation should be proven to be viable before it is approved.

h. ISSUE: Compliance with DEQ and DOGAMI standards does not result in no impacts

ISSUE RAISED BY: Arnold Rocklin

RESPONSE: It is not intended that compliance with DEQ and DOGAMI standards results in no impacts. It only means that the impacts are within the acceptable limits established by those agencies with expertise in those areas.

i. ISSUE: The economic and social impact of allowing conflicting uses, except perhaps for residential uses, would merely postpone, not prevent future mine expansion.

ISSUE RAISED BY: Neil Kagan

RESPONSE: Those conflicting uses that were identified as preventing mining expansion if fully allowed are scenic and wildlife resources. Those resources will always be present. If it is determined now that they significant enough to be fully allowed with respect to mine expansion, it is inconceivable that they would be determined to be less significant in the future. That would prevent mine expansion.

j. ISSUE: The analysis should have generally addressed the loss of revenue and attractiveness that destruction of the scenic, wildlife and stream resources would have in terms of economic and social consequences.

ISSUE RAISED BY: Neil Kagan

RESPONSE: Amendments were made.

k. ISSUE: Acerage calculations of mine area, buffers and conservation easement area were incorrect.

ISSUE RAISED BY: Arnold Rocklin

RESPONSE: That discussion was eliminated. Those acreages were derived from a previously proposed operation expansion plan that is not a part of this ESEE analysis. The present ESEE analysis would propose operational restrictions if mining expansion is allowed, and that expansion could vary greatly from previous proposals.

l. ISSUE: Expanded extraction of rock should be allowed for community needs.

ISSUE RAISED BY: Hampton Resources, Inc.

RESPONSE: The ESEE analysis will determine if expansion of the mining operation is appropriate.

CHAPTER V

WILDLIFE HABITAT

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A. SIGNIFICANCE ANALYSIS

1. RESOURCE DESCRIPTION

No precise definition for wildlife habitat is contained within the Oregon Statewide Planning Goals document or the Oregon Administrative Rules -- it is the responsibility of the local jurisdiction to make findings, based upon evidence, that an area is or is not significant for wildlife habitat. Multnomah County contains a number of existing areas which are identified as wildlife habitat, including areas which are important for big game, waterfowl, and sensitive bird species. However, recent studies have documented the importance of preserving whole eco-systems for a full range of wildlife, from insects to large carnivores, as opposed to identifying and preserving small areas for a certain target species of concern such as elk, or bald eagles. These studies (see bibliography for *Wild About the City*(Houle 1990) and *A Study of Forest Wildlife Habitat in the West Hills* (Lev, Fugate & Sharp, 1992), discussed later in this report) assert that the only way to preserve sensitive species from further declines in population or extinction is to preserve large, contiguous areas of the entire ecosystem in which these species reside.

The definition of wildlife habitat recommended by the Oregon Department of Fish & Wildlife and adopted for the purposes of this study reads as follows:

> *Wildlife habitat is an area containing physical and biological features which supply resources sufficient to sustain the presence of a resident or migratory wildlife species population for at least some part of their annual life cycle. Such an area is significant if it is large enough to sustain a viable population; or sustains the presence of unique, sensitive, threatened, or endangered species; or provides a critical component to a species' life requirements during some time during the year (i.e. nesting or roosting sites, big game winter range); or sustains the presence of a high diversity of native plant or animal species; or comprises a functioning ecosystem in whole or in part (i.e. wetland, old growth forest); or provides a connection between other areas of significant wildlife habitat (i.e. riparian or upland wildlife corridor).*

2. LOCATION

> *OAR 16-600(3): Some Goal 5 resources (e.g. natural areas, historic sites, mineral and aggregate sites, scenic waterways) are more site-specific than others (e.g. groundwater, energy sources). For site-specific resources, determination of location must include a description or map of the boundaries of the resource site and of the impact area to be affected, if different. For non-site-specific resources, determination must be as specific as possible.*

Wildlife are guided in their choice of locale and movement by natural features which may allow or hinder their movement (watercourses, terrain, type of vegetation) and built features which hinder them (roads, residences, fences, agricultural operations). Given the

large population of the Portland Metropolitan Area, the latter set of constraints are far more important in the patterns of wildlife habitation and migration. The West Hills rural area has a limited number of built features due to its location outside of the urban limit line and its low intensity levels of agricultural and forestry operations, and rural residential development.

Wildlife habitat areas, by definition, are not site-specific.[1] The distinct habitat needs of observed and probable wildlife species are described in Table 1 of *A Study of Forest Wildlife Habitat in the West Hills.* For example, some species require a forested habitat, while others do well in meadow and even suburban habitats; smaller mammals often have different habitat needs than larger mammals; birds often have different habitat needs than reptiles, etc. In short, the wildlife habitat areas of varying species overlap, and cannot be "unambiguously defined" by a line on a map.

However, it is useful to determine precise boundaries for primary, secondary, and impacted *forest* wildlife habitat areas. The determination of each wildlife habitat category is based on relative habitat suitability for *forest-dwelling species* with the most demanding forest habitat needs. Definitions and discussion of primary, secondary, and impacted wildlife habitat areas can be found later in this report under **QUALITY**.

3. QUANTITY

OAR 660-16-000(3)...A Determination of quantity requires consideration of the relative abundance of the resource (of any given quality).

Some amount of wildlife habitat occurs in all non-urban portions of Multnomah County. In the absence of more specific data on wildlife resources within other non-urban portions of Multnomah County, the best available standard of comparison of wildlife abundance (quantity) is the total size of each non-urban area within Multnomah County. The West Hills Rural Area is 34 square miles (approximately 21,865 acres) in size. The following table compares the size of the West Hills rural area to other non-urban portions of Multnomah County:

TABLE 1: RELATIVE SIZE OF MULTNOMAH COUNTY NON-URBAN AREAS

AREA	SIZE	% OF NON-URBAN AREAS
West Hills	34 sq. mi.	13%
Sauvie Island	26 sq. mi	10%.
West of Sandy River	16 sq. mi.	6%
East of Sandy River	128 sq.mi.	50%
Columbia Gorge NSA Area	52 sq. mi.	21%
TOTAL NON-URBAN AREA	256 sq. mi.	100%

In addition, the quantity of the wildlife habitat resource should be measured against three other areas outside Multnomah County and one area within the City of Portland. These

areas are chosen because they are directly adjacent to the West Hills Rural Plan Area.

a. Washington County Forest

This area, in Washington County, is a non-urban forested area bounded to the west by Highway 26, to the north by the Washington County line, to the east by the West Hills Rural Plan Area, and to the south by mixed agricultural and rural residential uses within Washington County. It is approximately 100 square miles in size and is almost entirely designated Washington County for non-urban, forest uses. It should be noted that west of Highway 26 lie the forested natural areas of the Oregon Coast range.

b. Washington County Farm

This area, also in Washington County, is a non-urban area consisting primarily of agricultural and rural residential uses which is bounded to the south by Highway 26 and the community of North Plains, to the east by the West Hills Rural Plan Area, and to the north and west by forested lands within Washington County. It is approximately 40 square miles in size.

c. Columbia County Forest

This area is within Columbia County and is designated primarily for non-urban forest uses, with some rural residential pockets included. It is bounded to the north and east by the communities of Chapman and Spitzenberg along the Scappoose-Vernonia Road, to the west by State Highway 47 and the Community of Vernonia, and to the south by the West Hills Rural Plan Area. It is approximately 80 square miles in size. It should be noted that west of Highway 47 and Vernonia lie the forested natural areas of the Oregon Coast Range.

d. Forest Park

The Forest Park area within the City of Portland is a public "natural" park with significant quantities of wildlife as documented by various sources. It is bounded to the north by the West Hills Rural Plan Area, to the south by Cornell Rd., to the east by urban development within Northwest Portland, and to the west by the Balch Creek portion of the West Hills Rural Plan Area and low-density residential development within the City of Portland. It is approximately 8 square miles in size.

The following table compares the size of the West Hills Rural Plan Area to these three areas outside of Multnomah County which are contiguous to the West Hills:

TABLE 2: RELATIVE SIZE OF NON-URBAN AREAS ADJACENT TO THE WEST HILLS

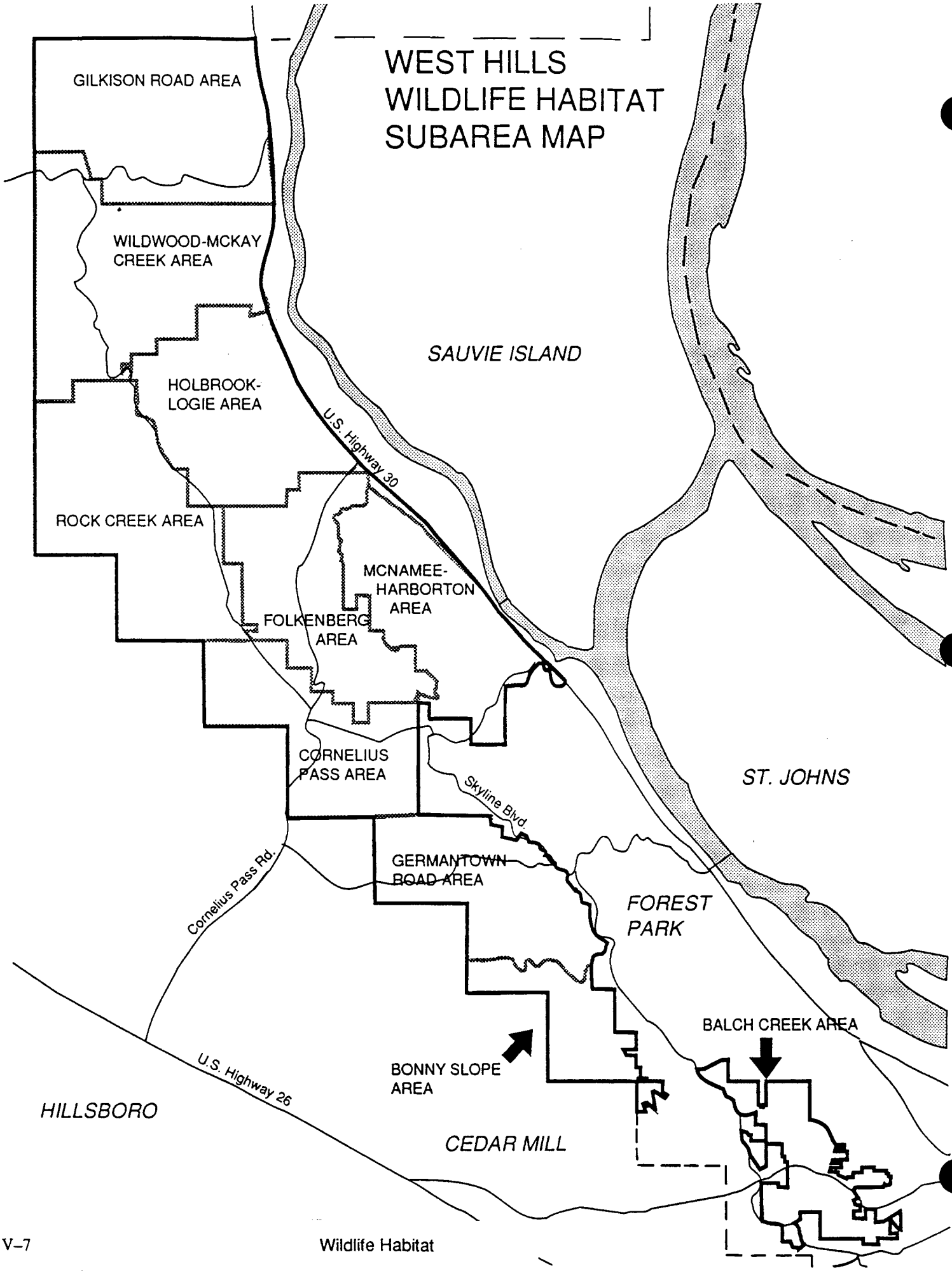
AREA	SIZE	% OF AREA
West Hills	34 sq. mi.	13%
Washington County Forest	100 sq.mi.	38%
Washington County Farm	40 sq. mi.	15%
Columbia County Forest	80 sq. mi.	31%
Forest Park	8 sq. mi.	3%
TOTAL AREA	262 sq. mi.	100%

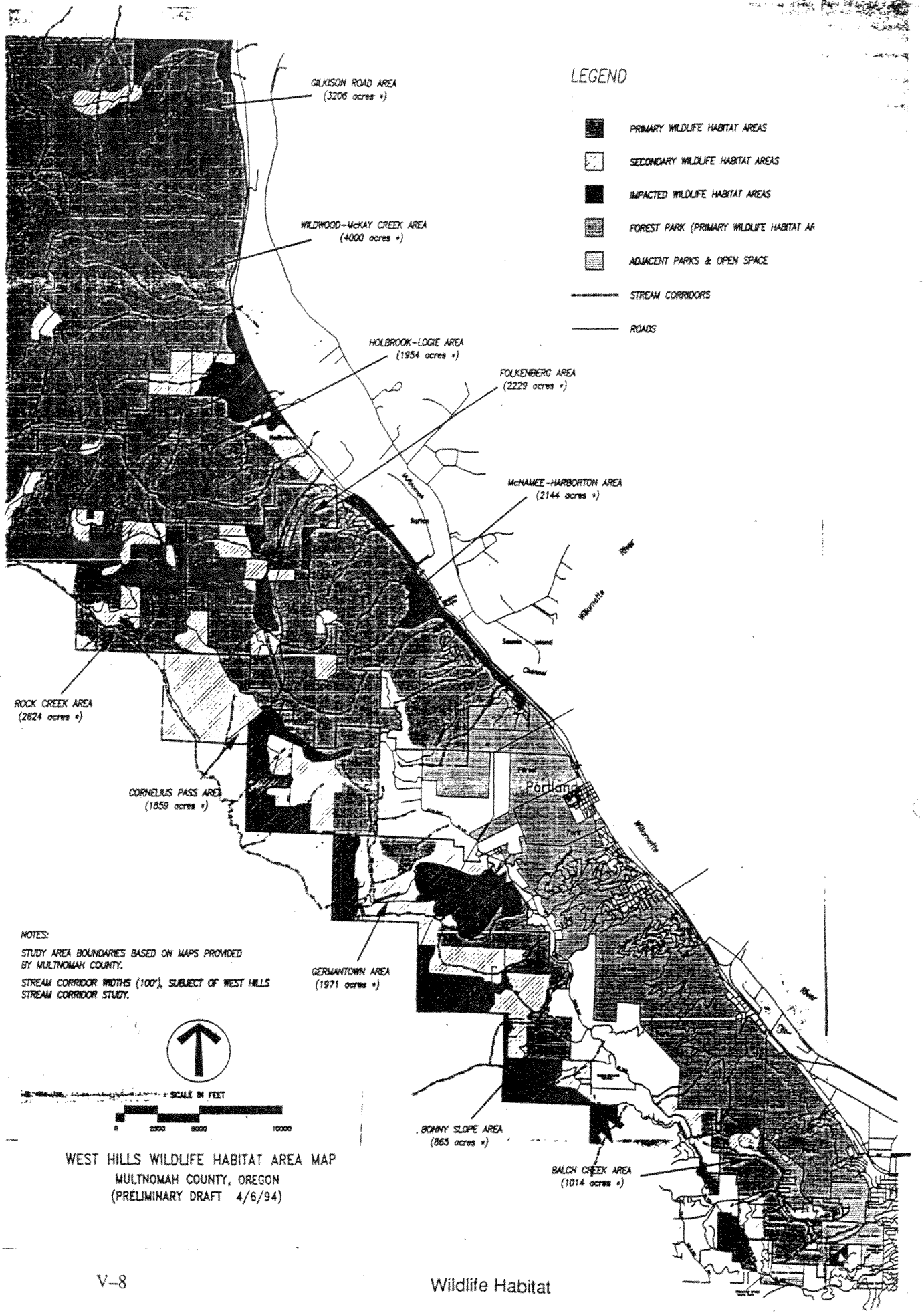
Within the West Hills, there lie areas differentiated by this study into primary, secondary, and impacted wildlife habitat areas within ten subareas (see definitions of these three categories under **QUALITY**). There are approximately 15,687 acres of primary wildlife habitat, 3,612 acres of secondary wildlife habitat, and 2,559 acres of impacted wildlife habitat within the West Hills Rural Area. The acreage breakdown among primary, secondary, and impacted wildlife habitat resource areas is as follows:

TABLE 3
WEST HILLS WILDLIFE HABITAT AREAS

SUBAREA OR IMPACT AREA	PRIMARY HABITAT ACRES	SECONDARY HABITAT ACRES	IMPACTED AREAS ACRES
GILKISON ROAD	2,935	105	166
WILDWOOD-MCKAY	3,860	94	46
HOLBROOK-LOGIE	1,385	310	260
ROCK CREEK	2,119	505	0
FOLKENBERG	1,841	260	128
MCNAMEE-HARBORTON	1,772	118	254
CORNELIUS PASS	533	921	406
GERMANTOWN ROAD	445	846	680
BALCH CREEK	628	248	139
BONNY SLOPE	169	205	490
TOTAL -- 21,865 Acres	15,687-- 72%	3,612--17%	2,569--11%

The quantity of the West Hills wildlife habitat resource also depends upon factors other than just gross acreage of the resource area. *A Study of Forest Wildlife Habitat in the*


WEST HILLS
WILDLIFE HABITAT
SUBAREA MAP
GILKISON ROAD AREA
WILDWOOD-MCKAY
CREEK AREA
HOLBROOK-
LOGIE AREA
ROCK CREEK AREA
SAUVIE ISLAND
U.S. Highway 30
MCNAMEE-
HARBORTON
AREA
FOLKENBERG
AREA
CORNELIUS
PASS AREA
Skyline Blvd.
ST. JOHNS
GERMANTOWN
ROAD AREA
Cornelius Pass Rd.
FOREST
PARK
BALCH CREEK AREA
BONNY SLOPE
AREA
U.S. Highway 26
HILLSBORO
CEDAR MILL



WEST HILLS WILDLIFE HABITAT AREA MAP
MULTNOMAH COUNTY, OREGON
(PRELIMINARY DRAFT 4/6/94)

West Hills (1992, Lev, Fugate & Sharp, see further discussion of this report under **QUALITY**) identifies the number of wildlife species, or category of species, found in the West Hills. This study found that species diversity depends upon both the quantity and the quality of habitat. Table 4, West Hills Wildlife Group Priority Habitat, describes the habitat needs of individual species, or groups of species, found within the West Hills Wildlife Forest Habitat Area.

Assured survival of diversified wildlife populations depends upon preventing local habitat loss and isolations (Merriam, 1991). Wilcox and Murphy (1985) have described habitat loss as the most serious threat to biological diversity and as the primary cause of the present extinction crisis. Noss (1987a) proposed a system of larger nodes of suitable habitat connected by corridors[2] to provide sufficient habitat for viable populations in a fragmented landscape.

For these reasons, *A Study of Forest Wildlife Habitat in the West Hills* recommends maintenance of a continuous, 1.5 mile peninsula of forested habitat extending from Forest Park[3] to the Coast Range. This recommended 1.5 mile swath of forest land is intended to compensate for the temporary loss of forest habitat that results from clear-cutting. A minimum half-mile wide corridor of forested habitat is necessary to maintain a forested connection at any given location.[4] The half-mile wide forest strip allows for animals to travel and seek cover in dense forests, and to compensate for edge effects that diminish wildlife habitat where forests meet clear cuts, agricultural land, roads, rural development, and mining operations.[5]

Finally, the West Hills' relationship to Forest Park is critical to the West Hills' significance. From a quantitative standpoint, Forest Park covers approximately 4,700 acres. Yet Forest Park, in isolation, is not large enough to support self-sustaining populations of medium and large size mammals, such as elk, bobcats, mountain lions (Felis con color) and black bears,[6] for which hundreds of square miles of habitat would be required (Brown 1985; Forman and Godron, 1986; Ruggiero et al., 1991). These species, as well as smaller and much less mobile species, will not be able to pass securely through the northern part of this peninsula if current trends of urbanization and clear cutting continue without regard to maintaining contiguous forest habitat throughout.

The long-term survival of smaller, less mobile species is dependent on the size of current populations within the undisturbed portions of Forest Park. Many of these species may already have been lost, or are in the process of disappearing, from residential and clear cut areas. The success of future colonization or recolonization of this peninsula will depend on habitat conditions throughout the peninsula. For example, species which for some reasons do not now occur, or those found primarily in older forests of the Coast Range, such as the red tree vole, white-footed vole, or marten (Manes Americans) will not be able to recolonize Forest Park if contiguous forest habitat throughout the peninsula is lost.

Thus, it is the quantity of the West Hills Wildlife Habitat Area in relation to its quality and location that are critical to this inquiry. High quality habitat elsewhere in Multnomah County can<u>not</u> substitute for even medium quality habitat in the West Hills.[7] It is because medium

TABLE 4: WEST HILLS WILDLIFE GROUP PRIORITY HABITAT

(adapted from "A Study of Forest Wildlife Habitat in the West Hills -- Final Report," Lev, Fugate and Sharp, 1992.)

Forest Wildlife Group	2nd Growth Forest	Clearcut	Early Succession	Young Forest	Meadow	Suburban	Quarry
Band tailed pigeon	P	S	S	P	N	L	N
Cavity makers	P	L*	L*	L*	N	L	N
Cavity users	P/S	L*	L*	L*	N	L	N
Flycatchers	P	L	S	P	N	L	N
Finches	P	S	P	P	N	L	N
Ground nesters	P	S	P	P	N	N	N
Raptors	P	S	P	P	S	L	N
Suburban	P	S	P	P	P	P	N
Thrushes	P	S	P	P	N	L	N
Warblers	P	S	P	P	N	L	N
Underground mammals	P	P	P	P	P	L	N
Small carnivores (weasel)	P	P	P	P	L	L	N
Shrews	P	P	P	P	N	N	N
Medium carnivores (coyote, bobcat)	S	P	P	P	L	N	N
Ungulates	P	P	P	P	L	N	N
Tree Squirrel	P	N	S	S	N	L	N
Chipmunk	P	S	P	P	N	N	N
Ground squirrel**	N	P	N	N	P	N	N
Voles/mice	P	P	P	P	P	L	L
Mountain beaver	P	S	S	P	N	N	N
Large carnivores (bear, cougar)	P	S	S	P	N	N	N
Brush rabbit	N	L	P	S	N	N	N
Bats***	P	P	P	P	N	N	N
Amphibians/reptiles	P	N	L	P	N	N	N

Key:

P = Primary habitat (an area which will support a viable population of a species because it provides all the environmental factors needed).

S = Secondary habitat (an area in which an animal may spend part of its time but which does not meet all its life requirements).

L = Limited

N = Not habitat

* Provides limited habitat only if some snlags are left after logging and persist through forest regeneration; otherwise is N (not habitat).

** Not a forest–dwelling species.

*** Bats may forage over open habitats, but many require forests for roosting.

quality habitat is limited, and *threatened* by conflicting uses at a *particular* location, that makes the West Hills a *significant* Goal 5 resource.

As noted in the ESEE analysis, the environmental consequences of losing a small amount of West Hills wildlife habitat in certain locations are much greater than losing a great deal of habitat in other portions of Multnomah County. Simply put, loss of the prime wildlife habitat in the West Hills means obstruction of a vital connecting link between Forest Park and the thousands of acres of wildlife habitat in the Coast Range.

4. QUALITY

OAR 660-16-000(3): The determination of quality requires some consideration of the resource site's relative value, as compared to other examples of the same resource in at least the jurisdiction itself.

Multnomah County has commissioned two studies of wildlife in the West Hills, which, along with other relevant studies, are summarized below.

a. *WILD ABOUT THE CITY* (Marcy Houle, 1990)

This report discusses the concept of contiguous areas of natural habitat for wildlife and the results of the fragmentation of habitat into "islands." In the latter instance, numerous biological studies (see bibliography for *Wild About the City*) have documented the diminishment and loss of native plants and animals due to a lack of connection to a larger ecosystem. Continued development in the West Hills wildlife area would result in the fragmentation, and therefore the degradation of both the West Hills' and Forest Park's natural systems, the loss of species diversity (particularly for larger mammals such as bears, elk, and cougars which require large habitat areas for each animal), the permanent loss of natural populations to catastrophe such as fire, and the weakening of plant and animal populations due to the lack of genetic diversity available in larger areas.

b. *A STUDY OF FOREST WILDLIFE HABITAT IN THE WEST HILLS* (Esther Lev, Jerry Fugate, Lynn Sharp, 1992)

This report provides a more in depth study of existing wildlife within the West Hills area. Research for the study included a series of six transects throughout the region, representing different types of land use (forested, residential, agricultural, clear-cut forest, quarry). A total of 19 species of mammals (including coyote, black bear, mountain beaver, trowbridge's shrew, and coast mole) and 34 species of birds (including Swainson's thrush, pine siskin, downy woodpecker, and black-headed grosbeak) were observed during the field study from both trapping and observations. The specific outcome of the transect evaluations are contained within the report; however, the transect with the most species diversity and numbers were found in the "control" transect within the boundaries of Forest Park. This indicates the high wildlife habitat values to be found within the park, and the importance of integrating Forest Park into a larger con-

tiguous wildlife habitat area in order to protect this high value. The amount and diversity of wildlife within the rural West Hills area to the northwest of Forest Park is somewhat lower due to the impact of residential development, agriculture, quarry operations, and commercial forestry. However, each of the five transects outside of Forest Park showed significant numbers and diversity of wildlife, indicating that this area remains an important area for native plants and animals.

c. Other Studies

The City of Portland has thoroughly studied the quality of wildlife habitat in the area of Forest Park to the south of the proposed West Hills wildlife habitat area/corridor. The *Northwest Hills Natural Areas Protection Plan*,(adopted 1992) documents the abundance of wildlife habitat in Forest Park and the surrounding areas within the City of Portland. The *Balch Creek Watershed Protection Plan* (adopted 1990) provides information about the wildlife habitat values in the portions of the Balch Creek basin which are within the Urban Growth Boundary and the Portland City limits. Both reports provide information about wildlife habitat values within adjacent unincorporated areas west and north of Forest Park, and within the Balch Creek basin. These habitat values are significant, associated with forested lands and the wildlife which inhabit them (such as salamanders, frogs, snakes, lizards, over 80 species of birds, and 62 mammal species, from squirrels and chipmunks to bears and cougars).

The County has already identified two significant wildlife habitat areas within the West Hills Rural Area based upon information compiled by the Oregon Department of Fish and Wildlife, a big game wintering habitat within much of the Northern Forested Area, and a bald eagle roost in the vicinity of Dixie Mountain in the far northern portion of the County. Additionally, fish and riparian-based flora and fauna are a significant identified resource within major streams in the West Hills area.

d. Comparison with Other Non-Urban Habitat Areas

i. Sauvie Island

Unlike the West Hills, the Multnomah County portion of Sauvie Island Area is generally flat, and approximately two-thirds is devoted to agricultural uses, of a significantly more intense nature than those in the West Hills, befitting the higher quality of soils on the island. Sauvie Island contains significant identified fish and wildlife habitat areas, including a large sensitive waterfowl area in the northern portion of the island. The Multnomah Channel Area, between Sauvie Island and Highway 30, contains significant identified wetland resources such as the Burlington Bottoms wetland located in the vicinity of the Sauvie Island bridge. While Sauvie Island provides very important habitat for waterfowl, fish, and wetland flora and fauna, it is relatively unimportant for terrestrial wildlife due to the preponderance of agricultural uses on the island and the its isolation by water from nearby wildlife habitat areas within the West Hills (separated by Multnomah Channel) and in Washington (separated by the Columbia River)

ii. Eastern Multnomah County Non-Urban Areas

Two of the eastern three rural areas (East of Sandy River and Columbia Gorge NSA Area) contain significant identified wildlife habitat areas, including large big game wintering areas and osprey nests. While no significant wildlife habitat areas have been identified by the Oregon Department of Fish & Wildlife in the West of Sandy River area, the Sandy River Gorge is identified as a significant natural area. These areas appear to maintain significant connectivity to each other and to adjacent areas of the Cascade Range -- however, this wildlife community is distinct from the wildlife in the Coast Range and West Hills area.

iii. Washington County Adjacent Non-Urban Areas

The Washington County Forested area between the West Hills Rural Area of Multnomah County and Highway 26 is designated on the Washington County Rural/Natural Resource Plan as a Wildlife Habitat Area, which contains sensitive habitat identified by the Oregon Department of Fish & Wildlife and forested areas coincidental with water areas and wetlands. The Washington County Non-urban farm areas contain a small amount of sensitive wildlife habitat. These areas are connected and contiguous to Columbia County natural areas to the north, the West Hills of Multnomah County to the east, and the Coast Range to the west and southwest.

Washington County's Rural Natural Resource Plan, Policies 6, 10, and 11 require protection and enhancement of significant fish and wildlife habitat areas, and water areas. Like Multnomah County, Washington County relies on Oregon Forest Practices rules to mitigate adverse impacts of commercial forestry on wildlife habitat values. Washington County also limits development in riparian corridors and implements the recommendations of the Oregon Department of Fish and Wildlife with respect to Big Game Range habitat. The Land Conservation and Development Commission has acknowledged Washington County's program as being in compliance with Statewide Planning Goal 5.

iv. Columbia County Adjacent Non-Urban Areas

The Columbia County forested area to the north of the West Hills Rural Area is designated by the Columbia County Comprehensive Plan as a major big game habitat area. These areas are connected and contiguous to the Washington County natural areas to the southwest, the West Hills of Multnomah County to the southeast, and the Coast Range to the west.

The Columbia County Zoning Code contains a Big Game Range Overlay to protect areas identified as major big game habitat areas. This Overlay district requires clustering of development to avoid habitat conflicts and consultation with the Oregon Department of Fish & Wildlife.

v. Forest Park Area

Based upon comprehensive studies, the City of Portland has identified large areas within and around Forest Park as significant wildlife protection areas, and has protected these areas through implementation of an environmental overlay zone which restricts disturbance and development of sensitive areas. This environmental overlay zone consists of two sub-zones, and E-P district which virtually prohibits new development except under extreme conditions, and an E-C district which limits new development and provides standards by which to mitigate impacts upon fish & wildlife habitat. The code also includes a provision for the Transfer of Development Rights from parcels constrained by the environmental overlay zone to parcels which are not so constrained. Forest Park is connected and contiguous to the West Hills area to the west and northwest.

e. Summary of Quality Findings

The suitability of the West Hills for wildlife habitat is documented in *A Study of Forest Wildlife Habitat in the West Hills*. When viewed in isolation, the intrinsic habitat suitability of the West Hills is comparable to (and in some cases worse than) many other forested areas of Multnomah, Washington, and Columbia Counties. In fact, the absolute wildlife habitat suitability of the West Hills (when considered in isolation) has declined as a result of many conflicting uses, as described in the ESEE analysis.

However, *if* the West Hills were not strategically located between two important wildlife habitat areas (Forest Park and the Coast Range) and *if* the West Hills were not located in a large metropolitan area where wildlife habitat is scarce, *then* it would not be uniquely significant. It is these two factors that make the West Hills a significant Goal 5 resource.

This report distinguishes among primary, secondary, and impacted wildlife habitat areas within the West Hills rural area.

Primary wildlife habitat areas have environmental qualities that support, or will support, viable populations of a wide range of animal species. One of the conditions that contributes greatly to quality of habitat is generally referred to as structure. This term includes such components as large trees, snags, downed and dead wood, and a wide range of plant species at all canopy levels (Ambuel, B. & Temple, S.A., 1983). Generally, mammal species diversity is lowes in young Douglas fir forests and increases toward the old growth stage (Franklin & Spies, 1991). Small mammal diversity is greatest in the early successional stage. In the case of the West Hills, maintaining black bear and elk habitat ensures that the habitat needs of a wide range of other species will be met (*A Study of Forest Wildlife Habitat in the West Hills*, page 3). Since bear and elk require large, contiguous forested tracts to survive, primary wildlife habitat areas are so defined. Primary habitat areas are located principally in the northern forested areas of the West Hills north of Forest Park and Cornelius Pass. As noted above, recently-logged areas also quality as primary habitat, because eventually they will be re-forest-

ed.[8]

Secondary wildlife habitat areas meet the habitat needs of well-adapted species, but overall support the needs of a narrower range of species. Secondary habitat areas are those which have been, or probably will be, adversely affected by human activity (usually farming or rural residential development) but which contribute to maintaining an open space connection between Forest Park and the Coast Range. Secondary wildlife habitat areas are generally found in (a) forested and riparian areas of within the agricultural areas between Laidlaw Road and Rock Creek Road along the west side of the West Hills that are connected to primary habitat areas within the West Hills Wildlife Forested Habitat Area, and 9b) in sparsely developed, forested, rural residential areas throughout the West Hills. Undeveloped, forested land zoned for Rural Residential uses is considered secondary wildlife habitat, recognizing that it will eventually be developed, and assuming that regulations will be in place to minimize the impacts of such development.

Impacted wildlife habitat areas support a much narrower range of animal species, and from barriers to the movement of many forest species. Impacted wildlife habitat areas are those which do not have, and are unlikely to have, forests in the short-to-medium future (1-10 years). Such areas typically are adjacent to primary or secondary habitat areas, but have been adversely affected (impacted) by residential development.[9] Human and pet impacts, roads, lawns, gardens, and fences associated with rural residential development in these impact areas can adversely affect resource quality. The Bonny Slope area and permanently cleared (pastures and cultivated land) portions of the agricultural area between Laidlaw Road and Rock Creek Road on the west side of the West Hills are considered to be "impacted wildlife habitat areas." The West Hills Rural Area has "patches" of land in this category, which are usually zoned rural residential and are located along roads.

Mining operations also fall into the category of impacted wildlife habitat areas. Where gravel pits are required to be reclaimed under ORS 517, they may eventually be reclassified as secondary habitat, even though they typically have low habitat value now. Residential "impacted" areas may also be reclaimed as wildlife habitat through techniques such as replanting of native vegetation and removal or modification of fences.

Primary, secondary, and impacted habitat areas have been mapped based on *existing* and *probable* conditions. Areas zoned Rural Residential probably will have, eventually, houses on five acre lots. Such development will degrade primary habitat areas to secondary habitat status, even with mitigating measures. Therefore, even relatively undisturbed areas zoned Rural Residential are defined as "secondary" habitat areas. Clear cut areas zoned CFU, however, usually are designated as primary habitat. Although recent clear cuts have relatively low wildlife habitat value, such areas will increase in habitat value over time, as revegetation occurs. Due to Statewide Planning Goal 4 (Forest Lands) constraints on non-forest uses (houses)[10], logged-over areas will again become primary wildlife habitat. Therefore, clear cut areas zoned for Commercial Forest Use are considered primary habitat areas for long-term planning purposes.

As part of the report, Ecologists Esther Lev and Lynn Sharp conducted analysis of roadways in the West Hills to document the degree to which the movement of wildlife is likely to be obstructed along roads. Their field notes are included in **Appendix A**.

The Map entitled West Hills Wildlife Habitat Area Map indicated primary, secondary, and impacted wildlife habitat areas within the West Hills Rural Area. This map was developed based upon field work, a detailed review of 1993 aerial photographs, METRO vegetative cover maps, and a review of Multnomah County data regarding the location of housing units.

5. CONCLUSION

OAR 660-16-000(3) Include on Plan Inventory: When information is available on location, quantity and quality, and the local government has determined a site to be significant or important as a result of the data collection and analysis process, the local government must include the site on its plan inventory and indicate the location, quality and quantity of the resource site (see above. Items included on this inventory must proceed through the remainder of the Goal 5 process.

This report, when combined with information already available to Multnomah County, describes the location, quality and quantity of wildlife habitat in the West Hills rural area in sufficient detail to support a determination of *significance*. Thus, the primary and secondary wildlife habitat areas in the West Hills Rural area are a 1C resource. The impacted wildlife habitat areas, while not significant in themselves, are within the impact area of the West Hills significant wildlife habitat resource due to their proximity to the resource and will be discussed as such within the ESEE analysis.

From this point on in this report, the significant resource shall be referred to as the West Hills Wildlife Forested Habitat Area.

6. FOOTNOTES -- Determination of Significance

[1] Nevertheless, the determination of resource site and impact area boundaries is property-specific. In this way, property owners and citizens will know which properties are affected by Goal 5 regulations.

[2] Within a peninsula of forested wildlife habitat area, there may be several "corridors" where various species of wildlife routinely travel. Examples of such corridors include streams, areas with protective vegetative cover, interconnected wetlands and ridgelines. Corridors may also be defined by obstacles. Thus, forest wildlife often will skirt recently cleared areas, agricultural areas, or areas characterized by human settlement.

[3] Forest Park itself averages about 1.5 miles in width.

[4] *A study of Forest Wildlife Habitat in the West Hills*, pages 26-27.

[5] The 1.5 mile peninsula is partially obstructed in the McNamee-Harborton and Folkenberg Sub-areas of the West Hills Rural Area (north of Forest Park, south of Cornelius Pass Road). For this reason, it is especially important to minimize further obstructions in these subareas. Because Oregon's forest practices rules allow for clear cutting of forested habitat areas, other uses (housing, roads and fences, agriculture, mining, etc.) must be limited more stringently in order to maintain continuous forest cover in these Sub-areas.

[6] The implication is not that Forest Park should be managed exclusively for bear and elk; rather, the point is that managing Forest Park and the adjacent wildlife area for bear and elk will ensure sufficient habitat for smaller mammal and bird species that reside in the Portland region. However, there have been several reported sightings of bear and elk in Forest Park. If the connection between Forest Park and the resources of the Coast Range were cut off, occasional visits from these large mammals to Forest Park probably would cease.

[7] An analogy with aggregate resource sites is appropriate in this case. Just as an aggregate resource site's *value* increases in proportion to its proximity to urban markets, so do wildlife habitat values increase in proportion to how close they are to population centers. It is the *scarcity* of forested wildlife habitat areas in metropolitan areas which increases their relative value to people who live there.

[8] Clear cut areas on forest land have a short-term adverse impact on habitat quality, and are considered a conflicting use in this study. Oregon Forest Practices rules require reforestation on such lands. One of the principal purposes of State-wide Planning Goal 4 (Forest Lands) is conservation of wildlife habitat. Moreover, State law prohibits local regulation of forest practices where forest operations are a permitted or conditional use, outside of urban growth boundaries or the Portland City Limits. Since Multnomah County lacks authority to regulate forest practices, it is especially important that the impacts of other conflicting land use be carefully controlled at the local level. One of the reasons why it is important to maintain a wide peninsula of undeveloped forest land is so that the pattern of clear cuts -- when combined with other conflicting land uses -- does not result in long-term, uninterrupted barriers to wildlife movement.

[9] Impacted areas were determined based on analysis of aerial photographs, vegetative cover maps, and zoning. Generally, an area is considered "impacted" if it (a) has developed residential densities of one unit per five acres or greater, (b) includes developed areas along Highway 30, (c) is predominately agricultural in character, or (d) is a large quarry.

[10] In the past, Multnomah County has approved many forest dwellings on land zoned for forest use (CFU). However, new County CFU regulations are expected to severely limit new dwellings on forest lands in the West Hills.

B. RESOURCE ANALYSIS

1. IMPACT AREA

The "impact area affected" includes forest wildlife habitat areas outside of the West Hills Rural Area, including Forest Park and forest land in Columbia and Washington Counties. These areas are *connected* to the West Hills Wildlife Forested Habitat Area. The quantity and diversity of forest wildlife habitat species in "impact areas" depends upon maintenance and enhancement of forest wildlife habitat values in the Wet Hills Wildlife Forested Habitat Area, and *vice versa.*

Unincorporated Multnomah County has no defined "impact area" which is directly affected by the West Hills Wildlife Forested Habitat Area. To the east, Highway 30, a major railroad, and development provide an effective wildlife barrier separating the West Hills from Sauvie Island.[11]

To the south and west, the Portland Metropolitan Area effectively separates the West Hills and Forest Park from forest land in East Multnomah County.

Impact areas outside unincorporated Multnomah County include:

(a) Washington County rural resource land north and west of the West Hills;

(b) Columbia County forest land immediately north of the West Hills; and

(c) Forest Park, neighboring parks, and the Balch Creek drainage.

Although these areas are outside of Multnomah County's jurisdiction, they are integrally connected with, and cumulatively define the resource value of, the West Hills Wildlife Forested Habitat Area.

2. REGULATORY CONTEXT

The economic, social, environmental, and energy(ESEE) consequences of protecting, partially protecting, or not conserving the West Hills Wildlife Forested Habitat Area should not be considered in a vacuum. This area has *cultural* as well as *natural* history. The relative environmental and social value of the West HIlls Wildlife Forested Habitat Area, and hence its *significance*, is a consequence of the cumulative impact of natural events as well as human actions. Similarly, the ESEE consequences of protecting, partially protecting, or not protecting the significant area depends on a number of site-specific factors, including the site's regulatory history, the location of property lines and public improvements relative to the resource site, and planned public and private development affecting the resource site. One of the key questions to be asked in any ESEE consequences analysis is: How practical is it to *avoid*, or *plan around*, significant wildlife habitat areas?

The regulatory context -- Multnomah County's existing natural resource conservation programs -- are critical to (a) setting a base line for evaluation of the impacts of additional resource conservation programs, and (b) determining conflicting uses allowed by zoning.

Were it not for the Statewide Planning Goals, Oregon's Forest Practices Act, the City of Portland's foresight in acquiring and maintaining Forest Park as an urban natural area, and Multnomah County's Comprehensive Plan and zoning regulations, there would probably be no significant wildlife habitat remaining in the West Hills. The existence of moderate-to-high value habitat so close to a major metropolitan area is uncommon among metropolitan areas in this country. This achievement is the result of the concerted efforts by the Oregon Legislature, County elected officials, local and state agencies, and an active, informed and engaged citizenry.

Nevertheless, a number of conflicting uses have degraded, and threaten to degrade further, wildlife habitat in the West Hills. As noted above, maintaining a peninsula of forested wildlife habitat connecting Forest Park with the Coast Range is essential to the long-term maintenance of forest species diversity and habitat quality for all three areas.

The primary adverse impacts to the quantity and quality of wildlife habitat are related to urban development. Urban development is prohibited by County zoning designed primarily to protect farm and forest land. Moreover, a beneficial secondary affect of farm and forest zoning is conservation of wildlife habitat.

a. Commercial Forest Land

The Commercial Forest Land designation applies to 16,700 acres, or 76%, of the land within the West Hills Rural Area. Most of the West Hills Rural Area's Commercial Forest Use land is also primary wildlife habitat. Developed areas along roads, areas that have been cleared for agriculture, and gravel mining areas are either secondary or impacted wildlife habitat areas. (See *West Hills Wildlife Habitat Area Map*)

Policy 11 of the Multnomah County Comprehensive Plan, as it pertains to commercial forestry and wildlife habitat, is primarily to allow commercial forest uses and secondarily to maintain wildlife habitat.[12] Other purposes include allowing agriculture, recreational opportunities, and forest/non-forest dwellings. The County's Commercial Forest Use (CFU) Zone (Multnomah County Zoning Ordinance 11.15.2042-2194) generally limits new residential (forest management) lot size to 80 acres, except for "lots of record." This large minimum lot size has been, and continues to be, critical to maintaining forest habitat.[13]

Table 5.A.(at the back of the report) describes each conflicting use[14] allowed in the CFU zoning district. The CFU zone allows for a number of additional conflicting uses outright, such as mineral, aggregate, and geothermal resource exploration, additional road travel lanes, and solid waste disposal sites ordered by the Oregon Department of Environmental Quality (DEQ). Replacement of a dwelling more than 200 feet from an existing dwelling may be permitted under "prescribed conditions." Conditional uses

include a variety of additional conflicting uses, including non-forest dwellings under limited circumstances (see also HB 3661, enacted by the Oregon Legislature in 1993), campgrounds, cemeteries, reservoirs, new utility distribution lines, forest management research stations, parks, power generating facilities, transmission towers, sanitary landfills and refuse dumps, private hunting and fishing operations, aggregate mining, forest products processing, logging equipment storage and repair, log scaling and weight stations, new passing and travel lands outside the right-of-way, and aircraft landing area expansions. Many of these conditional uses, if allowed, could have serious adverse impacts upon the West Hills Wildlife Forested Habitat Area.

b. Exclusive Farm Use

The Exclusive Farm Use (EFU) designation applies to 2,200 acres, or 10 percent, of the land within the West Hills Rural Area. Most EFU land is considered secondary and impacted wildlife habitat area (See *West Hills Wildlife Habitat Area Map.*)

Policy 9 of the Multnomah County Comprehensive Plan, Agricultural Land, designates Class I-IV agricultural soils that are not committed to non-resource use for exclusive farm use.

The EFU zone (Multnomah County Zoning Ordinance 11.15-2002-2030) generally limits residential development to lot sizes of 38 acres or greater.[15] The EFU zone permits farming as well as commercial forest uses outright. Other outright permitted uses that conflict with wildlife habitat include limited road expansions and DEQ mandated solid waste facilities.

Uses permitted under prescribed conditions include farm and non-farm dwellings and replacement dwellings. Conflicting conditional uses are similar to those allowed in the CFU zone, and also allow other uses which could have major adverse impacts on wildlife habitat, including private and public schools, churches, private parks and hunting and fishing preserves, golf courses, commercial activities in conjunction with farm use, non-farm dwellings, horse boarding and training facilities, "homestead lots," propagation of aquatic species, personal use airports, dog kennels, and "residential homes." Accessory structures are also allowed, including livestock fences and structures, outbuildings and barns, and parking. Table 5.B. describes conflicting uses allowed by EFU zoning.

c. Multiple Use Agriculture

The Multiple Use Agriculture (MUA) designation applies to only 400 acres, or two percent, of the land within the West Hills Rural Area. MUA land usually is considered either secondary or impacted wildlife habitat. However, the impact of MUA zoning is minor compared with Rural Residential (RR) zoning. MUA zoning is found only in isolated groupings in the western portion of the West Hills Rural Area (Cornelius Pass, Germantown Road, and Bonny Slope subareas). All of these sub-areas are located to the south and west of the northern boundary of Forest Park.

The large minimum lot sizes (20 acre minimum for new lots) and the largely developed character of land zoned MUA helps to reduce the impacts of rural residential development on these portions of the West Hills Wildlife Forested Habitat Area. The MUA district serves as a transition between farm and forest resource land, and rural residential land.

Policy 10 of the Multnomah County Comprehensive Plan designates land for "small-scale farm use" which has been parcelized or which is relatively unproductive. The County's policy is to protect adjacent exclusive farm use areas by restricting MUA uses. The MUA zoning district (Multnomah County Zoning Ordinance 11.15.2122-2150) establishes a 20-acre minimum lot size, with exceptions for conditional uses and lots or record. The MUA-20 zone encourages part-time farming, forestry, open space, and low density residential development. Permitted uses are generally the same as found in the CFU and EFU zones. Single-family residences and farm-worker residences are permitted under "prescribed conditions," as are retail and wholesale sales for products raised on site. Conflicting conditional uses include most of the uses allowed in farm and forest zones, except that "community service uses," "planned developments," and "limited rural service commercial uses" may also be approved. Accessory uses include any use customarily constructed in association with a permitted use, including fences, outbuildings, barns, etc. An exception to the 20-acre minimum lot size may be granted under limited circumstances; conditional uses have no minimum lot size.

Based on research conducted by County planning staff, there are 59 existing dwelling units sited on MUA land in the West Hills Rural Area. Based on County analysis, there is the potential for an additional 16 dwellings in the West Hills. If properly sited and conditioned, the limited residential development allowed in the MUA zoning district does not pose a serious threat to wildlife. It is the wide range of conditionally permitted uses that has the potential to adversely affect wildlife habitat values in the West Hills Wildlife Forested Habitat Area. Table 5.C. describes conflicting uses allowed by MUA zoning.

d. Rural Residential

The Rural Residential (RR) designation applies to 2,500 acres, or 11 percent, of the land within the West Hills Rural Area. Developed RR land is considered secondary or impacted wildlife habitat area (See *West Hills Wildlife Habitat Area Map*).

The RR designation offers the least amount of protection for wildlife habitat areas of any of the four major zoning districts. Policy 8, Rural Residential Land, states that RR zoning shall be applied where land has been significantly parcelized, is not part of a cohesive commercial farm or forest resource area, and would not conflict with adjacent resource uses.

The RR zoning district (Multnomah County Zoning Ordinance 11.15.2202-2230) establishes a five-acre minimum lot size, with exceptions for conditional uses and lots of record. Allowed conflicting uses are virtually the same as those allowed in the MUA-20

zoning district.

Based on research conducted by County planning staff, there are 446 existing dwelling units sited on RR land in the West Hills Rural Area. Based on County analysis,[16] there is the potential for an additional 286 dwellings in the West Hills -- an increase of 39 percent (see Table 6). Moreover, several rural residential areas are completely surrounded by CFU land, and are invariably located along roads, thus compounding their impacts. Thus, the location of these additional potential dwellings poses a serious threat to wildlife habitat and movement within the West Hills. Existing and potential RR dwelling units are located primarily along roadways that run in an east-west direction, limiting north-to-south wildlife movement through the West Hills.

Although prohibiting this conflicting use would have major economic consequences for owners of vacant RR property in the West Hills, there are methods of siting rural residences, and *limiting* conflicting activities associated with rural residential development, which can greatly reduce their impact on forested wildlife habitat values.

Table 5.D. describes conflicting uses allowed by RR zoning.

e. Urban Residential Zones

Urban residential development is allowed in portions of the Balch Creek subarea. In those areas, R10 and R20 zoning allows urban levels of development where urban services are available. Multnomah County is considering applying to METRO for exclusion of some currently urban zoned land in the Balch Creek basin from the regional urban growth boundary because of environmental constraints and because the City of Portland has determined that it will not provide urban services to this area. Areas which remain within the urban growth boundary will be excluded from the West Hills Wildlife Forested Habitat Area because of their urban nature. Land excluded from the urban growth boundary will most likely be designated rural residential and thus will have a similar regulatory context to other rural residentially-zoned areas of the West Hills. Therefore, specific impacts of uses allowed by the urban R-10 and R-20 zones will not be considered in the analysis of conflicting uses.

f. Mining

Multnomah County Comprehensive Plan Policy 16-B protects mineral and aggregate "from inappropriate land uses which could limit their future use." The County is committed to inventorying mineral and aggregate resources as part of the "ongoing planning process," based on Department of Geology and Mineral Resources (DOGAMI) and other sources of information. A threshold of 25,000 cubic yards for importance is listed. Only sites with OAR 660, Division 6 rating of 2A (no conflicting use), 3A (preserve resource site), or 3C (allow on limited basis) "should be considered for conditional use approval."

Mining for aggregate and geothermal resources is a conditional use in all four zones

applicable within the West Hills Wildlife Forested Habitat Area. County conditional use review criteria allow the County to approve, approve with conditions, or deny any conditional uses based on neighborhood impacts and consistency with comprehensive plan provisions. One of the approval criteria is that the mining operation, "will be located outside a big game winter habitat area as defined by ODF&W or that agency has certified that the impacts will be acceptable." The County's specific review criteria for mining proposals are currently under review by the Land Conservation and Development Commission, as part of Multnomah County's periodic review.

The Angell Brothers mining operation, the only major existing mining operation in the West Hills, covers two tax lots and about 114 acres. The proposal is to expand the area protected for mineral and aggregate extraction to include an additional 283 acres, extending a third of a mile westward into the West Hills Wildlife Forested Habitat Area. For these reasons, expansion of this mining operation, or introduction of a new mining operation, in the McNamee Road area is considered a major conflicting use. However, as noted below, prohibiting or limiting this conflicting use would have major economic consequences.

3. CONFLICTING USES

OAR 660-16(5): It is the responsibility of local government to identify conflicts with inventoried Goal 5 resource sites. This is done primarily by examining the uses allowed in broad zoning districts established by the jurisdiction...A conflicting use is one which, if allowed, could negatively impact a Goal 5 resource site. Where conflicting uses have been identified, Goal 5 resource sites may impact those uses. These impacts must be considered when analyzing the economic, social, environmental, and energy consequences...

Once conflicting uses are determined, the economic, social, environmental, and energy consequences of allowing the conflicting use must be determined.[17] To identify land use conflicts for each of the above categories, the applicable zoning districts are examined to identify permitted and conditionally permitted land uses. Land uses which are typically allowed in rural zoning districts are included as potential conflicting uses. However, this report does not rely exclusively on the Multnomah County Zoning Ordinance to determine conflicting land uses. Recent court decisions have made it clear that identification of conflicting uses allowed by zoning are only the first step in determining conflicting land uses.[18]

Other sources for identifying probable land use conflicts include public facilities master plans for sewer, water and storm drainage, known or probable development proposals, and planned transportation facilities. In the West Hills Rural Area, there are no major public facilities or road improvement projects planned. Possible developments include (a) the Angell Brothers quarry expansion, and (b) rural residential development on the hundreds of vacant lots in RR and MUA zones.

Once the land use conflicts have been identified, activities and side-effects of these land uses are considered.[19] In the ESEE consequences analysis, conflicts resulting from the

primary land use and secondary land use activities and impacts are considered together in packages. This report is intended to be useful to the County in determining whether and how to (1) make siting decisions for new or expanding conflicting uses, and (2) regulate the conflicting activities of existing and potential land uses.

Land uses and associated activities/impacts are described on Tables 5.A.-D. Permitted uses, uses permitted under prescribed conditions, and conditionally permitted uses are determined based on the Multnomah County Zoning Ordinance, Sections 11.15.2002 to 11.15.2270, which include the County's Exclusive Farm Use (EFU), Commercial Forest Use (CFU), Multiple Use Agriculture (MUA), and Rural Residential (RR) zoning districts.

Adverse impacts resulting from potential conflicting uses were derived from *A Study of Forest Wildlife Habitat in the West Hills.* Adverse impacts on wildlife habitat, from conflicting uses, are defined in Tables 5.A.-D. and in the ESEE Analysis below. For further elaboration on the meaning of these terms, *A Study of Forest Wildlife Habitat in the West Hills*, cited above, should be consulted.

Tables 5.A.-D. recognize conflicting uses and *associated adverse environmental impacts* on wildlife habitat values. Impacts are considered in terms of duration and magnitude, as follows:

As noted above, the West HIlls Wildlife Forested Habitat Area has three levels of wildlife habitat -- primary, secondary, and impacted. "Resource degradation," as applied in the table above, means degrading from one level of resource quality to the next lower level. Thus, clearing and plowing land for agriculture will result in primary forested habitat being re-classified to secondary wildlife habitat. Similarly, intensive residential development in RR-zoned areas can result (without mitigation) in the resource level dropping from "secondary" to "impacted."

4. ESEE ANALYSIS

There are four principal land use threats to the West Hills Wildlife Forested Habitat Area:

- -- Rural Residential Development and associated roads and public facilities
- -- Agriculture
- -- Forestry
- -- Mining

Since the environmental consequences of allowing these land uses, and their associated activities, overlap, environmental consequences common to most or all uses are described in subsection **a.** below. The remaining economic, social, and energy consequences of allowing these land uses, and their associated activities, are described in subsection **b.** below. Subsection **c.** addresses the economic, social, environmental, and energy consequences of prohibiting or limiting conflicting uses to protect wildlife habitat.

Rural residential development, because it is associated with roads, brings in people and traffic, and usually leads to long-term clearing of land, poses the greatest single threat to the objective of maintaining a continuous band of forested wildlife habitat. Community service and conditional uses whose impacts are listed on Tables 5.A.-D. have impacts similar to residential development. Throughout the remainder of this report, community service and conditional use impacts shall be considered synonymous with residential impacts.

Agricultural uses are largely established, and occur primarily on land planned and zoned for agricultural use on the west side of the West Hills Rural Area. Forested habitat areas are generally too steep, and soils generally unsuitable, for farming.

The County's ability to limit forest uses is restricted by State law, which states that conflict resolution involving forest operations on forest land occurs exclusively through Oregon Forest Practices rules.

The West Hills are a rich rock reserve, with huge, long-term potential for aggregate extraction. However, there is only one, large active mining operation in the West Hills, which is leased and mined by Angell Brothers. Unfortunately, this quarry already constricts wildlife movement, and is proposed to extend further into the narrowest portion of the forested habitat peninsula. For this reason, the ESEE consequences of expansion of the Angell Brothers quarry operation is a major focus of this analysis. The critical question which must be answered in the County's program to achieve the conflicting purposes of Goal 5 in this instance is which is ultimately of greater public value -- long term retention of a continuous half-mile of forested habitat, or expansion of this quarry operation.

a. Consequences of Allowing Conflicting Uses Upon Wildlife Habitat

i. Economic Consequences

The economic impacts of loss of wildlife habitat cannot be quantified with any reasonable degree of certainty. Wildlife habitat has not traditionally been part of the market system, and it is difficult, if not impossible to evaluate it in the same manner as market or commodity resources. There is no particular economic activity which relies on the maintenance of wildlife habitat in the West Hills to continue its existence. However, protection of wildlife habitat may provide some less direct economic benefits to the quality of life in Multnomah County, which is an attraction to new business, conventions, and tourism. In particular, Forest Park, one of the nation's most unique urban parks, is an amenity which adds significantly to the County's quality of life, which in turn attracts new business, conventions, and tourism. These indirect economic benefits could be lessened if conflicting uses cause impacts to wildlife habitat in the West Hills Wildlife Forested Habitat Area.

ii. Social Consequences

The West Hills have a psychological value to some people, being perceived as an integral and important part of the forested landscape linking Forest Park to the

Coast Range, and contributing to the image of a natural area with wildlife habitat on the outskirts of Portland. Loss of the wildlife habitat linkage between Forest Park and the Coast Range could have a social/public impact if the educational or passive recreational attributes of Forest Park and the West Hills Wildlife Forested Habitat Area (which includes a recently purchased 30-acre old grove forested area near McNamee Road) are eroded.

iii. Environmental Consequences

The following discussion describes adverse environmental consequences associated with allowing conflicting uses and activities recognized on Tables 5.A.-D. Table 5 documents the magnitude and duration of each of these impacts on individual species, or groups of species, in the West Hills Wildlife Forest Habitat Area. These adverse environmental impacts include:

- Direct Loss of Habitat
- Edge Effects
- Creation of Barriers
- Fragmentation
- Native Vegetation Removal
- Application of Herbicides
- Soil Excavation
- Topsoil Removal
- Human Intrusion
- Pet Impacts
- Increased Impervious Surface Area
- Use of Insecticides and Poisons
- Application of Fertilizers
- Other Water Quality Impacts

Following this discussion is a specific discussion of the environmental consequences of residential development, agriculture, forestry, and mining on wildlife habitat.

- Direct Loss of Habitat

Direct loss of habitat occurs whenever native vegetative cover is removed, water quality reduced or human intrusion increased. Thus rural residential development, clearing for agricultural purposes, harvesting of trees, road construction, and mining and a range of uses allowed in the four zoning districts which apply to the West Hills Wildlife Forested Habitat Area. However, direct loss of habitat area is much more critical in the Folkenberg and McNamee-Harborton Subareas, than in other areas within the West Hills.

A principal conclusion of *A Study of Forest Wildlife Habitat in the West Hills* was that *if* existing trends in residential development and logging continue without regard to maintaining continuous forested habitat throughout, isolation of Forest

Park and the entire peninsula will result. To avoid such isolation, the forest habitat throughout the peninsula must be capable of supporting viable populations of resident species native to the area. The continuous forest habitat should be wide enough to contain home ranges of smaller wildlife species; generally, the longer the connected strip of forested habitat, the wider the peninsula should be. (Noss, 1987a; Houle, 1990; Marcot, pers. comm., 1992). Maintenance of the West Hills Wildlife Forested Habitat Area peninsula as largely interconnected forest habitat will assure its value as a timber resource as well as protecting wildlife, water quality and the special livability of our community.

Existing residential development, and recent logging followed by subdivision and residential development along the top of the crest between the Tualatin River watershed and Multnomah Channel watersheds and on the west side probably preclude restoration of continuous forest sufficiently wide to be usable by many species. The only portion of the peninsula between Cornelius Pass Road and Newberry Road, in which a continuous forested area can be maintained over the long term, is on the east side of the crest.

However, land use practices in the McNamee-Harborton and Folkenberg Subareas have fragmented the existing forest habitat, to the point where there appear to be short term interruptions in the requisite half-mile-wide continuous forest habitat. Clear cut forests will re-generate over time. However, longer term impacts — such as rural residential development, clearing of land for agriculture, construction of roads and fences, and quarrying — must be strictly controlled if connectivity is to be maintained in the long run. There is little the County can do about existing conflicting uses. In a sense, those conflicting uses which are "last to the table" must compensate for the forest habitat degradation allowed in the past.

It is recognized that Cornelius Pass and McNamee Roads act as obstacles for small mammals, reptiles and amphibian species. However, the distance these animals must travel to cross the road is far less than required to cross a road with development on either side, or to cross an exposed agricultural area. The distance and height obstacles posed by an active quarry operation pose insurmountable obstacles for all but winged wildlife species.

As part of this study, Ecologist Lynn Sharp reviewed 1993 aerial photographs of the West Hills to determine changes from 1989 METRO data, and 1991 data derived from A *Study of Forest Wildlife Habitat in the West Hills* related to vegetative cover. The *West Hills Wildlife Habitat Vegetative Cover Map* precisely identifies developed or farmed areas, meadows, shrub (early successional forest) areas, and older, established forested areas. What is clear from this map is that the recommended 1.5-mile-wide forested peninsula has been fragmented by clear cuts, and that edge effects have increased markedly in the past five years.

This edge effect is especially pronounced in the McNamee-Harborton and Folkenberg subareas, where there are other obstructions to wildlife movement and forest

cover *(i.e.,* rural residential development, several roads, limited agriculture, and the Angell Brothers quarry operation.) The objective of maintaining a half-mile of continuous forested area is not fully met in these two subareas, and the connection between Forest Park and the Coast Range is in jeopardy due to the combination of the above-mentioned conflicting uses. Because the County cannot regulated forest practices in CFU zones, the threat to forested wildlife habitat is especially pronounced in the Folkenberg and McNamee-Harborton subareas, where other conflicting uses must be *limited* in order to maintain the recommended half-mile of continuous forest cover.

- Edge Effects

Edge effects have been studied by Kendeigh, (1944); Askins, et al., (1987) and Lemkuhl, et al., (1991). Edge effect is defined as the deleterious effects of increased edge to area ratios due to human activity on plant and animal communities (Soule, 1986; Harris, 1989; Reese and Ratti, 1989; Lemkuhl and Ruggiero, 1991). Potentially, one of these effects is competition between edge and interior species where species that use both edge and interior habitat can have a competitive advantage over species that are more dependent on the forest interior.

It was once thought that the creation of edge effect and the adjacency of highly contrasting plant communities like pasture and forest enhanced the wildlife habitat value of an area. Recent studies have shown that creation of sharp edges and maximum contrast, clear cuts next to old growth forest may cause serious losses of the biological health of the old growth stand due to losses of tree cover to wind throw and increased populations of nest parasites (Forman, 1991). Edge habitats provide different character and properties than forest interiors. For some species, mortality rate will be greater along the edge because of increased exposure to predation, nest parasites, sun, wind, or limited cover from rain and snow. Other species, including many predators, prefer ecotonal or edge to forest interior habitats.

Generally the narrower the forested area (in this case the West Hills Wildlife Forested Habitat Area peninsula of forested wildlife habitat) the higher the ratio of edge to interior species. Interior species will predominate in the center of a wider forested area. Examples of species tending to occur in portions of forest far from edges (interior areas) in the study area include the varied thrush, Townsend's warbler. and goshawk. disturbance tolerant species are often abundant in habitats with paths and roads, as well as those adjacent to agricultural fields and residential development (Soule, 1991). Long range migratory songbirds nesting in forests are particularly impacted by clearing and edge creation (Askins, 1987). Nest parasitism and predation increases for as much as 600 m into a stand (Gates, Gysel, 1978), effectively reducing functional interior area to none in small stands.

Animals leaving a forest stand to forage or explore dispersal possibilities may succumb to predation or, in the case of game species, be more likely to be killed by

hunters. In this regard the edge of the stand may be termed a unidirectional filter (Janzen, 1986) in that the net "flow" of animals is out of the stand and population, rather than being balanced by dispersing animals entering the stand from elsewhere decrease. This is not true of all edges, but is the case for systems where edge predominates, which is the situation occurring in the study area.

Changes in microclimate due to edge effect have been studied and found to significantly alter plant communities (Harris, 1984). This is due to light penetration, higher wind velocities and drier conditions (Ranney, et al., 1981). In Pacific Northwest forests, evidence indicates that this effect extends up to 160 meters in a stand (Franklin and Forman, 1987).

- Barriers -- Roads and Fences

Roadways and fences contribute to both the "edge effect" and to "fragmentation." Roadways are common to rural residential, agricultural, forestry and quarry conflicting uses. Fences are common to residential, agricultural and quarry conflicting uses, and may apply to some prescribed and conditional uses associated with forestry operations *(e.g.,* forest products processing facility, logging equipment repair, forest management research, gravel extraction and landfills).

No new major roads are planned for the West Hills. However, additional road and driveway construction will occur for residential development, quarrying operations, forestry and agriculture. Roads increase impervious surface area, remove vegetation, and, in steeply-sloped areas, can have major adverse impacts on water quality. Vehicle travel on roads also results in road kill. Finally, roads create barriers for animal movement, especially for less mobile species.

The *Rural West Functional Classification of Trafficways* shows principal and rural arterial roads, rural collectors and local roads. Appendix 1 describes is a "windshield" survey of the conditions along each of the roads in the West Hills Wildlife Forested Habitat Area.

Highway 30

The St. Helens Highway (30) is a principal arterial and defines the eastern boundary of the West Hills Wildlife Forested Habitat Area. When coupled with the railroad tracks which parallel this highway, the result is formidable barrier to less mobile wildlife. This barrier effect is increased by concentrations of development on the west side of the highway, and by a large quarry operation. (See *West Hills Wildlife Habitat Area Map,* which shows impacted wildlife habitat areas along Highway 30.)

Cornelius Pass Road

Cornelius Pass Road (a rural arterial) bisects the West Hills. There are concentrations of rural residential development along Cornelius Pass Road at Folkenberg and Cornelius Pass. Cornelius Pass road, roughly parallel railroad

tracks, and associated rural residential development are a major barrier to north-south wildlife movement across the West Hills Wildlife Forested Habitat Area.

Skyline Boulevard
Skyline Boulevard (a rural collector) runs roughly in a north-south direction, and through the middle of the West Hills. Skyline Boulevard also has concentrated rural residential development near Cornelius Pass Road. Skyline Boulevard generally separates forest land (to east) from agricultural land (to west) in the southern portion of the West Hills.

Germantown and Springville Roads
Germantown and Springville Roads, west of Skyline Boulevard, also are rural collectors. Old Germantown Road (a local street) combines with Germantown Road to access a large concentration of rural residential development west of Forest Park. Springville Road also accesses many rural residences. The West Hills Wildlife Forested Habitat Area is impacted in these areas because of the combination of roads and rural development.

Local Roads
Other local roads that serve as barriers to north-south wildlife movement include (from north to south) Gilkison Road, Rocky Point Road, Morgan Road, Logie Trail Road, McNamee Road, Kaiser Road and Newberry Road. Gilkison Road serves a large number of rural residential parcels at the north end of the West Hills, and is a barrier to wildlife movement north to Columbia County Forest Lands. Morgan and Logie Trail Roads serve a large concentration of rural residential development near their junctions with Highway 30. However, wildlife have plenty of room to "jog" westward to forested areas to avoid these rural developments. More serious problems are identified in the McNamee and Sheltered Nook Road areas, where there is rural residential development from a half-mile to a mile from Highway 30. Fences are especially prevalent in rural residential areas, and exacerbate the edge effect already present due to the combination of roads and houses. (See field notes, Appendix 1.)

Roadways present problems to many wildlife species for a variety of reasons. The movement of smaller vertebrates like forest rodents and amphibians is extremely limited by roads, while reptiles seeking to absorb heat from warm roads are killed in large numbers in some areas of the United States (Oxley et. al., 1974; Harris and Scheck, 1991). Highway construction and widening accompanying development, and the subsequent increase in automobile traffic, tend to further fragment habitat and disturb use by wildlife by interfering with foraging and dispersal of many species. Additional adverse to wildlife habitat values can be expected due to deleterious edge effects created by road construction and clearing. For example, the movements of large mobile mammals, such as elk, may be inhibited or disrupted by roads (Ward, 1982).

The evidence on carnivores is contradictory and may be species-specific and variable between regions. Noss (1987) reports that carnivores, particularly large ones, will avoid roads whenever possible. Harris and Scheck (1991) report that some predators opportunistically follow roadside and other linear habitat features while searching for carrion and prey. However, predators following roadside would be exposed to higher risk of mortality from automobile collisions. Significantly, this effect extends for a distance of at least one kilometer (0.62 miles) into adjacent natural areas (Harris and Scheck 1991).

Roadways and fences, together, can create impenetrable barriers for many species of wildlife in the West Hills. For example, wildlife making a dangerous road crossing may find that access to forest cover is blocked by a fence. Wildlife may then retreat back across the road and be struck by a vehicle.

- Fragmentation

Large tracts of forested habitat are necessary to sustain forest wildlife species in the West Hills and neighboring "impact areas." If the fragment size is too small to support a viable population of a given species, it may become locally extinct. Given sufficient time and proximity to a source, recolonization will likely occur (MacMahon et al., 1987). Lemkuhl and Ruggiero (1991) have evaluated a number of species with regard to their risk of local extinction due to fragmentation factors. Animals most at risk tended to be those with small body mass, amphibians and mammals with short dispersal distances and animals with high dependence on specific structural elements, such as snags or abundant large down woody material.

Moreover, the quality of a natural area is linked to its quantity at a particular location. A stand of trees must have a sufficient mix of bionic and abiotic components along with a large enough area to support the home ranges of species with limited dispersal capability (Lemkuhl and Ruggiero, 1991). Structure, including large trees, snags, downed and dead wood, and a wide range of plant species at all canopy levels is an important component of overall natural area quality (Ambuel and Temple, 1983). Fragmentation results in breaking up forested habitat areas, such that there is insufficient area with diversified structure to accommodate a wide range of animal species. It is fragmentation of remaining continuous forested habitat that poses the greatest threat to maintaining a stable ecosystem in the area.

As shown on the *West Hills Wildlife Habitat Area Map,* rural residential development, agriculture, quarrying, roads and quarrying all contribute to the fragmentation of forest habitat areas in the West Hills. The area of greatest fragmentation in primary forested habitat occurs in the vicinity of Folkenberg and Cornelius Pass Road, McNamee Road

- Native Vegetation Removal

Native vegetation, as used in this report, includes forest canopy in mature forests, understory in both early successional and mature forests, brush and dead/fallen trees. As noted above, the conservation of wildlife habitat values depends on maintaining all three native vegetation attributes over as much of the West Hills Wildlife Forested Habitat Area as reasonably possible.

Maintenance of native vegetation contributes directly to decreased to improved water quantity and quality, fish and wildlife habitat. The retention of native vegetation is a critical element in wildlife habitat functions and values. The impact of allowing rural residential development is much greater when it is accompanied by vegetation removal which occurs on otherwise forested areas.

Without vegetative cover, the potential for flood damage and erosion increases. Vegetated soils allow water to filter downward to the groundwater reservoir, adding volume to surface waters during low flow. Increased groundwater adds to surface water flows during low flow periods. Vegetative cover also absorbs chemicals and heavy metals, reducing water pollution. Thus, degradation of wildlife habitat caused by vegetation removal, whether as a result of excavation, cutting, or chemical removal, contributes to the direct loss of wildlife habitat functions and values.

Wildlife habitat areas are characterized by varying levels of plant and animal diversity. Where there is greater structural diversity, wildlife habitat generally has a higher rating. Reduction in the quality, quantity and availability of food and cover provided by forest and riparian vegetation has significant detrimental effect on wildlife. Where wetlands are connected to other natural resources, and provide cover and food for small animals and birds, they also provide essential travel corridors for wildlife.

When native vegetation is removed, the value of the forest or riparian area for habitat usually decreases. Spraying, cutting or scraping of vegetation is often considered to be "routine maintenance," but has the effect of changing vegetative structure and habitat qualities of forested habitat. The removal of native vegetation usually results in replacement with introduced and more hardy species, which tends to decrease biodiversity, as more aggressive and adaptable species survive and displace less adaptable species under changed ecological conditions.

Where native vegetation is replaced with lawns or gardens, increased nutrient loading is likely to occur from increased fertilization. The result is decreased water quantity and quality, and diminished fish and wildlife habitat. Even if the wetland were conserved, the side effects of wetland vegetation loss is more likely to occur where there are higher concentrations of population in proximity to the wetland resource site.

In conclusion, the environmental consequences of allowing native vegetation removal —whether through excavation, maintenance, chemical or mechanical removal — on a forest and riparian habitat would mean that many of the qualities which make each portion of the West Hills Wildlife Forested Habitat Area *significant* would be lost.

- Application of Herbicides

  Application of herbicides is widely used in forest practices, in agriculture and in residential lawn and garden maintenance. Logging practices in the Pacific Northwest Douglas-fir forests have included suppression of successional plant species via herbicide application followed by subsequent replanting using a single recommended species (Douglas fir). Unrestricted use of herbicides can destroy habitat diversity necessary for survival of wildlife species. Herbicides also kill plants which contribute to overall structural diversity, and may provide species-specific cover and food for wildlife.

- Soil Excavation

  Soil excavation occurs for most development activity. Soils are exposed routinely for agriculture. Quarrying requires excavation of soil and underlying rock. Road construction associated with forestry or development also requires soil excavation. Soil excavation removes vegetation, and increases erosion and sedimentation to streams and wetlands. All of these factors contribute to the degradation of forest wildlife habitat.

- Topsoil Removal

  Topsoil removal makes it impossible for native vegetation to be re-established, and thus eliminates most wildlife habitat. Topsoil removal may occur with residential development, although it is usually replaced on site. The practice of topsoil removal is most commonly associated with mining activities. Topsoil may be required to be replaced through reclamation, although this can take many years.

- Human Intrusion

  Human intrusion is one of the most detrimental impacts on wildlife. It is most often associated with residential development and along access roads. This "impact" ranges from shooting wildlife, to vandalism, to off-road recreational driving, to frightening animals by human presence. Land use regulations typically are relatively ineffective in controlling human intrusion factors. Education and peer pressure are considered more effective means of limiting this ubiquitous conflicting activity.

- Pet Impacts

  Residential developments pose some particular conflicts. Pets, specifically domestic dogs and cats, if allowed to roam free, will prey on a wide variety of small vertebrates from shrews to woodpeckers. Additionally, when dogs are allowed enough freedom they have been known to form packs. These packs have been reported to run off black-tailed deer (Odocoileus hemoinus), elk, and other large and medium-sized carnivores. Domestic cats are adept hunters, and are known to kill large quantities of birds and small mammals.

- Increased Impervious Surface Areas

  Increased impervious surface areas result from virtually all land development and road construction. Mining operations, by stripping topsoil and exposing bedrock, also increase impervious surface area. In addition to removing native vegetative cover, the result is that soils and vegetation lose no longer absorb water, and surface water runoff is concentrated. The potential for erosion and stream bank destabilization increases, and water quality decreases as more sediments reach streams and wetlands. Groundwater recharge and quality may also be adversely affected. The quality of wildlife habitat decreases with water quality, and the loss of native vegetation cover.

- Application of Insecticides and Poisons

  Insecticide use is usually associated with rural residential development, agriculture and forestry operations. Since insects are part of the wildlife food chain, the loss of insects, *per se,* contributes to a loss in habitat value. In addition, many insecticides directly harm small animals and birds. Poisons are often intentionally applied to kill predators, which are a danger to farmers or owners of small pets.

- Application of Fertilizers

  Fertilizer use is associated with agriculture, forestry, and rural residential uses (lawns, gardens). Over-use of fertilizers increases nutrient loading in streams, and decreases water quality. Fertilizers and irrigation also allow non-native vegetation species to thrive, to the detriment of native plant species which provide superior wildlife habitat.

- Water Quality Impacts

  Many of the impacts described above adversely affect water quality. Clean water is essential to maintaining diversity of aquatic life. Where wildlife are dependent upon aquatic life for food, the abundance and diversity of terrestrial life is adversely affected by decreased water quality. Streambank erosion is one of the principal ways in which wildlife habitat is lost. Streambank erosion is intensified as impervious surface areas increase, surface water flows are concentrated, and vegetative

cover lost. Livestock use of streams does major damage to streambanks, through grazing and trampling of vegetation. Many species flourish in riparian areas, which are damaged as streambanks erode. When soils are exposed as a result of development, agriculture, or forestry, especially in steeply-sloped areas, the chances of erosion and slumping increase. Sediment-laden water enters streams, and decreases water quality. Nutrient-loading to streams decreases water quality by increasing food levels for algae, which consume oxygen necessary for aquatic species to survive. Nutrient loading results from virtually all development, from application of fertilizers, from livestock use, and from increased runoff and sedimentation.

- Specific Environmental Consequences -- Residential Uses

Rural residential development requires native vegetation removal for house and road construction. Rural residential development usually results in substituting lawns and gardens for forested habitat. When rural residential development follows timber harvests, reforestation is uncertain. For these reasons, rural residential areas developed at five-acre densities or greater are considered to be impacted wildlife habitat areas. Where rural development is sparse, or where forest cover remains largely intact, Rural Residential and Multiple Use Agriculture-zoned areas may be considered as secondary habitat areas. Secondary wildlife habitat status can be retained over time, even with home construction, if conflicting activities associated with rural residential development are curtailed.

Lawn care and garden products such as pesticides and chemical fertilizers can seriously affect water quality. Some pesticides are toxic to wildlife and native plant species. Many garden crops will attract wildlife and conflicts will develop when homeowners erect fencing designed to keep them out. However, carefully designed fences are a possible solution to reducing conflicts with pets. For these reasons, significant wildlife habitat is reduced at particular locations as a result of rural residential development.

There are certain sub-areas where additional residential development could be extremely harmful to West Hills wildlife habitat values, as described in this analysis. On either side of Cornelius Pass Road (Folkenberg, McNamee Road, Sheltered Nook) there is a large area of Rural Residential land that currently creates significant barriers to wildlife movement, and which could, if fully developed without restriction, greatly restrict such movement:

Critical Sub-Area	Existing Units	Potential Units
Folkenberg	53	79
McNamee-Harborton	29	37

If these areas are built out at these densities, it is probable that the forested habitat connection between Forest Park and the Coast range will be interrupted by impacts from existing and potential residential development.

- Specific Environmental Consequences -- Agriculture

When land is cleared for agricultural use (cultivation of crops, orchards, grazing of livestock), the quantity, quality and location of forested wildlife habitat is diminished. Removal of forest cover increases "edge effect" and fragments forest habitat. Generally, large blocks of cleared agricultural land, such as found in EFU-zoned areas in the Cornelius Pass, Germantown Road, and Bonny Slope Subareas, is recognized as "impacted wildlife habitat." Such large blocks of agricultural land act as a buffer between urban development and forested wildlife habitat.

Conflicts between human uses and wildlife survival arise from fencing, pesticide use, carnivore predation on livestock and poultry, and crop damage by a variety of birds and mammals. Species that prey on poultry include foxes, weasels, skunks, bobcat, coyote, raccoon, red-tailed hawk, Cooper's hawk, northern goshawk, and great horned owl. However, these predators also consume rodents that may also be harmful to crops. Riparian areas are susceptible to great damage by large livestock, particularly cattle and swine. Fencing that would keep them out of sensitive areas should be designed to be passable by wildlife.

- Specific Environmental Consequences -- Forestry

Clear-cut logging in the study area has caused a temporary, but nonetheless detrimental, loss of continuous forested habitat. The problem arises when cuts over large areas deplete adjacent habitat by creation of large length of edge as well as eliminating continuous forest in this relatively narrow peninsula. In conjunction with other land uses, there are several areas where the continuous habitat has been effectively disrupted (see maps). This is a temporary situation if the cut-over area is allowed to regenerate. However, the quality of the regenerated area as habitat will be lowered if selective logging practices are not followed (Franklin, 1989). Logging practices in the Pacific Northwest Douglas-fir forests have included clear cutting, suppression of successional plant species via herbicide application followed by subsequent replanting using a single recommended species (usually Douglas fir). Herbicide application on federal lands is now prohibited. However, much of the forested lands within the West Hills Wildlife Forested Habitat Area are privately owned, where herbicide use is not restricted. It has also been standard practice to clear and burn slash and to eliminate down and standing dead wood. This reduces the structural elements and plant diversity carrying over into the re-generating clear-cut. Limiting size and configuration of cuts and replanting with a mix of natural species are practices that would ameliorate some conflicts associated with use of timber resources (Franklin, 1989).

- Specific Environmental Consequences -- Mining

It is important to consider the specific development plans of property owners, especially when the subject property is committed to a particular land use. At issue in *Columbia Steel Castings* was the fact that the company had made major infrastructure investments that could not be readily moved. There were specific impacts related to a particular industrial site that needed to be factored into the Goal 5 balancing process. A review of the Multnomah County Zoning Ordinance simply would not provide the level of detail necessary to consider the trade-offs that have to be made when an existing development desires to expand on a resource site.

The principal known development proposal is the Angell Brothers aggregate extraction mining operation located in the McNamee-Harborton Subarea. The existing mining operation covers approximately 114 acres. Angell Brothers proposes to expand the mining operation to include an additional 283 acres. If approved, the mining operation would extend almost to McNamee Road, and would obstruct the principal connection between Forest Park and the northern portion of the West Hills Wildlife Forested Habitat Area.

Mineral aggregate extraction (quarrying) has obvious and long-term impacts on the landscape and habitat of the area. The removal of top soil inhibits the regeneration of all three forest canopy levels, and makes it difficult to recreate forest conditions similar to the original forests of the site. Blasting and/or low frequency vibration in the ground from heavy equipment may disturb moles and pocket gophers. These fossorial animals play an important role in maintaining soil viability and fertility (MacMahon et al., 1989). The quarry head wall is a cliff which, in its current form, effectively prohibits the movement of terrestrial species, thus forcing animals downslope toward US Highway 30 or upslope toward the remaining strip of trees. The noise and human activity at the quarry may also be avoided by many wildlife species if alterative forested habitat is available. Water quality impacts increase as a result of soil and vegetation removal, especially when excavation occurs in drainage corridors.

Although the loss of wildlife habitat area (an additional 283 acres) is in itself a major conflicting use, it is the location of the Angell Brothers quarry in relation to McNamee Road, Newport Road and Skyline Boulevard which is of critical concern. As shown on the *West Hills Wildlife Habitat Area Map,* Forest Park borders the West Hills Wildlife Forested Habitat Area for a distance of about 1.5 miles. However, heading north from Forest Park, the recommended "peninsula" of forest land narrows to about a mile. The forest peninsula is infringed upon by development associated with Highway 30 on the northeast, and McNamee Road on the west. Continuing north (about two miles from Forest Park), the peninsula narrows to just over a half mile, between McNamee Road (and associated rural residential development) and the *existing* Angell Brothers quarry.

If the quarry were to expand to the southwest, towards McNamee Road, to include the entire 283 acres, *then* the "peninsula" would narrow to a few hundred yards. Such a narrow "neck" of forested land would be inadequate to provide the continuous forest cover needed to sustain wildlife large populations of diverse wildlife. (See *A Study of Forest Wildlife Habitat in the West Hills.)* The only alternative for wildlife needing

- continuous forest cover would be to jog westward, across McNamee Road and an associated "secondary habitat" area, which has been degraded by rural residential development and clearing for agricultural purposes.[20]

On the other hand, *if* the quarry were located further to the north, where the forest land peninsula is about three miles wide, it would not have the same constricting effect on forested habitat.[21]

iv. Energy Consequences

There are no significant identified energy consequences of allowing conflicting uses in place of wildlife habitat in the West Hills.

b. Consequences of Protecting Wildlife Habitat on Conflicting Uses

i. Residential Uses

- Economic Consequences

Ideally, to minimize adverse impacts on wildlife habitat, no additional rural residential development would be permitted in the West Hills. However, this would have major adverse economic consequences for property owners. Table 6, below, describes the existing and potential number of rural residences that may be sited in each of the West Hills subareas.

The value of a rural residential lot in the West Hills Rural Area varies according to a number of factors, including proximity to Portland, views (1-5 mountain views), buildability (slopes, access, availability, on-site sewage disposal, water, *etc.),* and whether the property (and surrounding properties) are forested or clear cut.

Based on our analysis of County Assessor's data, the average vacant RR, MUA or urban lot in the West Hills Rural Area has a market value at about $34,000.[22] This figure does not include development costs to render the lot buildable. On the other hand, this figure seems low, especially when scarce "view lots" are considered. Table 8, at the end of this report, uses County Assessor's Records[23] to document the *market value* of vacant, buildable Rural and Urban Residential properties.[24]

The West Hills Rural Area, exclusive of limited development potential in CFU and EFU land, has the *potential* for an additional 302 rural residential dwelling units

TABLE 6: EXISTING AND POTENTIAL[25] RURAL RESIDENTIAL UNIT SUMMARY

SUBAREA	EXISTING RESIDENTIAL UNITS		POTENTIAL UNITS	
	RURAL RESIDENTIAL	MULTIPLE USE AGRICULTURE	RURAL RES.	MULTIPLE USE AG.
GILKISON ROAD	26		4	
WILDWOOD-MCKAY CREEK	5		5	
HOLBROOK-LOGIE	71		25	
UPPER ROCK CREEK	17		10	
FOLKENBERG	53		79	
MCNAMEE-HARBORTON	29		37	
CORNELIUS PASS	22	17	10	6
GERMANTOWN ROAD	46	8	57	2
BONNY SLOPE	136	34	38	8
BALCH CREEK	41		21	
RURAL RESIDENTIAL TOTALS	446	59	286	16

on land zoned RR and MUA. Prohibition of development would mean a potential loss to private property owners of $10,268,000, and for urban property owners of $14,280,000.[26] Suffice to say, there would be substantial adverse economic impacts if the County were to down-zone all RR and MUA lots, so as to prohibit otherwise permitted development of these lots, not only in terms of lost value to owners, but also in terms of diminished tax revenues.[27]

On the other hand, since there is a limited supply of rural residential lots in the region, removing 302 buildable lots from the inventory of rural lots would likely increase rural residential lot and home prices elsewhere outside the Urban Growth Boundary. Such a price increase could benefit existing property owners and would adversely affect potential home buyers.

Owners of developed residential lots in the West Hills Rural Area likely would benefit from maintenance of open space on land surrounding their homes, rather than having new rural residential development. Thus, if vacant residential lots in the West Hills were restricted from development to maintain wildlife habitat, existing home values in the West Hills would likely increase, due to scarcity and open space conditions around them.

If residential development were not prohibited, but rather subject to development standards in order to partially protect wildlife habitat, adverse economic impacts for individual rural residential property owners would include limited use of property for hobby farm activities, slightly increased development costs if erosion control measures were required, and increased manual labor to maintain cultivated areas

without extensive use of herbicides. On the other hand, there would be positive economic consequence. such as reduced impacts from development of adjacent rural residential lots (e.g., erosion on to their properties) and an increase in forested areas and an "open space" ambience.

- Social Consequences

Multnomah County has already restricted the supply of rural residential lots through application of Statewide Planning Goals 3 (Agricultural Lands) and 4 (Forest Lands). Although there is general public acceptance of Oregon's strict regulation of rural residential development in agricultural and forest areas, there is also the expectation that limited rural residential development can occur in "exception" areas. Thus, further restriction of the rural residential land supply would have adverse social consequences for those seeking a rural lifestyle.

On the other hand, urban residents, and those who already live in the West Hills, would benefit from increased open space in the West Hills. Individuals who value wildlife habitat would also benefit from prohibiting additional residences in the West HIlls. There is substantial evidence that many residents of the West Hills place a high value on maintenance of native vegetation and wildlife habitat.

- Environmental Consequences

The negative environmental consequences of restricting rural residential development in the West HIlls are not significant. While some future rural West Hills residents might reside within the urban growth boundary instead, thus lowering environmental impacts, others might move to rural areas further away from Portland, thus raising environmental impacts in other rural areas.

- Energy Consequences

The energy consequences of prohibiting rural residential development in the West Hills are not significant. Rural West Hills residents probably consume proportionately more gasoline than urban residents, because they live at some distance from the urban center. However, there would be no assurance that displaced West Hills residents would live within the regional UGB; they could live even further out, and consume even more energy for transportation.

ii. Agriculture

- Economic Consequences

The West Hills Wildlife Forested Habitat Area includes large tracts of land designated as Exclusive Farm Use (EFU) in the Cornelius Pass and Germantown subareas, with limited EFU acreage in the Rock Creek and Bonny Slope subareas. EFU land in these areas is recognized as secondary or impacted wildlife habitat.

There would be severe adverse economic consequences if cultivated or pasture land in exclusive farm use zones were required to convert to forested wildlife habitat. Moreover, there would be little benefit to such a program, because Multnomah County's EFU land is not required to maintain the 1.5 mile forested peninsula.[28]

On the other hand, there appears to be little economic value in farming the steeply sloped areas which comprise most of the West Hills CFU, RR and MUA areas. Most of this land is not Class I-IV farm land, and has little value for agriculture.

- Social Consequences

The social consequences of prohibiting agriculture on EFU land with the West Hills Wildlife Forested Habitat Area are significant and adverse. Agricultural land is considered as attractive open space by urban dwellings, and farming constitutes a way of life for those who live on and operate farms in the area.

- Environmental Consequences

The negative environmental consequences of restricting agricultural development in the West Hills would not be significant. Any benefit to wildlife habitat in the West Hills would be offset by reduced wildlife habitat in "replacement" farming areas elsewhere in the state.

- Energy Consequences

Energy consequences would be negative. Farms in the west Germantown and Cornelius Pass subareas are part of a much larger farming region, which is located close to metropolitan area markets. Displacing farming operations in these areas would therefore increase transportation and energy costs.

iii. Forestry

- Economic Consequences

Statutory prohibitions aside, there would be major adverse economic consequences of prohibiting timber harvests throughout the West Hills Wildlife Forested Habitat Area. Commercial Forest Use (CFU) zoning accounts for approximately 14,600 acres, or 76% of the land (outside of rights-of-way) within the West Hills Rural Area. This land is comprised primarily of good quality forest land, with high yields for Douglas fir and other commercial species.

Using the following assumptions, the commercial value of an acre of mature timber is estimated as follows[29]:

- 50-60 year old Douglas fir
- fully stocked (not diseased or damaged by wind or fire)

- clear cut one full acre
- assume 25,000 board feet per acre (generous)

The net value, after transportation, logging costs, and taxes is estimated at approximately $8,000 to $10,500 per clear cut acre of quality Douglas fir. Assuming that one-third of this acreage will reach maturity during the 20-year planning period, the net future value (in 1994 dollars) of timber in CFU-zoned areas within the West Hills Rural Area is approximately $48 million.

The economic consequences for limiting timber harvesting on Rural Residential(RR) and Multiple Use Agriculture (MUA) exception lands are considerably less than for CFU (commercial forest) lands. There are approximately 2,500 acres zoned RR and MUA in the West Hills Rural Area. RR and MUA lands are often more difficult and costly to log, due to near-by residential development and small lot sizes. Moreover, rural residential parcels typically are not managed for timber production. Reducing the gross forested area by an acre for each existing and probable residence (807 acres), and assuming that 20 percent of the remainder will be logged over the next 20 years (339 acres), the net future value (in 1994 dollars) of timber in RR and MUA zoned areas is approximately $3.4 million. This amounts to the residential value of about 100 RR lots.

- Social Consequences

The social consequences of limiting timber harvesting on CFU lands within the West Hills Wildlife Forested Habitat Area are mixed. Clearly, the loss of $48,000 in net timber receipts would negatively affect job opportunities in the area, with attendant social problems. On the other hand, retention of forested areas in the West Hills Wildlife Forested Habitat Area would have open space and aesthetic value to residents of the area (with the probable exception of those who are dependent on the timber economy) .

- Environmental Consequences

The negative environmental consequences of restricting forestry in the West Hills would not be significant. Any benefit to wildlife habitat in the West Hills would be offset by reduced wildlife habitat in "replacement" forestry activities elsewhere in the state.

- Energy Consequences

Energy consequences of prohibiting timber harvesting in the West Hills Rural Area generally would be adverse, to the extent that timber must be imported from more distant areas. On the other hand, energy consequences from preserving wildlife habitat areas, and vegetation generally, would appear to be positive. Forest cover has a moderating effect on climate. Retaining open, forested habitat areas near urban centers may encourage people to recreate closer to home, thus reducing

transportation costs.

iv. Mining

Conflicts between gravel extraction (quarrying) and wildlife habitat in the West Hills Wildlife Forested Habitat Area are not easily resolved. It is recognized that State reclamation law and locally-imposed conditions of approval can mitigate the adverse impacts of quarrying over time. However, quarrying operations can be continuous, and can last for decades. It is uncertain whether forested habitat can ever be re-created fully. If wildlife movement and inter-action is blocked by a combination of rural residential development, roads and fences, clear cut logging practices, and quarrying, it will be difficult to re-establish the vital connection between Forest Park and large tracts of forest land to the north and west. It is unclear how many years it would take to reclaim an quarry, or how long it would take to create forest habitat over a quarry site. What is clear as that is that forest habitat will not be re-established from an expanded quarry mining operation for at least 10 years, and will therefore have "long-term" impacts as defined in this study.

It should be kept in mind that Multnomah County *may* allow additional quarrying operations in any of the rural zoning districts applicable to the West Hills Wildlife Forested Habitat Area. Much of the Tualatin Hills probably contain rock suitable for quarrying and crushing. However, the focus of this ESEE analysis is on the Angell Brothers quarry, because it is the only major quarry operation in the West Hills.

- Economic Consequences

From a regional perspective, there could be major economic consequences associated stopping further quarrying operations in the West Hills Wildlife Forested Habitat Area. From the point of view of Angell Brothers, and in the long-term, the economic consequences of prohibiting further gravel extraction (beyond current operations) are significant and adverse.

<u>Impact on Angell Brothers Quarry</u>

Angell Brothers currently leases 397 acres of land between US Highway 30 on the east and McNamee Road on the west. Angell Brothers currently have permits to mine 114 acres. The original permit, for 71 acres, was granted in 1958. In 1990, the County approved expansion of the site by 42 acres, to allow mining of an estimated 25 million cubic yards of rock. The *significance* of the 113 acre site is not at issue in this Goal 5 review, because conflicting uses have already been resolved in favor of gravel extraction at this location.[30]

However, the supply of rock in the existing quarry, and the timing of its extraction, are extremely important to this inquiry. When contacted by telephone on April 8, 1994, Skip Anderson of Angell Brothers stated that the remaining life of the 113 acre site could not be divulged, because this information is "propri-

etary." However, assuming that 400,000 cubic yards are mined annually (based upon the existing crushing capacity), there is a 62-year supply available on the 42-acre, 1990 expansion site (based upon the estimate of 25 million cubic yards of rock). There is considerable controversy over the useful life of the mining operation on land already approved by the County for rock extraction. Known estimates range from 14 months (David Evans Associates, 1990), to 25 years (Skip Anderson, Angell Brothers, **Oregonian,** January 6, 1994), to 60 years (evidence presented by Friends of Forest Park at October 1992 public hearing before Multnomah County Planning Commission). Clearly, the useful life of the existing quarry has a direct economic impact on the Angell Brothers. If there are 25 years of life left in the Angell Brothers quarry, then economic impacts will not be directly felt for many years.

Thus, what *is* at issue is both the timing and the extent of quarry expansion. Allowing additional mining on the 283 acres, leased by Angell Brothers, which currently has no mining permit, must be balanced against its impact on the West Hills Wildlife Forested Habitat Area.[31] According to Angell Brothers, the 283 acre expansion site has about 160 million cubic yards of rock (the 1989 Schlicker report indicates an estimate of about 195 million cubic yards in this area). Using Oregon Division of State Lands statewide[32] leasing price estimates ($0.50 per cubic yard), Mr. Anderson estimated the present (1994) value is $80 million.[33] This figure is based on gross income, and does not include the cost of extraction, crushing, transportation, or administration. The Angell Brothers payroll, which may be reduced if and when the subject site is "used up," is estimated at about a half million dollars. If this site were not available to the Angell Brothers, they would eventually need to find another quarry site or sites, or go out of business. As noted above, good quality rock underlies most of the Tualatin Mountains. The economic impact on consumers is unclear, because of the complexities of regional aggregate market.

Regional Economic Impacts

Determining the regional economic effects of stopping further mining operations, now and in the future, would require a detailed economic study, which is beyond the scope of this ESEE analysis.[34] However, it is probable that eliminating a major regional gravel supplier, such as Angell Brothers, will drive gravel prices up. Since gravel is consumed for a wide range of purposes — from road building to commercial/industrial development to home building — it is safe to say that consumer and government costs probably will increase to some degree.

The degree of consumer price increase depends primarily on the availability of similar aggregate[35] materials from other regional quarrying operations. If the market is competitive enough, losing one operation need not have a major impact on regional gravel prices. If supply is restricted by closure of one mining quarry operation, it is possible that other operations will buy more equipment

and extract gravel more efficiently, which could actually drive prices down. As capital is substituted for labor, it is also possible that unemployment in the gravel industry could increase.

Transportation costs are extremely important when moving heavy and bulky materials, such as rock and gravel. For every six miles of distance travelled, costs increase $1 per ton. If a ton of gravel sells for $5, increase in travel distance can have a major impact on price. Since aggregate material is heavy, public roads will be damaged more by if gravel is transported greater distances, and road congestion will increase.

Consider the potential impact on the average single family house, which uses an estimated 300 tons of aggregate for its foundation, driveway, patios, sidewalks, *etc.* The *per capita* consumption of aggregate in Oregon is 11-12 tons per year, or about 65 pounds per day. A large government project like Westside Light Rail can consume all that a single mine can produce in a year. If aggregate prices increase, even slightly, building costs will increase and all Oregonians will share in these increased costs. Oregon's economy, which is especially dependent upon the building industry, could suffer. If there were only two regional suppliers of aggregate material, and one of them closed down, *then* the remaining supplier would have a monopoly, and raise prices to those of a far distant quarry. The result would be a regional monopoly. However, such is not the case on the Portland metropolitan area, as shown on Table 7 below.

In order to quantify economic impacts, other suppliers of similar materials within the four county region would have to be considered. In addition, since Portland is well-served by rail and river barge, it is possible that out-of-region operators may be competitive in the Portland market. However, the Portland region's aggregate market appears to be fairly competitive. A list of major suppliers, the product supplied, and the County in which the supplier is located, is summarized in Table 7 below. There are a total of 25 aggregate suppliers in Multnomah, Clackamas, Washington, Clark and Columbia Counties, producing a range of products, including crushed rock, asphalt, ready mix, sand and gravel. In the Portland metropolitan region, Angell Brothers, Morse Brothers, Tigard Sand and Gravel, Lone Star, Baker Rock, Karban Corporation and Pacific Rock Products all produced crushed rock from quarries. According to Dick Angstrom of Oregon Concrete and Aggregate Producers, Multnomah and Washington Counties each operate their own rock quarries.

Thus, it would appear that the regional market is reasonably competitive. The useful life of the Angell Brothers permitted quarry has not been determined, but may be as long as 60 years. These two observations, taken together, would indicate that the regional market for aggregate products is unlikely to be constrained, at least in the short-term, if the quarry is not permitted to expand into the West Hills Wildlife Forested Habitat Area.

TABLE 7

AGGREGATE SUPPLIERS*

Multnomah, Clackamas, Washington and Columbia Counties, and Clark County, Washington

COUNTY	SUPPLIER	TYPE OF ROCK MATERIAL
MULTNOMAH@	Angell Brothers	Quarry#; asphalt ##
	Lone Star NW**	Ready mix only(no digging)
	Portland Sand & Gravel	Sand & gravel
	Ross Island Sand & Gravel	Sand & gravel (round rock)++
	Troutdale Sand & Gravel	Ready mix
	Porter Yett	Sand & gravel
	Gresham Sand & Gravel	Sand & gravel
	Estacada Rock Products	Aggregate; ready mix
CLACKAMAS	Concrete Service	Ready mix
	Lone Star NW**	Ready mix
	Parker NW	Sand & gravel; asphalt
	Wilmes Sand & Gravel	Aggregate; sand & gravel
	Wilsonville Concrete Products	Ready mix; aggregate***
WASHINGTON@@	Tigard Sand & Gravel	Quarry & asphalt
	Lone Star NW**	Ready mix
	Lone Star NW(Beaverton)	Quarry(crushed rock) & asphalt
	Baker Rock	Quarry & asphalt
	Morse Brothers	Quarry rock; asphalt & ready mix
	Best Mix Concrete	Ready mix
	Karban Corp.	Quarry
	Southwest Ready Mix	Ready mix
COLUMBIA	Scappoose Sand & Gravel	Sand & gravel
	Lone Star NW**	Aggregate****
CLARK	Aphis Ready Mix	Ready mix
	Pacific Rock Products	Quarry rock(crushed); asphalt

* Information provided by Dick Angstrom at Oregon Concrete & Aggregate Producers

** Lone Star has operations in Multnomah, Clackamas, and Columbia Counties, and two operations in Washington County

***Wilsonville Concrete Products is the only supplier who mines from the river. The other suppliers mine in upland areas

****Aggregate from this site is uses by Lone Star's ready mix operations for their sand and Gravel.

Quarry rock is extracted from a solid wall or block of rock, then crushed.

Asphalt is a mixture of rock (various sizes used) and a tar residue.

++ Sand and gravel contains round rock, which comes from rivers. If the rock is over 1 1/4" diameter, it can be crushed

@ Multnomah County does its own mining of about 6-8 million tons per year from one or two sites. The County also imports aggregate from surrounding counties.

@@ Washington County also has a quarry, but they import sand and gravel.

- Social Consequences

The social consequences of restricting expansion of the Angell Brothers operation to its present 114 acres are mixed. Jobs at the Angell Brothers quarry would be lost, once the current supply of aggregate is used up. As competing suppliers pick up the slack from closing down of Angell Brothers, there probably would be increased truck traffic in other neighborhoods, outside the West Hills / US Highway 30 area. If the construction costs were to increase, there could be increased unemployment in the building trades industries. To the extent that home construction costs increase, families may be priced out of the home ownership market.

On the other hand, immediate residents of the area would benefit from decreased noise, fewer trucks, and increased wildlife in their neighborhoods. Future users of Forest Park would benefit from increased wildlife diversity. Forest Park and the remainder of the West Hills Wildlife Forested Habitat Area peninsula are among the few reasonably high quality wildlife habitat areas remaining near large cities in the United States. These areas are of tremendous value to the people of the Portland Metropolitan area for scientific, educational, aesthetic and recreational purposes, and in some ways indicative of how a large natural area responds to urbanization. Where once human development occurred in a matrix of the natural landscape, today natural areas occur in a matrix of human-dominated landscape.

- Environmental Consequences

The negative environmental consequences of restricting mining in the West Hills would not be significant. Any benefit to wildlife habitat in the West Hills would be offset by reduced wildlife habitat in "replacement" mined areas elsewhere in the vicinity of the Portland Metropolitan Area.

- Energy Consequences

The energy consequences of prohibiting quarry expansion are largely negative. As noted above, the transportation and energy consumption costs for moving aggregate materials are high. Moreover, if concrete costs increase as a result of more expensive aggregate materials, the building industry will substitute other products if possible. Since concrete is an good insulator, substitution of a different product could result increased space heating costs. On the other hand, the availability of urban open space and recreational opportunities may mean that urban residents drive shorter distances to reach recreational destinations.

v Other Applicable Statewide Planning Goals

OAR 660-16-005(2) states: "*The applicability and requirements of other Statewide Planning Goals must also be considered, where appropriate, at this stage of the process.*" The following additional Statewide Planning Goals apply to this ESEE analysis:

- GOAL 3 - AGRICULTURAL LANDS

Goal 3 applies to those lands designated and zoned for Exclusive Farm Use. Portions of the three streams in the Howard Canyon area run through lands designated and zoned for Exclusive Farm Use. ORS 215.253 states that "*No ...county...may exercise any of its powers to enact local laws or ordinances or impose restrictions or regulations affecting any farm use land situated within an exclusive farm use zone...in a manner that would unreasonably restrict or regulate farm structures or that would unreasonably restrict or regulate accepted farming practices because of noise, dust, odor, or other materials carried in the air or other conditions arising therefrom...*" Consequently, regardless of impacts accepted agricultural practices may have on significant wildlife habitat, the County cannot place restrictions on accepted agricultural practices in areas designated and zoned as Exclusive Farm Use Use lands.

- GOAL 4 - FOREST LANDS

Goal 4 applies to those lands zoned Commercial Forest Use. Most of the West Hills Wildlife Forested Habitat Area (76%) is designated and zoned as Commercial Forest Use lands. Forest operations, practices, and auxiliary uses are subject only to such regulation of uses as are found in ORS 527.722, which states that "*no unit of local government shall adopt any rules, regulations, or ordinances or take any other actions that prohibit, limit, regulate, subject to approval or in any other way affect forest practices on forestlands located outside of an acknowledged urban growth boundary.*" Consequently, regardless of impacts forest practices may have on significant streams, the County cannot place restrictions on forest practices in areas designated and zoned as Commercial Forest Use lands. However, the County may prohibit forest practices on lands which are not designated as forest lands (e.g. Rural Residential and Multiple Use Agriculture "exception" lands).

- GOAL 5 - OPEN SPACES, SCENIC AND HISTORIC AREAS, AND NATURAL RESOURCES

Direction from the Department of Land Conservation and Development staff, as part of the Remand Order, requires that only those Goal 5 resources that have been inventoried and determined to be significant are appropriate to be included within the ESEE analysis. Of the three other identified significant Goal 5 resources in the West Hills (Scenic Views and Sites, Mineral & Aggregate Resources, Streams) only Mineral & Aggregate Resources have been deemed to be a use which conflicts with streams.

- GOAL 9 - ECONOMIC DEVELOPMENT

Goal 9 calls for adequate opportunities for a variety of economic activities in the

state. Opportunities for local businesses and industries that process local resources and serve local residents may be limited because of their conflicts with wildlife habitat. Alternatively, there may be a potential for tourist activities associated with Forest Park, a large natural park in a metropolitan setting, which would be enhanced by maintaining a functioning connection to the Coast Range for wildlife.

- GOAL 10 - HOUSING

  Goal 10 focuses on providing housing types to meet needs within urban growth boundaries. It indicates that ordinances and incentives should be used to increase population densities in urban areas rather than rural areas such as the West Hills Wildlife Forested Habitat Area

5. SUMMARY

a. Adverse consequences of allowing conflicting uses upon wildlife habitat are almost entirely environmental in nature. Adverse consequences of protecting wildlife habitat upon conflicting uses are mainly economic in nature.

b. In balancing wildlife vs. conflicting uses, it is clear that the adverse environmental consequences upon wildlife habitat would greatly outweigh the economic benefits of allowing conflicting uses without restriction. Likewise, the adverse economic consequences upon conflicting uses would greatly outweigh the environmental benefits of prohibiting conflicting uses in order to protect wildlife habitat. Therefore, a balanced approach, which limits, but does not prohibit, conflicting uses in order to protect wildlife habitat, is appropriate.

c. Synopsis of Consequences

<u>Consequences if Residential Uses are not allowed</u>
Economic: Lower property values, less tax revenue
Social: Loss to individuals wishing "rural lifestyle"
Environmental: Insignificant
Energy: Insignificant

<u>Consequences if Residential Uses are allowed in a limited manner</u>
Economic: Possible partial loss if regulations restrict use of property
Social: Loss to owners from diminishment of rural uses conflicting with wildlife.
Environmental: Insignificant
Energy: Insignificant

<u>Consequences if Residential Uses are allowed fully</u>
Economic: Loss of indirect benefits related to quality of life and tourism
Social: Loss of educational and passive recreational opportunities
Environmental: Numerous negative impacts from habitat loss & diminishment

Energy: Insignificant

Consequences if Agriculture is not allowed
Economic: Loss of economic value, loss of farm products to Portland area
Social: Loss of aesthetically pleasing open space, loss of farming lifestyles
Environmental: Insignificant
Energy: Increase in costs to bring more distant farm products to market

Consequences if Agriculture is allowed in a limited manner
Economic: Some loss of economic value and nearby farm products
Social: Loss of aesthetically pleasing open space, burden of regulations
Environmental: Insignificant
Energy: Marginal increase in costs to bring distant farm products to market

Consequences if Agriculture is allowed fully
Economic: Loss of indirect benefits related to quality of life and tourism
Social: Loss of educational and passive recreational opportunities
Environmental: Numerous negative impacts from habitat loss & diminishment
Energy: Insignificant

Consequences if Forestry is not allowed
Economic: Loss of jobs, taxes, and revenue from sales
Social: Loss of timber-based lifestyle
Environmental: Insignificant
Energy: Greater energy expenditure to bring wood products to market

Consequences if Forestry is allowed in a limited manner
Economic: Possible loss of some jobs, taxes and revenue from sales
Social: Insignificant
Environmental: Insignificant
Energy: Insignificant

Consequences if Forestry is allowed fully
Economic: Loss of indirect benefits related to quality of life and tourism
Social: Loss of educational and passive recreational opportunities
Environmental: Numerous negative impacts from habitat loss & diminishment
Energy: Insignificant

Consequences if Mining is not allowed:
Economic: Loss of long-term supplies, potential for increased cost of product
Social: Increased impacts to other communities
Environmental: Insignificant
Energy: Higher consumption for transport, less use of energy-efficient concrete

Consequences if Mining is allowed in a limited manner:
Economic: Possible loss of long-term supplies & increased cost of product

Social: Possibly increased impacts to other communities
Environmental: Insignificant
Energy: Possibly higher consumption for transport, less use of concrete

Consequences if Mining allowed fully
Economic: Loss of indirect benefits related to quality of life and tourism
Social: Loss of educational and passive recreational opportunities
Environmental: Numerous negative impacts from habitat loss & diminishment
Energy: Insignificant

6. FOOTNOTES

[11] Sauvie Island has relatively little forested habitat. Highway 30 is not an insurmountable barrier for forest bird species. Terrestrial species such as deer and coyote may also be able to cross Highway 30 during periods of low traffic. Sauvie Island is not considered an "impact area affected" because the island is primarily agriculture and not forest, and because Sauvie Island does not connect to large areas of forest land.

[12] The purpose of the County's Policy 11 is to: *...conserve forest lands by maintaining the forest land base and to protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of forest tree species as the leading use on forest land consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture....Forest operations, practices, and auxiliary uses shall be allowed on forest lands subject only to such regulations of uses as are found in ORS 527.722....The County's policy is to designate and maintain as commercial forest land, areas which are:...F.1. Necessary for watershed protection or are subject to landslides, erosion, or slumping. 2. Wildlife and fishery habitat areas, potential recreation areas or of scenic significance....The County's policy is to allow forest management with related and compatible uses, but to restrict incompatible uses, recognizing that the intent is to preserve forest lands from inappropriate and incompatible development.*

[13] HB 3661 establishes even tighter restrictions for high quality forest land, such as typically found in the West Hills.

[14] Non-conflicting uses, such as "uninhabitable structures accessory to fish and wildlife habitat enhancement," are permitted in the CFU zone, but are not listed on Table 5.A.

15 HB 3661 establishes even tighten restrictions for high quality agricultural land, such as typically found on the western portions of the Bonny Slope, Germantown Road, and Cornelius Pass Subareas in the West Hills.

[16] The County's analysis looked at individual lots to determine whether they could be further divided consistent with County zoning standards. The analysis did not consider whether each of these lots could meet "perk" tests for septic systems, or whether well

water is obtainable.

[17] The Goal 5 administrative rule reads:

Determine the Economic, Social, Environmental, and Energy Consequences: If conflicting uses are identified, the economic, social, environmental, and energy consequences of the conflicting uses must be determined. Both the impacts on the resource site and on the conflicting use must be considered in analyzing the ESEE consequences. The applicability and requirements of other Statewide Planning Goals must also be considered, where appropriate, at this stage of the process. A determination of the ESEE consequences of identified conflicting uses is adequate if it enables a jurisdiction to provide reasons to explain why decisions are made for specific sites.

[18] In the Columbia Steel Castings case, the Oregon Supreme Court refutes the City of Portland's argument that conflicting uses are identified primarily through an analysis of uses allowed in applicable zoning districts. (The City cited OAR 66016-005 in support of their contention.) The Court found that a review of the zoning code was merely a first step in a process -- not an end result: "An ESEE analysis describes the interaction of the two phenomena, i.e., the impact that each has on the other....The Goal 5 implementing rules contemplate that the resource site and conflicting use identification will be an ongoing process, subject to adjustment as new information appears.....If all that were necessary to complete the identification of conflicting uses were to scan the zoning maps, as City's argument would appear to suggest, it is difficult to imagine a situation in which there would not be adequate information on the nature of any conflicting use from the outset of a planning process....As noted, the end result of the process is supposed to be a balancing of the impacts that the resource site and the conflicting use have on each other....That balancing process cannot be adequate, under the Goal 5 implementing rules, unless the identification of conflicting uses is specific to each resource site." See also 1,000 Friends of Oregon v. LCDC(Tillamook County), 303 Or 430 737 P2d (1987) describing the balancing process.

[19] Some secondary land use impacts are typically not regulated by zoning, and include such activities as hiking, building forts, frog-collecting, using animals for target practice, climbing trees, and keeping pets. Other secondary impacts -- such as gardening, fence building, vegetation removal, grazing of animals, and siting of residences can be regulated through zoning, and are properly the concern of this analysis.

[20] The forested peninsula is also constricted immediately to the north of Angell Brothers, by existing and probable rural residential development in Folkenberg, Sheltered Nook, and along McNamee Road.

[21] The Tualatin Mountains (West Hills) have common geological and soil characteristics. (See e.g. Soil Survey of Multnomah County, Oregon, US Department of Agriculture, Soil Conservation Service, 1983) It appears that the quarry qualifies as a Goal 5 resource by virtue of leasing arrangements, as well as by geological conditions.

[22] This figure is based on an analysis of vacant Rural Residential lots in the West Hills Rural Area, exclusive of (a) lots that have agricultural or forest tax deferrals, (b) lots valued at $5,000 or less (under the assumption that they have serious development constraints in order to be valued so low), and (c) lots that are identified in the Tax Assessor's records as being unbuildable. A total of 163 lots were identified in the West HIlls Rural Area, spread throughout the area. Their total (1993) market value, based on Tax Assessor's records, was $5,527,500. The average parcel size was about 3 acres. The average value per acre was $11,000. A large proportion of the vacant lots were located in the Bonny Slope area.

[23] We have relied on Assessor's data because of the wide range of factors affecting parcel values. In order to get more precise and reliable data on property values in the West Hills, individual site appraisals would be necessary. At $500 per appraisal per lot, this would exceed the project budget.

[24] According to Professionals 100 Realty, forest land to the north which is outside an Urban Growth Boundary, which has been recently clear cut, is valued at $2,000 to $5,000 per acre. However, a one-acre buildable lot with views can be valued for as much as $95,000 to $125,000.

[25] The County's analysis looked at individual lots to determine whether they could be further divided consistent with County zoning standards. The analysis did not consider whether each of these lots could meet Department of Environmental Quality "Perk" tests for septic systems, whether well water is obtainable, whether access is available, or the willingness of the property owner to develop or sell.

[26] This figure does not consider timber values, of the sale value of Rural Residential or Multiple Use Agriculture zoned property to adjoining residential property owner, or as open space.

[27] However, there would be little environmental reason to do so. Since the majority of the vacant lots are located in the "impacted" portions of the West Hills Wildlife Forested Habitat Area, most lots do not interfere substantially with West Hills forested wildlife habitat values (i.e. with the optimum 1.5 mile wide peninsula, or the minimum 0.5 mile-wide strip of forest land necessary to maintain "connectivity."

[28] The possible exception occurs in Exclusive Farm Use land located about one-half mile west of Folkenberg, along Skyline Road, which is considered secondary wildlife habitat. (See West Hills Wildlife Habitat Area Map) Part of this area is forested, and helps to provide a continuous connection north to large tracts of forested land.

[29] Based on personal communication with a Banks Lumber Company representative on April 8, 1994. A representative from Forest Resources Management, Inc. of Wilsonville corroborated the views expressed by the Banks Lumber Company representative, and provided a net value estimate of $8,000 to $10,000 per clear cut acre of mature, good quality

Douglas Fir in the West Hills.

[30] The question of whether there has been valid Goal 5 inventory of the location of aggregate resource sites in the Tualatin Hills -- let alone on property leased by Angell Brothers -- is beyond the scope of this analysis.

[31] Recent timber harvests in the McNamee-Harborton and Folkenberg subareas have obstructed the requisite half-mile forested connection from Forest Park to the West Hills. Rural residential development partially obstructs the forested peninsula north and west of the Angell Brothers quarry. If the quarry were expanded before clear cut areas regenerate, or in conjunction with additional, unrestricted rural residential development along McNamee and Cornelius Pass Roads, the forested connection would suffer considerably, and perhaps irrevocably.

[32] According to DOGAMI, this 50 cent figure is probably low, since gravel prices tend to be higher in the Portland region than statewide.

[33] Other information presented to the County by Angell Brothers values the quarry rock at $42 million. However, this figure is based upon mining actually occurring on only half of the expansion area.

[34] Much of the economic discussion below is based on discussion with Bob Well at DOGAMI. Mr. Jerry Gray, Regional Geologist for DOGAMI, has commented that "planning issues such as this one can be better addressed in total with a more rigorous Goal 5 effort tied to regional supply and demand data." (letter dated April 13, 1990)

[35] It is important to differentiate between crushed quarry rock, with jagged edges, such as found in the Angell Brothers operation, and smooth river rock, such as mined at Ross Island. These two types of gravel have different purposes, and cannot be substituted for each other in many cases.

TABLE 5: WEST HILLS WILDLIFE GROUP PRIORITY HABITAT

Conflicting Uses and Activities

Forest Wildlife Group	IMPACTS OR ACTIVITIES ASSOCIATED WITH CONFLICTING USES															Water Quality		
					Native Vegetation Removal													
	Edge Effect	Barriers		Fragmentation	Canopy	Under-Story	Dead Wood	Herbicides Application	Soil Excavation	Topsoil Removal	Human Intrusion	Pet Impacts	Incr. Imperv. Surface Area	Insecticides, Poisons	Fertilizers	Streambank Destabilization	Exposed Soils, Erosion, Slump.	Nutrient Loading
		Roads	Fences															
Band tailed pigeon	L+			L+	L+	L+					L	L						
Cavity makers	L+			L+	L+(a)	L+	L+				L	L						
Cavity users	L+			L+	L+(a)	L+					L	L						
Flycatchers	L			L+	L+	L+					L	L		M+				
Finches	L+			L+	L+	L+					L	L						
Ground nesters	L			L+	L+	L+	L+				L	L+		M+				
Raptors	L			L+	L+(b)	L+(b)					L							
Suburban														M+				
Thrushes	L+			L+	L+	L+					L	L		M+				
Warblers	L+			L+	L+	L+					L	L		M+				
Underground mammals		L+		L	L−	L−	L−	L(f)	S+	L	L+(c)	L		L				
Small carnivores (weasel)	L−	L		L	L	L	L					L						
Shrews	L+	L+		L+	L+	L+	L+	L(f)	L	L		L		L				
Medium carnivores (coyote, bobcat)	L	L+		L		L					L	L−						
Ungulates	L	L+	L	L(d)	L(d)	L		L(f)			L	L						
Tree Squirrel	L	L		L+	L+	L						L						
Chipmunk	L	L		L+	L+	L+	L				L	L+						
Ground squirrel												L						
Voles/mice	L	L		L	L	L	L	L(f)	S+	L		L						
Mountain beaver	L+	L		L+	L	L		L(f)										
Large carnivore (bear, cougar)	L+	L+	L	L+	L+	L+					L							
Brush rabbit	L+	L		L+	L+	L+		L(f)			L	L						
Bats	L+			L+	L(e)	L(e)					L			L+				
Amphibians/reptiles	L+	L+		L+	L+	L+	L+	L(f)	L	L		L		L+	L+	L+		L+

Key:

S = Short term impacts lasting up to one year.	(S, M or L) − = Minor Impact
M = Medium term impacts lasting up to ten years.	(S, M or L) = Moderate Impact
L = Long term impacts lasting over ten years.	(S, M or L) + = Major Impact

(a) Over the very long term, grazing will totally eliminate forest canopy and therefore recruitment of snags.
(b) Forest raptors (sharp−shinned and coopers hawks, forest owls) would be severely affected. Others that use forested and open habitats (red−tailed hawk, great horned owl) would be less affected.
(c) These species are often eradicated by humans in agricultural and rural residential areas, and sometimes in regenerating clear cuts.
(d) Deer and elk use of open areas decines greatly beyond 200 feet from the nearest forest cover.
(e) Bats are assumed to forage over open areas but require nearby forest habitats.
(f) Direct effects of reductions in food supply and cover.

TABLE 5 : CONFLICTING USES ALLOWED IN COMMERCIAL FOREST USE ZONING DISTRICT

Affected Subareas: Gillsdon Road, Wildwood–McKay Creek, Holbrook–Logie, Upper Rock Creek, Folkenberg, McNamee–Harborton, Cornelius Pass, Germantown Road, Bonny Slope

Conflicting Use	Code Reference (11.15.)	IMPACTS OR ACTIVITIES ASSOCIATED WITH CONFLICTING USES: Edge Effect	Barriers: Roads	Barriers: Fences	Pregmentation	Native Vegetation Removed: Canopy	Native Vegetation Removed: Under-Story	Native Vegetation Removed: Dead Wood	Herbicides Application	Soil Excavation	Topsoil Removal	Human Intrusion	Pet Impacts	Incr. Impervious Surface Area	Insecticides, Poisons	Fertilizers	Water Quality: Streambank Destabilization	Water Quality: Exposed Soils, Erosion, Sharp.	Water Quality: Nutrient Loading
Uses Permitted Outright																			
A. Forest operations	2048(A)(1)	L+	L+		L+	L+	M+	L+	M+	M+	M+	L+			M+	M+	M+	M+	M+
1. Forest clear cut																			
2. Forest selective cut (a)		L	L+		L-	L	M+	L		M	M	L			M+	M+	M	M	M
3. Forest prod. propagation		M+	L		M	L	M	L	M	S	M	M			M+	M+	M	M	M+
B. Temporary structures	2048(A)(2)	S-	S		S-	S	S-	S-	S	S	S	M		S	S	S	S	S	S
C. Auxiliary uses	2048(A)(3)																		
Mining		L	L		L	L+	L+	L+		L	L	L+		L	L		L	L	L
Gravel extraction		L+	L+	L	L+	L+	L+	L+		L+	L+	L+		L	L		L	L	L
Landfills		L+	L+	L	L+	L+	L+	L+		L+	L+	L		L	L		L	L	L+
Dams/reservoirs			L-	L								L							
Road construction		L+	L		L+	L+	L+	L+	L	S	S	L		L+	L		M	M+	L+
Recreational activities		L	L		L-	L	L-	L	L	S	S	L	L	L-	L-	L-	L	S	L-
D. Temp processing facility	2048(B)	S	S						S	S	S	S		S	S	S	S	S	S
E. Farm use	2048(C)	L+	L-	L+	L+	L+	L+	L+	L+	L+	L+	L+			L+	L+	L	L+	L+
F. Maintenance, expansion of existing single family	2048(D)	L	L	L	L	L-	L-	L	L	S-	S-	L	L	L-	L	L	S	S	L
G. Replacement dwelling within 200' of existing dwelling	2048(E)	L	L	L	L	L-	L-	L	L	S	S	L	L	L	L	L	S	S	L
H. Uses to conserve soil, air, water quality & provide for wildlife/fisheries resources (b)	2048(F)		L-																
I. Nondwelling structure related to fish/wildlife enhancement	2048(G)	L-	L-		L-	L-	L-	L-		S-	S-	S-		L-			S	S	S
J. Park or hatchery caretaker residence	2048(H)	L-	L-	L-	L-	L-	L-	L-	L-	S	S	L	L+	L-	L-	L-			
K. Distribution lines (electric, telephone) & equipment	2048(I)	L	L	L	L	L	L	L	L	S	S	L			L		S	S	L-
L. Passing lines w/in ROW (c)	2048(J)	L	L		L	L	L	L		S	S	S		L			S	S	L-
M. Public road reconstruction (no additional lanes, building removal or new permit) (c)	2048(K)	L	L		L	L	L	L		S	S	S		L			M	M	L
N. Temporary detours	2048(L)	S	S		S	S-	S-	S-	S	S	S	S		S	S		S	S	S
O. Minor improvements to weigh stations, rest areas, maintenance yards	2048(M)									S	S	L		L-			S	S	L-
P. Forest fire lookout tower	2048(N)	L-	L-			L	L-	M-					L+	L-				S	L-
Q. Water intake facility & distribution lines for farm irrigation & ponds	2048(O)		L-									L		L-			L	S	L (d)
R. Temp forest labor camp	2048(P)	S-	S		S	S	S	S	S	S	S	M		S	S		S	S	S
S. Exploration for mineral & aggregate resources	2048(Q)	M	M		M	M	M	M	M	M	M	M		M			M	M	M
T. Exploration for geothermal	2048(R)	M	M		M-	M	M	M-	M	M	M	M		M			M	M	M
U. Solid waste disposal site	2048(S)	L+	L+	L	L+	L	L	L	L	L	L	L+		L	L		L	L	L+
Uses Permitted Under Prescribed Conditions																			
A. Replacement dwelling over 200' from existing dw.	2049(A)	L	L	L	L	L+	L+	L+	L	S	S	L	L	L	L	L	S	S	L
B. Restoration or replacement of dwelling	2049(B)	L	L	L	L	L-	L-	L	L	S	S	L	L	L	L	L	S	S	L
Conditional Uses																			
A. Forest management dwelling	2050(A)	L	L+	L-	L+	L+	L+	L+	L-	S	S	L	L+	L-	L-	L-	S	S	L-
B. Nonforest management dwelling, pursuant to MCC 2052 & 2074.	2050(B)	L	L+	L-	L+	L+	L+	L+	L-	S	S	L	L+	L-	L-	L-	S	S	L-
C. Community service uses:	2050(C)																		
Campground	2050(C)(1)	L+	L+		L+	L+	L+	L+	L	S	S-	L	L	L-	L	L	L	L-	L
Cemetery	2050(C)(2)	L+	L+	L	L+	L+	L+	L+	L+	L+	L+	L+		L-	L	L+	S+	S+	L+
Fire station – rural/forest	2050(C)(3)	L-	L-		L-	L-	L-	L-	L-	S	S	L		L-	L-	L-	S	S	L-
Aid to navigation/aviation	2050(C)(4)		L-									L							
Water intake facility, treatment facility, pumping station, distribution line	2050(C)(5)		L	L-						S	S	L		L-			S	S	L-
Reservoir & water impoundment	2050(C)(6)	L+	L+	L-	L+	L+	L+	L+		S	S	L-					L	L	
Gas distribution (gas, oil) or electric line	2050(C)(7)	L	L		L	L	L	L	L	S	S	L		L-	L-		S	S	L-
Forest management research (e)	2050(C)(8)		L-		L-	L-	M-	M-		S-	S-	L-		L-	L-	L-	S	S	L-
Park, including fish & wildlife conservation area (f)	2050(C)(9)	L-	L		L	L-	L-	L-	L-	S	S	L-	L	L-	L	L	L	S	L
Power generating utility facility	2050(C)(10)	L	L	L	L	L	L	L-	L-	S	S	L		L-	L-	L-	S	S	L
Radio, microwave, television transmission towers	2050(C)(11)	L-	L	L-	L-	L	M-	M-	L-	S	S	L-		L-				S	L-
Refuse dump or landfill	2050(C)(12)	L+	L+	L	L+	L	L	L	L	L	L	L+		L	L	L	L	L	L+
Regional sanitary landfill	2050(C)(13)	L+	L+	L	L+	L	L	L	L	L	L	L+		L	L	L	L	L	L+
Private hunting & fishing operation (no lodging) (g)	2050(C)(14)											L							
Private seasonal accommodations for hunting & fishing operation	2050(C)(15)	L	L-	L-	L-	L-	L-	L-	L-	S	S	L	L-	L-	L-	L-	S	S	L
Geothermal mining, processing & production	2050(C)(16)	L-	L-			L-	M-	M-		M	M	L-		L-	L-		M-	M-	L-
Aggregate mining & processing	2050(D)(1)	L+	L+	L	L	L+	L+	L+	L	L+	L+	L+		L+	L		L	M+	L
Forest products processing facility (permanent)	2050(D)(2)	L	L	L	L	L	L	L	L	S	S	L		L	L	L	L	S	L+
Logging equipment repair & storage (permanent)	2050(D)(3)	L-	L	L	L-	L	L-	L-	L-	S	S	L		L-	L-		S	S	L-
Log scaling & weigh stations	2050(D)(4)	L-	L			L-	L-	L-	L-	S	S	L		L-	L-		S	S	L-
Construction of passing & travel lanes requiring acquisition of ROW	2050(D)(5)	L	L		L	L+	L+	L+	L	M	M	L		L	L	L	M	M	L
Road reconstruction involving building removal	2050(D)(6)	L	L	--	L	L	L	L	L-	M	M	L		L	L	L	M	M	L
Weigh station & rest area improvement where additional ROW is required	2050(D)(7)	L	L		L	L-	L-	L-	L	S	S	L		L	L	L	S	S	L
Expansion of aircraft landing areas ancillary to forestry practices	2050(D)(8)	L	L		L+	L+	L+	L+	L	S	S	L+		L+	L	L	S	S	L

Key:

S = Short term impacts lasting up to one year.
M = Medium term impacts lasting up to ten years.
L = Long term impacts lasting over ten years.

(S, M or L) – = Minor impact
(S, M or L) = Moderate impact
(S, M or L) + = Major impact

Notes:

(a) Severity depends on proportion of canopy removed and ground disturbance.
(b) Assumes this applies to activities to benefit forest wildlife species.
(c) Effects may occur only if additional clearing occurs in R–O–W.
(d) Irrigation runoff can adversely affect water quality.
(e) May vary from no effect for simple data gathering to more severe effects shown here, which would result from physical stand management activities.
(f) Varies from no impact (wilderness or no development) to large impact shown here from recreational facilities, access and clearing.
(g) Assumes no land alteration.

TABLE 5 : CONFLICTING USES ALLOWED IN EXCLUSIVE FARM USE ZONING DISTRICT

Affected Sub.areas: Upper Rock Creek, Cornelius Pass, Germantown Road, Bonny Slope

Conflicting Use	Code Reference (11,15.)	IMPACTS OR ACTIVITIES ASSOCIATED WITH CONFLICTING USES: Edge Effect	Barriers: Roads	Barriers: Fences	Preg-nan-cies	Native Vegetation Removal: Canopy	Native Vegetation Removal: Under-story	Native Vegetation Removal: Dead Wood	Herbi-cides Appli-cation	Soil Excava-tion	Topsoil Removal	Humus Intru-sion	Pet Impacts	Incr. Imperv. Surface Area	Insecti-cides, Poisons	Ferti-lizers	Water Quality: Stream-bank Destabil-ization	Water Quality: Exposed Soils, Erosion, Sharp.	Water Quality: Nutrient Load-ing
Primary Uses																			
A. Farm use	2008(A)																		
Grazing, livestock		L+	L-	L+	L+	L+	L+	L+				L			L	L-	L+	L+	L+
Cultivated crops		L+	L-	L	L+	L+	L+	L+	L+	L+	L+	L+			L+	L+	L+	L+	L+
Orchard		L+	L-	L+	L+	L+	L+	L+	L+	L+		L			L+	L+	L+	L+	L+
B. Forest products propagation	2008(B)	M+	L		L+	L+	L+	L	L+	L+	L+	L			L+	L+	L+	L+	L+
Forest products harvesting	2008(B)																		
1. Clear cut		L+	L+		L+	L+	M+	L+	M+	M+	M+	L+			M+	M+	L+	L+	L+
2. Selective cut (a)		L	L		L	L	M+	L		M	M	L			M	M	M	M	M
C. Thermal energy power plant	2008(C)	L	L		L	L	L+	L+		L	L	L		L-			M	M	L
D. Pushing lines within ROW	2008(D)	L	L		L	L	L	L		S	S	S		L			S	S	L-
E. Road reconstruction not including addition of travel lanes, and no building removal or new land parcels	2008(E)	L	L		L	L	L	L	L	S	S	S		L			M	M	L
F. Temporary road closures	2008(F)	S	S		S	S-	S-	S-	S	S	S	S		S	S		S	S	S
G. Weigh stations & rest area improvements within ROW	2008(G)	L-	L-		L-	L-	L-	L-	L-	S	S	L		L-			S	S	L-
H. Replacement dwelling in conjunction with farm use	2008(H)	L	L	L	L	L-	L-	L	L	S	S	L	L	L	L	L	S	S	L
I. Solid waste disposal site	2008(I)	L+	L+	L	L+	L	L	L	L	L	L	L+		L	L		L	L	L+
Uses Permitted Under Prescribed Conditions																			
A. Farm residence	2010(A)	L	L	L	L	L	L-	L	L	S	S	L+	L+	L	L	L	S	S	L
B. Farm help residence	2010(B)	L	L	L	L	L	L-	L	L	S	S	L+	L+	L	L	L	S	S	L
C. Residences for relatives	2010(C)	L	L	L	L	L	L-	L	L	S	S	L+	L+	L	L	L	S	S	L
Conditional Uses																			
A. Public or private schools	2012(A)(1)	L	L		L+	L+	L+	L+	L			L		L	L	L	S	S	L
B. Churches	2012(A)(2)	L	L-		L+	L+	L+	L	L-	S	S	L		L-	L-	L-	S	S	L
C. Utility facilities for public service, except power generation	2012(A)(3)	L	L	L	L+	L+	L+	L-	L-	S	S	L		L-	L-	L-	S	S	L
D. Exploration for geothermal resources	2012(A)(4)	M	M		M-	M	M	M-	M	M	M	M		M			M	M	M
E. Private parks, playgrounds, hunting & fishing preserves & campgrounds (b)	2012(A)(5)	L	L		L	L+	L+	L+	L-	S	S	L-	L	L-	L	L	L	S	L
F. Parks, playgrounds, community centers owned by government or non-profit	2012(A)(6)	L+	L	L+	L+	L+	L+	L+	L	M	L	L+	L	L	L	L+	L	S	L+
G. Golf courses	2012(A)(7)	L+	L	L+	L+	L+	L+	L+	L+	M	L	L+		L	L+	L+	L+	S	L+
H. Solid waste disposal site	2012(A)(8)	L+	L+	L	L+	L	L	L	L	L	L	L+		L	L		L	L	L+
I. Construction of additional passing & travel lanes requiring acquisition of ROW	2012(A)(9)	L	L		L	L+	L+	L+	L	M	M	L		L	L	L	M	M	L
J. Road reconstruction involving building removal	2012(A)(10)	L	L		L	L	L	L	L	M	M	L		L	L	L	M	M	L
K. Improvement of weigh stations & rest areas where additional ROW required	2012(A)(11)	L	L		L	L-	L-	L-	L	S	S	L		L	L	L	S	S	L
L. Commercial activities in conjunction with farm uses	2012(B)(1)																		
M. Geothermal mining & processing	2012(B)(2)	L	L			L	M	M-	L-	M	M	L		L-	M		M	M	L
Aggregate exploration, mining & processing	2012(B)(2)	L+	L+	L	L+	L+	L+	L+	L	L+	L+	L+		L+	L		L	M+	L
N. Non-farm residential	2012(B)(3)	L	L	L	L	L+	L+	L+	L	S	S	L	L	L	L	L	S	S	L
O. Home occupations	2012(B)(4)	L	L-	L	L-	L+	L+	L+	L-	S-	S-	L	L-	L	L-	L-	S	S	L-
P. Forest products processing facilities	2012(B)(5)	L	L	L	L	L	L	L	L	S	S	L		L	L	L	L	S	L+
Q. Horse breeding & boarding for profit	2012(B)(6)	L+		L	L+	L+	L+	L+	L-	S	S	L-		L-	L	L-	L	L	L+
R. Residential use in conjunction with primary use on mortgage lot	2012(B)(7)	L	L	L	L	L-	L-	L	L	S	S	L-	L	L	L	L	S	S	L
S. Homestead lot w/residence	2012(B)(8)	L	L	L	L	L-	L-	L	L	S	S	L-	L	L	L	L	S	S	L
T. Propagation, cultivation maintenance & harvesting of aquatic species	2012(B)(9)		L-			L-	L-	L-		L-		L			L	L	S	S	L
U. Personal use airports	2012(B)(10)	L	L		L+	L+	L+	L+	L	S	S	L+		L+	L	L	S	S	L
V. Dog kennels	2012(B)(11)	L	L	L	L	L	L	L	L	S	S	L	L	L-	L	L-	S	S	L
W. Residential homes in existing dwellings for handicapped persons	2012(B)(12)	L	L	L	L	L-	L-	L	L	S	S	L	L	L	L	L	S	S	L

Key:

S = Short term impacts lasting up to one year.
M = Medium term impacts lasting up to ten years.
L = Long term impacts lasting over ten years.

(S, M or L) - = Minor impact
(S, M or L) = Moderate impact
(S, M or L) + = Major impact

Notes:

(a) Effects can vary from minimal (when relatively few trees are removed) to large (when over 20 percent of canopy or land aea are affected).

(b) Worst-case effects shown here. Undeveloped hunting and fishing preserves could have little to no effect.

TABLE 5 : CONFLICTING USES ALLOWED IN MULTIPLE USE AGRICULTURE ZONING DISTRICT

Affected Subareas: Cornelius Pass, Germantown Road, Bonny Slope

Conflicting Use	Code Reference (11.15.)	IMPACTS OR ACTIVITIES ASSOCIATED WITH CONFLICTING USES: Edge Effect	Barriers: Roads	Barriers: Fences	Fragmentation	Native Vegetation Removal: Canopy	Native Vegetation Removal: Understory	Native Vegetation Removal: Dead Wood	Herbicides Application	Soil Excavation	Topsoil Removal	Human Intrusion	Pet Impacts	Incr. Impervious Surface Area	Insecticides, Poisons	Fertilizers	Water Quality: Streambank Destabilization	Water Quality: Exposed Soils, Erosion, Slump.	Water Quality: Nutrient Loading
Primary Uses																			
A. Farm uses for: Raising & harvesting crops	2128(A)	L+	L-	L	L+	L+	L+	L+	L+	L+	L+	L+			L+	L+	L+	L+	L+
Raising livestock & honeybees		L+	L-	L+	L+	L+	L+	L+				L			L	L-	L+	L+	L+
Any other agricultural use		L+	L-	L+	L+	L+	L+	L+	L+	L+		L			L	L+	L+	L+	L+
B. Forest products propagation	2128(B)	M+	L		M	L	M	L	M	S	M	M			L+	L+	L+	L+	L+
Forest products harvesting	2128(B)	L+	L+		L+	L+	M+	L+	M+	M+	M+	L+			M+	M+	L+	L+	L+
1. Clear cut																			
2. Selective cut (a)		L	L		L	L	M+	L		M	M	L			M+	M+	M	M	M
C. Single family dwelling	2128(C)	L	L	L	L	L+	L+	L+	L	S	S	L	L	L	L	L	S	S	L
D. Public & private conservation areas for protection of water, soil, open space, forest & wildlife resources	2128(D)		L-									L-	L-						
Conservation structures		L-	L-		L-	L-	S	S		S	S-	L-		L-					
Uses Permitted Under Prescribed Conditions																			
A. Single family dwelling constructed off-site	2130(A)	L	L	L	L	L-	L-	L	L	S	S	L+	L+	L	L	L	S	S	L
B. Farm help residence	2130(B)	L	L	L	L	L-	L-	L	L	S	S	L+	L+	L	L	L	S	S	L
C. Sale of farm or forest products raised on premises or in immediate vicinity	2130(C)																		
Conditional Uses																			
A. Community service uses	2132(A)																		
Boat moorage or marina	7020(A)(1)	L	L	L-	L	L	L	L+		L	L	L	L-	L-			L	L	L+
Camp, campground, RV park	7020(A)(2)	L-	L	L	L	L-	L	L+	L	S	S	L	L	L-	L	L	L	L-	L+
Cemetery, mortuary	7020(A)(3)	L	L-	L	L	L	L	L	L	S	S	L		L-	L	L	S	S	L
Church	7020(A)(4)	L	L-		L+	L+	L+	L	L-	S	S	L		L-	L-	L-	S	S	L-
Group care facility	7020(A)(5)	L	L-		L-	L-	L-	L-	L-	S	S	L	L-	L	L	L-	S	S	L-
Government building or use	7020(A)(6)	L	L	L	L	L	L	L	L	S	S	L		L	L	L	S	S	L
Hospital, rest or retirement home	7020(A)(7)	L	L		L	L	L	L	L-	S	S	L		L+	L	L	S	S	L
Kindergartens or day nursery	7020(A)(8)	L	L-	L	L-	L	L	L	L-	S	S	L		L	L-	L-	S	S	L-
Library	7020(A)(9)	L	L		L-	L	L	L	L-	S	S	L		L	L-	L-	S	S	L
Park, playground, sports area, golf course	7020(A)(10)	L+	L	L+	L+	L+	L+	L+	L	M	L	L+	L	L	L	L+	L+	S	L+
Philanthropic or eleemosynary institution	7020(A)(11)	L	L-	L-	L-	L-	L-	L-	L-	S	S	L		L	L-	L	S	S	L
Power substation or other public utility building or use	7020(A)(12)	L	L	L-	L+	L+	L+	L-	L-	S	S	L-		L-	L-	L-	S	S	L
Private club, fraternal organization	7020(A)(13)	L		L-	L	L	L-	L	L-	S	S	L		L	L-	L	S	S	L
Racetrack	7020(A)(14)	L	L+	L	L	L	L	L	L	S	S	L+		L+	L	L	S	S	L+
Radio & television transmission towers	7020(A)(15)	L-	L	L-	L-	L	M-	M-	L-	S	S	L-		L-				S	L-
Refuse dump or sanitary landfill	7020(A)(16)	L+	L+	L	L+	L	L	L	L	L	L	L+		L+	L		L	L	L+
Resort, dude ranch, hunting or fishing lodge	7020(A)(17)	L	L	L+	L	L	L-	L	L	L	L	L	L	L	L	L	L	L	L+
Recycling collection center	7020(A)(18)	L	L+		L	L	L	L	L	S	S	L		L	L		S	S	L
Riding academy / horse boarding for profit	7020(A)(19)	L+		L	L+	L+	L+	L+	L-	S	S	L-		L-	L	L-	L	L	L+
Private or public schools	7020(A)(20)	L	L		L+	L+	L+	L+	L			L		L	L	L	S	S	L
Transit station	7020(A)(21)	L	L+		L	L	L	L	L	S	S	L+		L			S	S	L
Waste collection, transfer processing facility	7020(A)(22)	L+	L+	L	L	L	L	L	L	S	S	L+		L+	L		S	S	L
Regional sanitary landfills	7020(A)(25)	L+	L+	L+	L+	L+	L+	L+	L	L	L	L+		L+	L		L	L	L+
B. Geothermal mining & processing operations	2132(B)(1)	L	L		L	L	M	M-	M	M	M	L		L-	M		M	M	L-
Aggregate exploration, mining & processing	2132(B)(1)	L+	L+	L	L+	L+	L+	L+	L	L+	L+	L+		L+	L		L	M+	L
C. Commercial processing of agricultural products	2132(B)(2)	L	L+	L	L	L	L	L	L	S	S	L+		L+	L		S	S	L+
D. Raising any type of fowl & selling by-products	2132(B)(3)	L	L	L	L	L	L	L	L	S	S	L		L	L	L			L+
E. Peat log	2132(B)(4)	L	L	L+	L	L	L	L	L	S	L+	L		L	L		L+	L+	L+
(b) F. Raising four or more swine	2132(B)(5)	L	L-	L	L	L	L	L	L	S	L	L		L	L		L+	L+	L+
G. Raising fur bearing animals	2132(B)(6)	L-	L-	L	L	L	L	L	L	S	S	L		L	L	L-			L
H. Commercial dog kennels	2132(B)(7)	L	L	L	L	L	L	L	L	S	S	L	L	L-	L	L-	S	S	L
I. Commercial processing of forest products	2132(B)(8)	L	L	L	L	L	L	L	L	S	S	L		L	L	L	L	S	L+
J. Houseboats & houseboat moorages	2132(B)(9)		L	L															L+
K. Permitted on lands not predominantly Class I, II, or III soils: 1. Planned developments for single family residences	2132(C)(1)	L+	L+	L+	L+	L	L+	L+	L	M	M	L+	L+	L+	L	L+	M	M	L+
2. Cottage industries	2132(C)(2)(a)	L	L-	L	L-	L+	L+	L+	L-	S-	S-	L	L-	L	L-	L-	S	S	L-
3. Rural service commercial (local stores, shops, offices)	2132(C)(2)(b)	L	L	L-	L	L	L	L	L-	S	S	L+		L+	L-	L-	S	S	L
4. Tourist commercial (restaurants, gas stations)	2132(C)(2)(c)	L	L	L-	L	L	L	L	L-	S	S	L+		L+	L-	L-	S	S	L

Key:

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M = Medium term impacts lasting up to ten years.
L = Long term impacts lasting over ten years.

(S, M or L) - = Minor Impact
(S, M or L) = Moderate Impact
(S, M or L) + = Major Impact

Notes:

(a) Effects can vary from minimal (when relatively few trees are removed) to large (when over 20 percent of canopy or land aea are affected).

(b) Worse-case scenario assumed with free-ranging animals in fenced outdoor enclosure. Indoor facilities would have fewer impacts.

TABLE 5 : CONFLICTING USES ALLOWED IN RURAL RESIDENTIAL ZONING DISTRICT

Affected Subareas: Wildwood–McKay Creek, Holbrook–Logie, Upper Rock Creek, Folkenberg, McNamee–Harborton, Cornelius Pass, Germantown Road, Bonny Slope, Balch Creek

Conflicting Use	Code References (11.15.)	IMPACTS OR ACTIVITIES ASSOCIATED WITH CONFLICTING USES: Edge Effect	Barriers: Roads	Barriers: Fences	Pragmatation	Native Vegetation Removal: Canopy	Native Vegetation Removal: Understory	Native Vegetation Removal: Dead Wood	Herbicides Application	Soil Excavation	Topsoil Removal	Human Intrusion	Pet Impacts	Incr. Imperv. Surface Area	Insecticides, Poisons	Feed-Burn	Water Quality: Stream-bank Destabilization	Water Quality: Exposed Soils, Erosion, Sloughing	Water Quality: Nutrient Loading
Primary Uses																			
A. Farm use: Raising & harvesting crops	2208(A) 2208(A)(1)	L+	L-	L	L+	L+	L+	L+	L+	L+	L+	L+			L+	L+	L+	L+	L+
Raising livestock	2208(A)(2)	L+	L-	L+	L+	L+	L+	L+				L			L	L-	L+	L+	L+
Any other agricultural use	2208(A)(3)	L+	L-	L+	L+	L+	L+	L+	L+	L+		L				L+	L+	L+	L+
B. Forest products propagation	2208(B)	M+	L		L+	L+	L+	L	L+	L+	L+	L			L+	L+	L+	L+	L+
Forest products harvesting 1. Clear cut		L+	L+		L+	L+	M+	L+	M+	M+	M+	L+			M+	M+	L+	L+	L+
2. Selective cut (a)		L	L		L	L	M+	L		M	M	L			M	M	M	M	M
C. Single family dwelling	2208(C)	L	L	L	L	L-	L-	L	L	S	S	L+	L+	L	L	L	S	S	L
D. Public & private conservation areas for protection of water, soil, open space, forest and wildlife resources (b)	2208(D)		L-																
Conservation structures	2208(D)	L-	L-		L-	L-	S	S		S	S-	L-		L-			S	S	S
Uses Permitted Under Prescribed Conditions																			
A. Single family dwelling constructed off-site	2210(A)	L	L	L	L	L-	L-	L	L	S	S	L+	L+	L	L	L	S	S	L
B. Farm help residence	2210(B)	L	L	L	L	L-	L-	L	L	S	S	L+	L+	L	L	L	S	S	L
C. Sales of products raised or grown on premises	2210(C)																		
Conditional Uses																			
A. Community Service Uses: Boat moorage or marina	2212(A) 7020(A)(1)	L	L	L-	L	L	L	L		L	L	L	L-	L			L	L	L+
Camp, campground, RV park	7020(A)(2)	L-	L	L	L	L-	L	L+	L	S	S	L	L	L-	L	L	L	L-	L+
Cemetery, mortuary	7020(A)(3)	L+	L+	L	L+	L+	L+	L+	L+	L+	L+	L+		L	L	L+	S+	S+	L+
Church	7020(A)(4)	L	L-		L-	L+	L+	L+	L-	S	S	L		L-	L-	L-	S	S	L-
Group care facility	7020(A)(5)	L	L-		L-	L-	L-	L-	L-	S	S	L	L-	L	L	L-	S	S	L-
Government building or use	7020(A)(6)	L	L	L	L	L	L	L	L	S	S	L		L	L	L	S	S	L
Hospital, rest or retirement home	7020(A)(7)	L	L		L	L	L	L	L-	S	S	L		L+	L	L	S	S	L
Kindergarten or day nursery	7020(A)(8)	L	L-	L	L-	L	L	L	L-	S	S	L		L	L-	L-	S	S	L-
Library	7020(A)(9)	L	L		L-	L	L	L	L-	S	S	L		L	L-	L-	S	S	L
Park, playground, sports area, golf course	7020(A)(10)	L+	L	L+	L+	L	L	L	L	M	L	L+	L	L	L	L+	L	S	L+
Philanthropic or eleemosynary institution	7020(A)(11)	L	L-	L-	L-	L-	L-	L-	L-	S	S	L		L	L-	L	S	S	L
Power substation or other public utility building or use	7020(A)(12)	L	L	L-	L	L	L	L-	L-	S	S	L-		L-	L-	L-	S	S	L
Private club, fraternal organization	7020(A)(13)	L		L-	L	L	L-	L	L-	S	S	L		L	L-	L	S	S	L
Racetrack	7020(A)(14)	L	L+	L	L	L	L	L	L	S	S	L+		L+	L	L	S	S	L+
Radio & television transmission towers	7020(A)(15)	L-	L	L-	L-	L	M-	M-	L-	S	S	L-		L-				S	L-
Refuse dump or sanitary landfill	7020(A)(16)	L+	L+	L	L+	L	L	L	L	L	L	L+		L+	L		L	L	L+
Resort, dude ranch, hunting or fishing lodge	7020(A)(17)	L	L	L+	L	L	L-	L	L	L	L	L	L	L	L	L	L	L	L+
Recycling collection center	7020(A)(18)	L	L+		L	L	L	L	L	S	S	L		L	L		S	S	L
Riding academy/horse boarding for profit	7020(A)(19)	L+		L	L+	L+	L+	L+	L-	S	S	L-		L-	L	L-	L	L	L+
Private or public schools	7020(A)(20)	L	L		L	L+	L+	L+	L			L		L	L	L	S	S	L
Transit station	7020(A)(21)	L	L+		L	L	L	L	L	S	S	L+		L			S	S	L
Waste collection, transfer processing facility	7020(A)(22)	L+	L+	L	L	L	L	L	L	S	S	L+		L+	L		S	S	L
Regional sanitary landfill	7020(A)(25)	L+	L+	L+	L+	L+	L+	L+	L	L	L	L+		L+	L		L	L	L+
B. Geothermal mining & processing operations	2212(B)(1)	L-	L-		L-	L-	M-	M-		M	M	L-		L-	L-		M	M	L-
Aggregate exploration, mining & processing		L+	L+	L	L+	L+	L+	L+	L	L+	L+	L+		L+	L		L	M+	L
C. Commercial processing of agricultural products	2212(B)(2)	L	L+	L	L	L	L	L	L	S	S	L+		L+	L		S	S	L+
D. Raising any type of fowl & selling by-products	2212(B)(3)	L	L	L	L	L	L	L	L	S	S	L		L	L	L			L+
E. Feed lots	2212(B)(4)	L	L	L+	L	L	L	L	L	S	L+	L		L	L		L+	L+	L+
(c) F. Raising four or more swine	2212(B)(5)	L	L-	L	L	L	L	L	L	S	L	L		L	L	L	L+	L+	L+
G. Raising fur bearing animals	2212(B)(6)	L-	L-	L	L	L	L	L	L	S	S	L		L	L	L-			L
H. Commercial dog kennels	2212(B)(7)	L	L	L	L	L	L	L	L	S	S	L	L	L-	L	L-	S	S	L
I. Single family planned developments	2212(B)(8)	L+	L+	L+	L+	L	L+	L+	L	M	M	L+	L+	L+	L	L+	M	M	L+
J. Cottage industries	2212(B)(9)	L	L-	L	L-	L+	L+	L+	L-	S-	S-	L	L-	L	L-	L-	S	S	L-
K. Local stores, offices, repair services, etc.	2212(B)(10)	L	L	L-	L	L	L	L	L-	S	S	L+		L+	L-	L-	S	S	L

Key:

S = Short term impacts lasting up to one year.
M = Medium term impacts lasting up to ten years.
L = Long term impacts lasting over ten years.

(S, M or L) – = Minor impact
(S, M or L) = Moderate impact
(S, M or L) + = Major impact

Notes:

(a) Effects can vary from minimal (when relatively few trees are removed) to large (when over 20 percent of canopy or land aea are affected).

(b) Assumes this applies to activities to benefit forest wildlife species.

(c) Worse–case scenario assumed with free–ranging animals in fenced outdoor enclosure. Indoor facilities would have fewer impacts.

TABLE 8 : WEST HILLS RESIDENTIAL LAND VALUES

Market Value of Vacant Non–Resource Parcels
(Source: Multnomah County Assessor's Records, 1993)

TOTAL – ALL AREAS

	Acres	Value
Total all subareas:	500.8	$5,518,100
No. of parcels:	161	
Mean size (acres):	3.1	
Mean market value:		$34,274

Subarea: Germantown

	Total Acres	Total Value
Subarea totals:	107.9	$1,056,500
No. of parcels:	21	
Mean size (acres):	5.1	
Mean market value:		$50,310

Subarea: Folkenberg

	Total Acres	Total Value
Subarea totals:	121.7	$1,127,900
No. of parcels:	46	
Mean size (acres):	2.6	
Mean market value:		$24,520

Subarea: Gilkison Road

	Total Acres	Total Value
Subarea totals:	10.3	$92,000
No. of parcels:	2	
Mean size (acres):	5.2	
Mean market value:		$46,000

Subarea: Rock Creek

	Total Acres	Total Value
Subarea totals:	27.5	$334,500
No. of parcels:	9	
Mean size (acres):	3.1	
Mean market value:		$37,167

Subarea: Bonny Slope

	Total Acres	Total Value
Subarea totals:	56.7	$603,100
No. of parcels:	15	
Mean size (acres):	3.8	
Mean market value:		$40,207

Subarea: Wildwood–McKay

	Total Acres	Total Value
Subarea totals:	44.6	$501,700
No. of parcels:	9	
Mean size (acres):	492381.6	
Mean market value:		$55,744

Subarea: Cornelius Pass

	Total Acres	Total Value
Subarea totals:	24.8	$355,800
No. of parcels:	9	
Mean size (acres):	2.8	
Mean market value:		$39,533

Subarea: Holbrook–Logie

	Total Acres	Total Value
Subarea totals:	16.1	$257,400
No. of parcels:	14	
Mean size (acres):	1.2	
Mean market value:		$18,386

Subarea: McNamee–Harborton

	Total Acres	Total Value
Subarea totals:	8.7	$47,400
No. of parcels:	6	
Mean size (acres):	1.5	
Mean market value:		$7,900

Subarea: Balch Creek

	Total Acres	Total Value
Subarea totals:	82.5	$1,141,800
No. of parcels:	30	
Mean size (acres):	2.8	
Mean market value:		$38,060

TABLE 8 : WEST HILLS RESIDENTIAL LAND VALUES

Market Value of Vacant Non–Resource Parcels

(Source: Multnomah County Assessor's Records, 1993)

Subarea: Germantown

Section 9 1N 1W Zoning: RR

Parcel	Street or Addition	Acres	Value
TL 17	Germantown Rd.	11.0	$69,900
TL 7	Germantown Rd.	2.6	$9,300
Lot 3	Germantown Add.	4.7	$43,700
TL 1 of 4,5,6	Germantown Add.	9.2	$101,000
Lot 9 (part)	Germantown Rd.	1.5	$7,500
Lot 10 (part)	Germantown Add.	2.4	$54,400
Lot 11	Germantown Add.	4.4	$29,900
TL 1 of 12,13	Germantown Add.	6.4	$95,600
Lot 15	Germantown Add.	8.2	$85,400
Lots 22,23 (part)	Germantown Add.	6.7	$93,200
Lot 2	Germantown Add.	4.6	$74,800
Lot 3	Germantown Add.	4.8	$74,800
Lot 24	Skyline Acres	1.8	$7,800
Lot 27	Skyline Acres	2.6	$54,400
Lot 29	Skyline Acres	3.6	$14,000
TL 2	Germantown Rd.	6.8	$23,300
TL 4	Germantown Rd.	2.2	$38,900
TL 11	Germantown Rd.	11.6	$93,200
TL 18	Germantown Rd.	6.4	$62,100
TL 20	Germantown Rd.	6.4	$23,300

Subarea: Rock Creek

Section 23 2N 2W Zoning: RR

Parcel	Street or Addition	Acres	Value
TL 48	Elliott Rd.	2.0	$28,800
TL 47	Elliott Rd.	2.0	$11,500
TL 18	Elliott Rd.	5.6	$30,200
Section 26 1N 1W	Zoning: RR		
TL 18		0.9	$28,800
TL 22		0.8	$23,000
TL 47		10.3	$149,500
TL 51		5.0	$34,500
TL 52		0.5	$23,000
TL 92		0.4	$5,200

Subarea: Folkenberg

Section 19 2N 1W Zoning: RR

Parcel	Street or Addition	Acres	Value
TL 8	Sheltered Nook Rd	10.0	$58,700
TL 55		1.0	$17,300
TL 21		3.4	$29,900
TL 20	NW Vista	0.3	$12,100
TL 19	NW Vista	4.3	$31,100
TL 11	NW Vista	0.1	$5,200
Section 24 2N 2W	Zoning: RR		
Lot 2	Sheltered Nook	4.5	$32,200
Lot 1	Sheltered Nook Rd.	4.3	$36,300
Section 25 1N 1W	Zoning: RR		
TL 5		0.3	$40,300
TL 4		0.7	$61,400
Lot 8, Bl. 3		0.3	$44,200
Lot 10,11, Bl.3		0.1	$55,700
Lot 1, Bl. 4		0.3	$44,200
TL5,Lot 10,Bl.4		0.3	$44,200
Lot 16, Bl. 4		0.4	$38,400
Lot 3, Bl. 5		0.3	$38,400
Lot 4, Bl. 5		0.3	$38,400
TL 40		4.9	$50,900
TL 53		3.6	$48,100
TL 56		1.7	$12,700
TL 83		5.0	$51,800
Section 30 2N 1W	Zoning: RR		
TL 22	McNamee Rd.	6.7	$50,600
TL 8	McNamee Rd.	4.6	$5,300
TL 7	McNamee Rd.	4.6	$5,300
TL 6	McNamee Rd.	5	$5,800
Block 13	Cornelius Pass Rd.	1.6	$10,900
Block 12	Cornelius Pass Rd.	2.7	$12,100
Lot 1–10, Bl. 7		1.5	$13,800
Lot 5&12, Bl. 6		0.2	$5,800
Lot 4&13, Bl. 6		0.2	$5,800
Lot 1–10, Bl. 5		1.5	$13,800
Lot 1–21,22–27, Bl.3	Corn. Pass Rd.	3.0	$29,900
TL 3,Lot 41–43	Cornelius Pass Rd.	7.7	$38,800
Lot 31&31	Cornelius Pass Rd.	5.7	$23,000
Lot 25	Cornelius Pass Rd.	3.8	$15,000
Lot 22–24	Cornelius Pass Rd.	6.4	$25,900
Lot 21	Cornelius Pass Rd.	2.0	$8,100
TL 6, Lot 19,20	Cornelius Pass Rd.	4.0	$16,100
Lot 16&17	Cornelius Pass Rd.	8.3	$25,900
Lot 14	Cornelius Pass Rd.	2.0	$5,800
Lot 13	Cornelius Pass Rd.	4.1	$15,000

Subarea: Gilkison Road
Section 26 3N 2W Zoning: RR

Parcel	Street or Addition	Acres	Value
TL 38	Gilkison Rd.	5.3	$33,400
TL 34	Watson Rd.	5.0	$58,600

Subarea: Holbrook–Logie
Section 12 2N 2W Zoning: RR

Parcel	Street or Addition	Acres	Value
Lot 6	King Rd.	0.5	$14,400
Lot 4	King Rd.	0.5	$14,400
Lot 3	King Rd.	0.3	$9,200
Lot 2	King Rd.	0.5	$14,400
TL 31	Morgan Rd.	1.0	$20,700
TL 34	Morgan Rd.	0.3	$8,100
TL 27	Clark Ave.	0.4	$7,500
TL 22	Morgan Rd.	0.6	$13,200
TL 19	Clark Ave.	0.9	$18,400
TL 10	Cleetwood	0.9	$19,600
TL 8	Cleetwood	1.0	$20,700
TL 3	Cleetwood	0.4	$6,900
TL 9	Gallaher Rd.	5.7	$46,000
TL 29	St. Helens Rd.	2.8	$34,700
TL 1	King Rd.	0.3	$9,200

Subarea: Wildwood–McKay
Section 10 1N 1W Zoning: RR

Parcel	Street or Addition	Acres	Value
TL 33	Skyline Blvd.	5.7	$62,100
TL 25		2.2	$7,800
TL 12	Germantown Rd.	5.3	$66,800
TL 10		9.9	$116,500
Lot 19	Tulamette Acres	4.8	$46,500
TL 8, Lot14,15		0.8	$7,800
TL 7, Lot 12–15		9.6	$108,700
TL 6, Lot 12–14	Germantown Rd.	3.5	$38,900
Lot 5–7	Lambert St.	2.8	$46,600

Subarea: Cornelius Pass

Section 31 2N 1W Zoning: RR

Parcel	Street or Addition	Acres	Value
TL 61	Skyline Blvd.	5.0	$46,000
TL 57	Old Corn. Pass Rd.	2.9	$43,700
TL 55	Old Corn. Pass Rd.	2.0	$34,500
Section 6 1N 1W	Zoning: MUARR		
TL 68		1.9	$35,000
	Zoning: RR		
TL 65		5.0	$60,600
TL 37	Cornelius Pass Rd.	1.1	$42,700
TL 23, Lot 12	NW 185th Pl.	2.4	$38,900
TL 22, Lot 11, 12	NW 185th Pl.	2.3	$31,100
TL 54	Plainview Rd.	2.2	$23,300

Subarea: McNamee–Harborton

Section 28 2N 1W Zoning: RR

Parcel	Street or Addition	Acres	Value
TL 5	NW Riverview Dr.	3.6	$10,400
TL 29	NW Riverview Dr.	0.6	$6,900
TL 57	NW Riverview Dr.	3.5	$10,200
Section 20 2N 1W	Zoning: R7		
Lot 1–5, Bl. 9		0.4	$5,500
Section 33 2N 1W	Zoning: RR		
Lots 18–20, Bl.4	Harborton	0.3	$7,200
Lot 18–20, Bl.4		0.3	$7,200

Subarea: Bonny Slope

Section 22 1N 1W Zoning: RR

Parcel	Street or Addition	Acres	Value
Lot 1	NW Laidlaw Rd.	7.3	$86,300
TL 17, Lot 4		2.9	$34,500
TL 3, Lot 4		1.1	$5,800
TL 2, Lot 5	NW Laidlaw Rd.	0.8	$53,500
TL 22, Lot 8		0.6	$17,300
TL 14, Lot 11		3.0	$8,600
TL 1, Lot 12		0.5	$5,800
Lot 17		5.0	$34,500
TL 21, Lot 19		1.4	$40,300
Lot 21	NW Laidlaw Rd.	4.8	$74,800
Lot 23		1.3	$34,500
Lot 28–30		11.4	$63,300
Lot 31		9.5	$63,300
TL 8, Lot 39		1.0	$11,500
Lot 47		4.7	$28,800
TL 9		1.4	$40,300

Subarea: Balch Creek

Section 23 1N 1W Zoning: RR

Parcel	Street or Addition	Acres	Value
TL 26	Thompson Rd.	3.0	$60,600
Map 3022	Zoning: R10		
Lot 13, Bl. D	Barnes Pk. Hts. Addn.	1.6	$22,200
TL 62	NW Penridge	1.2	$61,100
	Zoning: R20		
TL 4, Lot 2,Bl.E	Barnes Pk. Hts. Addn.	1.0	$38,900
TL 119	NW Skyline	0.3	$11,100
TL 197		0.4	$30,000
Map 2922	Zoning: R10		
Block A		2.6	$22,200
Lot 1–4, Bl. B	Barnes Pk. Hts. Addn.	8.8	$48,600
Lot 1–4, Bl. C	Barnes Pk. Hts. Addn.	6.0	$33,300
Lot 1–3, Bl. D	Barnes Pk. Hts. Addn.	5.0	$28,200
Lot 4,5, Bl. D	Barnes Pk. Hts. Addn.	2.1	$11,700
Lot 6–12, Bl. D	Barnes Pk. Hts. Addn.	12.6	$69,700
Lot 1–5, Bl. E	Barnes Pk. Hts. Addn.	10.3	$56,600
Lot 6,7, Bl. E	Barnes Pk. Hts. Addn.	2.0	$11,100
Lot 8, Bl. E	Barnes Pk. Hts. Addn.	2.0	$11,100
Lot 9, Bl. E	Barnes Pk. Hts. Addn.	1.0	$7,000
Map 2922	Zoning: R20		
Lot 1–3, Bl. A	NW Skyline	8.0	$83,900
Lot 4, Bl. A		0.7	$11,100
TL 5,Lot1–3,Bl.C	NW Penridge	1.4	$77,700
Lot 5,6, Bl. C	NW Penridge	1.0	$61,100
TL3,Lot6,7,Bl.D		0.4	$22,200
TL4,Lot7,8,Bl.C	St.Helens Ave.	0.4	$22,200
Lot 5, Bl. H	Barnes Pk. Hts. Addn.	1.0	$7,000
Lot 6, Bl. H	Barnes Pk. Hts. Addn.	1.4	$10,000
Lot 6, Bl. J	Barnes Pk. Hts. Addn.	1.5	$10,900
Lot 7, Bl. J	Barnes Pk. Hts. Addn.	1.3	$25,500
TL 4,Lot 4,Bl.A	NW Penridge	0.9	$77,700
TL 6,Lot 6,Bl.A	NW Penridge	1.1	$77,700
TL 8,Lot 8,Bl.A	NW Penridge	1.3	$99,900
TL 162		2.2	$31,500

APPENDIX A

ROAD IMPACT ANALYSES

The following mile-by-mile, roadside analysis was conducted by Ecologists Esther Lev and Lynn Sharp, in January of 1994. The analysis documents obstacles to wildlife movement along roadways crossing through the WHWFHA.

1. **NEWBERRY ROAD** -- starting at Highway 30.

0 - .43 steep slope, patches of conifers, mostly deciduous (50 -80 year old forest)
ivy and Himalayan blackberry in patches
major fragmentation is 2 lane road

0- .1 3 strand barb wire fence paralleling road
some snags

.45-.46 5 strand fence and clearing

.468 west of road large clear cut
east of road 5 strand barb wire fence

1.25 5 strand barb wire fence

1.4 -1.73 undisturbed conduit to Forest Park, mixed deciduous forest, good habitat, very important as houses and roads fragment the habitat
some laurel and holly invasion

1.73 - 2.0 scattered residential, some second growth forest, few fences

1.9 chain link fence

2.0 MacNamee Road

2. **SKYLINE ROAD**

ivy, rural residential, lots of clearing, fences, dogs and cats, small pockets of trees

small riparian corridor very important

.83- .85 large meadow/ agriculture hay
transmission line, all grasses and forbes below

.85 large subdivision, roads have been built

1.5 transmission line

1.8 Old Skyline Rd.

3. SKYLINE ROAD AT MCNAMEE ROAD

0 barb wire fences, clearing, rural residential including houses with large clearings and fences

.55 selective logging, small stream with remaining trees

.7 - .8 major fences/houses

.85 - 1.1 ravine on left, fence on the right; left side good regrowth on clearcut- 100% cover, existing forest corridors, several tributaries, right side lots of impenetrable fences blocking off movement

1.2 -1.45 good habitat on ridgeline, good herp. underpass potential

1.45 fences, houses and major clearcut to the left

1.55 ravine with forest on both sides good herp underpass potential

1.7 Pauley Road

4. MACNAMEE ROAD

1.75 along ridgeline immediately adjacent to road good mixed forest

2.2 open field

2.4 re growing clearcut

2.6 - 2.8 woods again

2.8 clearcut/ for sale signs on right

2.9 forest again

major fence left/residential

3.0 orchard, residential fences

3.2 - 3.3 no fences

3.3 - 3.4 fences

3.45 out of fence, houses, pockets of trees

3.7 right is good, left is clearcut.

5. CORNELIUS PASS ROAD – HIGHWAY 30

0 left side old trees, good habitat/ mixed conf/decid.
houses down along creek on the left side

1.25- 1.27 slope selectively logged

1.25 Sheltered Nook Road

1.5 fences residential

1.25- 2.8 young forest

0 - .7 back on Cornelius Pass Road, chopped up, residential/ fences

.9 1.4 forest on both sides

1.2 stream corridor

1.25 stream corridor

1.4 marginal young forest, mostly broken up

1.75 road con.

1.9 tenuous connection on left

2.0 - 2.15 forest on both sides
Cornelius Pass road is wide and very busy, difficult for mammal and amphibian and reptile crossing.

6. SKYLINE ROAD AT CORNELIUS PASS ROAD

rural residential

. 5 Rock Creek Road turn onto Rock Creek Road, mixed stages of forest cover

.51 Railroad

Multnomah County Line

0 Rural Residential, lots of bad fences

Clearcut on both sides of road, narrow strip of trees along the road corridor

.6 good habitat left

.7 house on left

.88 young forest

1.08 house

1.15 young forest

1.25 good older young forest

1.3 house

1.35 house

1.8 houses, cleared land, sculpture garden

2.0 220th Road major dam on Rock Creek

7. SKYLINE ROAD AT CORNELIUS PASS - MACNAMEE ROAD

0 - .7 Ag

.7 major clearcut on left

1.1 small patches of fragmented forest

1.25 new fence, rural residential/ag.

8. SKYLINE ROAD WEST FROM CORNELIUS PASS

rural residential/ fences

.4 young forest on right

.5 clearcut right/ ag. left

1.1 houses left and right

1.25 forest on right

1.45 open ag both sides

1.7 forest both sides

1.8 houses, fences

1.9 good ravine on left side

1.95 open on left

2.1 some forest cover/ ridgeline with houses

2.3 chopped up rural residential

2.5 right side forest with houses

2.7 forest both sides

3.0 clearcut right

3.1 early successional clearcut

3.3 forest left Early successional clearcut right

3.4 forest rural residential

8. BECK ROAD

0 - .4 Early Succession, planted clearcut

.4 strip of trees along road

.55- .6 major fence

.7 trees

.9 fences

1.05 forest both sides

1.2 creek

1.28 creek

1.28 young forest both sides

1.5 early successional planted

1.6 young forest with patches of early successional

1.8 residential on right

1.9 selectively logged forest left

2.0 young forest both sides

2.5 clearcut on right

2.6 good mixed forest

9. JOHNSON ROAD – BECK TOWARD SKYLINE

0 - .15 young forest

.15 clearcut both sides

.4 trees, houses, fences, patchy

.7 young forest

.9 end

SKYLINE (RIGHT)

0 - .15 good young forest
.15 mosaic

.2 good forest

.4 house/ fences right, clearcut left

.7 end of road

10. LOGIE TRAIL AT SKYLINE DOWN TO HIGHWAY 30

0 .1 good patch

clearcut on all sides

.25 clearcut to road on left, right good cover (small area between road terraces)

.8 creek

.9 clearcut growing up

1.8 early successional both sides

1.75 young forest

1.8 under transmission line

1.8 - 1.9 nice old cedars

1.9 houses, fences, animals

2.4 right side good habitat/ stream corridor

11. KAISER – OLD GERMANTOWN ROAD

0.3 some oak

.04 second growth

.55 rural residential/ 4 strand fences

1.05 stream crossing

1.0 rural residential with large pockets of forest

1.25 stream crossing

1.38 transmission line

1.40 - 1.5 dense residential

1.5 second growth/stream corridor

1.7 hairpin curve, new housing, good example of forest houses - lack of landscaping and fences

2.4 edge/rural residential

2.8 second growth

2.9 more residential density; turn onto Germantown Road; young forest pockets of older conifers, scattered residential no fences

1.1 logged and cleared on right side

1.3 rural residential, agriculture, fences, cleared

1.25 back to junction with Old Germantown Road

12. KAISER AT OLD GERMANTOWN

Agriculture/ rural residential

.5 young forest interspersed with agriculture/rural residential use

.6 agriculture/rural residential, bad fences

2.4 Cornelius Pass; second growth good residential mix

3.1 clearing/ agriculture

13. ROCK CREEK

Agriculture/Rural Residential

Patchy young forest

.3 railroad

.5 stream

.6-.7 fences, houses

.7 mixed forest right, clearcut left stream

1.1-1.4 houses, fences, dead cars

1.4 young forest

1.7 stream parallels road, good second growth left

1.8 both sides

2.2 fences/clearing domestic animals

2.45 NW 220th Ave.

3.1 Opening, large house with big white fence along ridge top

3.5 trees right along road, cleared to left, logged to the right; new houses

4.0 right side short bad fence

4.3 end

14. ELLIOTT ROAD

second growth; young forest; field

patchy young forest with dense residential

.4 clearcut left

.5 new houses

15. ROCKY POINT AT SKYLINE

2nd growth

.2 clearcut on left (1 snag)

.5 good second growth on both sides; stream to right, good habitat

1.8 transmission line

1.9 young forest -left

2.2 2nd growth

2.6 young forest

2.8 early succession

16. WATSON / HIGHWAY 30

rural residential fences major

.5 transmission corridor; ponderosa pine, oak

17. GILKISON ROAD

.85 second growth

rural residential fences; clearcut to the left; dense rural residential with fences; some older conifers

1.35 good 2 nd growth on right

1.65 2 nd growth both sides/ some houses

2.25 clearcut on left

2.4 end of road

18. SKYLINE (INTERSECTION WITH BECK AND LOGIE TRAIL)

second growth; some rural residential, some clearcuts

.5 weather station; interspersed second growth, clearcut, low density rural residential

1.2- 1.6 clearcut on both sides; rural residential with some trees

1.7-2.3 clearcut, planted 1994

2.3 second growth, fences, horses

19. MORELAND ROAD

rural residential

APPENDIX B

LANDSCAPE ECOLOGY DEFINITIONS

Adaptation: a process of gradual change resulting from environmental constraints and variation among individuals in a population.

Carrying capacity: the maximum number of individuals or maximum biomass that a particular environment can support.

Catastrophe point: a threshold at which the continuity in structure and function of a system is easily and significantly altered or broken.

Configuration: the location and juxtaposition of landscape elements.

Convergency line: a line corridor separating two types of landscape elements, thus providing three types in close proximity.

Corridor: a narrow strip of land that differs from the matrix on either side.

Cultivated landscape: a landscape dominated by plowed land for crops, but usually with patches of natural and managed land present.

Disturbance: an event that causes a significant change from the normal pattern in an ecological system.

Land potential: the possible uses and values of a land area.

Landscape: a heterogeneous land area composes of a cluster of interacting ecosystems that are repeated in similar form throughout; landscapes vary in size, down to few kilometers in diameter.

Landscape ecology: a study of the structure, function and change in heterogeneous land area composed of interacting ecosystems.

Landscape Element: the basic, relatively homogeneous, ecological unit, whether of natural or human origin, on land at the scale of a landscape.

Line Corridor: a narrow band essentially dominated throughout by edge species.

Long distance dispersal: movement to a different landscape.

Managed landscape: a landscape, such as rangeland or forest, where native species are harvested.

Mosaic tract: a tract of patches of different aged trees.

Multi-aged stand: a naturally developed stand usually with trees of many ages.

Natural landscape: an area where human effects, if present are not ecologically significant to the landscape as a whole.

Network complexity: the combination of network connectivity and circuity.

Network connectivity: the degree to which all nodes in a system are linked by corridors.

Node: a patch attached to a corridor, both of the same landscape type. Also, an intersection of corridors, and a source or sink of flows of object.

Non-equilibrium coexistence: survival of species with irregular fluctuations because of disturbance or unpredictable (stochastic) events.

Patch: a nonlinear surface area differing in appearance from its surroundings.

Patch turnover: the rate of appearance and disappearance of patches.

Porosity of landscape matrix: the measure of density of patches in a landscape.

Recovery: ability of a system to return to an earlier state after being changed.

Recovery time: a measure of how long it would take to replace a characteristic with a comparable one if it were disturbed or destroyed.

Regenerated patch: an area that becomes free of disturbance within a chronically disturbed matrix.

Remnant patch: an area remaining from a former large landscape element and now surrounded by a disturbed area.

Shifting mosaic: a system exhibiting a pattern of long-term change along with short-term internal spatial conversions.

APPENDIX C

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APPENDIX D

RESPONSE TO COMMENTS

WILDLIFE RESOURCE ANALYSIS REPORT

1. ISSUE: Multnomah County has not unambiguously described the precise location and extent of the inventoried significant wildlife habitat.

ISSUE RAISED BY: Dorothy Cofield, Richard Shepard

DISCUSSION:

OAR 660-16(2), which implements Goal 5 of the Statewide Planning Program, states:

Some Goal 5 resources (e.g. natural areas, historic sites, mineral and aggregate sites, scenic waterways) are more site-specific than others (e.g. groundwater, energy sources). For site-specific resources, determination of location must include a description or map of the boundaries of the resource site and of the impact area to be affected, if different. For non-site-specific resources, determination must be as specific as possible.

The commentors on this issue are correct in stating that Multnomah County has not analyzed the significance of wildlife habitat on a site-specific basis appropriate for such resources as historic sites, mineral and aggregate sites, etc. The commentors apparently look upon wildlife habitat in a very specific manner, as in the specific habitat of an endangered species pursuant to the classical interpretation of the Federal Endangered Species Act. However, scientists are now in general agreement that such a detailed, or site specific look at wildlife habitat is myopic -- wildlife survive in the context of a larger ecosystem, interrelated with other ecosystems. The location of ecosystems is not site-specific -- wildlife do not observe jurisdictional boundaries and do not always observe physical and man-made boundaries as well.

RESPONSE:

Staff has made some adjustment to the significance report. The concept of four subareas (Northern Forested Area, Western Agricultural Area, etc.) has been replaced with a more specific map of primary, secondary, and impacted habitat areas in the West Hills. Staff believes that this level of specificity is appropriate for consideration of the ecosystem which serves wildlife habitat in the West Hills.

2. ISSUE: Multnomah County has not made a sufficient determination of quantity of wildlife in the West Hills rural area.

ISSUE RAISED BY: Dorothy Cofield, Richard Shepard

DISCUSSION:

OAR 660-16(3), which implements Goal 5 of the Statewide Planning Program, states:

A determination of quantity requires consideration of the relative abundance of the resource (of any given quality). The level of detail that is provided will depend on how much information is available or "obtainable."

The measurement of quantity of West Hills wildlife habitat in the abstract, without relating quantity to issues of quality and location, is difficult. In addition to the measurement of quantity contained in the original significance report (relative size of similar non-urban areas in Multnomah County, Washington County, and Columbia County), quantity could also be considered in terms of numbers of species found, numbers of individuals of each species found, and quantity attributes of neighboring non-urban areas.

RESPONSE:

In response to this issue, the revised significance report contains additional information on general quantity measures within the West Hills, dealing with primary, secondary, and impacted habitat areas as defined in the report. The revised report highlights the closely interlocking relationship between location, quantity and quality of wildlife habitat in the West Hills which makes clear distinctions between these categories difficult.

3. ISSUE: Multnomah County does not adequately compare relative quality of wildlife habitat in the West Hills rural area in relation to other areas.

ISSUE RAISED BY: Dorothy Cofield, Richard Shepard

DISCUSSION:

OAR 660-16(3), which implements Goal 5 of the Statewide Planning Program, states:

The determination of quality requires some consideration of the resource site's relative value, as compared to other examples of the same resource in at least the jurisdiction itself.

To determine quality, the significance report cites two reports prepared for Multnomah County, *Wild About the City*, and *A Study of Forest Wildlife Habitat in the West Hills.* These reports are not all-inclusive, detailed studies of wildlife habitat in the West Hills, but rather present information on 1) the importance of contiguous wildlife areas to avert a biological "island" in Forest Park, 2) a baseline of data on wildlife in different sampled transects representing different types of land conditions in the West Hills, and 3) a specific analysis of the critical habitat area connecting Forest Park to the Oregon Coast Range in the Cornelius Pass area. These reports present information on the West Hills' intrinsic value as wildlife habitat.

Relative value of wildlife habitat is analyzed by comparing the known quality of the West Hills with the known quality of wildlife habitat in other non-urban areas of Multnomah County and adjacent non-urban areas in the City of Portland, Washington County, and Columbia County. The staff report discusses the available information by which to compare this quality.

RESPONSE:

Staff believes that the information on quality presented in the staff report adequately addresses the issue of relative quality of the West Hills wildlife habitat resource, and justifies a finding of significance. Staff does not believe that the time and expense necessary to prepare a study of wildlife habitat which may meet the commentors' standards as to rigorousness is necessary, mainly because the West Hills wildlife habitat area is being studied as a part of a broad ecosystem, not as a limited, defined habitat for a single endangered or threatened species of plant or animal.

4. ISSUE: The report contains no explanation of how built features affect wildlife's choice of locale.

ISSUE RAISED BY: Steve Oulman

DISCUSSION:

This issue is important not at the significance level of discussion, but rather at the next level of discussion, relating to conflicting uses.

RESPONSE:

This issue is addressed in the discussion of conflicting uses to wildlife habitat.

5. ISSUE: Multnomah County does not include substantial comparative information regarding other wildlife habitat areas in jurisdictions adjacent to the West Hills rural area, and what effect those jurisdictions' policies have on wildlife.

ISSUE RAISED BY: Steve Oulman

DISCUSSION:

The original staff report on significance does contain information on the relative quality of designated significant wildlife habitat areas in the City of Portland, Washington County, and Columbia County. All of these jurisdictions have completed the Goal 5 process, and their determinations of location, quantity, quality, impact area, conflicting uses, ESEE analysis, and Protection Program have been acknowledged by the Land Conservation and Development Commission.

RESPONSE:

Staff has revised the significance report to more fully describe the implementation measures these adjacent jurisdictions have in place to protect significant wildlife habitat.

6. ISSUE: It is questionable whether a functional wildlife corridor actually exists in the West Hills.

ISSUE RAISED BY: Steve Oulman

DISCUSSION:

This issue is the crux of the debate of the debate as to whether the West Hills wildlife habitat area is significant. It is discussed in the significance report and the Resource Analysis Report.

RESPONSE:

Staff believes that the revised significance report, along with the resource analysis report, justifies a determination that a functional wildlife corridor exists in the West Hills.

7. ISSUE: The significance report erroneously identifies agricultural areas along Springville Road as significant wildlife habitat, which is inappropriate since they were not surveyed.

ISSUE RAISED BY: Robert Burnham

DISCUSSION:

A Study of Forest Wildlife Habitat in the West Hills does not contain specific analysis of observed wildlife habitat in all areas of the West Hills -- rather, it surveyed representative transects of different land use types. None of the transects were conducted in the Springville Road area. Since the original significance report was completed, additional information has been collected in order to identify primary, secondary, and impacted wildlife habitat areas in the West Hills. Definitions of these three categories are contained within the revised significance report.

RESPONSE:

Based upon the refining of the significance determination, areas such as the commentors' farm are generally designated secondary or impacted wildlife habitat areas. While they may not be primary in nature, such areas are integral to the concept of the West Hills as an entire ecosystem, since wildlife does use these areas to some extent. A Specific protection measures for these areas are forthcoming in the protection program.

8. ISSUE: The value of the wildlife corridor in economic terms is infinite because it is irreplaceable.

ISSUE RAISED BY: Chris Wrench

DISCUSSION:

The Resource Analysis report indicates that the contiguous wildlife connection between Forest Park and the Coast Range which runs through the West Hills is vital to the continued viability of Forest Park as significant wildlife habitat. The report presents this information in terms of its environmental value, rather than trying to convert this environmental value into economic terms. The report describes the impacts to the Angell Brothers quarry expansion proposal and the regional market for mineral and aggregate resources in economic terms.

RESPONSE:

Staff does not believe that it is appropriate to convert an environmental resource (wildlife habitat) into an economic commodity in order to directly compare it to the economic commodity of the Angell Brothers quarry. If one assumes that the economic value of the wildlife habitat area is infinite because it is "irreplaceable," then one could argue that the Angell Brothers quarry resource is also "irreplaceable" because there is no other quarry site in the Portland Metropolitan Area with exactly the attributes of this quarry. It is appropriate to compare the *environmental* consequences of quarry expansion with the *economic* consequences of maintaining wildlife habitat.

9. ISSUE: The Resource Analysis Report does not address the social, economic, and energy consequences of conflicting uses upon wildlife habitat.

ISSUE RAISED BY: Neil Kagan

DISCUSSION:

The initial draft of the Resource Analysis Report did not directly discuss the consequences listed by the commentor.

RESPONSE:

The revised Resource Analysis Report discusses the consequences listed by the commentor.

10. ISSUE: The Resource Analysis Report does not address the issue that the Angell Brothers quarry site expansion would detract from the extensive scenic and recreational values of the West Hills, and would detract from tourism, which provides economic benefits.

DISCUSSION:

The initial draft of the Resource Analysis Report did not directly discuss the consequences listed by the commentor.

RESPONSE:

The revised Resource Analysis Report discusses the consequences listed by the commentor.

11. ISSUE: The Resource Analysis Report ignores the existing operation of the Angell Brothers quarry and its existing supply approved for expansion.

ISSUE RAISED BY: Neil Kagan, Arnold Rochlin

DISCUSSION:

Figures for the amount of recoverable aggregate material on the Angell Brothers quarry site are in dispute. There are three areas of the quarry site:

1) The existing operating quarry (approximately 70 acres)
2) The quarry expansion approved in 1990 (approximately 42 acres)
3) The proposed expansion area under discussion (283 acres)

The Angell Brothers have not divulged the amount of aggregate material in the existing operating quarry stating that it is proprietary information. A 1989 study by H.G. Schlicker & Associates indicated that there are approximately 220 million cubic yards of crushable aggregate material in the 325 unmined acres of the Angell Brothers site (42 acres approved in 1990, plus 283 acres proposed for expansion). If the aggregate material o the site is evenly distributed, then the 42-acre approved expansion area holds about 25 million cubic yards of aggregate material. Based upon an existing ability to crush approximately 400,000 cubic yards (810,000 tons) on -site, this would equal a supply of approximately 60 years in the existing expansion area, plus remaining aggregate supply in the existing quarry.

These figures are subject to challenge based on two of the assumptions: 1) that the 220 million cubic yards of aggregate is evenly distributed over the entire site (yielding more or less than 25 million cubic yards on the 42-acre expansion area approved in 1990), and 2) that the Angell Brothers operation will not expand its existing crushing capacity. If crushing capacity is increased, the life of the quarry will be shortened.

As for the issue of value of the mined material, a figure of $0.50 per cubic yard is available from the Oregon Division of State Lands (a low figure, since prices in the Portland area tend to be higher according to the Oregon Department of Geology and Mineral Industries). Based on this figure, the 42-acre approved expansion area and the 283-acre proposed expansion area have the following value:

AREA		CU.YDS.(million)	VALUE($million)
42-acre approved expansion area	25	12.5	
283-acre proposed expansion area	195	97.5	

Mr. Skip Anderson's estimate of 160 million cubic yards of recoverable rock material on the expansion area, 20% less than the 195 million indicated by the 1989 Schlicker report, would yield;d approximately $80 million in value. This estimate is within a reasonable range of deviation from the Schlicker report.

The commentors also note that in 1992 Frank Parisi, representing the Angell Brothers, indicated in a letter to the Multnomah County Planning Commission that the Angell Brothers would produce only 84 million cubic yards of rock on the site, at a value of $42 million. However, this estimate was based upon a plan which mined only 141 acres of the 283 acre site -- preserving a "buffer area" on the north of the site and a "wildlife conservation easement" on the south of the site. Since the resulting figures for recoverable rock and value are approximately half of those if the entire site is mined, these figures are not in conflict with the others.

RESPONSE:

The revised resource analysis report will reflect these issues.

Interestingly, the line of questioning regarding the operating life of the quarry may be irrelevant if the purpose of the Goal 5 process is to protect resources for future generations without regard to time. If so, then the operating life of the quarry is not an issue -- the issue is the presence of the resource on the site and its relative scarcity.

12.ISSUE: The Resource Analysis Report does not identify actual and conflicting uses for the ten subareas of the West Hills Rural Area.

ISSUE RAISED BY: Dorothy Cofield

DISCUSSION:

In addition to broad zoning district use conflicts, an ESEE analysis must analyze actual and potential conflicting uses specific to each resource site (Columbia Steel Castings Co. v. the City of Portland 314 Or 422,431, ___P2d___(1992).

It is the contention of the commentor that the County must identify actual uses in the ten subareas of the West Hills Wildlife Forested Habitat Area to the level of specificity such as "on Skyline Blvd., there are two nurseries and there is the Plainview Store on Cornelius Pass Rd." (Cofield letter)

The Resource Analysis Report does not provide this level of specificity. However, it does provide a level of specificity considerably beyond the mere analysis of zoning district conflicting uses. Of major importance is the division of the significant area into three cate-

gories, primary, secondary, and impacted habitat. These categories are based for the most part upon actual uses in place at this time. A map of the West Hills shows with a reasonable level of specificity the boundaries of the three gradations of habitat. Table 3 of the Resource Analysis Report gives an acreage breakdown of each gradation of habitat by subarea. Table 6 analyzes existing and potential residential development for exception lands in each of the ten subareas.

The report provides particular specificity to the conflicting uses in the McNamee-Harborton and Folkenberg subareas -- uses such as the Angell Brothers quarry and proposed expansion, forest clear-cuts, and new residences. This additional specificity is justified by the critical place this area has in maintaining wildlife contiguity between Forest Park and the Coast Range.

As a final point, the West Hills Wildlife Forested Habitat Area is not a site-specific resource as exemplified by, for example, a bald eagle roost or a sensitive wetland. This resource site is being analyzed as an ecosystem, or to be more precise, as part of an ecosystem stretching from Forest Park to the Coast Range. The level of specificity required for the analysis of conflicting uses is therefore lessened.

RESPONSE:

Staff sees no need to provide further specificity to uses conflicting with wildlife habitat in the Resource Analysis Report.

13. ISSUE: Technical terms used in the Resource Analysis Report need to be clarified.

ISSUE RAISED BY: Steve Oulman

DISCUSSION:

Various terms within the Resource Analysis Report are not defined.

RESPONSE:

The revised Resource Analysis Report clarifies these terms.

14. ISSUE: The Resource Analysis Report must better address the impacts of roads on wildlife habitat.

ISSUE RAISED BY: Steve Oulman

DISCUSSION:

Roadways have a significant adverse impact upon wildlife habitat. They act as obstacles to the movement of wildlife habitat across them, in terms of the danger from vehicles, the

fencing property owners put along them, and the clearing and development which clusters along them.

RESPONSE:

The revised Resource Analysis report provides additional information on the impact of roads to wildlife habitat in the West Hills. Appendix A of the document is an analysis of specific roadside conditions and obstacles to wildlife habitat along paved public roads in the West Hills.

15.ISSUE: The Resource Analysis Report does not adequately discuss the feasibility or desirability of medium and large mammals residing in Forest Park.

ISSUE RAISED BY: Steve Oulman, Richard Shepard

DISCUSSION:

Large mammals are an "indicator" species in terms of studies of the biology of "islands" (areas of habitat which are cut off by natural or man-made barriers to other habitat areas). They are an indicator in that they have the most difficult locational requirements in order to survive and move about -- if a black bear or a mountain lion can live or range in Forest Park, then all animals lower on the food chain can also live or range in the park. The desirability of such animals ranging in Forest Park is a decision for the City of Portland.

As for the West Hills Wildlife Forested Habitat Area, the Resource Analysis Report does not state that use of the park by these large carnivores is desirable, the report states that if contiguity between Forest Park and the Coast Range is maintained for these animals, then smaller mammal and bird species will be assured habitat and contiguity in order to prevent the creation of a biological "island" in Forest Park.

RESPONSE:

The Resource Analysis Report has been revised to clarify the issues raised by the commentors.

16.ISSUE: Has the one-half mile(minimum) wide area of continuous forest cover between Newberry and Cornelius Pass Roads already been lost?

ISSUE RAISED BY: Steve Oulman

DISCUSSION:

The critical area of habitat which would assure or destroy contiguity between Forest Park and the Coast Range lies between Newberry and Cornelius Pass Roads to the east of Skyline Blvd. Maintenance of a one-half mile area of continuous forested habitat (not cover) in this area is considered essential. Forested habitat includes areas of varying levels of for-

est canopy, ranging from cleared brushy areas to old-growth forest. *A Study of Forest Wildlife Habitat in the West Hills* (Lev, et.al, 1992) recommends maintenance of minimum 200-foot wide forested canopy areas running throughout the half-mile width in order to provide cover for those animals which require it in order to survive, range, and feed.

The critical area noted by the commentor has been extensively logged over the last several years, and the ratio of cleared areas to forest canopy areas at this point in time is such that certain animals that require forest cover would find it difficult to survive, travel in, and feed in this area. However, regeneration of forests in the area will change this situation and, once grown to the point of providing additional forest canopy, allow for additional use of this area by certain species.

RESPONSE:

Staff believes that the evidence shows that a minimum one-half mile wide area of contiguous forest wildlife habitat does currently exist in the critical area between Newberry and Cornelius Pass Roads in the West Hills. Regeneration of recently clear-cut areas will solidify this area's contiguity to Forest Park on one side and forested areas leading to the Coast Range on the other.

17.ISSUE: The Resource Analysis Report does not adequately discuss the recent spate of forest management dwellings placed on forest lands in the West Hills and their impact on wildlife habitat.

ISSUE RAISED BY: Steve Oulman

DISCUSSION:

A number of forest management dwellings were approved in the West Hills immediately prior to the elimination of the Multiple Use Forest Zone and its replacement with the more restrictive Commercial Forest Use Zone at the beginning of 1993. These dwellings clearly impact wildlife habitat as identified in the Resource Analysis report.

Under the current land use rules in place for the Commercial Forest zone, which applies to 76% of the West Hills, new construction of dwellings is severely curtailed. All of the primary habitat areas designated in the Resource Analysis Report are zoned Commercial Forest Use.

RESPONSE:

Under the current rules regulating construction of new dwellings in the Commercial Forest Use zone, very few additional forest management dwellings will be constructed in the West Hills and the primary habitat areas will be preserved as forested areas, in various stages of timber management and regeneration.

18. ISSUE: The concept of a wildlife corridor and a potential "bottleneck" to wildlife movement between Forest Park and the Coast Range is a myth.

ISSUE RAISED BY: Richard Shepard

DISCUSSION:

Staff does agree with Mr. Shepard the the concept of a wildlife corridor between Forest Park and the Coast Range is a myth. Wildlife do not use their habitat as a motorist uses a freeway, to drive to work, home, or other destinations. Such an analogy may be useful in explaining the importance of maintaining a connection between Forest Park and the Coast Range, but is certainly highly simplified. Wildlife have home ranges where they live, feed, procreate, and avoid being eaten which, with the exception of perhaps a few large mammals, are localized to the point where a "corridor" is unnecessary.

What in fact exists in the West Hills is a connection of contiguous habitat areas stretching from Forest Park adjacent to the City of Portland to the Oregon Coast Range and the Pacific Ocean. The amalgamation of these habitat areas is an ecosystem. Within this ecosystem wildlife live and interact in such a way so as to create a rough "balance of nature." This balance has been impacted to some extent by the presence of humanity within the ecosystem, but has not been impacted to the extent of an urban area within the Portland city limits, for example. The data contained in the Resource Analysis report, and the reports upon which it is based, adequately document this determination. One does not need mountains of data to make the logical, common-sense conclusion that Forest Park and the West Hills are part of a larger forested ecosystem.

The separation of Forest Park from this ecosystem would not be the equivalent of severing a motorized transportation link -- the change would be more subtle and long-term, but just as far-reaching. Forest Park would become an "island" ecosystem, with a resulting lack of diversity and strength in wildlife populations due to lack of genetic interchange, susceptibility to further negative interaction with humanity, lack of ability for repopulation in the case of a catastrophic natural or man-made event, and the other consequences of such ecosystems which are well documented in the scientific literature on the subject.

RESPONSE:

Staff believes that the Resource Analysis Report, as well as *A Study of Forest Wildlife Habitat in the West Hills*, do not simplify the concept of a single ecosystem for the West Hills and Forest Park to the metaphor of a "wildlife corridor." The reports instead show the nature of the ecosystem, and the effects of severing Forest Park from it.

19. ISSUE: Edge effects are not uniformly negative as is asserted in the Resource Analysis Report.

ISSUE RAISED BY: Richard Shepard

DISCUSSION:

It was once thought that the creation of edge effect and the adjacency of highly contrasting plant communities like pasture and forest enhanced the wildlife habitat value of an area. However recent studies have shown that creation of sharp edges and maximum contrast, clear cuts next to old growth forest, may cause serious losses of tree cover to wind throw and increased populations of nest parasites. Edge habitats provide different character and properties than forest interiors. For some species, mortality rate will be greater along the edge because of increased exposure to predation, nest parasites, sun, wind, or limited cover from rain and snow. Other species, including many predators, prefer edge habitats and variety in cleared and forested areas to forest interior habitats. In order to provide for all species, there must be both edge areas and interior forest areas -- due to conflicting uses in the West Hills, the edge areas now predominate, and more interior forest areas are needed to provide for a full range of species.

RESPONSE:

Staff believes that the consequences of edge effects, both positive and negative, are well documented in the revised Resource Analysis Report.

20.ISSUE: The Resource Analysis Report's discussion of the value of residential lots within the West Hills is flawed.

ISSUE RAISED BY: Arnold Rochlin

DISCUSSION:

The initial draft of the Resource Analysis Report included an estimate of the value of a Rural Residential-zoned lot at $70,000. This was based upon a response from a local real-estate firm to the question.

The revised resource analysis report contains a more thorough analysis of residential lot prices based upon data from the County assessor. A revised estimate of the average cost of a Rural Residential-zoned lot is $34,000.

RESPONSE:

The commentor's concerns are answered in the revised Resource Analysis Report.

CHAPTER VI
RECONCILIATION

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A. INTRODUCTION

Preceding chapters have determined that scenic views, streams, wildlife habitat and the Angell Brother's aggregate site are significant Goal 5 resources in the West Hills. Uses that would conflict with each resource were identified, as follows:

Scenic
- Forestry
- Community service and Conditional Uses
- Residences
- Mining

Wildlife
- Forestry
- Agriculture
- Residences
- Mining

Streams
- Forestry
- Agriculture
- Community Service and Conditional Uses
- Residences
- Transportation/Public Improvements
- Mining

Angell Brother's Aggregate
- Forestry
- Uses to conserve soil, air & water quality & wildlife & fisheries resources
- Residences
- Scenic resources
- Wildlife resource
- Streams resources

Previous chapters identified the economic, social, environmental and energy (ESEE) consequences that allowing conflicting uses would have on the significant resources, and the consequences if the conflicting uses were not allowed. Decisions to allow, not allow, or limit conflicting uses must be based on this analysis of ESEE consequences. However, each of the significant resources does not stand alone. The impact areas of the resources overlap in many areas. For example, both the Angell Brother's aggregate site and portions of significant streams lie within the scenic area, which itself lies within the significant wildlife habitat area. Consequently, decisions about whether to allow fully, not allow, or allow conflicting uses in a limited manner must consider the results of the resource analysis for the other significant resources, and reconcile any differences. For example, if the results of the ESEE analysis of forestry showed that forestry should not be allowed in the scenic area, but should be allowed in the other resource areas, these different conclusions would have to be reconciled.

Section B of this chapter will examine the previously identified ESEE consequences for each conflicting use and reconcile any differences to reach a conclusion as to whether that particular *use* should be allowed, not allowed, or allowed in a limited manner. Section C will than reach a determination as to whether each significant *resource* should be fully protected by not allowing conflicting uses (designate "3-A"), not protected because conflicting uses are of such importance that they should be allowed fully (designate "3-B"), or protected by allowing conflicting uses in a limited manner (designate "3-C").

B. CONFLICT RESOLUTION

OAR 660-16-010: Based on the determination of the economic, social, environmental and energy consequences, a jurisdiction must "develop a program to achieve the Goal". Assuming there is adequate information on the location, quality, and quantity of the resource site as well as on the nature of the conflicting use and ESEE consequences, a a jurisdiction is expected to "resolve" conflicts with specific sites in any of the following three ways listed below....

(1) Protect the Resource Site: Based on the analysis of the ESEE consequences, a jurisdiction may determine that the resource site is of such importance, relative to the conflicting uses, and the ESEE consequences of allowing conflicting uses are so great that the resource site should be protected and all conflicting uses prohibited on the site and possibly within the impact area identified in OAR 660-16-000(5)(c). Reasons which support this decision must be presented in the comprehensive plan, and plan and zone designations must be consistent with this decision.

(2) Allow Conflicting Uses Fully: Based on the analysis of ESEE consequences and other Statewide Goals, a jurisdiction may determine that the conflicting use should be allowed fully, not withstanding the possible impacts on the resource site. This approach may be used when the conflicting use for a particular site is of sufficient importance, relative to the resource site. Reasons which support this decision must be presented in the comprehensive plan, and plan and zone designations must be consistent with this decision.

(3) Limit Conflicting Uses: Based on the analysis of ESEE consequences, a jurisdiction may determine that both the resource site and the conflicting use are important relative to each other, and that the ESEE consequences should be balanced so as to allow the conflicting use but in a limited way so as to protect the resource site to some desired extent. To implement this decision, the jurisdiction must designate with certainty what uses and activities are allowed fully, what uses and activities are not allowed at all and which uses are allowed conditionally, and what specific standards or limitations are placed on the permitted and conditional uses and activities for each resource site. Whatever mechanisms are used, they must be specific enough so that affected property owners are able to determine what uses and activities are allowed, not allowed, or allowed conditionally and under what clear and objective conditions or standards. Reasons which support this decision must be presented in the comprehensive plan, and plan and zone designations must be consistent with this decision.

The "goal to be achieved", according to Goal 5, is protection of significant resources for future generations. This does not simply mean that a use which adversely impacts the resource should not be allowed if the ESEE analysis has shown that protection is more important than the conflicting use (a "3-A" designation). The conflict resolution process should also take into consideration whether adverse impacts can be mitigated. If mitigation is possible, the appropriate designation is "3-C", and clear and objective standards should be adopted which will allow the conflicting use in a manner that also protects the resource. If the use of development standards would resolve conflicts by both allowing the use and

protecting the resource, then the appropriate Goal 5 level of protection is "3-C", limit conflicting uses.

The following subsections re-examine the previously identified ESEE consequences of the conflicting use, resolve any conflicts, and reach a conclusion as to whether that conflicting use should be allowed, not allowed, or allowed in a limited manner.

1. Forestry

Forestry activities have been identified as a conflicting use in all four resource impact areas. A synopsis of the identified ESEE consequences is as follows:

Consequences if Forestry is not allowed

Economic: Loss of jobs, taxes, and revenue from sales; increased transport costs, regulatory burden

Social: End to resource-based lifestyle/heritage for some families; reduced property rights;

Environmental: Older, less productive forest, possibility of disease and infestation

Energy: Possibility of greater energy expenditure to import/transport materials and wood products, shortage of goods; greater energy used for mining

Goal 4: County cannot prohibit forest practices

Consequences if Forestry is allowed in a limited manner

Economic: Possible loss of some jobs, taxes, and revenue from sales; regulatory burden

Social: Reduced property rights, impact on "timber" lifestyle, reduced local sources for timber

Environmental: No impacts

Energy: Some increase in energy use for transporting materials to market, shortage of goods

Goal 4: County cannot limit or regulate forest practices

Consequences to Scenic Resource if Forestry is allowed fully

Economic: Loss of indirect benefits related to quality of life

Social: Loss of aesthetic enjoyment

Environmental: Less protection of fish and wildlife habitat, water and air quality

Energy: No impact

Consequences to Streams if Forestry is allowed fully

Economic: Reduced water quality for use, change in water quantity for use

Social: Loss of flood storage capacity

Environmental: Loss of riparian vegetation, reduced water quality

Energy: Decreased water flow for energy use

Consequences to Wildlife Habitat Area if Forestry is allowed fully

Economic: Loss of indirect benefits related to quality of life and tourism

Social: Loss of educational and passive recreational opportunities

Environmental: Numerous negative impacts from habitat loss and diminishment

Energy: Insignificant

Consequences to Angell Brothers if Forestry is allowed fully

Economic: Loss of jobs, taxes and revenue from aggregate sales if forestry supercedes mining

Social: Loss of construction material if forestry supercedes mining

.Environmental: No impact

Energy: Less energy used for forestry than mining

DISCUSSION: Growing and harvesting trees is a cyclical process, and many of the negative effects caused by logging are temporary in nature - once trees begin to regrow the scenic appearance of the site and its usefulness as wildlife habitat and riparian value are regenerated. The impacts to streams, wildlife habitat and scenic resources if forestry is allowed fully are generally environmental and aesthetic in nature, as compared to the economic impacts if forestry activities were not allowed. The impacts to mining if forestry is allowed fully center around whether utilizing the site for forestry would supercede mining. However, since allowing forestry is not the same as requiring forestry to occur on the mineral and aggregate site, a decision to fully allow forestry would cause no major conflicts with the Angell Brother's site.

The Oregon Forest Practices Act contains rules to provide for the overall maintenance of water resources, fish and wildlife. For instance, the rules require maintaining a buffer area along streams and the Highway 30 scenic corridor. Thus the impacts caused by forestry are limited. More importantly, ORS 527.722 restricts the county from prohibiting, limiting or regulating forest practices on forest lands.

The county could prohibit forest practices on lands zoned RR and MUA, where an exception to Goal 4 has been taken. However, most of these lots are too small to be of commercial value for logging. In addition, the aesthetic value and tax incentives of retaining forested areas on these properties makes much logging unlikely. The expense and effort for the county to set up its own program to regulate forestry practices on exception lands would be great. Consequently, since impacts from allowing forestry on exception lands are minimal, forestry should not be prohibited.

CONCLUSION: The county cannot regulate or prohibit forestry activities on forest lands. On exception lands, forestry activities are unlikely to occur on a scale that would impact significant resources, the Forest Practices Act provides adequate safeguards to protect streams, and logging causes only a temporary interruption to wildlife habitat and scenery. For these reasons, forestry activities should be allowed fully within all four significant resource areas.

2. Agriculture

Identified as a conflict to wildlife habitat and streams. The synopsis of ESEE consequences is as follows:

Consequences if Agriculture is not allowed

Economic: Loss of economic value, loss of farm products to Portland area,lost jobs, reduced tax revenues, regulatory burden

Social: Loss of aesthetically pleasing open space, loss of farming lifestyles, reduced property rights, reduced local sources of farm products

Environmental: Transferring environmental impacts to another site.

Energy: Increase in costs to bring more distant farm products to market, shortage of goods

Consequences if Agriculture is allowed in a limited manner

Economic: Some loss of economic value and nearby farm products, regulatory burden, potential for loss of jobs and tax revenues

Social: Loss of aesthetically pleasing open space, burden of regulation, reduced farm lifestyle, reduced local sources of farm products

Environmental: Transfer of some environmental impacts to another site

Energy: Marginal increase in costs to bring distant farm products to market, shortage of goods

Consequences to Wildlife Habitat if Agriculture is allowed fully

Economic: Loss of indirect benefits related to quality of life and tourism

Social: Loss of educational and passive recreational opportunities

Environmental: Numerous negative impacts from habitat loss & diminishment

Energy: Insignificant

Consequences to Streams if Agriculture is allowed fully:

Economic: Reduced water quality for use, change in water quantity for use

Social: Insignificant

Environmental: Loss of riparian vegetation, reduced water quality, greater wildlife disturbance

Energy: Decreased water flow for energy use

DISCUSSION: The analysis for significant streams (Chapter III) identifies specific conflicts with agricultural activities only in certain West Hills streams -- other stream impact areas have no soils which are suitable for agricultural activities. The analysis for significant wildlife habitat identifies conflicts with agriculture primarily in "secondary" habitat areas, and "impacted" habitat areas so designated because existing agricultural activities make the area less desirable as wildlife habitat when compared to the forested "primary" habitat areas. Soils in the "primary" habitat areas make agricultural activities generally infeasible. So agriculture is not a major threat to wildlife habitat in the West Hills. However some agricultural practices, such as misuse of pesticides, degradation of stream quality, and removal of riparian vegetation, do have negative consequences upon both streams and wildlife habitat.

Regulation and restriction of agricultural activities to protect Goal 5 natural resources is theoretically possible for Multnomah County.

ORS 215.253 states: *No State Agency, City, County, or Political Subdivision of this state may exercise any of its powers to enact local laws or ordinances or impose restrictions or regulations affecting any farm use land situated within an exclusive farm use zone established under ORS 215.203 ...in a manner which would unreasonably restrict or regulate farm structures or that would unreasonably restrict or regulate accepted farming practices because of noise, dust, odor, or other materials carried in the air or other conditions arising therefrom... ..."Accepted Farming Practice" as used in this subsection shall have the meaning set out in ORS 215.203.*

Nothing in this section is intended to limit or restrict the lawful exercise by any state agency, city, county or political subdivision of its power to protect the health, safety, and welfare of the citizens of this state.

As this language seems to indicate, regulation of agricultural activities by Multnomah County is feasible under state law.

However, it is not desirable or necessary for the County to institute a regulations for agricultural activities or practices, for the following reasons:

1. Agricultural activities and practices have been demonstrated to be marginal in their negative impact upon the primary wildlife habitat areas identified in the Resource Analysis Report.

2. Areas where agricultural activities would have a more significant impact upon wildlife habitat have soil types unsuitable to agriculture, and thus are unlikely to be cleared for such use.

3. Because of steep topography and poor soil conditions, many West Hills streams will likewise not be impacted by agricultural activities and practices.

4. Regulation of agricultural activities and practices would require a major effort by Multnomah County in order to study and adopt appropriate regulatory mechanisms and would require significant expenditure in order to enforce them.

5. The regulatory burden of mandatory restrictions on agricultural practices would be considered onerous by many if not most farmers.

6. Measures to protect streams and associated wildlife habitat areas are already practiced by many farmers, and are considered to be beneficial not only to the natural resources involved, but also to the agricultural activity or practice.

7. The U.S. Soil and Water Conservation Service and the West Multnomah Soil and Water Conservation District have as one of their primary missions the promotion of sound agricultural practices which protect streams and associated wildlife habitat areas from degradation due to agricultural activities and practices.

8. Multnomah County is part of a program to educate farmers in measures which will maintain and improve water quality within the Tualatin River Basin as per Department of Environmental Quality mandates.

CONCLUSION: For the reasons listed above, Multnomah County should not institute a regulatory scheme for agricultural activities. As an alternative, Multnomah County should work cooperatively with the U.S. Soil Conservation Service and the West Multnomah Soil and Water Conservation District to promote agricultural practices which protect streams and associated wildlife habitat. Joint programs should promote the following measures:

- Fencing could be limited in uncultivated areas along roadways, thus reducing barriers to wildlife movement.

- Fencing should be used to keep domestic livestock from degrading streams and adjacent riparian habitat. Design standards for fences could be used which ensure that fences do not block passage for a wide range of wildlife species.

- Application of fertilizers and pesticides could be limited, especially outside of cultivated farming areas.

- Uncultivated riparian "buffer" areas should be maintained along streams in order to maintain fish and wildlife habitat values and maintain water quality.

3. Community Service and Conditional Uses

Community service and conditional uses have been identified as uses that would conflict with the scenic area and streams. The identified ESEE impacts are:

<u>Consequences if CS and Conditional Uses are not allowed</u>

Economic: No new jobs/income/taxes, possible increased costs to develop elsewhere
Social: No new provider of local goods and other services
Environmental: No opportunity for potential benefits provided by environmental protection facilities; transfer of impacts to another site
Energy: Continuing energy used for transportation to obtain goods, services and employment outside area
Goal 9: Decreased opportunity for local economic development

<u>Consequences if CS and Conditional Uses are allowed in a limited manner</u>

Economic: Regulatory burden, changes in customary practices; less exposure to Highway 30 could reduce commercial business
Social: Reduced availability of amenities
Environmental: Possible impacts related to siting
Energy: Insignificant
Goal 9: Compatible with Goal

Consequences to Scenic Resource if CS and Conditional Uses are allowed fully

Economic: Loss of indirect benefits related to quality of life
Social: Loss of aesthetic enjoyment
Environmental: Less protection of fish and wildlife habitat, water and air quality
Energy: No impact

Consequences to Streams if CS and Conditional Uses are allowed fully

Economic: Insignificant
Social: Insignificant
Environmental: Deterioration of water quality, increased disturbance of wildlife
Energy: Decreased water flow for energy use

DISCUSSION: There are a variety of community service, conditional uses and other uses that, if allowed, could conflict with preservation of streams and scenic values. Within this category are commercial businesses, churches, schools, solid waste facilities, forest processing operations, and transmission towers, to name a few. The likelihood of these uses being approved is unknown, but the total number is limited due to restrictive CFU zoning and a lack of public services such as water and sewer.

The greatest potential for new commercial or industrial uses is in Burlington and in a small area along Highway 30 just south of Scappoose. Both these areas already contain commercial development, so scenic value is compromised. Both areas also are visible from only one key viewing area - Highway 30 - and are seen only briefly as travellers pass by. Jones Creek and Joy Creek flow through the Scappoose area, so would potentially be impacted by the location of new uses. "Burlington" Creek is along the southern edge of the platted Burlington community, so would not be impacted by new uses in the area.

If allowed fully, community service and conditional uses could have negative effects to stream quality, quantity and associated habitat, and contribute to a loss of aesthetic enjoyment of scenic views. If the uses were not allowed, there would be less availability of social and environmental benefits provided by some uses, and economic and energy costs to area residents to travel elsewhere to obtain the amenities provided by these services.

If the uses are allowed, but in a limited manner that requires location away from stream corridors and siting in a manner that reduces visibility from key viewing areas, the impacts to the significant resources will be minimal.

CONCLUSION: In Burlington, community service and conditional uses should be allowed fully (subject to other zoning requirements for approval). In all other areas, uses should be allowed in a limited manner by requiring the use to meet siting standards that reduce visibility of the use from key viewing areas and prevent removal of vegetation and runoff into stream corridors.

4. Uses to Conserve Soil, Air and Water Quality and to Provide for Wildlife and Fisheries Resources

Uses to conserve soil, air and water quality and to provide for wildlife and fisheries

resources has been identified as a possible conflicting use only within the Angell Brothers mineral and aggregate impact area. A synopsis of the identified ESEE consequences between mining and those uses is as follows:

Consequences if Uses to Conserve Soil, Air and Water Quality and to Provide for Wildlife and Fisheries Resources are not allowed

Economic: Reduction of mining operation expense
Social: Loss of habitat and passive recreation opportunities
Environmental: Reduction of environmental quality and habitat within impact area
Energy: Reduction of energy expended for environmental quality control measures

Consequences if Uses to Conserve Soil, Air and Water Quality and to Provide for Wildlife and Fisheries Resources are allowed in a limited manner

Economic: No increase over existing mining expense for environmental quality control measures; reduction of possible expansion areas
Social: Provision of passive recreation opportunities
Environmental: Maintenance of resource quality and habitat areas
Energy: No increase over existing energy expended for environmental quality control measures

Consequences if Uses to Conserve Soil, Air and Water Quality and to Provide for Wildlife and Fisheries Resources are allowed fully

Economic: No, or slight, increase over existing mining expense for environmental quality control measures; reduction of possible expansion areas
Social: Provision of passive recreation opportunities
Environmental: Maintenance of resource quality and habitat areas
Energy: No increase over existing energy expended for environmental quality control measures

DISCUSSION: Any mining must be conducted under appropriate DEQ and DOGAMI operating permits that insure acceptable levels of air and water quality and provide for bank stabilization, erosion control and reclamation. The benefits of allowing uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources on surrounding properties within the impact area outweigh the burden on a mine operator of any additional regulations that might be placed on aggregate mining.

CONCLUSION: Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources should be allowed without limitation throughout the impact area of the Angell Brothers resource site.

5. Residential Use

Identified as a conflict to Wildlife Habitat, Streams, Scenic Views and Sites, and Mining (Angell Brothers quarry). The synopsis of ESEE consequences is as follows:

Consequences if Residential Uses are not allowed:

Economic: Lower property value, less tax revenue, protection of aggregate resource

Social: Reduced availability of amenities, "takings" issue, loss to individuals of opportunity for "rural" lifestyle

Environmental: Transferring environmental impacts to another site.

Energy: Greater distance between destinations, increased cost of infrastructure

Consequences if Residential Uses are allowed in a limited manner:

Economic: Partial loss of property value, regulatory burden, changes in customary practices

Social: Regulatory burden, diminishment of rural uses which conflict with wildlife, reduced availability of amenities, additional complaints about mining operation impacts

Environmental: Possible increase in erosion, drainage problems and fire hazards, possible transferring environmental impacts to another site

Energy: Increased energy consumption in home construction to mitigate mining impacts

Consequences to Wildlife Habitat if Residential Uses are allowed fully

Economic: Loss of indirect benefits related to quality of life and tourism

Social: Loss of educational and passive recreational opportunities

Environmental: Numerous negative impacts from habitat loss & diminishment

Energy: Insignificant

Consequences to Streams if Residential Uses are fully allowed:

Economic: Insignificant

Social: Insignificant

Environmental: Loss of riparian vegetation, loss of water quality, more disturbance of wildlife

Energy: Decreased water flow for energy use

Consequences to Scenic Views if Residential Uses are fully allowed:

Economic: Loss of indirect benefits related to quality of life

Social: Loss of aesthetic enjoyment

Environmental: Less protection for fish & wildlife habitat, water & air quality

Social: Insignificant

Consequences to Mineral & Aggregate (Angell Bros.) if Residential Uses are fully allowed (in impact area):

Economic: Retention of property values, possible modification of mineable area and/or operational methods

Social: More opportunity for rural homesites and lifestyle; increase in complaints regarding aspects of mining operation

Environmental: New homes could be located in a manner that could place an aggregate operation in violation of DEQ environmental standards

Energy: Insignificant

DISCUSSION: Residential uses represent a significant potential impact upon wildlife habitat and streams resources because areas of the West Hills where most additional homes at the greatest densities could be built -- Rural Residential zoned "exception" lands are in the midst of important wildlife habitat and significant stream areas. Almost all lands within the impact area of scenic views and sites are zoned Commercial Forest Use, and will therefore be built at very low residential densities which will have much less impact on scenic qualities. Likewise, new homes sited on lands zoned Commercial Forest Use will have a lesser impact upon wildlife habitat and streams due to the low densities of development allowed. Also, conflicts between the proposed Angell Brothers Quarry expansion and potential new residential development are fairly small because virtually all land within the proposed quarry's impact area is zoned Commercial Forest Use. It should be noted, however, that the lesser impacts upon Commercial Forest Use lands are the result of strong, controversial statewide restrictions on residential development on rural forest lands -- should these restrictions be lessened by future legislative action, the impacts of residential development on forest lands could grow significantly. Animal control requirements -- fencing of dogs and "belling" of cats, is not a proper use of zoning powers. More appropriately, Multnomah County should increase enforcement of existing animal control ordinances which require restraining of dogs, and also institute educational programs to educate pet owners as to the negative impacts their domesticated pets can have on wildlife if not properly restrained.

CONCLUSION: Clearly, there would be significant adverse consequences to Goal 5 resources if residential uses were allowed fully, and to property owners and the community if residential uses were prohibited. A balanced approach, which protects the resources while allowing residential development which minimizes impacts upon these resources, is the optimal solution for this issue.

6. Transportation/Public Improvements

Identified as a conflict to streams. The synopsis of ESEE consequences is as follows:

Consequences if Transportation/Public Improvements are not allowed:
- Economic: Increased cost of material transport, regulatory burden, changes in practices
- Social: Insignificant
- Environmental: Insignificant
- Energy: Increased energy expenditure on infrastructure

Consequences if Transportation/Public Improvements are allowed in a limited manner:
- Economic: Increased cost of material transport, regulatory burden, changes in practices
- Social: Insignificant
- Environmental: Insignificant
- Energy: Increased energy expenditure on infrastructure

Consequences to Streams if Transportation/Public Improvements are fully allowed:
- Economic: Insignificant

Social: Loss of education & recreation associated with wildlife habitat
Environmental: Loss of riparian vegetation, loss of water quality, more disturbance of wildlife
Energy: Decreased water flow for energy use

DISCUSSION: Transportation facilities and Public Improvements have the potential to adversely impact significant streams wherever such an existing facility is modified or a new facility is constructed within the riparian zone of the stream. The County has no regulatory authority over logging roads constructed in accordance with the Forest Practices Act, and driveways are more appropriately considered under the category of the development they are proposed to serve (residential, community service, etc.). Although no major proposed public improvements, such as utility extensions, or road widenings were identified in the West Hills, such improvements may be proposed in the future.

Transportation facilities and public improvements which are located within a stream's impact area are too vital in most cases to be prohibited in order to protect the stream. However, such facilities can generally be constructed in a manner which can minimize the impacts to streams.

CONCLUSION: Clearly, there would be significant adverse consequences to Goal 5 resources if transportation facilities and public improvements were allowed fully, and to the community if such uses were prohibited. A balanced approach, which protects the resources while allowing improvements to roads and public facilities which minimizes impacts upon these resources, is the optimal solution for this issue.

7. Mining

Mining has been identified as a conflicting use in the scenic, streams, and wildlife habitat impact areas. A synopsis of the identified ESEE consequences of mining with respect to those other uses is as follows:

Consequences if Mining is not allowed
Economic: Loss of jobs, taxes, and revenue from sales; increased cost to consumers; loss of long-term supplies
Social: Reduced property rights; no more local sources; loss of needed construction material; increased impacts on other communities
Environmental: Insignificant
Energy: Increased energy consumption in transporting material and building infrastructure

Consequences if Mining is allowed in a limited manner
Economic: Regulatory burden, taxes, and revenue from sales; possible loss of long-term supply and increased cost
Social: Reduced property rights, reduced local sources; possible increased impacts on other communities; less availability of needed construction material

Environmental: More stringent buffering and reclamation requirements
Energy: Some increase in energy use for transporting materials to market; less use of concrete

Consequences to Scenic Resources if Mining is allowed fully
Economic: Loss of indirect benefits related to quality of life
Social: Loss of aesthetic enjoyment
Environmental: Less protection of fish and wildlife habitat, water and air quality
Energy: No impact

Consequences to Streams if Mining is allowed fully
Economic: Insignificant
Social: Insignificant
Environmental: Loss of riparian vegetation, deterioration of water quality
Energy: Insignificant

Consequences to Wildlife Habitat Area if Mining is allowed fully
Economic: Loss of indirect benefits related to quality of life and tourism
Social: Loss of educational and passive recreation opportunities
Environmental: Numerous negative impacts from habitat loss and diminishment
Energy: Insignificant

DISCUSSION: Mining is a conflicting use that potentially could occur at many locations throughout the West Hills. The Angell Brothers site, however, is the only location in the West Hills that has been identified as being a significant mineral and aggregate site. The discussion of mining use conflicts with other identified significant Goal 5 resources, then, will be limited to the Angell Brothers resource site.

Scenic: The scenic resource analysis indicates that mining, like logging, temporarily affects the scenic qualities of the West Hills through removal of the vegetative cover and modification of the landform that comprise a portion of the scenic resource. The analysis indicates, however, that it is possible to maintain the scenic qualities of the West Hills Scenic Area if mining is allowed in a limited manner. A protection program for the mineral resource should include restrictions that would only allow mining expansion in a manner that minimized impacts on the scenic resource both during and after extraction.

Streams and Wetlands: The North Angell Brothers Creek has been found to be a significant stream because of its minor contribution of water to the Rafton/Burlington Bottoms, its provision of "essential" connections exist between fish and wildlife habitat areas on high quality upstream and low quality downstream portions of the stream, and its canopy cover and riparian vegetation which has a positive impact on water quality.

The significance of this stream, however, is minor compared with other streams in the West Hills which meet more of the criteria for significance found in the Multnomah

County Comprehensive Plan. The contribution of water from this stream to Burlington Bottoms has been found to be minor compared to other water sources such as Multnomah Channel. Only the upper portion of the watershed, a small portion of which is on the Angell Brothers quarry site, is of high quality and is critical to maintaining a minimum one-half mile width of undisturbed forest habitat for the maintenance of wildlife (see discussion under "Wildlife Habitat" below). The areas where canopy cover improves water quality also lie for the most part in the upper reaches of the watershed which are not proposed for mining. Therefore, the mineral and aggregate resource on the Angell Brothers site clearly has greater weight than the stream resource.

The Rafton/Burlington Bottoms and the East bank of Multnomah Channel are significant "3–C" resource areas that must continue to be protected by limiting conflicting uses, of which mining is one. Water quantity and quality flowing into Burlington Bottoms should be maintained by the quarry operator pursuant to standards set by the Oregon Department of Environmental Quality.

Wildlife Habitat: The wildlife habitat analysis indicates that a forest habitat would not be re-established on a mined area for at least 10 years following reclamation. That would have the long-term impact of destroying the vital connection between Forest Park and large tracts of forest land to the north and west. The analysis indicates that a minimum half-mile wide undisturbed forested habitat is necessary at any given location to allow animals to travel and seek cover in dense forests, and to compensate for edge effects that diminish wildlife habitat where forest meet clear cuts, agricultural land, roads, rural residential development, and mining operations.

The wildlife study has identified three areas of secondary wildlife habitat along McNamee Road within one-half mile of the Angell Brothers resource site. One site is south of the resource site, and the other two are to the west. Any mining expansion should preserve the minimum forest habitat of the surrounding area with respect to those secondary habitat areas.

CONCLUSION: The above discussion indicates that mining is a use that may occur only if conflicts with the scenic, streams and wetlands, and wildlife habitat resources can be mitigated. Any new or expanded mining operation in the West Hills should only be allowed under a program that balances conflicts with other Goal 5 resources and all impacted uses.

Expansion of the Angell Brothers quarry site into the watershed of the significant "North Angell Brothers" stream should be allowed. The proposed quarry operation should not be allowed in higher quality upstream sections of the creek, because these areas are needed to protect a minimum one-half mile contiguous wildlife habitat area. Therefore, mining would occur only on the lower quality downstream portions of the creek.

Quarry expansion should be allowed only outside of a continuous one-half mile wide primary forested habitat area located between the quarry on the northeast and secondary cleared habitat areas along McNamee Road to the southwest. This will result in allowing the quarry to expand only to the northern (approximately 1/2) portion of their 283 acre pro-

posed expansion site. Such a solution is a proper "balance" of the competing resources, which allows some protection for both.

C. RESOURCE PROTECTION

1. SCENIC VIEWS OF THE WEST HILLS

a. Designated Level of Protection

The identification of conflicting uses in Chapter II showed that forestry activities, residential use, community service and conditional uses, and mining could all conflict with preservation of the scenic qualities of the West Hills if the use or structure would be visible from a key viewing area. The subsequent ESEE analysis and conflict resolution led to the conclusion that forestry activities should be allowed fully, but the other conflicting uses should be limited in manner through the use of siting, design and screening requirements. The exception would be uses within Burlington, which would be allowed fully since the area is already developed to an extent that it no longer has the same scenic appearance as the rest of the West Hills scenic resource area and is only visible from the Highway 30 key viewing area. Scenic views of the West Hills should be designated "3-C".

b. Uses Which Will Be Allowed Fully (subject to other code requirements)

Agriculture
Forestry
Uses and structures in Burlington
Any other use or structure which would not be visible from a key viewing area

c. Uses Which Will Be Allowed Conditionally (also subject to other code requirements)

Residences
Mining
Any use or structure which is visible from a key viewing area, unless in Burlington

d. Program to Achieve the Goal

The Comprehensive Framework Plan must be amended to include Scenic Views of the West Hills as a significant scenic resource. An overlay zone should be applied to the resource area, and standards to protect the scenic resource need to be incorporated into the zoning code.

The attributes of the scenic resource which contribute to its significance are the existing landform, the vegetation pattern which provides a blanket of various shades of green along with colorful fall foliage, and the overall intactness and lack of development to disrupt the overall forested appearance. Zoning code standards should be developed which will allow uses but preserve scenic attributes. Applicability of standards should be based on the degree of visual impact the development would have, as seen from

key viewing areas. The degree of impact would be determined after consideration of the size of the developed area that would be visible, the distance from the development to key viewing areas, the number of key viewing areas that could see the development, and the linear distance the development could be seen from key viewing corridors such as Highway 30. Development should be exempted from complying with the standards if it would not be visible from a key viewing area because of existing topographic features. In addition, the Burlington area should be exempted because it is already developed and is visible only from Highway 30, as discussed in the previous section. Standards for protection of the scenic resource should include:

- New development should be visually subordinate - it should not noticeably contrast with the surrounding landscape as seen from a key viewing area. Development that is visually subordinate may be partially visible, but should not be visually dominant in relation to the surroundings.

- Development should be sited on portions of the property which utilize existing topography and vegetation to minimize visibility from key viewing areas.

- New development that does not require an alteration to the landform should be sited to retain the existing topography and reduce necessary grading to the maximum extent practicable.

- Existing vegetation that screens the development should be retained wherever possible.

- New vegetation should be planted to provide additional screening when any portion of new development will be visible from a key viewing area. Such trees should be primarily coniferous to provide winter screening, and species native to the West Hills such as Doug fir, grand fir, alder or white oak.

- The exterior color of structures should be natural or dark earthtone colors that blend with the forested landscape.

- Reflective building materials should not be allowed.

- Exterior lighting should be sited, hooded, or shielded so that it is not visible from key viewing areas.

- Structure height should remain below the surrounding forest canopy level.
- The silhouette of structures should remain below the skyline.

- Activities that require alterations to the landform, such as mining, should be staged so that the land area disturbed at any one time remains visually subordinate as seen from key viewing areas.

- Landform altering activities should show, prior to approval, that after reclamation the resulting landform and vegetation will be similar to and not contrast with the surrounding landscape as seen from key viewing areas.

2. SIGNIFICANT STREAMS

a. Designated Level of Protection

The designated level of protection for the Significant Streams in the West Hills area is 3.C. -- Limit Conflicting Uses.

b. Conflicting Uses to be allowed fully

Forestry/timber
Farm Use

c. Conflicting Uses to be allowed conditionally

Community Service/Commercial Uses
- Wood Processing(limited, sawmills, etc.)
- Wholesale/retail for farm/forest products
- Playgrounds, Churches, Schools
- Parks/Golf Courses
- Dog Kennels
- Aircraft Landing Area
- Cottage Industries
- Rural Service/Commercial
- Other Community Service Uses

Transportation/Public Improvements
Residential Uses
- Single-family Residential
- Farm/Forest Worker Housing

Mining/Geothermal Uses

d. Conflicting Uses not allowed

None

e. Program to achieve the goal

Residential, Community Service/Commercial, and Transportation/Public Facilities

Standards for protection of stream resources should consider erosion control, native vegetation maintenance and enhancement, and fish and wildlife maintenance and enhancement for any of the conflicting uses proposed for development within the riparian zone which are designated above as uses to be allowed conditionally. This protection can best be accomplished through placement of an "overlay" zone similar in concept to the Significant Environmental Concern (SEC)-Streams overlay currently within the Multnomah County Zoning Ordinance.

The riparian zone for the West Hills has been generally measured as part of the stream survey conducted by SRI/Shapiro. The area where the SEC overlay zone should be placed is within the riparian area, defined as follows in the SRI/Shapiro Report:

"A riparian area is comprised of an aquatic ecosystem and associated upland area. Water in the aquatic system influences upland vegetation and microclimate. Upland areas affect the aquatic ecosystem by providing thermal regulation, biomass, and structure."

Since measurement of the riparian zone was very generalized in the Streams study, provisions should be made for an applicant under the SEC provisions to provide evidence as to a more precise boundary of the riparian zone on the property which meets the above-listed definition.

Specific protection measures for streams which will be used with the SEC overlay zone provisions include the following:

- Maximum provision of landscaped area, scenic and aesthetic enhancement, open space, or vegetation between any use and a stream.
- Preservation of agricultural and forest land adjacent to streams for farm and forest use.
- Building, structure, or use located so as to best preserve and protect the riparian zone area
- Minimum conflict between recreational uses and the riparian zone area
- Protection of public safety and private property from vandalism and trespass to the maximum extent practicable considering environmental values of the riparian zone
- Protection and enhancement of opportunities for fish and wildlife to live in and travel through the riparian zone
- Protection and enhancement of natural vegetation along streams
- Retention of areas of annual flooding and wetlands in their natural state
- Limit development to portions of a site located away from steep slopes, soils, and other unstable geological conditions
- Protection of areas within and adjacent to the riparian zone from erosion
- Regulation of construction practices and schedules in order to minimize erosion into streams from water runoff and soil erosion

- Minimization of impervious surface area in order to reduce pollution of stream waters

- Limit expansion of the Angell Brothers quarry site to the lower quality downstream portions of the significant "North Angell Brothers" stream.

- Water quantity and quality flowing into Burlington Bottoms should be maintained by the quarry operator pursuant to standards set by the Oregon Department of Environmental Quality.

3. ANGELL BROTHERS AGGREGATE

a. Designated Level of Protection: There are portions of the Angell Brothers resource site where mining can not occur without destroying an identified Goal 5 resource. That resource is the wildlife habitat area within one-half mile of the secondary wildlife habitat areas along McNamee Road. Therefore, the portions of this resource site within one-half mile of those habitat areas should be designated 3–B. The remainder of the site can be mined with minimal impact on the identified conflicting uses and other Goal 5 resources. That area should be designated 3–C.

b. Uses Fully Allowed – The following uses should be allowed fully in the impact area:

Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

Exploration for mineral and aggregate resources as defined in ORS Chapter 517

Widening of roads within existing rights-of-way in conformance with the transportation element of acknowledged comprehensive plans including public road and highway projects as described in ORS 215.213(1)(m) through (p) and ORS 215.283(1)(k) through (n)

Exploration for and production of geothermal, gas, oil, and other associated hydrocarbons, including the placement and operation of compressors, separators and other customary production equipment for an individual well adjacent to the well head

Mining and processing of oil, gas, or other subsurface resources as defined in ORS Chapter 520, and not otherwise permitted under OAR 660-06-025(3)(m) (e.g., compressors, separators and storage serving multiple wells), and mining and processing of aggregate and mineral resources as defined in ORS Chapter 517

Temporary asphalt and concrete batch plants as accessory uses to specific highway projects

Public road and highway projects as described in ORS 215.(1,(2)(q) through (s), 215.213(10), 215.283(2)(p) through (r) and 215.283(3)

Forest operations or forest practices including, but not limited to, reforestation of forest land, road construction and maintenance, harvesting of a forest tree species, application of chemicals, and disposal of slash (on properties within the impact area other than the site itself)

Temporary on-site structures which are auxiliary to and used during the term of a partic-

ular forest operation (on properties within the impact area other than the site itself)

Physical alterations to the land auxiliary to forest practices including, but not limited to, those made for purposes of exploration, mining, commercial gravel extraction and processing, landfills, dams, reservoirs, road construction or recreational facilities (on properties within the impact area other than the site itself)

Farm use as defined in ORS 215.203

Local distribution lines (e.g., electric, telephone, natural gas) and accessory equipment (e.g., electric distribution transformers, poles, meter cabinets, terminal boxes, pedestals), or equipment which provides service hookups, including water service hookups

New electric transmission lines with right of way widths of up to 100 feet as specified in ORS 772.210. New distribution lines (e.g., gas, oil, geothermal) with rights-of-way 50 feet or less in width

Temporary portable facility for the primary processing of forest products

Towers and fire stations for forest fire protection

Water intake facilities, canals and distribution lines for farm irrigation and ponds

Uninhabitable structures accessory to fish and wildlife enhancement

Permanent facility for the primary processing of forest products

Permanent logging equipment repair and storage

Log scaling and weigh stations

Disposal site for solid waste that has been ordered established by the Environmental Quality Commission under ORS 459.049, together with the equipment, facilities or buildings necessary for its operation

Disposal site for solid waste approved by the governing body of a city or county or both and for which the Oregon Department of Environmental Quality has granted a permit under ORS 459.245, together with equipment, facilities or buildings necessary for its operation

Television, microwave and radio communication facilities and transmission towers

Fire stations for rural fire protection

Utility facilities for the purpose of generating power

Aids to navigation and aviation

Cemeteries

c. Uses Conditionally Allowed – The following uses should be conditionally in the impact area:

Forestland dwellings

Alteration, restoration or replacement of a lawfully established dwelling

A mobile home in conjunction with an existing dwelling as a temporary use for the term of a hardship suffered by the existing resident or a relative

d. Uses Not Allowed – The following uses should not be allowed in the impact area:

Destination resorts reviewed and approved pursuant to ORS 197.435 to ORS 197.465

and Goal 8
Residential on the resource site
Temporary forest labor camps
Caretaker residences for public parks and fish hatcheries
Private seasonal accommodations for fee hunting operations
Private accommodations for fishing occupied on a temporary basis
. Water intake facilities, related treatment facilities, pumping stations, and distribution lines
Reservoirs and water impoundments
Forest management research and experimentation facilities accessory to forest operations
Private hunting and fishing operations without any lodging accommodations
Parks and campgrounds

e. Program to Achieve the Goal

Multnomah County needs to amend its Comprehensive Framework Plan to identify that portion of the Angell Brothers mineral resource site within one-half mile of the secondary wildlife habitat areas along McNamee Road as 3–B and the remainder of the site as 3–C. The county also needs to adopt a modified impact area for the resource site and develop zoning restrictions for uses within that area. That impact area would be reduced from that identified in Chapter IV through the elimination of that portion of the site designated 3–B. Comprehensive Framework Plan Policy 16–B and the Zoning Code must be amended to include items required by the Land Conservation and Development Commission.

The amendment of Comprehensive Framework Plan Policy 16–B must include quarry development conditions specific to the Angell Brothers mineral and aggregate resource site. Those conditions should include:

- Minimization of the area the mined at any given time to reduce visual impact;
- Demonstration that reclaimed areas are capable of supporting forest vegetation;
- Simultaneous reclamation along with mining to minimize non-vegetated areas and to provide a maximum amount of regenerating wildlife habitat;
- Screening of the operating face from significant views as much as practicable through such techniques as landscaping, berming and maintenance of intervening topography;
- A final slope configuration that blends with the topography of the surrounding area;
- Compliance with all applicable DEQ and DOGAMI regulations to minimize any on and off-site water quality impacts and provide for soil and slope stability on mined

areas; and

- Prohibition of mining within one-half mile of the secondary wildlife habitat areas along McNamee Road.

4. WILDLIFE

a. Designated Level of Protection

The designated level of protection for the Significant Wildlife Habitat in the West Hills area is 3.C. -- Limit Conflicting Uses.

b. Conflicting Uses to be allowed fully

Forestry/timber
Farm Use

c. Conflicting Uses to be allowed conditionally

Community Service/Conditional Uses
- Wood Processing(limited, sawmills, etc.)
- Wholesale/retail for farm/forest products
- Campgrounds
- Cemeteries
- Fire Stations
- Water infrastructure facilities
- Utility facilities
- Parks
- Landfills
- Hunting & Fishing lodges
- Logging equipment repair and storage
- Aircraft landing areas
- Schools
- Churches
- Golf Courses
- Road widening requiring additional right-of-way or building removal
- Farm-related commercial activities
- Dog Kennels
- Group Care Facility
- Cottage Industries
- Rural Service/Commercial
- Tourist Commercial
- Other Community Service Uses

Residential Uses
- Single-family Residential

Farm/Forest Worker Housing
Mining/Geothermal Uses

d. Conflicting Uses not allowed

None

e. Program to achieve the goal

Residential and Community Service/Conditional Uses

Standards for protection of wildlife habitat should consider various measures to ensure the maintenance and enhancement of the designated primary habitat areas as homes for various species of wildlife. Differing standards are necessary for protection of primary, secondary, and impacted wildlife habitat areas. Implementation of these standards as regards residential and community service/conditional uses should be accomplished through use of a Significant Environmental Concern (SEC) overlay zone for wildlife habitat protection.

Specific protection measures for primary wildlife habitat areas include the following:

- Where a parcel to be developed contains both primary and secondary, or primary and impacted wildlife habitat areas, development activities should be limited to the secondary or impacted areas to the maximum extent feasible.

- Fencing should be prohibited along roadways, thus reducing barriers to wildlife movement. Design standards for fences outside of the "cultivated" area discussed below should be adopted which ensure that fences do not block passage for a wide range of wildlife species.

- The "cultivated" area *(i.e.,* lawns and gardens) of residential lots in the primary habitat areas should be limited to one acre (consistent with fire safety standards), leaving the remaining land in the parcel in native vegetation, to be altered only in conjunction with approved forest management practices. This cultivated area should be designed to minimize the edge effect along roads.
- Similarly, the cleared area for community service and conditional uses should be limited to the minimum size necessary for the use, and should under no circumstances exceed two acres (consistent with fire safety standards).

- Certain introduced vegetation should be prohibited *(e.g.,* English Ivy, Vinca, and other invasive species), even in cultivated areas.

- Erosion control standards should be adopted where there will be prolonged exposure of soils, or excavation, associated with residential development.

- Development along significant streams should be regulated as proposed in the dis-

cussion of streams.

Specific protection measures for secondary and impacted wildlife habitat areas should include the following:

- Where a parcel to be developed contains both secondary and impacted wildlife habitat areas, development activities should be limited to the impacted areas to the maximum extent feasible.

- Fencing should be prohibited along roadways, thus reducing barriers to wildlife movement. Design standards for fences outside of the "cultivated" area discussed below should be adopted which ensure that fences do not block passage for a wide range of wildlife species.

- New development activities should be located on existing cleared areas of the site to the maximum extent feasible. Existing forested areas should be maintained consistent with approved forest management practices.

- Certain introduced vegetation should be prohibited *(e.g.,* English Ivy, Vinca, and other invasive species), even in cultivated areas.

- Erosion control standards should be adopted where there will be prolonged exposure of soils, or excavation, associated with residential development.

- Development along significant streams should be regulated as proposed in the discussion of streams.

In addition, it should be noted that the existing Commercial Forest Use Designation and Zoning District provides significant protection for wildlife habitat because of its severe limitations on new residential and non-forest practices type development. This protection is in part based upon state land use law, which is controversial and subject to change by legislative action in the future. Consequently, it is recommended that the Comprehensive Framework Plan include a policy for the West Hills Wildlife Forested Habitat Area which states that, should state law regarding forest lands change so as to allow more intensive non-forestry related uses on such lands, that Multnomah County would require a minimum parcel size of 38 acres (similar to the old Multiple Use Forest Zone) for new subdivision parcels in the areas within the significant wildlife habitat area designated as Commercial Forest Use lands.

Protection measures for the Angell Brother's aggregate site include prohibiting mining on the southern half of the site in order to provide a continuous one-half mile wide primary forested habitat area located between the quarry on the northeast and secondary cleared habitat areas along McNamee Road to the southwest. This will result in allowing the quarry to expand only to the northern (approximately 1/2) portion of their 283 acre proposed expansion site. Additional protection measures include the following:

- Establish a forested buffer area to allow for entry to the habitat area at the eastern end of the quarry boundary. This buffer area is most appropriately located using the "South Angell Brothers" stream drainage, where quarry expansion would not be allowed anyway in order to maintain the minimum one-half mile wide contiguous habitat area.

- Any reclamation plan for the site should be reviewed by Oregon Department of Fish and Wildlife and the County to accommodate mining needs and maximize wildlife benefits and use.

- An on-going research and monitoring program is recommended to monitor wildlife use changes during quarry activity and after reclamation of the site.

5. SUMMARY

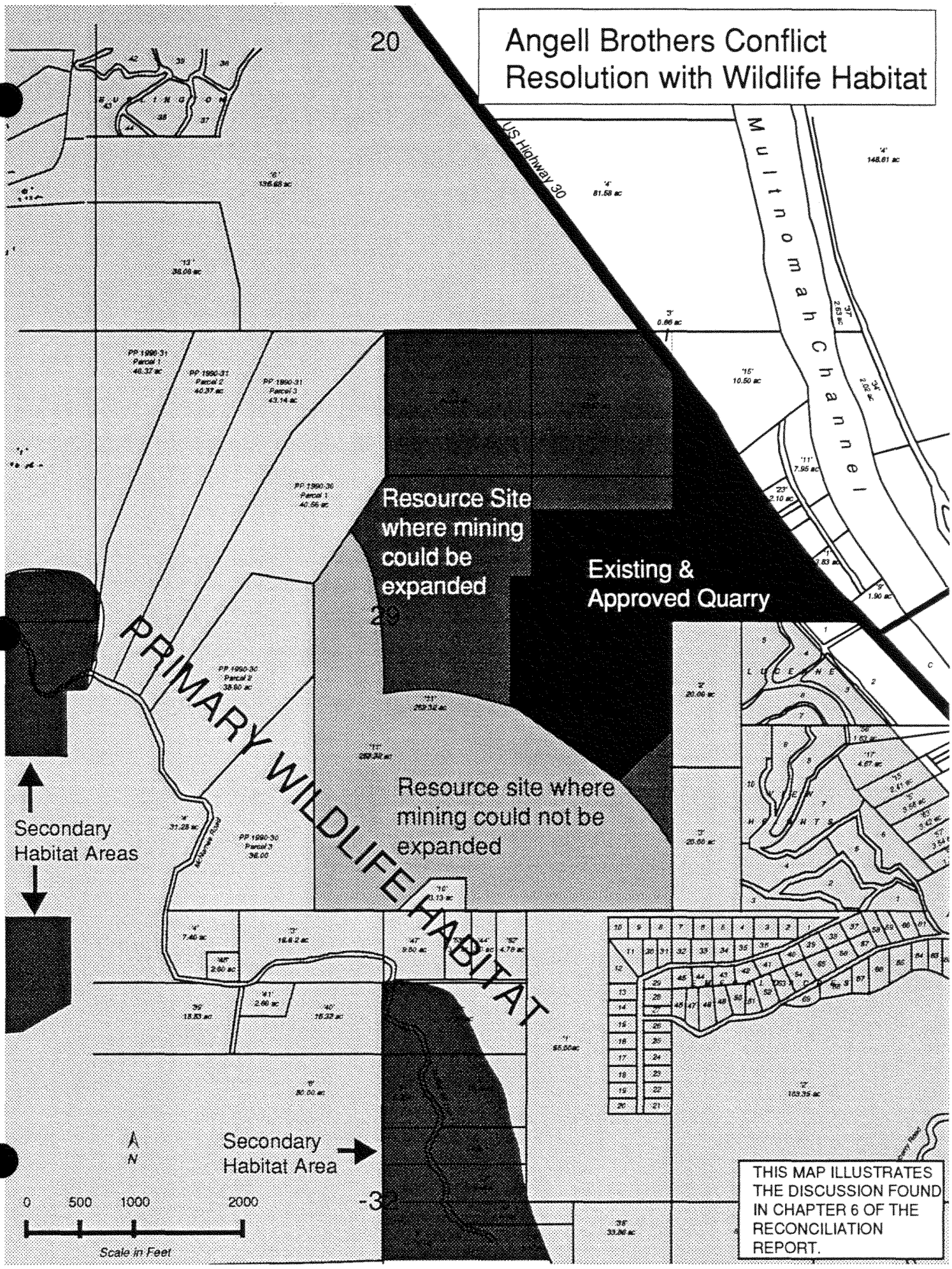
All four significant resources in the West Hills should be designated "3-C". This will provide a level of protection that recognizes and protects the attributes that make each resource significant, while preventing the economic and social consequences that would occur if conflicting uses were prohibited.

The scenic area, stream riparian areas and wildlife habitat areas should be protected through implementation of the Significant Environmental Concern (SEC) overlay zone. Specific standards to govern new development have been outlined in the previous section. These standards will be drafted into code language and reviewed by the Planning Commission and Board of County Commissioners.

Protection and utilization of the Angell Brother's aggregate site will be accomplished through zoning restrictions for uses within the impact area and Comprehensive Plan amendments detailing operating standards. This would allow expansion of mining to the northern half of the site, provided that the mining plan met certain standards designed to protect the other significant resources such as compliance with DEQ and DOGAMI regulation regarding water quality, screening requirements for protection of scenic views, and demonstration that reclaimed areas are capable of supporting forest vegetation.

The "3-C" designations and proposed protection standards provide overall protection to all four of the significant resources in the West Hills. This program complies with Statewide Planning Goal 5.

Angell Brothers Conflict Resolution with Wildlife Habitat



THIS MAP ILLUSTRATES THE DISCUSSION FOUND IN CHAPTER 6 OF THE RECONCILIATION REPORT.

MULTNOMAH COUNTY

Howard Canyon Reconciliation Report

(May 23, 1994)

Prepared by:
Multnomah County Planning Division

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CHAPTER I

INTRODUCTION

ORS 197.628 requires cities and counties to review their comprehensive plans and land use regulations periodically and make changes necessary to keep plans and regulations up-to-date and in compliance with the statewide planning goals. If plans are found to be out-dated or not in compliance with statewide planning goals, local governments must adopt findings and enact measures to make their plan and regulations current.

On October 30, 1980, the Land Conservation and Development Commission acknowledged the Multnomah County Comprehensive Framework Plan and land use regulations to be in compliance with the statewide planning goals. Approximately seven years later, on August 27, 1987, the Department of Land Conservation and Development (DLCD) notified the county of requirements under the periodic review and initiated a periodic review process with the county. On February 22, 1989, Multnomah County submitted its proposed periodic review order to the DLCD, and the department subsequently directed the county to complete additional work on two aggregate sites. The additional work was completed and conveyed to the DLCD on June 27, 1990.

The Land Conservation and Development Commission on April 23, 1993 determined additional Goal 5 work needed to be completed on several aggregate sites, streams and West Hills wildlife and scenic views (Remand Order 93-RA-876). This Remand Order required Multnomah County to complete work by October 29, 1993. Several extensions have been granted by the Land Conservation and Development Commission, in part because additional work on streams needed to be completed which had not been anticipated in the Remand Order . Under the requirements of the Multnomah County Periodic Review Revised Work Program (WKPROG - 0038), adopted by the commission on March 4, 1994, all remaining work must be submitted to the DLCD by September 6, 1994.

The revised work program requires Multnomah County to complete a Goal 5 planning process that concludes with the adoption of "Reconciliation Reports" and protection measures which resolve (reconcile) stream, wildlife, scenic views and mineral/aggregate resource issues. Two "Reconciliation Reports" have been prepared, one for the West Hills rural area and the other for the east rural county area in the vicinity of Howard Canyon. The "West Hills Reconciliation Report" and the "Howard Canyon Area Reconciliation Report" focus on different Goal 5 issues.

Four Goal 5 resource issues exist in the rural West Hills of the county and two Goal 5 resource issues are analyzed in the Howard Canyon area. West Hills Goal 5 resource issues which are analyzed include wildlife, scenic views, streams and the Angell Brothers aggregate site. In the Howard Canyon area, three streams within the Howard Canyon drainage and the Howard Canyon aggregate site are the subject of the Reconciliation Report.

In general, the Reconciliation Reports record the County's effort to complete the Goal 5 process as outlined in OAR 660-16-000. The rule requires local governments to analyze the significance of Goal 5 resources, and, if deemed significant (designated "1-C"), determine the appropriate level of protection ("3-A", "3-B", and "3-C") and provide protection strategies. The process includes a number of steps intended to provide the basis for establishing a rationale for deciding which resources should be protected and what types of protection are required.

Specifically, the Goal 5 process begins with the local government determining significance based on an analysis of location, quality, and quantity. The local government is required to use the best available information to make determinations throughout the Goal 5 process. If the resource is deemed "significant" it is designated "1-C" and the process continues. Conversely, the process is concluded if the resource is determined to not be significant and designated "1-A". Significant resources must then be analyzed to determine the appropriate level of protection when compared to other resources and conflicting uses. This analysis compares the **E**conomic, **S**ocial, **E**nvironmental, and **E**nergy consequences of protecting the entire resource as compared to allowing conflicts to exist. This analysis is commonly referred to as the ESEE analysis. The last step in the Goal 5 process is the determination of the level of protection based on the rationale provided by the the ESEE analysis. At this final step, local governments are required to identify the "uses" that will be allowed on the resource site and vicinity, and explain programs deemed necessary to protect the resource.

The "Reconciliation Report" is organized in a manner that follows the Goal 5 process. The report consists of two major parts: "Resource" chapters for each Goal 5 resource under review (*i.e.*, streams, scenic view, wildlife, mineral/aggregate), followed by the "Conflict Resolution and Protection Program" chapter. Each "resource" chapter is broken down into three subsections. Subsection "A" explains the "significance" determination and includes a discussion of "location", "quantity", and "quality". Subsection "B" contains the ESEE analysis, including a description and rationale for the "Impact Area" and a listing and description of conflicting uses. Subsection "C" contains the appendixes, which include technical background information and responses to public comments received throughout the process. The public comment/response component of the of the appendix is intended to provide a quick reference of the primary issues identified by the public during draft report stages of the Reconciliation Report development.

The last chapter of the "Reconciliation Report" is the "Conflict Resolution and Protection Program". This chapter reconciles conflicts between each Goal 5 resource and other uses and/or other Goal 5 resources. The chapter also reaches conclusions concerning the appropriate level of protection and suggests specific protection strategies. Subsection "B" discusses previously identified ESEE consequences for each conflicting use and reconciles any differences to reach conclusions concerning whether conflicting uses should be allowed. Subsection "C", "Resource Protection", determines the level of protection and discusses a protection program for each of the Goal 5 resources.

The "Reconciliation Report" is considered an amendment to the Multnomah Comprehensive Framework Plan. The "Reconciliation Reports" include both findings and policy recommendations. Policy recommendations will be incorporated into the Comprehensive Framework Plan by separate actions by the Multnomah County Planning Commission and Board of County Commissioners pursuant to the Multnomah County Code and state statutes. Also, some subsequent Planning Commission and Board actions may be required to implement the full set of strategies outlined in the protection programs.

The "Reconciliation Report" is intended to satisfy in part the requirements of the Land Conservation and Development Commission's Remand Order 93-RA-876 and satisfies all other statewide goal requirements of the county's work program approved by the Commission, WKPROG - 0038.

CHAPTER II

HOWARD CANYON STREAM RESOURCES

C 6-94

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A. SIGNIFICANCE DETERMINATION

1. BACKGROUND

Multnomah County's Periodic Review Order was reviewed by the Land Conservation & Development Commission on April 23, 1993 (Remand Order 93-RA-876). Among the actions of the Commission was a finding that the Multnomah County Comprehensive Plan and land use regulations for significant streams do not comply with Goal 5 of the Oregon Statewide Planning Program and Oregon Administrative Rules (OAR) 660, Division 16, which implements the Statewide Planning Program. The Remand Order stated that the County must amend the comprehensive plan to map or identify significant streams.

To complete this work, the County must conduct an inventory of streams in order to determine which are significant. The procedure for determining significance is stated in OAR 660-16-000 (1) through (5). The rule directs the local government to determine whether there is sufficient information on the location, quality, and quantity of the resource at a particular site. The County has determined that the most efficient way to complete this work for the entire County is to conduct stream inventories concurrently with the Rural Area Planning Program, by which rural area plans will be adopted for the entire rural Multnomah County between now and 1998. The Howard Canyon Stream inventory is being completed at this time because of the need to analyze the significance of streams which may be impacted by the Howard Canyon quarry site.

This significance chapter is the second of two documents completed to date which discuss significance of streams in Multnomah County per the Remand Order. The first of these documents, Multnomah County Ordinance # 784, amends the Multnomah County Comprehensive Plan to provide specific criteria for judging the significance of streams, and adopts a map of streams which have already been determined to be significant pursuant to the criteria.

This significance chapter covers three streams in the Howard Canyon area of Corbett, Big Creek, Howard Canyon Creek, and Knierem Creek. Significance reports on these streams have been completed at this time because of their relevance to the issue of mineral and aggregate resources pursuant to the Howard Canyon Quarry site. Significance reports on the remainder of the streams in the eastern, rural unincorporated portions of the County will be completed as part of the preparation of Rural Area Plans for these areas over the next four years

2. LOCATION

The three streams surveyed are located east of the Sandy River and approximately one-half to two miles south and east of the rural community of Corbett. Knierem Creek and Howard Canyon Creek are tributaries of Big Creek, which in turn is a tributary of the Sandy River which empties into the Sandy at Oxbow County Park. A map of the sites is located within the SRI/Shapiro section of this chapter contained in the appendix to this document.

3. QUANTITY

For a measurement of quantity, the length and drainage area of these three streams will be compared to the length and drainage area of all Oregon Department of Forestry Class I designated streams within the eastern unincorporated area of Multnomah County outside of the Columbia Gorge National Scenic Area and west of the Bull Run River watershed (more detailed statistics on East County streams is not available at this time). The following table summarizes this comparison:

STREAM	LENGTH	DRAINAGE AREA
KNIEREM CREEK	2.4 mi.	1,185 acres
HOWARD CANYON CREEK	3.2 mi.	1,575 acres
BIG CREEK	1.2 mi.	1,374 acres (excluding Knierem & Howard Canyon Creek drainages)
TOTAL FOR THREE CREEKS	6.8 mi.	4,134 acres
TOTAL FOR EAST MULTNOMAH COUNTY (EAST OF SANDY RIVER, CLASS I STREAMS ONLY, EXCLUDING GORGE NSA AREA, WEST OF BULL RUN WATERSHED)	84 mi.	33,000 acres
PERCENTAGE OF THREE CREEKS VS. EAST RURAL AREA	8%	12%

Comparatively speaking, these streams and their watersheds are a small percentage of all stream mileage and watershed area within an area of similar streams in East Multnomah County. When streams in the West Hills, Sauvie Island, and remainder of eastern Multnomah County are added, these streams are even less significant in terms of quantity. Following is a discussion of stream quantity in the West Hills and Sauvie Island.

WEST HILLS

A recently completed inventory of streams in the West Hills has identified 64.2 miles of USGS-mapped streams draining a combined area of 19,425 acres. The drainages on the east side of the West Hills, into Multnomah Channel, are generally small and steeply-sloped, on heavily forested or recently cut land. the drainages on the west side are part of the Tualatin River watershed, and are generally gently-sloped, draining both forest and farm land. The character of these western drainages is most directly comparable to Big, Howard Canyon, and Knierem Creeks. The streams in these drainages are approximately

23.4 miles long, and drain approximately 7,470 acres.

SAUVIE ISLAND

Sauvie Island is approximately 26 square miles(16,600 acres) in size. Since the island is virtually flat, waterways on the island are of a much different nature than those of the West Hills, being best characterized as drainage ways for runoff from adjacent agricultural lands and as sloughs and wetlands.

REMAINDER OF EAST MULTNOMAH COUNTY

The remainder of East Multnomah County streams include streams to the west of the Sandy River, which run through urbanized and developed rural areas, the Bull Run watershed, which is tributary to the Sandy River and is in a condition adequate to supply drinking water to the City of Portland, and various streams in the Columbia River Gorge. Length and watershed data for these streams is not available.

4. QUALITY

The quality of these six streams is measured by the five criteria adopted by Multnomah County as part of Ordinance 784 discussed above and contained within Policy 16-G of the Multnomah County Comprehensive Framework Plan. These criteria, and the measurements used to judge these criteria, are discussed extensively in the "Multnomah County Significant Streams Study Howard Canyon Area" contained in the Appendix.

Based upon the inventory of streams conducted by SRI/Shapiro and contained in the Appendix, all three of the streams in the Howard Canyon area meet at least several of the criteria for significance stated in Policy 16-G of the Multnomah County Comprehensive Plan.

In terms of quality relative to other streams in the eastern portion of Multnomah County, east of the Sandy River and outside of the Columbia Gorge NSA, detailed data is available only for Gordon Creek, a tributary of the Sandy which lies to the south of the three creeks inventoried. This data is contained within *An Inventory of Nine Stream Corridors in Multnomah County, Oregon* prepared for the East and West Multnomah County Soil and Water Conservation Districts in 1990. This report found Gordon Creek to be relatively undisturbed by human intrusion and of a quality which, despite different measurement levels, is higher than that of Knierem, Howard Canyon, and Big Creeks. Absent a detailed survey of all East County streams which will be completed during Multnomah County's Rural Area Plan Program as each plan is prepared, the only other comparison of relative quality available is the common designation of these three streams and 77 other miles of streams in East Multnomah County between the Sandy River and the Bull Run drainage (south of the Columbia Gorge NSA) as Class 1 streams by the Oregon Department of Forestry.

Multnomah County has recently collected detailed information on quality of streams in the

West Hills of Multnomah County. Some information is also available as to significant water features on Sauvie Island. Very little information is available on stream resources in the remainder of East Multnomah County.

WEST HILLS

A recently completed inventory of streams in the West Hills has identified 62.2 miles of significant streams draining a combined area of 18,750 acres. These streams are significant because they meet at least one of the five criteria contained in the Multnomah County Comprehensive Plan for evaluating significance. The most comparable streams in the West Hills, those within the Tualatin River basin, are all deemed to be significant.

SAUVIE ISLAND

Sauvie Island contains numerous protected water resources. However, these resources are not directly comparable to the streams of the Howard Canyon area in that they are slow-moving drainages and sloughs on the island's flat terrain.

REMAINDER OF EAST MULTNOMAH COUNTY

The limited amount of quality information on the remainder of streams in East Multnomah County is not directly comparable to these three streams. Streams in the Bull Run watershed serve a national forest area and Portland City's water supply. Streams in the Columbia Gorge are part of a National Scenic Area. Streams west of the Sandy River flow through urbanized areas.

5. CONCLUSION

Big Creek, Howard Canyon Creek, and Knierem Creek are significant streams based upon the above description of location, quantity, and quality and are designated "1-C".

B. RESOURCE ANALYSIS REPORT

RESOURCE ANALYSIS REPORT

1. INTRODUCTION

The analysis of significant streams is an element of the broader analysis of water resources as required by Goal 5. The stream analysis is focused on stream channels and the riparian zone along stream channels. This analysis does not directly address associated wetlands or the watershed outside the riparian zone. It is recognized that other Goal 5 studies including the Wildlife Habitat analysis and the analysis of Scenic Resources will address resource protection on a broad scale and will discuss impacts similar to those that will affect the watershed as a whole.

As part of the Goal 5 process, streams were inventoried to determine location, quantity, and quality. The qualitative aspect of each stream was examined using a modified "streamwalk" methodology and a wildlife habitat assessment process. Field inventory data sheets were prepared for two-tenths mile segments. The "streamwalk" data forms included the collection of information related to the stream channel, streambank stability, the width of the riparian corridor, streamside vegetation, stream conditions, and adjacent land use. The wildlife habitat assessment forms addressed habitat in terms of the presence of water, food, and cover. The inventory was valuable in assessing the significance of each stream. It was also valuable in providing information on riparian zone width, wetlands, and adjacent uses. This data is important in addressing impact areas and conflicting uses.

The Goal 5 analysis is designed to meet the requirements of the Goal 5 Administrative Rule (OAR Chapter 660, Division 16). The report will address impact areas, conflicting uses, and the economic, social, environmental, and energy (ESEE) consequences of conflicting uses. Each component of the analysis is organized by county study area.

2. DESCRIPTION OF RESOURCE

This report discusses three significant streams in the Howard Canyon, sub-region of the West Hills Rural Area. These streams drain westward from Ross Mountain to the Sandy River. They lie between the Sandy River and Louden Road to the south, and Larch Mountain Road and the rural community of Corbett to the north. A map of the sites is contained within the Technical Appendix relating to significance at the back of this report.

The significant streams discussed in this Resource Analysis Report are as follows:

STREAM	LENGTH (feet)	DRAINAGE AREA (acres)
"Big" Creek	5,125	4,135*
"Knieriem" Creek	12,670	1,185
"Howard Canyon" Creek	15,840	1,575

* includes drainage area for Howard Canyon and Knieriem Creeks.

The rationale for determining that these streams are significant is contained within the attached Appendix relating to significance at the back of this report.

3. IMPACT AREAS

The impact area for this study is the riparian zone along each stream. The riparian zone influences the quality and health of the stream and varies in width. It is affected by adjacent slope and the size of the vegetation along the stream. Generally, wider riparian zones have steep slopes with large trees, which shade the stream and contribute woody debris to the stream channel.

For streams that flow through or contribute water to public parks or to recreation areas used by the public, the impact area includes the downstream park or recreational facility.

Each stream is examined in terms of the number of properties abutting the stream and the zoning of the adjacent properties. The property/land use data provided is based on County study area maps.

Streams in the Howard Canyon area include: Big Creek, Knieriem Creek, and Howard Canyon Creek. All three streams met the County's significance criteria.

HOWARD CANYON
LAND USE DATA

Stream	Number of Adjacent Properties	Zoning of Adjacent Properties	
		#	Zoning
Big	11	1 6 4	EFU - Exclusive Farm Use CFU - Commercial Forestry Use RR - Rural Residential
Knieriem	18	7 11	EFU - Exclusive Farm Use CFU - Commercial Forestry Use
Howard Canyon	19	7 11	EFU - Exclusive Farm Use CFU - Commercial Forestry Use

The impact area and land use adjacent to each stream is discussed below. Land uses were inventoried and documented by field survey crews. It was noted if uses were "present" and whether the use was "clearly impacting" the stream.

Big Creek - The width of the riparian zone along Big Creek averages 126 feet with a range of 80-200 feet. Adjacent land uses which clearly impact the stream include logging, housing, roads and culverts, and agriculture (pasture land). The stream drains to the Sandy River.

Knieriem Creek - The width of the riparian zone along Knieriem Creek averages 107 feet with a range of 0-160 feet. Adjacent land uses which clearly impact the stream include housing, roads and culverts, and agriculture (pasture land). The stream drains to Big Creek and then to the Sandy River.

Howard Canyon Creek - The width of the riparian zone along Howard Canyon Creek averages 150 feet with a range of 10-200 feet. Adjacent land uses which clearly impact the stream include roads and culverts, housing, and agriculture (pasture land). The stream drains to Big Creek and then to the Sandy River.

4. CONFLICTING USE ANALYSIS

a. Planned Uses

Conflicting uses include those uses which conflict or interfere with the protection of the significant streams. To identify conflicting uses, the uses permitted under the zoning ordinance and comprehensive plan were examined. In addition, other known conflicts are noted. Conflicting uses which "clearly impact" the stream were identified in the field by survey crews and have been referred in the previous section.

The analysis is based primarily on uses outlined in the zoning ordinance. The zoning districts that affect the relevant sites include the following:

- Exclusive Farm Use - EFU
- Commercial Forestry Use - CFU
- Rural Residential - RR

Uses that represent potential conflicts with streams include any use that results in the removal of vegetation along the riparian zone. The removal of vegetation and trees will reduce shade along the stream, eliminate wildlife cover, and decrease the amount of woody debris that enters the stream channel. When this occurs, the stream will fail to provide economic, social, and environmental benefits. When healthy, streams and the associated riparian zone provide water for domestic use and irrigation, fish and wildlife habitat, and flood storage capacity. A stream on which the riparian zone has been eliminated or severely damaged poses a threat by the increased amount of run-off and turbidity and by the increased potential for flooding.

The generic uses permitted in each zone are described in the following table:

USE BY ZONING DISTRICT

Use	EFU	CFU	RR
Forestry/Timber	P	P	P
Wood Processing (limited)	CU	P/C	NP
Farm Use: crops/livestock	P	P	P

USE (continued)	EFU	CFU	RR
Resource Conservation	P	P	P
Single Family Residential Use on > 80 acres	P/C	CU	P
Single Family Residential Use on < 80 acres in conjunction with a Farm/Forest Use	P/C	CU	P
Two-Family Dwelling	NP	NP	NP
Farm/Forest Worker Housing	CU	NP	P/C
Wholesale/retail for farm/forest products	CU	NP	P/C
Play Grounds, Churches and Schools	CU	NP	CU
Parks/Golf Courses	CU	CU	CU
Other Community Service Uses	CU	CU	CU
Mining/Geothermal	CU	CU	CU
Agricultural Processing	NP	NP	CU
Wood Processing (sawmills, etc.)	CU	CU	NP
Fowl, feed lot, swine, fur farming	P	CU	CU
Dog Kennels	CU	NP	CU
Aircraft Landing Area	CU	CU	NP
Single Family Residential Use (Non Farm/Forest)	CU	CU	P
Home Occupations	CU	P	P
Planned Developments	NP	NP	CU
Cottage Industries	NP	NP	CU
Rural Service/Commercial	NP	NP	CU

KEY: P - Permitted
P/C - Permitted with conditions
CU - Conditional Use
NP - Not Permitted

b. Conflicting Use Impacts

For purposes of further analysis, uses are grouped into general categories. The categories and a brief discussion of the nature of the conflicts follow.

Forestry Use - Forestry uses have significant conflicts with stream resources. The standard process of clear cutting increases run-off and turbidity in the streams. This results in a reduction in water quality and a loss of fish habitat. Logging roads that cross streams result in extensive stream damage. Field teams conducting the stream survey in the west hills noted numerous instances where logging roads and clear cutting had significantly damaged the streams. Wood processing facilities and whole/retail sales of forest products will result in the increase in stormwater run-off from impervious surfaces. Housing in connection with forest use may be located near streams and have impacts similar to those listed below under residential use. Forestry use includes the following uses permitted under the zoning ordinance: forestry/timber; wood processing (limited); wood processing (sawmills, etc.); forest worker housing; single family residential in conjunction with a forest use; wholesale/retail for forest products.

Agricultural Use - Agricultural use conflicts with stream resources in a variety of ways. Agricultural chemicals, including pesticides and fertilizers, may enter the stream and destroy or alter wildlife habitat. Farm livestock may graze near and enter the stream thereby destroying riparian vegetation and depositing excrement, which can affect water quality. Riparian vegetation may be removed to maximize cultivated area. Agricultural processing, housing, and wholesale/retail use will result in the increase of stormwater run-off from impervious surfaces. Housing will also have impacts similar to those listed below under residential use. Agricultural use includes the following uses permitted under the zoning ordinance: farm use crops/livestock; agricultural processing; fowl, feed lot, and swine for farming; farm worker housing; single family residential housing in conjunction with a farm use; wholesale/retail for farm products.

Residential Use - Streams provide an amenity for a residential dwelling. According to Rick Walker, a residential appraiser with Palmer Groth and Pietka, a stream will generally increase the value of any nearby dwelling. For this reason, pressure exists for new dwellings to be located near streams. Riparian vegetation may need to be removed to site the dwelling near the stream. Often residents living along streams clear the native vegetation adjacent to the stream and install lawn up to the stream bank, which results in a significant loss of habitat. Residential development adjacent to the stream increases impervious surface, which can result in increased run-off to the stream. Residential use includes the following uses permitted under the zoning ordinance: single family residential on > 80 ac; two family dwellings; single family residential (non farm/forest); home occupations; and planned developments.

Community Service Use/Commercial Use - Community service and commercial uses conflict with streams due to the potential for increased storm water run-off from structures and parking areas. The increase in storm water run-off from hard surfaces will increase the rate of flow and result in erosion and a deterioration of water quality. Parks or recreation facilities, including golf courses, may result in the removal of vegetation along the stream and the use of pesticides and fertilizer. Community service/commercial uses include the following uses from the zoning ordinance: play grounds, churches, schools; parks; other community service uses; dog kennels; cottage industries; and rural service/commercial.

Mining - Aggregate mining is a potential conflict for stream in the study areas. Aggregate mining will result in alteration of the land contours and the diversion of the stream. Until full restoration of the stream following the mining operation, the stream resource will be impacted. The time period of this impact will vary depending on the restoration plans filed with the Department of Geology and Mineral Industries (DOGAMI). Following restoration the stream may return to health, but it will no longer follow the original natural stream bed. Aggregate mining operations located away from the channel can have water quality impacts related to siltation and increased turbidity from mine run-off. Mining uses include the following uses from the zoning ordinance: mining/geothermal.

The Howard Canyon Quarry, which comprises the ridge between the canyons of Knieriem Creek on the north and Howard Canyon Creek on the south, is identified as a Goal 5 Mineral and Aggregate resource site (site #8). The Howard Canyon Quarry is located upslope from both Knieriem Creek and Howard Canyon Creek.

The site geology and potential as a mineral and aggregate resource was evaluated by Schlicker and Associates in 1989. Schlicker and Associates concluded that the ridge rock deposit is more than 4,200 feet long and 350 feet wide and contains at least 33 acres of ground, and that the volume of rock in place is about 2.2 million cubic yards, which will produce more than 2.7 million tons of crushed basalt. In 1994, as part of the County's ESEE analysis, Squier Associates were hired as independent consulting geologists to review and verify information regarding quantity and quality of the resource.

Based upon Squier's review of available data and experience in Multnomah County, it was concluded that the Howard Canyon Quarry contains a substantial aggregate resource.

Transportation/Public Improvements - Transportation systems create conflicts with streams. Fill is often necessary to cross a stream. Culverts generally increase erosion. Field teams found that private logging roads have severe impacts on streams in the Howard Canyon Area. Public improvements, such as utility extensions, can result in alteration and conflict of streams. No planned public improvements were identified.

Other Uses - Aircraft landing areas are likely to locate in this area due to topography constraints. If a landing area were to be sited, it would most likely be located away from a stream channel due to slope and vegetation constraints.

Resource conservation is a permitted use and does not present a conflict with the stream resource. No other uses allowed outright, conditionally, or under prescribed conditions have been noted within the impact area for these streams.

c. Conflicting Use By Study Area

Conflicting uses are examined by study area and stream. Known conflicts are described based on field observations. No other uses allowed outright, conditionally, or under prescribed conditions have been noted within the impact area for these streams.

i. Howard Canyon Study Area

Big Creek: This watershed is affected primarily by use of adjacent properties as pasture land and by rural residential development in its upper reach (below the confluence of Howard Canyon Creek and Knieriem Creek). The lower stream segments, west of Gordon Creek Road, are more protected by vegetation and steep topography. The creek does not flow into a wildlife habitat area or any other sensitive area.

Knieriem Creek: This watershed is affected by logging in its upper reach, mining in its middle reach, and use of adjacent property as pasture land in its lower reach where it joins Howard Canyon Creek. Rural residential uses associated with exclusive farm use also impact the watershed, primarily along the lower stream segments. The creek flows into Big Creek.

Howard Canyon Creek: This watershed, like the Knieriem Creek watershed, is affected by logging in its upper reach, mining in its middle reach, and adjacent pasture land uses in its lower segments; where it joins Knieriem Creek. A small segment of the creek, near its confluence with Knieriem Creek, is affected by rural residential use associated with the exclusive farm use zone.

5. ESEE ANALYSIS

The ESEE consequences analysis includes a general discussion of impacts by conflicting use category. The initial section examines impacts on the stream if the conflicting uses are allowed. The second section addresses impacts on the conflicting uses if the stream is protected. Each section includes a listing of impacts that are keyed to matrices that specifically tie the impacts to each stream. The matrices are organized by County study area.

a. ESEE Consequences of Allowing Conflicting Uses - Impacts on Streams

i. Economic Consequences of Allowing Conflicting Uses

Negative economic impacts result from conflicting uses which lower water quality and reduce the usefulness of water withdrawn from the stream. The reduction of water quality has a direct economic impact on those properties and streams where water rights exist for domestic and irrigation purposes. If water quality is lowered to a point that water is no longer useful, alternative sources will need to identified. An economic consequence is noted only in those instances where water rights exist along the stream. Conflicting uses that have the potential of lowering water quality include uses which increase run-off, erosion, turbidity, and pollutants.

A negative economic consequence also will result if water quantity is reduced or increased due to stream or riparian alteration. Streamside vegetation has the effect of moderating the flow and transport of water through the drainage. Removal of vegetation increases the rate of run-off and reduces water storage capacity. This results in higher peak flows and lower flows during drought periods.

Development of paved parking areas or roadways associated with transportation facilities, community service commercial uses, and residential uses will generally increase the rate of run-off and increase the potential for erosion unless storm water detention facilities are planned in conjunction with the improvement. Detention facilities or special designs are generally addressed on a case by case basis depending on the scale of the proposed development or improvement.

Forestry practices that result in clear cut areas near a stream will have the effect of increasing run-off, turbidity, and water temperature, thus lowering water quality and storage capacity. Logging roads and yarding disrupt the terrain and result in increased erosion. Field observation indicates that vegetation buffers in the West Hills are inconsistent and sometimes destroyed by roads and yarding.

Agricultural use adjacent to streams also may have the effect of lowering water quality due to uncontrolled use of fertilizers and pesticides. Livestock with access to stream banks have negative effects on the streams. Impacts included run-off due to overgrazing, increased turbidity from trampled streamside vegetation, and increased pollutants from animal excrement.

MATRIX KEY:

ECON 1: Negative economic impacts result from reduced water quality for domestic or irrigation use due to increased run-off, erosion, turbidity, water temperature, or pollutants.

ECON 2: Negative economic impacts result from changes in water quantity that can affect availability for domestic or irrigation use due to loss of storage capacity and increased run-off.

ii. Social Consequences of Allowing Conflicting Uses

Conflicting uses adjacent to a stream may have a social impact if removal of riparian vegetation has occurred and there has been a significant loss of wildlife habitat. The social impact results in the loss of opportunities for nature study and recreational activities if vegetation and wildlife habitat are removed. Streams that flow through public parks or publicly-accessed recreation facilities have the greatest potential to be negatively affected in this manner. Although none of the study area streams flow into publically-owned parks or recreation facilities, they do drain to the Sandy River, which flows past state parks and private recreation facilities (e.g. Camp Collins).

Social consequences also result from impacts on the aesthetic quality of a stream if riparian vegetation is removed and a stream is degraded. This has an overall impact on the livability of the area.

The removal of riparian vegetation will also reduce water storage capacity and increase the rate of run-off. This has the potential of increasing the capacity for flooding, especially where wetlands are associated with the stream. For those streams with wetlands, negative social consequences may occur if vegetation is removed and the wetlands flood storage capacity reduced.

MATRIX KEY:

SOC 1: Negative social impacts result from the loss of educational and recreational opportunities associated with wildlife habitat and riparian vegetation.

SOC 2: Negative social impacts result from the loss of flood storage capacity and increases in the rate of run-off.

SOC 3: Negative social impacts result from a loss in aesthetic quality and livability

iii. Environmental Consequences of Allowing Conflicting Uses

Environmental consequences of allowing conflicting uses vary by the type of conflicting use. As noted above, forestry practices that include clear cut areas result in increased run-off, turbidity, water temperature, and sedimentation. The removal of vegetation reduces food and cover for wildlife. The loss of wildlife habitat directly impacts wildlife diversity. During the stream inventory, field teams observed a wide range of wildlife from amphibians and rodents to elk and eagles. As one would expect, clear cut areas contained less habitat and less wildlife.

Consequences of agricultural use include water quality and wildlife habitat impacts. Agricultural use adjacent to the stream may result in damage to the stream through the use of chemical pesticides and fertilizers. Livestock along a stream will negatively impact the water quality by trampling streamside vegetation, overgrazing, and through the deposition of animal excrement. Removal of streamside vegetation either by livestock or to increase cultivated area will reduce wildlife cover and habitat. Pastures where streams are not fenced have the greatest potential for negative impact.

Residential, community service, and commercial uses negatively impact the environmental quality of streams. The primary impact is the loss of wildlife habitat that results from nearby human activity. For example, it is rare when elk wander into residentially developed areas. Domestic animals are a major source of conflict with wildlife and often drive animals from their natural habitat. New residential dwellings often include residential lawns which replace riparian vegetation along streams and the wildlife cover that it provides. As noted previously, parking areas associated with community service or commercial uses may increase run-off. These areas may also result in water quality deterioration due to oils and materials that are washed into the streams and drainageways.

Transportation and public improvements have negative environmental consequences. Road that cross streams often are culverted. Culverts increase the rate of flow and result in a narrowing of the stream channel. Culverts and roads also create a barrier for wildlife migration. Roads also result in wildlife mortality when animals are hit by vehicles.

Allowing mining will result in temporary adverse stream impacts including rerouting and stream channel destruction. Reclamation would include stream channel restorations. Environmental compliance issues for quarry operations are regulated by the Oregon Department of Geology and Mineral Industries and the Oregon Department of Environmental Quality.

MATRIX KEY:

ENV 1: Negative environmental impacts result from the loss of wildlife habitat when riparian vegetation is removed or destroyed.

ENV 2: Negative environmental impacts result from deterioration in water quality due to increased run-off, turbidity, water temperature, and pollutants.

ENV 3: Negative environmental impacts result from increased disturbance or mortality of wildlife, or by limiting the mobility of wildlife.

iv. Energy Consequence of Allowing Conflicting Uses

Energy consequence of allowing conflicting uses are less clear than other impacts. When streams are used for small hydro-electric or mill purposes a negative impact may occur if the flow of the stream is interrupted. No negative energy impacts were found for any of the streams in the Howard Canyon Area.

MATRIX KEY:

ENRGY 1: Negative energy impacts would result from decreased water flow.

v. Summary of ESEE Consequences - Impacts on Streams

A summary of ESEE consequences describing impacts on streams is included in Matrix 1. The matrix lists ESEE impacts by stream and conflicting use category.

b. ESEE Consequences of Prohibiting Conflicting Uses - Impacts on Uses

i. Economic Consequences of Prohibiting Conflicting Uses

Prohibiting natural resource based activities, including forestry, agriculture and mining, can result in substantial economic impacts by causing loss in jobs, preventing creation of new jobs, reducing tax revenues, and reducing revenues from the sale of raw materials or finished products.

The economic value of a resource-based operation is increased when it is located relatively close to markets or potential consumers, since the cost of transporting the raw materials is reduced. For example, construction projects, such as major public road projects, benefit from having a rock source nearby and the cost of such projects can increase when a nearby mining activity is prohibited.

Similarly, prohibiting transportation or other public improvements projects, particularly utility projects, can increase the cost of providing a service to consumers. For example, if development of a electric substation is not allowed, it may cost more to provide electricity to residents in the county or region, because the power must be obtained from a more distant source or purchased from another utility with excess supply.

MATRIX 1.

HOWARD CANYON
ESEE CONSEQUENCES
Allowing Conflicting Uses - Impacts On Streams

Stream	Forestry	Agriculture	Residential	Community Service	Mining	Transportation /Public Improvements
Big	-	ENV 1,2,3 ECON 1,2	ENV 1,2,3	ENV 2,3	EVN 2	SOC 1,2 ENV 1,2,3
Knieriem Canyon	SOC 2,3 ENV 1,2 ECON 1,2	ENV 1,2,3 ECON 1,2	ENV 1,2,3	ENV 2,3	ENV 1,2 SOC 1,3	SOC 1 ENV 1,2,3
Howard Canyon	SOC 2,3 ENV 1,2 ECON 1,2	ENV 1,2,3 ECON 1,2	ENV 1,2,3	ENV 2,3	ENV 1,2 SOC 1,2,3	SOC 1,2 ENV 1,2,3

MATRIX KEY:

ECON 1: Reduced water quality for domestic or irrigation use.

ECON 2: Reduced or increased water quantity for domestic or irrigation use.

SOC 1: Loss of educational and recreational opportunities associated with the loss of wildlife habitat.

SOC 2: Loss of flood storage capacity.

SOC 3: Negative social impacts result from a loss in aesthetic quality and livability.

ENV 1: Loss of wildlife habitat when riparian vegetation is removed or destroyed.

ENV 2: Deterioration of water quality.

ENV 3: Increased disturbance or mortality of wildlife, or limitation in the mobility of wildlife.

ENRGY 1: Decreased water flow for energy use.

Note: 1) For Forestry, Community Service, and Mining uses the listed impacts represent potential for the impact to result. Forestry and mining impacts are not likely on Big Creek due to the location of the resources at the upper reaches of the streams. For Agriculture, Residential, and Transportation/Public Improvements uses the listed impacts represent actual impacts that are currently occurring along the creek.

2) Refer to previous section for a description of the impacts.

Prohibiting residential development to protect streams can negatively affect the value (purchase price and tax assessment) of a lot, thus affecting the property owner. A reduction in value can affect the potential tax revenue to the county.

With any use, the economic costs of carrying on an activity (whether extraction, construction, or residential development) can increase when regulations or standards are enacted to specify conditions under which the activity can occur. For example, regulations that limit the size of the working face, specify the timing of reclamation activities, or require extensive screening of mining activities can increase the economic cost to the operator of carrying on the mining business.

In regard to the Howard Canyon Quarry, it is one of a very limited number of known aggregate sources in Multnomah County. Limitations on site development to preserve significant streams will result in a shortened life span of the facility, with economic impacts on the owners, and on employees and suppliers.

MATRIX KEY:

ECON 1: Negative economic impacts result from lost jobs, reduced tax revenues, or reduced revenue from the sale of goods and services.

ECON 2: Negative economic impacts result from increased cost of transporting raw materials to markets or consumers, and providing services.

ECON 3: Negative economic impacts result from decreased property value (for residential uses).

ECON 4: Negative economic impacts result from regulations and standards that specify conditions under which an activity or use can occur.

ECON 5: Negative economic impacts result from increased cost due to practices or construction techniques.

ii. Social Consequences of Prohibiting Conflicting Uses

Prohibiting natural resource based activities, such as forestry, agriculture and mining, can affect property owners who depend on revenue from the activity as an income source. Reduced income from prohibiting these activities can affect the way of life of families that may have carried on the operation (e.g., timber production, farming, or mining) for several generations. These families, who have a heritage of being involved with these activities, would consider a change in their way of life a negative social impact. In regard to quarry operations, once resources are depleted, social impacts result from attendant relocation or dislocation of employees.

Another social impact of prohibiting resource based activities is reducing or eliminating access to a local source of a needed material. For example, mining provides a social benefit by providing a needed supply of rock and aggregate material for construction projects in the county and region. This social benefit would be negatively affected by prohibiting mining activities because access to these materials would become more difficult. In addition, longer haul distances increase traffic loads with resultant social impacts.

Prohibiting certain uses can affect the amenities available to local residents, whether these are natural or man-made. For example, residential lots located along a stream often are sought by buyers, since the stream is considered a positive natural amenity. Not allowing residential development on lots with stream access would prevent this social benefit. Similarly, community services and commercial facilities provide a social benefit to local residents by providing needed goods and services near where they live and work. Prohibiting these uses would negatively affect this social benefit by causing residents to drive further to obtain the goods and services.

MATRIX KEY:

SOC 1: Negative social impacts result from reduced income (from natural resource based activities).

SOC 2: Negative social impacts result from affecting or changing the way of life of families involved in natural resource based activities and industries.

SOC 3: Negative social impacts result from reduced or eliminated access to local sources of needed materials.

SOC 4: Negative social impacts result from reduced availability of amenities (both natural and man-made).

iii. Environmental Consequences of Prohibiting Conflicting Uses

Not allowing uses that involves construction of buildings or public improvements, can result in the use occurring elsewhere. Transfer of the use to a new location can result in the same or even greater environmental impacts on site, depending on the natural features of the new site, its location, and the type of development or activity that is proposed. It is possible that the new site would require more infrastructure or improvements to service, thus resulting in greater impacts from construction of roads, utilities, and services.

MATRIX KEY:

ENV 1: Negative environmental impacts result from transferring development (and associated impacts) from a site where a conflicting use is prohibited to one where it is allowed.

iv. Energy Consequences of Prohibiting Conflicting Uses

One energy consequence of prohibiting natural resource based uses is increased use of energy for transporting raw materials to markets and consumers. For example, it requires less energy to transport logs from a harvesting site near a mill than from a site farther away. Similarly, transporting rock and aggregate materials to Portland from more distant locations requires more energy than from a source within the county.

Prohibiting resource based uses can result in a shortage of goods and services, such as lumber or produce, for construction or processing. Particularly with lumber and forestry products, limited availability can result in use of alternative, less energy-efficient building materials.

Prohibiting residential uses and development of community services and commercial areas can result in greater distances between local residents and the places where they work and purchase goods and services. If community services or commercial amenities are located farther from residents, they must drive greater distances to obtain these goods and services. Increased travel results in increased use of energy for transportation.

Greater distances between raw materials and processing, products and markets, and consumers and goods and services, can result in additional energy expenditure to construct needed roads, transportation facilities (such as transit centers), and infrastructure that may not be necessary if conflicting uses were allowed to occur.

MATRIX KEY:

ENRGY 1: Negative energy impacts result from increased use of energy for transporting raw materials to markets and consumers.

ENRGY 2: Negative energy impacts result from shortage of goods and services, such as lumber or produce, for construction or processing.

ENRGY 3: Negative energy impacts result from greater distances between local residents and the places where they work and purchase goods and services.

ENRGY 4: Negative energy impacts result from increased energy expenditure to construct additional roads, transportation facilities, and infrastructure to accommodate greater distance between products and consumers.

v. Summary of ESEE Consequences - Impacts on Conflicting Uses

A summary of ESEE consequences describing impacts on conflicting uses is included in Matrix 2. The matrix lists ESEE impacts by stream and conflicting use category.

c. Other Applicable Statewide Planning Goals

OAR 660-16-005(2) states: "The applicability and requirements of other Statewide Planning Goals must also be considered, where appropriate, at this stage of the process." The following additional Statewide Planning Goals apply to this ESEE analysis:

i. Goal 3 - Agricultural Lands

Goal 3 applies to those lands designated and zoned for Exclusive Farm Use. Portions of the three streams in the Howard Canyon area run through lands designated and zoned for Exclusive Farm Use. This designation is intended to preserve and maintain agricultural lands. Limitations of agricultural uses in order to protect streams would result in a direct conflict between implementation of Goal 4 and Goal 5 of the Statewide Planning Program.

ENRGY 2: Shortage of goods and services, such as lumber or produce, for construction or processing.

ENRGY 3: Greater distances between local residents and the places where they work and purchase goods and services.

ENRGY 4: Increased energy expenditure to construct additional roads, transportation facilities, and infrastructure to accommodate greater distance between products and consumers.

Note: For forestry, community service, and mining uses, the listed impacts represent potential for the impact to result. It is unlikely that forestry and mining uses will impact Big Creek due to the location of the potential resources at the upper reaches of the streams. For Agriculture, Residential, and Transportation/Public Improvement uses, the listed impacts represent actual impacts that are currently occurring along the creek.

MATRIX 2.

HOWARD CANYON
ESEE CONSEQUENCES
Prohibiting Conflicting Uses - Impacts on Conflicting Uses

Stream	Forestry	Agriculture	Residential	Community Service	Mining	Transportation /Public Improvements
Big	-	ECON 1,2,4 SOC 1,2,3 ENRGY 1,2,4	ECON 3,4,5 SOC 4 ENV 1 ENRGY 3,4	ECON 4,5 SOC 4 ENV 1 ENRGY 3,4	-	ECON 2,4,5 ENRGY 4
Knieriem	ECON 1,2,4 SOC 1,2,3 ENRGY 1,2,4	ECON 1,2,4 SOC 1,2,3 ENV 1 ENRGY 1,2,4	ECON 3,4,5 SOC 4 ENV 1 ENRGY 3,4	ECON 4,5 SOC 4 ENV 1 ENRGY 3,4	ECON 1,2,4 SOC 1,2,3 ENRGY 1,2,4	ECON 2,4,5 ENRGY 4
Howard Canyon	ECON 1,2,4 SOC 1,2,3 ENRGY 1,2,4	ECON 1,2,4 SOC 1,2,3 ENV 1 ENRGY 1,2,4	ECON 3,4,5 SOC 4 ENV 1 ENRGY 3,4	ECON 4,5 SOC 4 ENV 1 ENRGY 3,4	ECON 1,2,4 SOC 1,2,3 ENRGY 1,2,4	ECON 2,4,5 ENRGY 4

MATRIX KEY:

ECON 1: Lost jobs, reduced tax revenues, and reduced revenue from the sale of goods and services.

ECON 2: Increased cost of transporting raw materials to markets or consumers, and providing services.

ECON 3: Decreased property value (for residential uses).

ECON 4: Increased cost resulting from regulations and standards that specify conditions under which an activity or use can occur.

ECON 5: Increased cost due to changes in customary practices or construction techniques.

SOC 1: Reduced income (from natural resource based activities) and possible "taking" of private property for public benefit.

SOC 2: Affecting or changing the way of life of families involved in natural resource based activities and industries.

SOC 3: Reduced or eliminated access to local sources of needed materials.

SOC 4: Reduced availability of amenities (both natural and man-made).

ENV 1: Transferring development (and associated impacts) from a site where a conflicting use is prohibited to one where it is allowed.

ENRGY 1: Increased use of energy for transporting raw materials to markets and consumers.

ii. Goal 4 - Forest Land

Goal 4 applies to those lands zoned Commercial Forest Use. All significant streams in the Howard Canyon Area of the West Hills run through lands designated and zoned as Commercial Forest Use lands. Forest operations, practices, and auxiliary uses are subject only to such regulation of uses as are found in ORS 527.722, which states that "no unit of local government shall adopt any rules, regulations, or ordinances or take any other actions that prohibit, limit, regulate, subject to approval or in any other way affect forest practices on forestlands located outside of an acknowledged urban growth boundary." Consequently, regardless of impacts forest practices may have on significant streams, the County cannot place restrictions on forest practices in areas designated and zoned as Commercial Forest Use lands.

iii. Goal 5 - Open Spaces, Scenic and Historic Areas, and Natural Resources

Direction from the Department of Land Conservation and Development staff, as part of the Remand Order, requires that only those Goal 5 resources that have been inventoried and determined to be significant are appropriate to be included within the ESEE analysis. Of the three other identified significant Goal 5 resources in the West Hills (Scenic Views and Sites, Mineral & Aggregate Resources, Fish & Wildlife Habitat) only Mineral & Aggregate Resources have been deemed to be a use which conflicts with streams.

iv. Goal 6 - Air, Water, and Land Resources Quality

Goal 6 requires that, "All waste and process discharges from future development, when combined with such discharges...shall not (1) exceed the carrying capacity of such resources, considering long range needs; (2) degrade such resources; or (3) threaten the availability of such resources."

All of the impacts posed by various uses upon streams have a bearing on the water quality of such streams. To the extent that these conflicts can be resolved in a manner which preserves or enhances the existing water quality of these significant streams, such resolution would be in conformance with the requirements of Goal 6.

In addition, Clean Water Act requirements may affect proposed conflicting uses. As noted, Goal 6 requires that all waste and process discharges from future development, combined with those from existing development, not threaten to violate or violate state or federal environmental quality statutes.

v. Goal 7 - Areas Subject to Natural Disasters and Hazards

Goal 7 requires "Developments subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards." Pursuant to this Goal, the Multnomah County Comprehensive Framework Plan has identified areas of the County which are the result of steep slopes, unstable geological and soil conditions, erosion potential and stream flooding.

Many of the impacts posed by various uses upon streams have a bearing on the capacity of these streams to instigate flooding and siltation problems to downstream areas. To the extent that these conflicts can be resolved in a manner which minimizes the flood and siltation hazard potential of streams, they would be in conformance with the requirements of Goal 7.

vi. Goal 9 - Economic Development

Goal 9 calls for adequate opportunities for a variety of economic activities in the state. Opportunities for local businesses and industries that process local resources and serve local residents may be limited because of their conflicts with significant streams.

vii. Goal 10 - Housing

Goal 10 focuses on providing housing types to meet needs within urban growth boundaries. It indicates that ordinances and incentives should be used to increase population densities in urban areas rather than rural areas such as the Howard Canyon significant streams sites.

6. SUMMARY

a. General Conclusions

The consequences of not protecting significant streams are primarily environmental in nature, while the consequences of prohibiting or limiting conflicting uses in order to preserve significant streams are primarily economic, social, and energy in nature.

b. Synopsis of ESEE Consequences

Consequences if Forestry is not allowed:
Economic: Lost jobs, reduced tax revenues, increased transport costs
Social: Reduced property rights, end of "timber" lifestyle, no more local sources
Environmental: Insignificant
Energy: More energy use for transporting materials & building infrastructure, shortage of goods

Consequences if Forestry is allowed in a limited manner:
Economic: Regulatory burden, potential for some los jobs, tax revenues
Social: Reduced property rights, impact on "timber" lifestyle, reduced local sources
Environmental: Insignificant
Energy: Some increase in energy use for transporting materials to market, shortage of goods

Consequences if Forestry is fully allowed:
Economic: Reduced water quality for use, change in water quantity for use
Social: Loss of flood storage capacity
Environmental: Loss of riparian vegetation, reduced water quality
Energy: Insignificant

Consequences if Agriculture is not allowed:
Economic: Lost jobs, reduced tax revenues, increased transport costs
Social: Reduced property rights, end of farming lifestyle, no more local sources
Environmental: Transferring environmental impacts to another site
Energy: More energy use for transporting materials & building infrastructure, shortage of goods

Consequences if Agriculture is allowed in a limited manner:
Economic: Regulatory burden, potential for some lost jobs, tax revenues
Social: Reduced property rights, impact on "timber" lifestyle, reduced local sources
Environmental: Transfer of some environmental impacts to another site
Energy: Some increase in energy use for transporting materials to market, shortage of goods

Consequences if Agriculture is fully allowed:
Economic: Reduced water quality for use, change in water quantity for use
Social: Insignificant
Environmental: Loss of riparian vegetation, reduced water quality, greater wildlife disturbance
Energy: Insignificant

Consequences if Residential Use is not allowed:
Economic: Decreased property value
Social: Reduced availability of amenities
Environmental: Transferring environmental impacts to another site
Energy: Greater distance between destinations, increased cost of infrastructure

Consequences if Residential Use is limited:
Economic: Regulatory burden, changes in customary practices
Social: Reduced availability of amenities
Environmental: Transferring environmental impacts to another site
Energy: Insignificant

Consequences if Residential Use is fully allowed:
Economic: Insignificant
Social: Insignificant
Environmental: Loss of riparian vegetation, loss of water quality, more disturbance of wildlife
Energy: Insignificant

Consequences if Community Service Uses are not allowed:
Economic: Changes in customary practices
Social: Reduced availability of amenities
Environmental: Transferring environmental impacts to another site
Energy: Greater distance between destinations, increased cost of infrastructure

Consequences if Community Service Uses are limited:
Economic: Regulatory burden, changes in customary practices
Social: Reduced availability of amenities
Environmental: Transferring environmental impacts to another site
Energy: Insignificant

Consequences if Community Service Uses are fully allowed:
Economic: Insignificant
Social: Insignificant
Environmental: Deterioration of water quality, increased disturbance of wildlife
Energy: Insignificant

Consequences if Mining is not allowed:
Economic: Lost jobs, reduced tax revenues, increased transport costs
Social: Reduced property rights, no more local sources
Environmental: Insignificant
Energy: More energy use for transporting materials & building infrastructure, shortage of goods

Consequences if Mining is allowed in a limited manner:
Economic: Regulatory burden, potential for some los jobs, tax revenues
Social: Reduced property rights, impact on "timber" lifestyle, reduced local sources
Environmental: Insignificant
Energy: Some increase in energy use for transporting materials to market, shortage of goods

Consequences if Mining is fully allowed:
Economic: Insignificant
Social: Insignificant
Environmental: Loss of riparian vegetation, deterioration of water quality
Energy: Insignificant

Consequences if Transportation/Public Improvements are not allowed:
Economic: Increased cost of material transport, changes in practices
Social: Insignificant
Environmental: Insignificant
Energy: Increased energy expenditure on infrastructure

Consequences if Transportation/Public Improvements are allowed in a limited manner:
Economic: Increased cost of material transport, regulatory burden, changes in practices
Social: Insignificant
Environmental: Insignificant
Energy: Increased energy expenditure on infrastructure

Consequences if Transportation/Public Improvements are fully allowed:
Economic: Insignificant
Social: Loss of education & recreation associated with wildlife habitat
Environmental: Loss of riparian vegetation, loss of water quality, more disturbance of wildlife
Energy: Insignificant

APPENDIX A

INVENTORY/SIGNIFICANCE ANALYSIS

PREPARED BY SRI/SHAPIRO

INVENTORY/SIGNIFICANCE ANALYSIS

INTRODUCTION

Inventories have been completed for streams in the Howard Canyon Area. The inventory profiles address location, quality, and quantity consistent with Statewide Planning Goal 5 requirements. The inventory is part of the Multnomah County Significant Streams study. Stream profiles are mapped and organized by planning area. Maps indicate which stream reaches were inventoried.

Stream profile sheets include the location and the length of stream inventoried. The profiles provide information on economic use based on water rights data. The profiles address educational, recreational, and public safety issues. Natural resource values are addressed in terms of Stream Class, threatened and endangered species information, wildlife habitat assessment information and riparian vegetation. A qualitative description of each stream is also provided.

The significance criteria is addressed in a matrix format. If any of the criteria are is satisfied, the stream is considered significant and a Goal 5 analysis is conducted. If the stream does not meet the criteria, an ESEE analysis under Goal 5 is not prepared and no further action is required or appropriate under Goal 5. These streams are not included on the Plan Inventory for Goal 5 purposes.

The significance analysis is conducted on a stream by stream basis. Because a stream's tributaries contribute to the health, quality, and significance of the whole stream, individual tributaries are examined collectively. Field data was collected along individual stream segments, but the data has been consolidated for purposes of this evaluation. The limitations of this process are that data is averaged and segments of exceptionally high quality or exceptionally low quality may be over looked. The advantage of this process is that streams are examined as a whole and are not fractured into small segments that may include highly conflicting data. It should be noted that water seasonality is based on USGS mapping. Canopy cover is "winter canopy." In areas with a deciduous overstory component, "summer canopy" cover could be significantly higher.

SIGNIFICANCE CRITERIA

Policy 16-G sets forth the criteria for determining significance of water resources and wetlands. The methodology followed for use of the criteria is described below.

A. Economic Value

Strategy A of Policy 16-G states that sites should be designated significant "if any use of the water resource can be shown to be feasible for use in significantly increasing a specified economic activity or function or substantially increasing the economic value of the land through which the waters flow".

To assess economic significance, we analyzed surface water rights for properties along the streams. A list of surface water rights was obtained from the Oregon Water Resources Department. The list of relevant permits is included as part of the stream profile. The rate or quantity of water being diverted and the use of the water is noted. All uses, including domestic use, are assumed to provide an economic benefit to the user.

B. Recreation Value

Strategy B of Policy 16-G states that a water resource should be designated significant if:

1. The resource lies within the boundaries of a public park or recreation facility and the resource is an integral part of the facility's recreational activities; or

2. The resource contributes water to a park or recreation facility and diversion or degradation of the resource would significantly diminish the recreational value of the resource.

Park and recreation facilities along stream segments and downstream were documented. The role of the water resource in regard to the recreational activity was noted. For example, boating or fishing activities are water based and diversion and degradation of the water resource would clearly diminish the recreational quality of the resource.

C. Educational Value

Strategy C of Policy 16-G states that water resources should be designated significant if they have been identified as being ecologically or scientifically significant by the Oregon Natural Heritage Program or if the resource is used for public educational purposes.

Sue Vrilakas, botanist and data manager for the Oregon Natural Heritage Program conducted a data system search of the West Hills Rural Area for rare, threatened, and endangered plant and animal species. The search, completed on February 22, 1994, identified 34 records in the general vicinity but only four records were within the watersheds for the streams being studied. The existence of the significant sites is noted on the inventory profile sheets but detailed locations are not provided due to the confidential nature of the data.

Ron Klein of the Metro Greenspaces program was contacted regarding public educational activities. Ron provided information on streams that have been used for classes offered by the Portland Audubon Society and for public and private school classes sponsored through the Green City Data grants program.

D. Public Safety

Policy 16-G includes strategy D which states that sites and resources should be designated significant in the following cases:

1. The water resource is within the Watershed Management Unit of an existing or proposed municipal water source; or

2. The water resource is part of the groundwater area for a municipal water supply; or

3. The water resource and surrounding lands are flood storage areas which if altered would increase the frequency or height of floods downstream.

Strategy D also addresses water quality in terms of the significance of the riparian vegetation associated with the water resource.

To document water source information, the cities of Portland, Beaverton, Hillsboro, and Scappoose were contacted. Staff at each city indicated that the study area streams were not part of the respective municipal water supply systems.

In regard to flood storage, field inventories documented whether wetlands were associated with the streams. The number of wetlands and the approximate size of wetlands were noted. Depending on the size of the wetland and the form of the stream channel, wetlands may provide water storage capacity that will reduce the intensity of a storm event. When streams and wetlands provided this function, a determination of significance was made.

In regard to water quality and riparian vegetation, the width of the riparian corridor was documented in the field and canopy cover was noted. The inventory profiles provide the average maximum width of the corridor. If 75% of the stream length had canopy cover that was less than 25%, the riparian vegetation was determined to be insignificant and have little positive influence on water quality. If greater canopy cover was provided, the riparian area was considered significant. If field surveyors were unable to inventory at least two-thirds of the length of a stream within the county, the relationship of riparian vegetation and water quality could not be established with confidence. For this reason, if a stream appears to meet the canopy cover criteria, it is considered significant only if more than two-thirds of the stream was inventoried.

E. Natural Area Value

Strategy E of Policy 16-G addresses the natural area value of the resource. Sites are considered significant if they are designated Class 1 by the Oregon Department of Forestry, if the area is the habitat of a threatened or endangered species or if a Wildlife

Habitat Assessment form has been completed and the site scored 45 or more points. A site may also be considered significant if it scores between 35-44 and it provides an essential connection between or enhances adjoining higher rated areas.

As part of the inventory Class 1 waters were documented and noted on inventory forms. If any portion of the stream within the County is designated Class 1, the stream was considered significant.

As noted under Educational Value, above, the Oregon Natural Heritage Program data base was searched for rare, threatened and endangered plant and animal species. Inventory forms identify whether sites were identified. Due to the confidential nature of the data, details are not provided.

Wildlife Habitat Assessment forms were completed for segments along each stream at two/tenths of a mile intervals. The data is summarized in a table following each of the profile forms. Streams averaging 45 points and above were considered significant resources. Sites with WHA scores between 35-44 points were designated significant if they function as "essential connections or demonstrably enhance higher rated adjacent areas." The scope of this study was limited to the stream channel area and only addresses connections and enhancement within a given stream channel. Connections or enhancement to upslope areas were not considered.

For the purposes of this report, a riparian area is comprised of an aquatic ecosystem and associated upland area. Water in the aquatic ecosystem influences upland vegetation and microclimate. Upland areas affect the aquatic ecosystem by providing thermal regulation, biomass, and structure.

SIGNIFICANCE MATRIX

The Significance Matrix summarizes the findings and research documented on the profile sheets. The matrix is designed so that a yes - no answer is provided when the county significance criteria are satisfied. The conclusion is based on whether the threshold for significance has been met.

SIGNIFICANCE MATRIX – Study Area: Howard Canyon

CRITERIA:	STREAMS: Big	Howard Canyon	Knieriem
ECONOMIC:			
Water Rights Permits	Y	Y	Y
RECREATION:			
Within Park/Rec. Facility	N	N	N
Contributes water to Park/Rec. Facility	Y	Y	Y
EDUCATION:			
Designated significant by the Oregon Natural Heritage Program	N	N	N
Used for public education	N	N	N
PUBLIC SAFETY:			
Within Watershed Management Unit	N	N	N
Groundwater Recharge for Municipal Supply	N	N	N
Flood Storage Function	Y	Y	Y
Riparian Zone Water Quality Benefits	N	Y	N
NATURAL AREA VALUE:			
Designated Class 1	Y	Y	Y
Habitat of an Endangered or Threatened Species	N	N	N
Wildlife Habitat Assessment Score			
If > 44 points – considered significant	N	Y	Y
If 35–44 points, essential connections are provided	Y	–	–
CONCLUSION: Significant	Y	Y	Y

Key:	
Y – Yes	I – Incomplete
N – No	NA – Not Applied

Howard Canyon Area

BIG CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Howard Canyon

Length Inventoried: 5,124 ft

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 6,000 ft

Area of Watershed in Multnomah County: 4,134 acres - Includes Knieriem and Howard Creek drainages.

Abutting Land Use Designations (percent of study area stream length):

	Exclusive Farm Use	Commercial Forest Use	Rural Residential
Big Creek	15%	70%	15%

Stream Description:

The survey started at the west side of the bridge where the stream crosses Littlepage Road and ended where the stream creates a 90 ft falls. There was no safe way of continuing the survey past this point. The mouth of the stream could not be located in the amount of time allowed.

Big Creek was severely impacted by housing and pasture land. Over half of the surveyed area had paved roads adjacent to the stream. Streamside vegetation was degraded and cover was minimal in most areas. In some parts of the riparian area natural vegetation was present. There were at least two obvious withdrawal sites with pipes in the stream and a landowner told us how he had confronted another neighbor about gravel removal from Big Creek. Much of the creek contained potentially good gravel cobble. The flow of the stream was fast enough for good aeration.

Section one runs along Littlepage Rd. The first half of this section has some riffles and deep areas that could count as pools. It even contained some backwater areas. The stream is wide, average 35 feet, consisting mainly of runs. There is woody debris in the first half of this section along with trees and shrubs that have been recently uprooted, see photos. Banks are undercut or have silt build up. However,in the first half there is some cover and groundcover is more natural.
The second part of section one is closer to the road and more severely impacted by housing and pastures. What over there is, is brushy and grass runs up to stream. Banks are often bare and muddy. Animals have unrestricted access to stream. There are good gravels in this section, though somewhat embedded.

Section two continues to look like the last half of section one. Pasture is dominant and cover is minimal. Parts of the creek are fenced off to limit animal access. Alders and cedars provide some cover toward the end of this section. Banks not well covered and show signs of erosion, see photos.

Stream fairly uniform but in some places depths can reach hip boot level. Flow is steady, not many pools or riffles, mostly runs.

Section three had better cover from cedar trees. Much of the groundcover continues to be lawn grass. First part of the section is pasture. There is a fence and blackberry brambles form a partial barrier to animal access. Second half of this section almost looks like a park with evidence of horse use. Some intrusive plants in area like English ivy and Himalayan blackberry and non-native holly trees. Large area of banks are bare.

There is a pumping station by a modern-looking brown house. This house also has a tire structure to enforce landscape. There looks like there might be some construction in this area. There are some boulder and riffle areas in this section.

Section four is characterized by change in gradient. Rapids instead of riffles are evident. Boulders make up the major part of the substrate. Houses on both sides of the creek still impact area and there seems to be another pumping station right by small falls. Creek entering Big Creek from the south side had cattle in and around it. There are steep hillsides but surrounding area is still pasture and houses. Some woody debris in and around streams but not much. Landslide area in this section. Canyon walls provided the majority of shade in this area.

Section five had natural riparian vegetation and cover. More evidence of landslide. Cover is shrubby consisting of flowering currant and willows; trees include some cedar, with more Douglas fir. There is more woody debris in this area than before. Springs and tributaries coming in from both sides of canyon. Predominant plants are sword fern, piggyback, bleeding hearts, and oxalis.

Substrate along this section was bedrock and boulders. Water very fast with a 90ft falls at about 900ft into section. Banks showed large areas of wearing away and, as mentioned, there was landslide by the falls where the survey ended.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S8927	SWSE 2 1S4E	Domestic	.0500 CFS
S12596	SESW 2 1S4E	Domestic (incl. lawn & garden)	.0100 CFS
S16233	SWNE 2 1S4E	Irrigation	.0600 CFS
S22546	SWSW 35 1N4E	Irrigation	.0700 CFS
S22539	NESW 2 1S4E	Irrigation	.3000 CFS
S24926	SESE 3 1S4E	Irrigation	.4600 CFS
S22535	SWSW 2 1S4E	Irrigation	.2500 CFS
S24053	SWSW 2 1S4E	Irrigation	.1600 CFS
S37747	SWSE 2 1S4E	Irrigation	.0200 CFS
S39817	SWSE 2 1S4E	Domestic	.0050 CFS
S39817	SWNE 2 1S4E	Irrigation	.0400 CFS
S39817	SWNE 2 1S4E	Livestock	.0050 CFS

RECREATION

Park/Recreational Facility: Big Creek drains to the Sandy River. The creek meets the river at Camp Collins, a private YMCA camp adjacent to Oxbow County Park. The Sandy flows downsream through Dabney State Park and Lewis and Clark State Park.

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: None

Public Educational Use: None identified

PUBLIC SAFETY

Within a Watershed Management Unit: N/A

Groundwater Recharge for a Municipal System: N/A

Flood Storage Area:

Number of wetlands/ approximate size: Small wetlands adjacent to stream.

Flood Storage Capacity: Small increase in storage capacity beyond that of the immediate stream channel.

Riparian Corridor: see attached table

Average Width: 126 ft

Range of Width: 80-200 ft

Benefit to Water Quality: The current low level of low canopy cover will allow seasonal increases in water temperature and may result in higher peak flow levels. Stream cover is insufficient to be a benefit to water quality.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 100%

Threatened and Endangered Species data: N/A

Wildlife Habitat Assessment: (see attached table) Wildlife Habitat quality is directly related to water quality activities.

Average score: 42

Range of scores: 39-49

Essential Connections: Wildlife habitat quality is directly related to water quality and seasonality. High water quality is essential for survival, growth, reproduction, and migration of species present in aquatic and riparian communities. Overstory removal and other activity can alter the amount and timing of streamflow by changing on-site hydrologic processes. This can result in increased sediment transport, higher peak flows and lower summer water levels, which would negatively influence the riparian habitat quality. The water quality created by upstream conditions should maintain the downstream areas at the current habitat quality.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: Howard Canyon

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Big Creek	1	8	6	4	4	3	3	2	3	2	2	1	1	1	0	40
Big Creek	2	8	6	5	4	3	3	2	3	3	2	0	0	2	0	41
Big Creek	3	8	6	4	3	3	3	2	3	3	2	0	0	2	0	39
Big Creek	4	8	6	7	3	5	4	2	4	4	2	1	0	3	0	49
Big Creek	5	8	6	5	2	3	3	2	3	3	2	2	2	2	0	43
AVERAGES		8.0	6.0	5.0	3.2	3.4	3.2	2.0	3.2	3.0	2.0	0.8	0.6	2.0	0.0	42.4

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width of Rip. Corridor* Left (ft)	Right (ft)	Extent of Overhead Canopy: 0–25%	25–50%	50–75%	75–100%
Big Creek	1	50	80	X			
Big Creek	2	20	100	X			
Big Creek	3	30	50	X			
Big Creek	4	50	50	X			
Big Creek	5	100	100		X		
AVERAGES		50.0	76.0	80%	20%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

HOWARD CANYON CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Howard Canyon

Length Inventoried: 15,840 ft

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 17,000 ft + 8,000 ft for two unsurveyed tributaries.

Area of Watershed in Multnomah County: 1,575 acres

Abutting Land Use Designations (percent of study area stream length):

	Exclusive Farm Use	Commercial Forest Use	Rural Residential
Howard Canyon	20%	80%	0%

Stream Description:

The survey started from the confluence with Big Creek at Littlepage Road. The first seven sections have housing and pasture lands adjacent to stream. Where there is pasture, animals for the most part have unrestricted access and at the time this survey was done, cattle were actually seen in the stream. Streamside cover is of moderate quality and density near houses and pasture cover was sparse to none. Banks along this area were eroding with large pieces of bank falling off into stream because of a storm event.

The start of the Howard Canyon Creek survey was arbitrary and assigned to Littlepage Road. This is how the data sheets and this report will reference the stream, however, the first section could be assigned as Big Creek and the first 400 ft of section two could also be assigned as Big Creek.

Sections 8-12 showed many small springs coming from north side of road. At least 12 small tributaries formed from springs crossed under road via culvert. These springs usually corresponded to adjacent wetlands along the main stream. These sections were also characterized by large cedars, cedar snags and large downed woody debris on hillside and in stream.

Section 1 started at bridge where stream crosses under Littlepage Road. Most of section one was landscaped front yard of house. Large cedars provided cover along with salmonberry, red alders, and willows for shrub layer. In front of house groundcover was mostly grass but other groundcover was more natural like piggyback, sword fern, buttercup, English ivy, and Himalayan blackberry. Area that was not house yard had good natural cover. Toward end of section there was a small wetland area that had dense, tall horsetails. Substrate in this area was composed of mainly cobble and gravels. Typical banks were silt with some cover. The water in this system even after flood event contained suspended material, however the substrate did not seem severely embedded.

Section two consisted mostly of pasture for cows and possibly horses. Animals had unlimited access to stream and there were severe erosion problems and bank degradation. Cover was minimal to non-existent. There was evidence of vehicle traffic through stream via mud road. Pasture drained directly to stream. Substrate consisted of cobbles and gravels. No pools were evident at time of sampling.

Section three was continuation of section two. Pasture with unrestricted access to stream by animals. Some cover was provided by brushy alders and willows. Severe bank erosion. Saw rivulets coming from pasture into stream during storm event. Substrate still a mixture of gravel and cobbles.

Section four at the beginning has pasture with cows in stream. Stream is culverted and crosses Howard Road. This section has new construction, trailer house, and outbuildings on it. Much of the bank around houses is garden area and grass. Steep mud bank on new construction site. Man-made pond in same area between new house and trailer house. Cover is provided by hillside and sparse trees. Stream consists of runs and some riffles. Substrate continues to be gravel and cobble.

Section five has structures close to stream but the cover is more natural. Thick blackberry brambles prevent access to stream first 400ft. Howard Road is still running parallel to stream but further away than downstream sections. Trees consist of cedar, red alder, big leaf maple. Shrub layer is made up of alder, willows, and salmonberry. Groundcover is blackberry, waterleaf, piggyback, sword fern. Small wetland appears toward end of this section. There is a side gravel road that heads north off Howard Road that has large dump truck traffic.

Section six starts with a house and outbuildings. Grass runs down to streamside and front of house has large cement patio area. Cover here is cedar, hemlock and alders predominantly. Large snags and large down woody debris along banks make good habitat. Very brushy along streamside after the house, made up of salmonberry, willow, small red alder, and blackberry. Noticed some 12-inch cedar seedlings growing along streamside in this section. Groundcover upstream from house consists of sword fern, licorice fern, oxalis, nettles, phalaris.

Garbage dumped adjacent to stream severe in one area where the road is fairly close to stream. Some pools in this area but hard to tell because of level of water. Lots of large and small woody debris in and around stream. Substrate appeared to be mostly cobble and gravel.

Section seven has more tributaries coming in on both sides of the creek allowing for better developed wetlands on either side of creek. Big cedars across stream, along bank and standing snags. Looks like a fire went through this section some years back. Cover came from cedars, hemlock, Douglas fir, red alder. shrub layer consisted of willow, salmonberry, vine maple, and small red alders.

Besides wetlands alongside stream there were mud bars or silt build up. Substrate when visible was cobble and gravel. This section had some good riffles and lots of down woody debris.

Section eight is similar to section seven but the brush is not so dense. Snags are smaller and there is more down woody debris in and around stream. More moss and groundcover consists of sword fern, bracken fern, licorice fern, oxalis, iris, nettles, piggyback, devil's club. Cedar, hemlock, red alder still predominant tree cover and shrubs still salmonberry, willow with some blackberry.

Section nine is similar to last two sections. Most of the same plant species with good assortment of liverworts on bank in evidence. Still lots of good moss and to groundcover add bleeding heart and mullen. Possibly more hemlocks in this area and black cottonwoods added to cedar, red alders as tree layer. There are more small tributaries coming in and more wetlands on both sides of creek. Wetlands have skunk cabbage. Cedar and deciduous snags and down woody debris in and around stream still common. Shrub layer not as dense as previous sections made up of willow, salmonberry, not as much blackberry. Substrate is gravel and cobble with gravel bars along side. Also have island in stream to add to diversity.

Section ten looks comparable to sections seven through nine. New feature in this section are the islands in the stream adding to the diversity of habitat. Most of these islands are 10ft wide and 20ft long. There are several in this section. Not as many large snags, but still some smaller deciduous snags. Less brush in this section. There seems to be less tributaries and correspondingly less wetlands. Half way through section there is a dirt road that crosses stream that is used, possible house(s) on south side of creek that use road. Banks in this section appear more undercut with possible erosion potential. Substrate silt, gravel and cobble.

Section eleven has more conifer cover with cedars being the dominant tree. Stream receives good shade from trees and down woody debris in stream. Tributaries, springs, and wetlands are back in this section. Stream has good diversity with pools, backwater, runs and riffles. Plants stay about the same with moss and liverworts in wet and shady areas. Substrate still gravel and cobble with more sand, silt still present.

Section twelve is similar to eleven but less riffles and pools. Tributaries and wetlands on both sides of stream. Cover is still good. There is more silt in stream though it is usually in isolated areas or near stream bank. Gravel and cobble does not seem to be severely embedded. Not as much large woody debris but still plenty of small woody debris in and around stream.

Section thirteen has the faster riffles back like in section eleven. Sections eleven, twelve and thirteen are very comparable in cover and plant species. Still have liverworts and moss, sword fern, piggyback. Shrub layer is still dense with dominant plant species being salmonberry and willow. Large cedars present but not as numerous as in eleven. Not as many wetlands but tributaries and wetlands are still present. Snags, woody debris in and around streams add to habitat dimensions. Substrate embeddedness is minimal.

Section fourteen at the beginning has skunk cabbage wetlands. Trees do not seem as old and cover is less. More brushy with smaller snags than in previous sections. No new plant species. There is still down woody debris in and around stream but not as common. This is the first section that has had boulders except for pasture in first section. Stream more uniform. Banks are undercut.

Section fifteen is where the fork in stream is. This survey chose the stream on left looking upstream. Other stream headed south and quickly disappeared from sight. Both streams looked similar in flow. Wetlands and tributaries drop out in this section. Plant species stay the same except no liverworts and less moss. Add deer fern to plant list. Very shrubby, predominantly willow. There is still woody debris in and around stream, but not as common. Trees and woody debris much smaller in diameter. Substrate still gravel and cobble with silt in isolated areas. Stream continues on.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
S22539	NESW 2 1S4E	Irrigation	.3000 CFS

RECREATION

Park/Recreational Facility: Howard Canyon Creek flows into Big Creek which drains into the Sandy River. Big Creek meets the Sandy River at Camp Collins, a private YMCA camp adjacent to Oxbow County Park. The Sandy flows downstream through Dabney State Park and Lewis and Clark State Park.

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: None

Public Educational Use: None identified

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage Area:

Number of wetlands/ approximate size: Eleven - small to medium size wetlands adjacent to stream.

Flood Storage Capacity: The wetlands provide greater flood storage capacity than the stream channel alone. They are spread out over the length of the stream and will also mitigate flow rates.

Riparian Corridor: see attached table

Average Width: 150 ft

Range of Width: 10-200 ft

Benefit to Water Quality: Present canopy cover is sufficient to increase water quality by maintaining stream temperature and mitigate peak flows.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 100%

Threatened and Endangered Species data: None

Wildlife Habitat Assessment: see attached table

Average score: 55.4

Range of scores: 22-73

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: Howard Canyon

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water:				Food:			Cover:			Additional Values:				TOTAL SCORE
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Howard Canyon Creek	1	8	6	6	4	5	5	3	6	6	3	1	1	3	0	57
Howard Canyon Creek	2	8	6	1	3	1	1	1	1	1	1	0	0	1	0	25
Howard Canyon Creek	3	8	6	0	2	0	1	1	1	1	1	0	0	1	0	22
Howard Canyon Creek	4	8	6	3	2	2	2	2	2	2	2	0	0	1	0	32
Howard Canyon Creek	5	8	6	6	4	5	6	3	6	6	3	2	2	3	0	60
Howard Canyon Creek	6	8	6	7	4	5	7	3	6	6	3	2	2	3	0	62
Howard Canyon Creek	7	8	6	7	5	4	5	3	7	7	3	2	2	3	0	62
Howard Canyon Creek	8	8	6	7	4	6	7	3	6	6	3	2	2	3	0	63
Howard Canyon Creek	9	8	6	6	5	4	6	3	6	5	3	3	3	5	0	63
Howard Canyon Creek	10	8	6	6	4	6	6	3	6	6	3	2	2	4	0	62
Howard Canyon Creek	11	8	6	7	7	7	7	3	7	7	3	2	3	6	0	73
Howard Canyon Creek	12	8	6	6	7	7	7	3	6	6	3	2	2	5	0	68
Howard Canyon Creek	13	8	6	6	6	6	6	3	6	6	3	3	3	5	0	67
Howard Canyon Creek	14	8	6	5	6	6	6	3	4	5	3	3	4	4	0	63
Howard Canyon Creek	15	8	6	4	3	4	4	2	4	4	2	4	4	3	0	52
AVERAGES		8.0	6.0	5.1	4.4	4.5	5.1	2.6	4.9	4.9	2.6	1.9	2.0	3.3	0.0	55.4

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: Howard Canyon

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width of Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Howard Canyon Creek	1	100	100		X		
Howard Canyon Creek	2	0	100	X			
Howard Canyon Creek	3	0	10	X			
Howard Canyon Creek	4	100	10	X			
Howard Canyon Creek	5	100	60		X		
Howard Canyon Creek	6	100	50		X		
Howard Canyon Creek	7	100	60		X		
Howard Canyon Creek	8	100	50		X		
Howard Canyon Creek	9	100	90		X		
Howard Canyon Creek	10	100	50		X		
Howard Canyon Creek	11	100	50		X		
Howard Canyon Creek	12	100	50		X		
Howard Canyon Creek	13	100	70		X		
Howard Canyon Creek	14	100	100		X		
Howard Canyon Creek	15	100	100	X			
AVERAGES		86.7	63.3	27%	73%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

KNIERIEM CREEK
Stream Profile

GENERAL INFORMATION

Location Study Area: Howard Canyon

Length Inventoried: 12,670 ft

Estimate of Total Length - main branch and tributaries in Multnomah County (excludes extensions out of County): 12,670 ft

Area of Watershed in Multnomah County: 1,185 acres

Abutting Land Use Designations (percent of study area stream length):

	Exclusive Farm Use	Commercial Forest Use	Rural Residential
Knieriem Creek	15%	85%	0%

Stream Description:

Knieriem Creek in general is impacted by housing, roads running alongside and lack of cover. Large trees are minimal in the area. The diversity of different water habitats in the sections are low, tending mostly toward runs with few pools and riffles. Substrate is embeddded and consists predominantly of silt. The water is murky and banks show signs of erosion.

Knieriem Creek has two areas of severe impacts to the stream and riparian area. The first two sections, starting at the mouth where Knieriem Creek and Howard Canyon Creek meet, run through pasture. Animals have direct access to stream and there is little or no riparian vegetation. The stream also looks channelized.

The second major area of concern is near the source. There is dense housing for a rural area at the end of Salzman Road off the Crown Point Highway. A private gravel drive leads across the stream. To the east there is stream diversion, ponding and clearing of riparian vegetation.

Section one Knieriem Creek meets Howard Canyon Creek in pasture next to Howard Road. There is no cover and cattle have unrestricted access to stream. Banks show severe signs of erosion and in places stream is channelized.

Section two has pasture and houses alongside the creek. Cover is minimal consisting mainly of willows and Himalayan blackberry brambles. There is a pond adjacent to stream, great blue heron and mallards were sighted there.

Section three has better tree cover than the previous section, still sparse. Wetlands adjacent to streamside. Stream substrate predominantly silt in this section. Banks show some signs of erosion. Some woody debris in stream.

Section three has woody debris in and around stream. Gravels are present but embedded. Wetlands are adjacent to stream. Knieriem Road runs 20-30ft away from stream. Cover is better in this area with some conifers.

Section four similar to section three. Banks show signs of erosion. Cover is still sparse but there are tress and woody material is present in and around stream. Wetlands present both sides of stream.

Section five single family dwelling with much clearing and construction started in this section. Land scraped clean down to stream. There is a gravel road that crosses and continues alongside the stream and up hill. English ivy is present around construction area. Stream heavily silted.

Section six has three noticeable tributaries entering stream. There is housing at downstream and upstream portions of section. Stream itself has more diversity. Riffles are better developed and there are boulders. Banks still show signs of severe erosion. Cover is better, and there is woody debris in and around stream. Wetlands are present but not common.

Section seven has brushy cover with some trees. Pond and better developed wetlands in this section. Some woody debris in stream and snags along riparian area. House and pasture impacts section at downstream beginning.

Section eight similar to sections six and seven. Hillside provides shade and there are more trees in riparian area. Several springs enter creek in this section. Substrate still silty and gravels embedded.

Section nine has grassy road leading down to stream from hill. Hillside has sparse vegetation with possibility of pasture and construction above horizon. Creek extremely turbid. Bank erosion evident. Some tree cover. Silt built up alongside stream. Dominant substrate still silt.

Section ten is transition between nine and eleven. Few conifers and cover is sparse. Water is very silty, noticed abrupt change around 700ft into section where water cleared. Could not locate source of turbidity. Possible construction on hilltop. Bank erosion still evident.

Section eleven is most natural section. Cover is thicker with more sword ferns. There is a footpath that follows creek from gravel road at end of this section down through section eight. Small wetlands adjacent to stream. Man-made pond runs alongside stream for about 120ft and is 30ft wide. Pond receives shade form hillside and trees.

Section twelve highly impacted by housing and construction. Stream has been diverted to make two pond areas. Trees have been cut and riparian area cleared. Segment outside construction area is brushy and substrate is silty. Flow is mostly runs. Banks eroded and covered with silt.

ECONOMIC

DWR Water Rights Data:

Permit Number	Location	Use	Rate/Quantity
15917	NENE 2 1S4E	Irrigation	.8700 CFS
40933	NENE 2 1S4E	Irrigation	.0600 CFS
40933	NENE 2 1S4E	Livestock	.005 CFS

RECREATION

Park/Recreational Facility: Knieriem Creek flows into Big Creek which drains into the Sandy River. Big Creek meets the Sandy River at Camp Collins, a private YMCA camp adjacent to Oxbow County Park. The Sandy flows downstream through Dabney State Park and Lewis and Clark State Park.

EDUCATIONAL

Oregon Natural Heritage Program - significance designation: None

Public Educational Use: None identified

PUBLIC SAFETY

Within a Watershed Management Unit: No

Groundwater Recharge for a Municipal System: No

Flood Storage Area:

Number of wetlands/ approximate size: Five adjacent to stream channel.

Flood Storage Capacity: The wetlands provide greater flood storage then the stream channel alone. They are spread out over the length of the stream and will also mitigate flow rate and reduce erosion.

Riparian Corridor: see attached table

Average Width: 10 ft

Range of Width: 0-160 ft

Benefit to Water Quality: Canopy where it exists is predominantly deciduous - it will mitigate summer temperatures to maintain summer stream temperatures.

NATURAL AREA

Class I Stream Designation:

% of stream within county designated as Class I: 100%

Threatened and Endangered Species data: None

Wildlife Habitat Assessment: see attached table

Average score: 51
Range of scores: 30-72

Essential Connections: N/A

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY STUDY AREA: Howard Canyon

RIPARIAN CORRIDOR

STREAM NAME	SITE NO.	Width of Rip. Corridor*		Extent of Overhead Canopy:			
		Left (ft)	Right (ft)	0–25%	25–50%	50–75%	75–100%
Knieriem Creek	1	0	0	X			
Knieriem Creek	2	10	10	X			
Knieriem Creek	3	60	80	X			
Knieriem Creek	4	100	30	X			
Knieriem Creek	5	50	20	X			
Knieriem Creek	6	80	50	X			
Knieriem Creek	7	80	60	X			
Knieriem Creek	8	60	60		X		
Knieriem Creek	9	50	80	X			
Knieriem Creek	10	40	80	X			
Knieriem Creek	11	80	80	X			
Knieriem Creek	12	80	40	X			
AVERAGES		57.5	49.2	92%	8%	0%	0%

*Width of riparian corridor in feet (in segment) looking downstream.

MULTNOMAH COUNTY SIGNIFICANT STREAMS STUDY

STUDY AREA: Howard Canyon

WILDLIFE HABITAT ASSESSMENT

STREAM NAME	SITE NO.	Water: A	B	C	D	Food: E	F	G	Cover: H	I	J	Additional Values: K	L	M	N	TOTAL SCORE
Knieriem Creek	1	8	6	1	2	1	4	3	1	1	3	0	0	1	0	31
Knieriem Creek	2	8	6	5	4	3	3	3	3	2	3	0	0	2	0	42
Knieriem Creek	3	8	6	6	4	5	5	3	5	4	2	2	2	3	0	55
Knieriem Creek	4	8	6	5	4	5	5	3	5	5	3	1	1	3	0	54
Knieriem Creek	5	8	6	6	5	6	6	3	3	3	2	0	0	2	0	50
Knieriem Creek	6	8	6	5	6	6	6	3	6	6	3	2	2	3	0	62
Knieriem Creek	7	8	6	5	6	4	4	4	6	6	3	2	2	4	0	60
Knieriem Creek	8	8	6	6	4	5	6	3	5	5	3	3	3	4	3	64
Knieriem Creek	9	8	6	4	4	3	3	3	4	3	3	2	2	3	0	48
Knieriem Creek	10	8	6	4	3	4	3	3	2	2	3	3	3	3	0	47
Knieriem Creek	11	8	6	7	8	7	7	3	6	6	3	3	3	5	0	72
Knieriem Creek	12	8	6	2	2	2	2	3	1	1	2	0	0	1	0	30
AVERAGES		8.0	6.0	4.7	4.3	4.3	4.5	3.1	3.9	3.7	2.8	1.5	1.5	2.8	0.3	51.3

APPENDIX B

RESPONSE TO COMMENTS

1. **ISSUE:** The impact area for the three streams in the Howard Canyon area is not precisely defined, and does not include areas outside of the riparian zone.

   ISSUE RAISED BY: Klaus Heyne

   DISCUSSION:

   The impact area is defined as the riparian zone along each stream. The average, minimum, and maximum width of each stream's riparian zone is contained within the report. A discussion of the existing condition of the impact area/riparian zone is contained within the Stream Profile information in the Technical Report.

   The impact area was limited to the riparian zones along each stream in order to make the report manageable in the time allotted for its completion. Impacts to streams beyond the riparian zone are much reduced, and unless practiced at a large scale are in fact negligible. The only such significant potential impact within the watershed of these streams comes from the Howard Canyon Quarry proposal, which is discussed in a separate Resource Analysis Report. This report includes discussion of the consequences of protecting the mineral and aggregate site for the streams, and the consequences of protecting the streams upon the mineral and aggregate site. To include that information in this report as well is superfluous.

   RESPONSE:

   Staff believes that the Resource Analysis Report adequately defines the impact area for these streams -- a precise map (at what scale?) as opposed to a narrative definition is not required. The only identified impact outside of the riparian zone, the proposed Howard Canyon Quarry, is discussed in the report on that site.

2. **ISSUE:** The stream survey inventoried only portions of each creek, does not indicate whether summer and winter conditions on the creeks vary, and did not include any surveys for fish.

   ISSUE RAISED BY: Klaus Heyne, Paul Hribernick

   DISCUSSION:

   The survey of the Howard Canyon streams inventoried 63% of Howard Canyon Creek (omitting a survey of its upper two tributaries) and 85% of Big Creek (omitting a survey of its lower reaches below the 90-foot waterfall). The remainder of Howard Canyon Creek was not surveyed because of lack of time -- the time spent on the survey was used on the more critical downstream reaches of the creek to the south of the proposed quarry site.

The area below the waterfall on Big Creek was not surveyed because of a lack of access to the area below the falls, and a lack of time to negotiate an accessway to survey this portion of the stream.

The survey was conducted in February and March of 1994. These are indicative of winter conditions on the streams. The LCDC timeline for this project did not permit for a survey of summer conditions.

The profiles do not include specific information on fish in the streams because, 1) detailed information on fish is not directly necessary in order to make a significance determination regarding the fish & wildlife habitat criteria of Comprhensive Framework Plan Policy 16-G, and 2) the time and expense of conducting fish surveys were beyond the scope or timeline of this project.

RESPONSE:

While more information on any subject is always welcome, what Goal 5 requires is that the local jurisdiction gather sufficient information to make a significance determination. Staff believes that sufficient information has been gathered to make a significance determination for Big Creek, Howard Canyon Creek, and Knierem Creek.

3. **ISSUE:** The significance determination does not contain sufficient or adequate information on the relative quality of the streams in the Howard Canyon area.

ISSUE RAISED BY: Klaus Heyne, Paul Hribernick

OAR 660-16(003) states that a determination of quantity and quality "requires some consideration of the resource site's relative value, as compared to other examples of the same resource in at least the jurisdiction itself." Unfortunately, Multnomah County has not yet conducted a detailed inventory of other streams in the east portion of the County. This inventory will be conducted during the preparation of the East of Sandy River Rural Area Plan, scheduled for the 1994-95 fiscal year.

In the absence of this detailed information, and required by the Land Conservation and Development Commission to make a significance determination on the Howard Canyon area streams at this time, the significance report contains the best available comparative information for these streams. Comparative information is available only in terms of Department of Forestry identification of other Class 1 streams in East Multnomah County and a specific report compiled for Gordon Creek by the East Multnomah Soil and Water Conservation District. Also, information is available on streams in the West Hills area of Multnomah County.

RESPONSE:

The revised significance report contains additional information on the relative quality and quantity of the Howard Canyon streams, comparing them to West Hills and Sauvie Island

streams, and incorporating comparative information available on Gordon Creek. However, a detailed stream inventory for all streams in East Multnomah County will not be completed work on the East of Sandy River rural area plan is underway.

4. **ISSUE:** The conflicting use impacts section of the Resource Analysis Report does not mention the potential impacts of runoff and turbidity into a stream from mining activities and omits negative impacts for Big Creek from mining activities.

   ISSUE RAISED BY: Klaus Heyne

   DISCUSSION:

   Mining activities can impact streams in terms of runoff and turbidity. While Big Creek would not be directly affected by the Howard Canyon Quarry operation in terms of loss of wildlife habitat and riparian vegation, water quality could be impacted by unregulated discharge from the quarry operation.

   RESPONSE:

   The revised resource analysis report will include this statement. The matrix has been amended to include mining impacts to Big Creek.

5. **ISSUE:** The Resource Analysis Report is biased towards mining in that it suggests mining impacts to streams can be mitigated without offering similar mitigation measures for other impacts (forestry, residential, etc.)

   ISSUE RAISED BY: Klaus Heyne

   DISCUSSION:

   The report discusses (briefly) the regulatory context in which potential mining impacts to streams are regulated by the Department of Environmental Quality and the Department of Geology and Mineral Industries. If these departments properly implement their regulations, such impacts can indeed be minimized. However, the statement is conclusory.

   RESPONSE:

   The revised Resource Analysis Report amends this statement to take out its conclusory nature.

6. **ISSUE:** The report fails to consider the considerable social and economic impact a commercial quarry operation would have on surrounding residences.

   ISSUE RAISE BY: Klaus Heyne

   DISCUSSION:

The issue of social and economic impacts of a commercial quarry operation upon existing residences is an issue which is properly considered in the Resource Analysis Report for the Howard Canyon Quarry site, not the streams report.

RESPONSE:

No change to the Streams Resource Analysis Report is necessary.

7. **ISSUE:** The Resource Analysis Report generalizes potential conflicts, but does not thoroughly relate these conflicts to conditions on the ground.

ISSUE RAISED BY: Steve Oulman

DISCUSSION:

The Howard Canyon Resource Analysis Report contains summary information on each of the three streams, Big Creek, Knierem Creek, and Howard Canyon Creek. Since a large number of streams are being inventoried and analyzed, the report creates summary tables which may give the appearance of over-generalization. In fact, the preparers of the report have determined that there differentiations between the conflicting uses on each particular stream are in fact minor or non-existent. Multnomah County is not required by Goal 5 to invent individuality for each stream if such individuality does not in fact exist.

RESPONSE:

Staff does not believe that the Resource Analysis Report needs significant revision in order to create more detail which in fact is not justified.

8. **ISSUE:** The study assumes that mining will occur in the creeks. The Howard Canyon quarry site is not within any of the creeks.

ISSUE RAISED BY: Paul Hribernick

DISCUSSION:

The report discusses direct mining impacts to creeks when the mine is located within the stream channel, but does not discuss impacts from mines which may be up-slope from the stream channel.

RESPONSE:

The report has been amended to discuss impacts to streams from up-slope mining activities and the report notes that the Howard Canyon Quarry is located up-slope from both Knierem and Howard Canyon Creeks.

APPENDIX C

SAMPLE WILDLIFE HABITAT ASSESSMENT FORM

MULTNOMAH COUNTY SIGNIFICANT STREAMS
SRI/SHAPIRO
RIPARIAN WILDLIFE HABITAT ASSESSMENT*

SITE NUMBER 2	TOTAL HABITAT SCORE AS EXISTING 24	POTENTIAL HABITAT SCORE IF ENHANCED	TOTAL ACRES
SITE LOCATION Burlington	FIELD DATES 03/08/94	FIELD OBSERVERS BAH ADL	

GENERAL COMMENTS Continues through clear cut. Stream slopes become less steep. Stream bed widens - Rd bed crosses stream 48-52" culvert. Fill 100-200' wide & 100' high

Tree Ø

Shrubs - Salmonberry, vine maple, occ. Willow and red osier dogwood

g.c. Rushes

CWD - small diameter 2-6" abundant. 18" low 1 lg Doug Fir snag upslope

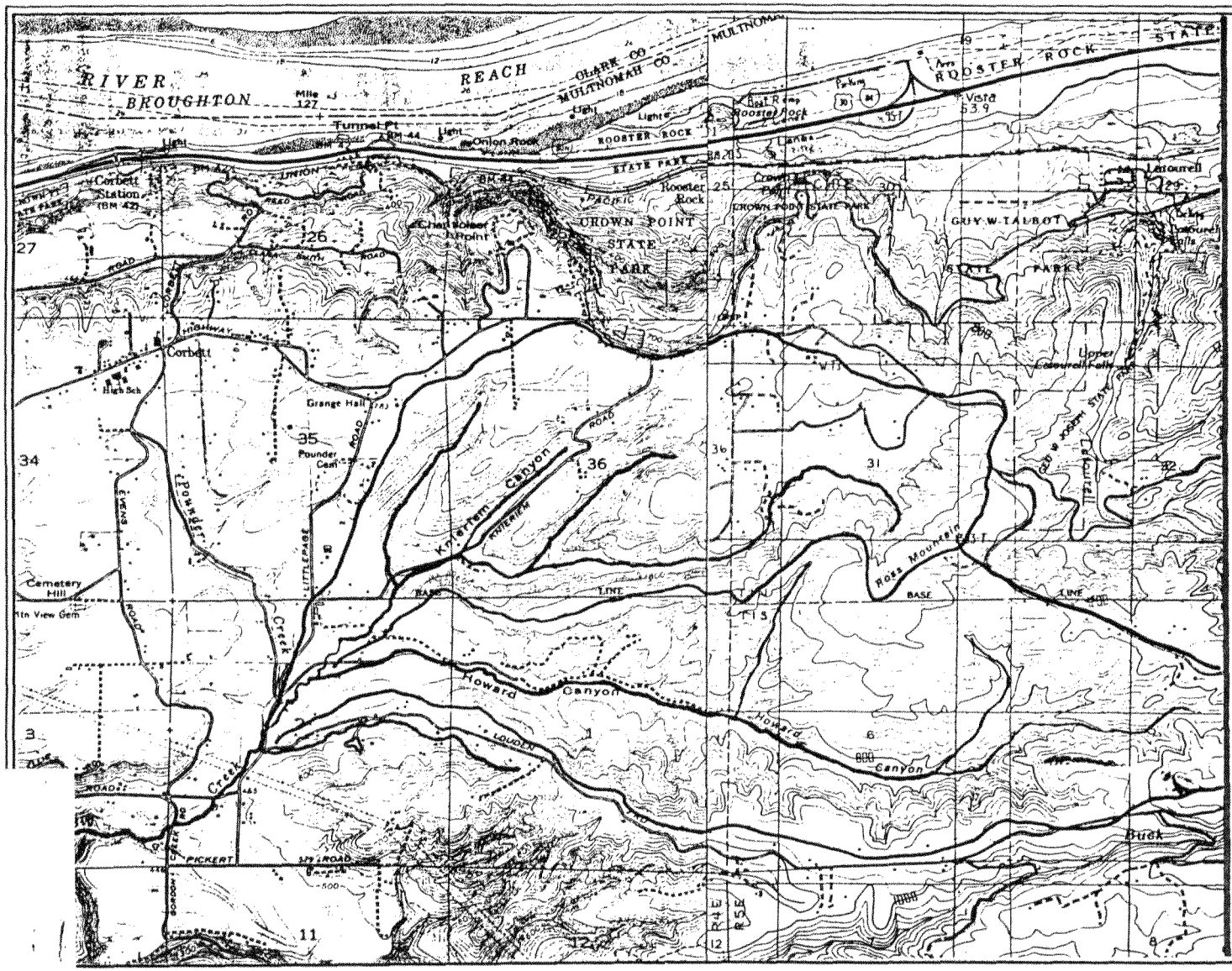
Pair of red tails seen hunting

	COMPONENT	DEGREE	SCORE	COMMENTS
WATER	Seasonality	Seasonal 4 — Perennial 8	4	U.S.G.S
	Quality	Stagnant 0 — Seasonally Flooded 3 — Continually Flushed 6	3	
	Proximity to Cover	None 0 — Nearby 4 — Immediately Adjacent 8	Ø	
	Diversity (Streams, Ponds Wetlands	One Present 2 — Two Present 4 — Three Present 8	2	
FOOD	Variety	Low 0 — Medium 4 — High 8	3	
	Quantity	Low 0 — Medium 4 — High 8	3	
	Seasonality	None 0 — Limited 2 — Year Round 4	1	
COVER	Structural Diversity	Low 0 — Medium 4 — High 8	1	
	Variety	Low 0 — Medium 4 — High 8	2	
	Seasonality	None 0 — Limited 2 — Year Round 4	1	

ADDITIONAL VALUES

Disturbance	Physical	High 0 — Medium 2 — Low 4	0	CC Power line, Road's
	Human	High 0 — Medium 2 — Low 4	4	
Interspersion		Low 0 — Medium 3 — High 6	0	
Unique Features -4 points each		Wildlife ____ Flora ____ Rarity of Habitat Type	0	

*Developed with the assistance of Mike Houck, Portland Audubon Society, Ralph Rogers U.S.E.P.A., Dennis Peters & Diana Hwang, U.S. Fish & Wildlife Service, Gene Herb Oregon Dept. of Fish & Wildlife, Esther Lev, Biological Consultant



Significant Streams Study
for
Multnomah County

HOWARD CANYON
AREA

LEGEND

- Water rights permit
- Study area boundary
- Watershed boundary
- Stream segment inventoried

NORTH

0 2000 4000
FEET

Base map from U.S.G.S. 7.5-minute quadrangles (Linnton, Sauvie Island, Portland, Hillsboro, and Dixie Mountain)

7935258 March 1994

FIGURE

SMI/SHAPIRO

CHAPTER III

HOWARD CANYON AGGREGATE RESOURCE

Mineral and Aggregate Inventory Site #8

C 2-94

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A. AGGREGATE RESOURCE SIGNIFICANCE DETERMINATION

1. BACKGROUND

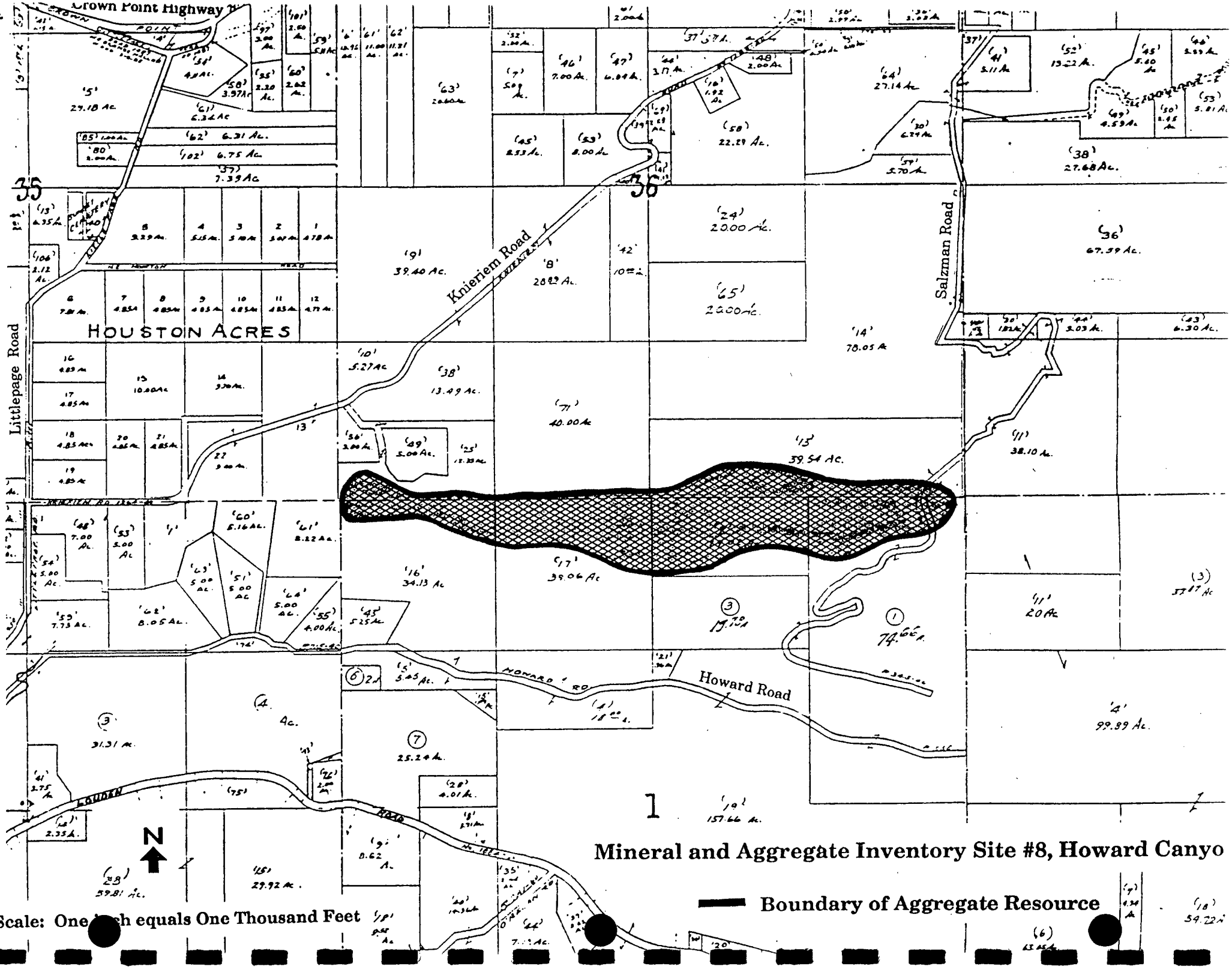
This first portion of this revised analysis is the determination of significance. The procedure for this determination is given in Oregon Administrative Rules (OAR) 660-16-000 (1) through (5). The rule directs the local government to determine whether there is sufficient information on the location, quality and quantity of the resource at a particular site. Then, based on that evidence, the local government must decide if the site is significant. The County's Comprehensive Plan will then reflect that conclusion. The prior determination of significance for this site was adopted on March 27, 1990 and concluded that the Howard Canyon site was significant and the site was included in the significant (important) site inventory. The following significance determination report is a redraft of the 1990 analysis to more closely follow the administrative rule requirements.

2. LOCATION

This aggregate resource is a cleared ridge top which runs in an east-west orientation along the section line between Section 36, Township 1 North, Range 4 East and Section 1, T. 1 S., R. 4 E., WM. The resource is a Boring Lava Formation that comprises the ridge between Knieriem / Ross Creek on the north and Howard Canyon Creek on the south. The formation covers portions of tax lots 25, 71, and 13 in Section 36 and tax lots 16, 17, 2 and 1 in Section 1.

The extent of the resource is shown on a map submitted by the property owner and confirmed by 31 test pits dug by both the property owner and the consulting firm of H. G. Schlicker & Associates, Geologists and Engineers. Maps in this Goal 5 report have been prepared by County staff, but are based upon the map submitted by the property owner. The location of the test pits are shown on the property owner's map and on a map in the appendix of a January 9, 1989 report entitled "Geologic Reconnaissance, Howard Canyon Quarry, East Multnomah County, Oregon," Project #88-416, prepared by H.G. Schlicker & Associates, Inc., Geologists and Engineers, 235 NE 122nd Avenue, Suite 315 [now 300], Portland, Oregon, 97230. The 22 page Schlicker report is incorporated in it's entirety by reference as findings. That report did not map the boundary of the resource, only the location of the test pits. The westernmost test pit, as shown on the Schlicker report test pit map, is actually about 700 feet from the western boundary of the resource as drawn on the property owner's map. Except for the exact westerly extent of the resource, Multnomah County accepts and believes the aggregate resource location information cited. However, lacking any conflicting information, the property owner's boundary will be used for this Goal 5 analysis.

The geologic process that resulted in this ridgetop formation occurred from basalt lava pouring from boring vents into and filling stream valleys that existed about 2 million years ago. Since that time streams have cut new channels and valleys into the softer "Troutdale Formation" that is between the lava filled valleys. As a result, the former valleys are today's ridge tops (page 2, Schlicker, 1/9/89).


Crown Point Highway
Knieriem Road
Salzman Road
Littlepage Road
Howard Road
HOUSTON ACRES
35
36
Mineral and Aggregate Inventory Site #8, Howard Canyo
Boundary of Aggregate Resource
Scale: One inch equals One Thousand Feet
N

The basalt lava resource occupies the upper 50 feet or more of the ridge crest and is more than 4,200 feet long and more than 350 feet in width. The width of the whole ridge, (not just the lava), is approximately 700 feet. The ground surface at the top ranges in elevation from 780 feet to 860 feet above sea level. On page one of a December 8, 1986 "Report of On-Site Inspection," (site ID #26-0065), written by E. Frank Schnitzer, Reclamationist with the Department of Geology and Mineral Industries, it was reported that the slopes off of the ridge range from 50 to 90 percent. Access to the resource area is by private drives connecting with Knieriem Road on the north side of the ridge and connecting with Howard Road on the south side.

The Howard Canyon aggregate resource is located just north of the approximate geographic center of the unincorporated area of the County that is between the City of Gresham on the west and the National Forest on the east. There is no other aggregate site in unincorporated East Multnomah County with the required Goal 5 OAR location, quantity and quality information available.

The Boring Lava geologic unit is not uncommon in Multnomah County. In the area east of the Sandy River to the National Forest, Boring Lava (basaltic flows, cinders and tuffs) is the predominant geologic unit in area covered, (Geologic Map, Figure 5, "Geologic and Slope Hazard Maps, Unincorporated Multnomah County, Oregon," Shannon & Wilson, Inc., Geotechnical Consultants, September, 1978). What is not known about these locations is the depth of overburden, quality of the rock, and the extent of the quality rock.

Unlike other operating quarries in Multnomah County, such as the Angell Brothers site and nearly all urban locations, direct access to the Howard Canyon quarry is only from local roads instead of collector, major collector, or arterial streets.

The closest operating aggregate quarries are in the City of Gresham, located in the vicinity of SE 190th Avenue between SE Division and SE Yamhill Streets (Gresham Sand and Gravel, Rogers Construction, and Multnomah County Public Works). There is no current information on the quantity of the aggregate resource remaining at these sites. The sites are all zoned Heavy Industrial under the jurisdiction of the City of Gresham. Urban land uses, including residential, commercial, and industrial, surround and abut the resource sites. Under the present zoning, it appears that the sites are at some risk of conversion to non-mining land uses before depletion of the resource if the value of the properties for industrial uses exceed the value of the aggregate resource.

3. QUANTITY

On page three of the January 9, 1989 Schlicker report it reads:

> Quantity
>
> The basalt occupies the upper 50 feet or more of the ridge crest except for the thin Loess overburden. The ridge rock deposit is more than 4200 feet

long and 350 feet wide and contains at least 33 acres of ground. The volume of rock in place is then (4200' x 350' x 40') / 27 = 2,177,778 cu yards. When rock is crushed it expands about 25% therefore the deposit will produce more than 2.7 million tons of crushed basalt.

Because the lava is believed to occupy an old stream valley and the center of the valley should be much deeper, the deposit should be thicker than it appears and an estimate of an additional 30% of rock is not unreasonable. This additional rock would bring the total to 3.5 million tons. ...

On page one of the same report it was stated that the 31 test pits that were dug showed that, on average, there was a little over seven feet of overburden on top of the rock. The top two feet of the rock is highly weathered and is considered to also be overburden (page three). These two depths are conservatively added together to total ten feet of overburden.

At the time of the Schlicker report there had not been any drillings to determine the depth of the resource. However, from the rock exposures in the existing quarry face and the geologic knowledge of this formation there is confidence in the continuity of the resource depth across the ridgetop.

The above cited DOGAMI on-site inspection report of December 8, 1986 notes that at that time of the inspection the DOGAMI Reclamationist also believed the layer of hard rock to be approximately 40 feet thick. The report is incorporated by reference as findings.

Multnomah County accepts the above as sufficient findings in determining the quantity of aggregate material at the resource site.

There is only one other aggregate site in unincorporated Multnomah County for which there is sufficient information on quantity to meet Goal 5 OAR requirements. That site is the Angell Brothers Quarry which is located west of the City of Portland. Angell Brothers is estimated to contain approximately 220 million cubic yards of very good aggregate material (see the Resource Significance Determination portion of the chapter on Angell Bros. in the "West Hills Reconciliation Report"). In comparison with the quantity of aggregate at the Angell Brothers site, the Howard Canyon site is small. However, the 2.2 million cubic yards at Howard Canyon is the only aggregate resource site in unincorporated East County for which the quantity of material has been verified. Therefore, it is Multnomah County's determination that an amount of material in the millions of cubic yards, although so much smaller than the site on the other side of the County, is difficult to deny as being significant, especially in light of the lack of information on other sites.

Multnomah County Comprehensive Framework Plan Policy 16–B (effective at the time of this report) states, "Determination that a particular mineral and aggregate site is both *Important* and should be included in the plan inventory is to be based on the site's proven ability to yield more than 25,000 cubic yards of resource." Therefore, this site with a reserve of over 2 million cubic yards is significant by the Comprehensive Plan criteria.

The closest operating aggregate quarries, located in the City of Gresham, are the Gresham Sand and Gravel, Rogers Construction, and Multnomah County Public Works. What information that is known on the quantity of aggregate resource at these sites is from a 1978 publication from the State of Oregon Department of Geology and Mineral Industries. The publication is titled "Special Paper 3, Rock Material Resources of Clackamas, Columbia, Multnomah, and Washington Counties, Oregon" and the authors are Jerry J. Gray, Garwood R. Allen, and Gregory S. Mack. On Table 5 of the publication, the 1978 estimate of "future potential" production was: 230,000 cubic yards on the Multnomah County property (which now contains the Yeon Shops, main offices and maintenance facilities for the Division of Transportation); 1,200,000 cubic yards on the Gresham Sand and Gravel property; and 4,000,000 cubic yards on the Rogers Construction property. Tables 5 and 11 are incorporated by reference as findings. In consideration of the 16 years of extraction that have taken place since the 1978 DOGAMI publication and the questions about future availability of these sites raised in the previous section, it is difficult to compare the quantities of aggregate available at these City of Gresham sites with the quantity available at the Howard Canyon site.

4. QUALITY

The January 9, 1989 Schlicker report states on page three:

> Quality
>
> Exposures in the existing quarry face show the basalt to be columnar jointed and thinly weathered. Beneath the thin weathering scale the rock is hard and fresh. ... Tests show the partially weathered rock to make satisfactory base rock. The harder fresh rock can be used for oil and topping. ...
>
> In addition to crushed rock, the site can produce high quality rip-rap. This material is scarce and after major floods is in short demand.

A December 13, 1988 letter from Gary Fielding, (Senior Technician with Rittenhouse-Zeman & Associates, Inc., Geotechnical & Hydrogeological Consultants, 8050 SW Cirrus Drive, Beaverton, Oregon, 97005), to Raymond Smith, Corbett, Oregon, reads in part:

> This letter presents the results of laboratory testing of rock sampled from the subject location. The purpose of this test was to determine the suitability and quality of the rock products for use in construction as defined by the Oregon State Highway Division (OSHD). The test was performed in general accordance with the American Standard for Materials and Testing (ASTM), test designation C-535, Resistance to Abrasion of Large Size Course Aggregate by use of the Los Angeles Machine.
>
> Based upon the above test results, it is our opinion this rock meets OSHD's specifications for Base Aggregate.

Attached to Mr. Fielding's letter to Mr. Smith is a letter, dated the same date, to Mr. Fielding from a Dennis Cody, Supervisor of Field Operations, with Northwest Testing Laboratories, Inc., 5405 N. Lagoon Avenue, Portland, Oregon, 97217. This one page report, (number 86679), stated in part:

> Subject: Abrasion test performed one (1) aggregate sample 12-12-88
> Item: Howard Canyon Pit
>
> Results:
>
> Abrasion: ASTM C-535 Grading #3
>
> % Wear 32.7%
> Spec: OSHD 703.07 (base aggregate) ..... 35 max.

Multnomah County believes that the Oregon State Highway Department specifications are a valid test of the quality of a significant aggregate resource. In the test cited above, by use of a "Los Angeles Machine" abrasion test the Highway Department specifications require that the percent of wear in the test cannot be more than 35 percent. The percent wear from the Howard Canyon sample was 32.7 percent.

There is only one other aggregate site in unincorporated Multnomah County for which there is sufficient information on quality to meet Goal 5 OAR requirements. That site is the Angell Brothers Quarry, west of the City of Portland. The test results for rock at the Angell Brothers site were 12.2 percent and 15.0 percent loss or wear in the "Los Angeles Machine" abrasion test. These results demonstrate that rock from this site is harder and better for many uses than the rock at the Howard Canyon site.

For the aforementioned sites in the City of Gresham, Table 11 of the 1978 DOGAMI publication lists the following quality information on the percent loss by test in the "Los Angeles" machine: 20.0 - 23.6 percent for rock from the Multnomah County property (essentially depleted and converted to other land uses); 15.5 - 23.3 percent for rock from Rogers Construction; and no information for rock from Gresham Sand and Gravel.

The quality of the aggregate from the Howard Canyon site is less than the one other site in unincorporated Multnomah County and is less than the closest sites in the City of Gresham. However, the Howard Canyon resource is significant when the following is considered: the aggregate does meet the State of Oregon Highway Department wear requirements, the site is the only one in unincorporated East Multnomah County with sufficient known information on quality of the resource, and there is some uncertainty regarding future production potential from the City of Gresham sites.

5. SIGNIFICANCE CONCLUSIONS

This site is a significant Goal 5 Mineral and Aggregate resource site based upon the above description of the location, quantity and quality.

B. AGGREGATE RESOURCE ANALYSIS

1. DESCRIPTION OF THE RESOURCE

a. Summary of Statewide Planning Goal 5 Administrative Rules

Goal 5 requires local governments to inventory certain natural resources and develop programs to protect the resources that are determined to be significant. The Howard Canyon aggregate resource was determined to be significant in the preceding section A "Significance Determination." This Resource Analysis section is the second portion of the revised Goal 5 work on the Howard Canyon aggregate resource. The requirements for this analysis are given in OAR 660-16-005 and 660-16-010. An additional guide in the process is a May, 1990 technical bulletin entitled "Planning for Mineral and Aggregate Resources Under Statewide Planning Goal 5" by the Oregon Department of Land Conservation and Development (DLCD).

This section will address the part of the administrative rules which direct the local government to: (1) identify land uses which would conflict with the resource, (2) analyze the economic, social, environmental, and energy consequences of allowing, limiting or prohibiting the mining and the conflicting uses, and (3) determine the level of protection for the resource. The last task, the determination of the level of protection will not be fully resolved in this section B, but will be concluded in Chapter IV which will also include other Goal 5 resources.

b. Site Description

This aggregate resource is a cleared ridge top which runs in an east-west orientation along the section line between Section 36, Township 1 North, Range 4 East and Section 1, T. 1 S., R. 4 E., WM. The resource is a Boring Lava Formation that comprises the ridge between the canyons of Big Creek and Knieriem/Ross Creek on the north and Howard Canyon on the south. The formation covers portions of tax lots 25, 71, and 13 in Section 36 and tax lots 16, 17, 2 and 1 in Section 1. The extent of the resource is shown on a map submitted by the property owner and confirmed by 31 test pits dug by the applicant and the consulting firm of H. G. Schlicker & Associates, Geologists and Engineers.

The geologic process that resulted in this ridge top formation occurred from basalt lava pouring from boring vents into and filling stream valleys that existed about 2 million years ago. Since that time streams have cut new channels and valleys into the softer "Troutdale Formation" that is between the lava filled valleys. As a result, the former valleys are today's ridge tops.[1]

The basalt lava resource occupies the upper 50 feet or more of the ridge crest and is more than 350 feet in width. The width of the entire ridge is approximately 700 feet and the ground surface ranges from 780 feet to 860 feet in elevation. Access to the

resource area is by two private drives, one connecting with Knieriem Road on the north side of the ridge and one connecting with Howard Road on the south side.

c. Existing and Anticipated Mining Activities

(i) Existing Mining Activities. The following description of the existing mining activities at the Howard Canyon site is from a site inspection report written by Allen H. Throop, Reclamationist with the Oregon Department of Geology and Mineral Industries (DOGAMI):

> This inspection was conducted to determine if this site remains qualified for a Grant of Total Exemption. The total exemption remains valid until such time as commercial production exceeds 5,000 cubic yards per year.
>
> ... The site was active at the time of the visit. Two locations are being worked. The biggest disturbance is a two-acre area near the northeast corner of Section 1. Approximately one acre is an extraction area of diced basalt. The other acre has been used to store overburden which has been stripped off of the basalt. Mr. Muck was ripping some of this basalt for later crushing at the time of this visit. According to the owner and operator, most of the crushed material is used on-site for the logging road construction on contiguous parcels owned or being logged by Mr. Muck. Such production is exempt from the 5,000 yard limit under on-site construction exemption.
>
> The second site being actively mined is an outcrop of columnar basalt a few hundred yards to the southwest of the first site. This is being mined with a back hoe and loader. Large rocks are being hauled from the site for use as rip rap. According to Mr. Muck, less than 5,000 cubic yards will be produced for this job and other commercial sales within a 12-month period. The 5,000 yard limit would apply to overburden hauled from the site as well as the rock that is removed.
>
> As long as commercial production remains below the 5,000 cubic yard limit, no permit is needed from this department and the Grant of Total Exemption remains valid. However, prior to the time when the 5,000 cubic yard for a 12-month period level is exceeded, a full Operating Permit complete with reclamation plan and bond is required. This would also be required should commercial mining expand the pit such that over one new acre is affected during a year or a total of five acres are affected. There is no evidence that these thresholds have ever been exceeded.[2]

(ii) Anticipated Future Mining Activities. A mining plan at this stage in the Goal 5 process is not required and no detailed mining plans have been submitted to

DOGAMI or the County. In a 1987 application to Multnomah County for Conditional Use approval of an expanded three acre commercial operation, the proposed mining was described at that time as follows:

> The applicant has leveled out a platform below the rock face on which are now located a rock crusher, trailer and a large shovel. ... The proposal is to remove the soil overburden (about one and one-half to five feet) on the grass ridge top and then cut into the face of the rock cliff in one-half acre cells. ... The proposal would result in a lower ravine in the middle of the east/west hill top.[3]

In a 1986 inspection report from a DOGAMI reclamationist, a brief appraisal of the anticipated mining that might take place under a full operational DOGAMI permit reads in part:

> Mining and reclamation at this remote site will involve scalping the topsoil material, and then removing the layer of hard rock which is approximately 40' thick. The Troutdale Formation is present under the mineable rock deposit. After mining the topsoil material will be placed back over the leveled mine area. It is planned that the mined area will be planted to Christmas trees and/or grasses. The slopes off of this ridge range from 50 to 90 percent. The sideslopes are thickly vegetated with red alder, vine maple, big leaf maple, cottonwood and willows. The trees along the sideslopes will be left intact for visual screening.
> ...
>
> There are no drainages, springs or sweeps which would be affected by this operation as it is a hilltop removal project. ...
>
> The rock deposit should be easy to reclaim providing the topsoil resource is properly stored and then replaced over the mine area. Once an adequate area is opened up for mining, which will be approximately five acres, topsoil stripped from the expansion areas will be directly reapplied to the mined out pit.[4]

2. IMPACT AREA

Identification of an impact area surrounding the resource is required by OAR 660-16-000(2). The impact area is the area in which specific conflicting uses may adversely affect the resource. However, aggregate resources, which are "protected" for eventual extraction, are different from other Goal 5 resources in this part of the analysis. Not only must the impact area include an area that includes uses that could adversely affect the resource, but the impact area must also encompass those land uses which could be affected by the presence of the aggregate resource (expected extraction activities).

The description of the impact area for this resource falls into two categories. The first impact area is a mapped distance surrounding the entire known aggregate resource. The second impact area is a description of specific points and segments in the transportation network of East Multnomah County.

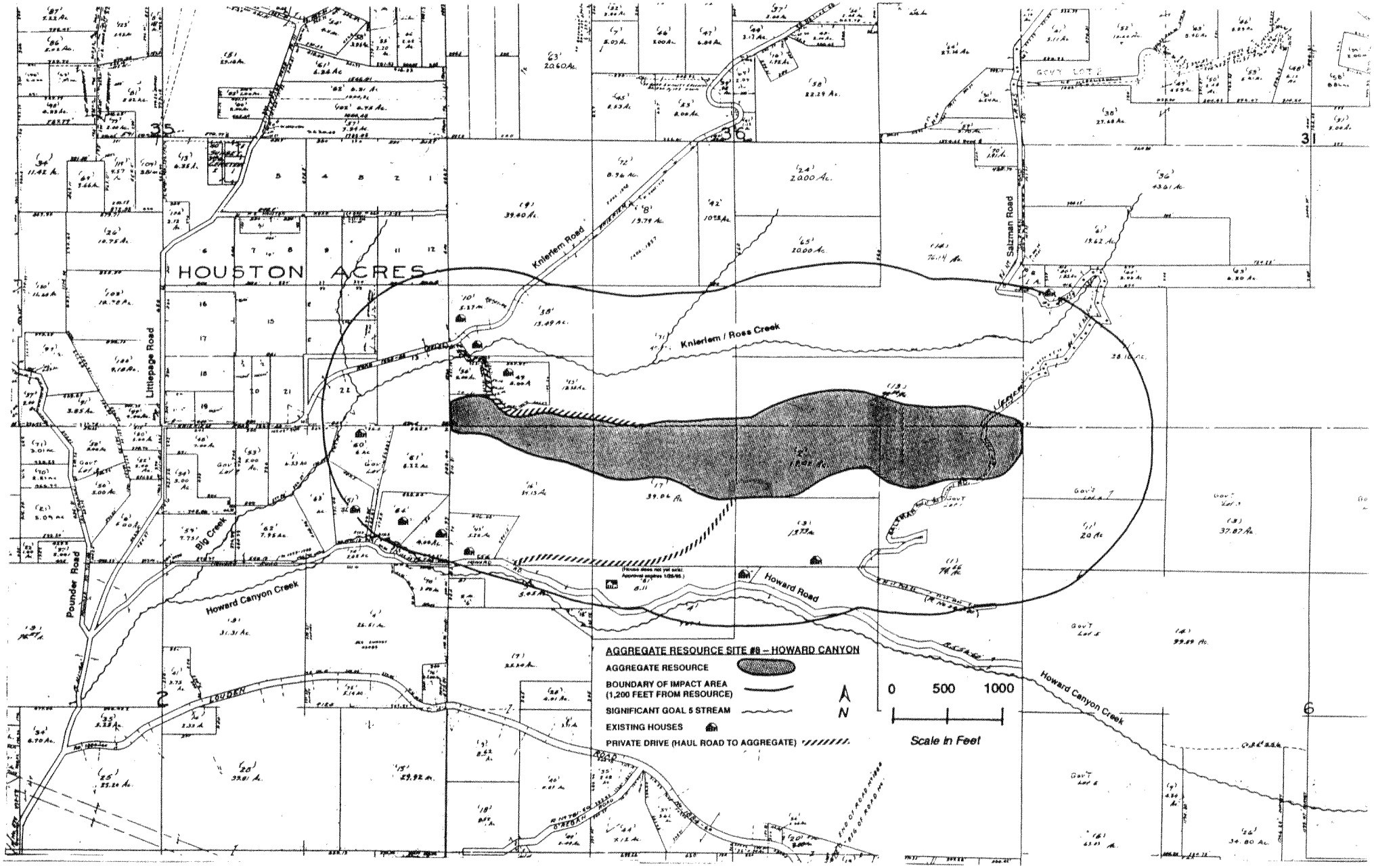
a. Impact Area Description

In the process of mapping an impact area for an aggregate resource a very important consideration must be in the forefront: the larger the area, the more properties that will receive restrictions on future permitted future land uses if the aggregate site is, in the later stages of the Goal 5 analysis, determined to meet the standards for protection. Therefore, an impact area that extends farther than the distance in which conflicts will actually occur, results in unnecessary development restriction on some property owners.

Noise, dust, and blasting associated with extraction and processing of aggregate resources may adversely affect surrounding land uses. Conversely, complaints expressed by surrounding property owners about those effects, as well as complaints about visual concerns and traffic may influence how aggregate is mined. In addition, there are Goal 5 inventoried "Significant Streams" to the north and south of the subject aggregate resource for which extraction and processing activities may conflict. To address these potential impacts, Multnomah County believes that an impact area of 1,200 feet is appropriate.

A noise assessment study of this site, prepared for the aggregate property owner, has been submitted to the County. At seven different distant locations, predictions of noise levels were made based upon the mining equipment located in the center of the resource on both the north and south sides. Typical mining equipment sound levels used in the test were those for a dozer, front end loader, jaw crusher, screens, cone crusher, and generator set. At receiver point number 4 the sound level, without any mitigation methods such as berms, exceeded the DEQ noise standard. At receiver point number 5 the sound levels, again without berms, did not exceed the DEQ noise standard.[5] Using the scale shown on a map within the report, County staff has estimated that the distances between the noise source and the receiving points were about 1,000 feet for number 4 and about 1,200 feet for number 5. The 1,200 foot distance is thus determined to be valid estimate of the range of noise conflicts because it is the distance in which DEQ standards could be met without berms – a distance greater than necessary if berms were in place. Noise from blasting was addressed in a subsequent March 13, 1990 addendum to the February 19, 1990 noise study by the same consultant. The report concluded:

> We have found at other quarry sites similar in layout to that at Howard Canyon that blasting related sound can be reduced effectively by using berms. If a berm were located around the initial start-up area to barrier residences to the south, blasting noise could be reduced to meet DEQ standards at all residences. Once the quarry operation is moved into the


HOUSTON ACRES
Knieriem Road
Knieriem / Ross Creek
Littlepage Road
Salzman Road
Pounder Road
Big Creek
Howard Canyon Creek
Howard Road
LOUDEN ROAD
AGGREGATE RESOURCE SITE #9 – HOWARD CANYON
AGGREGATE RESOURCE
BOUNDARY OF IMPACT AREA (1,200 FEET FROM RESOURCE)
SIGNIFICANT GOAL 5 STREAM
EXISTING HOUSES
PRIVATE DRIVE (HAUL ROAD TO AGGREGATE)
N
0 500 1000
Scale in Feet

mountain, the natural barrier provided by the rock formation will be adequate to insure DEQ standards are met at all residences without the need for a man-made barrier.

State DEQ noise standards do not apply to trucks engaged in interstate commerce but would apply to trucks and equipment that were permanently on-site during extraction and processing activity. For a further justification of the impact area chosen see section C.2.b.

The 1,200 foot distance also includes the drainages from the aggregate resource area down to the Howard Canyon Creek, Big Creek, and Knieriem/Ross Creeks. The 1,200 foot distance includes all three creeks at least in part. The stream lengths that fall within the impact area are sufficient to to address all conflicts that could occur between the aggregate resource and the stream resources – any erosion problem into one portion of the stream is also a conflict downstream.

There is confidence that the chosen distance is a reasonable balance between resolving potential conflicts and not burdening more property owners than necessary with additional land use regulations. The difference in elevation of the resource and the surrounding lands could result in extraction activities, over time, to progress into the ridge to where they would take place in a modified "bowl" below the ridge top. In this situation, impacts associated with noise, dust, blasting, and visibility of the operation would be lessened for surrounding properties.

b. Area Road Limitations on Resource Protection

"Impact area" is not defined in either the Statewide Planning Goals or Administrative Rules. As such, it is Multnomah County's position that the above described impact area does not contain all locations of conflict with full "protection" (utilization) of this resource. Using an extreme hypothetical example, not applicable to this site, there could exist severe weight limits on the bridges on all of the roads that led from a site. If those road limitations were outside a single mapped impact area of, for example 1,000 feet, then to ignore the road limit conflict is a disservice to any potential extraction operation who was not informed of the limits and was not aware that the operation would be forced to utilize uneconomical size trucks to transport the material.

Load limits placed at different points of the road system adversely affect the delivery and as such the "protection" for use of an aggregate site. These same points of weakness in the road system which cannot accommodate aggregate truck traffic from a resource site can be adversely affected by structural failures occurring from frequent large truck traffic. The road restrictions for this resource site fall into two categories: (1) bridges and culvert structures, and (2) certain road segments. Additional discussion of these road limitations is found in subsection B.4.e., Statewide Planning Goal 12, Transportation.

(i) Bridges and Culverts.

An "Inventory Rating" on a County bridge applies to situations of regular, long-term use by heavy traffic. The ratings differ for different truck configurations. Based upon what County transportation Engineers know of typical gravel/crushed rock hauling, a Type 3 truck would be expected to be used. A Type 3 truck has tandem rear axles and a total maximum weight of 25 tons. Listed below is an assessment of the capability of certain East County bridge structures which would be marginal or fail to handle this type of truck traffic on a long term basis. The information is from a report from the Multnomah County Bridge Office, Division of Transportation.[6]

- Corbett Hill Viaduct: This is a concrete bridge built in 1952 located at the bottom of Corbett Hill Road approximately 1,000 feet east of the Corbett overpass / entrance / exit to Interstate 84. The Type 3 Inventory Rating is 22.9 tons. This is below the legal limit for Type 3 trucks.

- Stark Street Bridge over the Sandy River: This is a steel truss/stringer bridge located near Dabney State Park where Stark Street intersects with the Crown Point Highway. The Type 3 Inventory Rating is 18.3 tons. This rating is well below the 25 ton legal limit for Type 3 trucks.

- Stark Street Viaduct: This is a concrete arch structure built in 1915, about a thousand feet south of the Stark Street Bridge. There are two Type 3 Inventory ratings: 28.0 tons for the main arch, but only 9.0 tons for floor beams in the current condition of the bridge. Structure is unacceptable for high-volume heavy truck traffic.

- Gordon Creek Road Viaduct: This concrete bridge, built in 1952, is located northeast of Oxbow County Park. The Type 3 Inventory Rating is 24.8 tons. Rating is "barely OK" being right at the legal limit for Type 3 trucks.

- Littlepage Road over Big Creek: This short-span concrete culvert is about 3,000 feet south of the intersection of Knieriem Road with Littlepage Road. The Type 3 Inventory Rating is 25.0 tons. Rating is "barely OK," right at the legal limit for Type 3 trucks.

(ii) Road Segments. Following is an assessment of the three road segments nearest the Howard Canyon aggregate site. In describing the structural cross section of the roads it should be noted that for roughly equivalent durability: **"for each inch of Plant Mix AC you would need two inches of Road Mix AC."**[7] For example, to equal three inches of Plant Mix AC there would need to be six inches of Road Mix AC.

- Howard Road: This road is designated a local road on the Multnomah County Functional Classification of Trafficways adopted in March, 1993. The road travels up Howard Canyon to the south of the aggregate resource. The road is, at

least directly south of the resource, north of and parallel to Howard Canyon Creek. The road intersects with Littlepage Road on the west end and at about a mile and a half to the east it narrows to one lane of traffic, becoming unimproved shortly thereafter. One of the two access drives to the resource site is from Howard Road.

Existing structural section of the road:	4 inches of **road mix** AC 9 inches of rock base[8]

Determination of the present and projected needed structural sections for this road have not been determined as has been done for the following two roads. It is determined by Multnomah County that existing and projected needed road improvements would be similar to the calculations made for the following listings for Knieriem and Littlepage Roads.

- Knieriem Road: This road is designated a local road on the Multnomah County Functional Classification of Trafficways adopted in March, 1993. Knieriem Road is also a bikeway route on the April, 1992 Multnomah County Bicycle Master Plan. The other private drive to the aggregate resource is from this road. Knieriem travels from Littlepage Road northeasterly to Crown Point Highway. Existing and projected needed road improvements are as follows:[9]

Existing structural section of the road:	3 inches of **road mix** AC 5 inches of rock base
Under present traffic loading conditions the structural section should be:	3 inches of **plant mix** AC 14 inches of 1 inch rock base
If aggregate truck traffic increases according to projections,* the structural section should be:	4 inches of **plant mix** AC 20 inches of 1 inch rock base

* In Conditional Use application CU 7-87 the applicant for mining this site stated that he intended to mine "less than one acre per year." The property owner also estimated that each acre contains about 75,000 cubic yards of material. Extracting one acre a year would then result in 7,500 full truck loads at 10 cubic yards per truck load, and an equal number of empty truck trips.[10]

- Littlepage Road: This road is also designated a local road on the Multnomah County Functional Classification of Trafficways adopted in March, 1993. The portion of Littlepage Road between Knieriem Road south to Hurlburt Road is shown to be a bikeway route on the April, 1992 Multnomah County Bicycle Master Plan. Both Howard Road and Knieriem Road intersect with Littlepage Road. Littlepage Road is a north-south route that connects with the Crown Point Highway (Columbia River Scenic Highway) on the north and travels southward on the east side of the Sandy River. Existing and projected needed road improvements are as follows:[11]

Existing structural section of the road:	5 inches of **road mix** AC 6 inches of rock base
Under present traffic loading conditions the structural section should be:	3 inches of **plant mix** AC 7.5 inches of 1 inch rock base
If aggregate truck traffic increases according to projections,* the structural section should be:	4 inches of **plant mix** AC 10 inches of 1 inch rock base

* See * comments under Knieriem Road above.

3. CONFLICTING USES

The Goal 5 Rule requires identification of conflicting uses. A conflicting use is one which, if allowed, could adversely affect a Goal 5 resource site. Identifying conflicting uses is primarily done by examining uses authorized by zoning districts within the impact area.

There are two zoning districts within the impact area (the resource site plus a 1,200 foot deep perimeter area): Commercial Forest Use (CFU) and Exclusive Farm Use (EFU). The CFU zoned portion covers approximately five-sixths of the total impact area with EFU zoning on the remainder. Both zoning districts require a minimum parcel size of 80 acres for the creation of new parcels.

Multnomah County is required to only permit those uses allowed by the new requirements of Oregon Administrative Rule 660, Division 6 – Forest Lands and Division 33 – Agricultural Land, (adopted February 18, 1994), even though the Rules have not yet been incorporated into the CFU and EFU sections of the County Zoning Code. Therefore, subsections a through d of the following analysis considers only those uses allowed by the new Rules and potential conflicts between allowing those uses and protection of the aggregate resource.

a. Allowed Uses Not Applicable to the Analysis

(i) CFU District. The following uses allowed in the Commercial Forest Use district are not applicable to the analysis:

- Exploration for mineral and aggregate resources as defined in ORS Chapter 517
- Widening of roads within existing rights-of-way in conformance with the transportation element of acknowledged comprehensive plans including public road and highway projects as described in ORS 215.213(1)(m) through (p) and ORS 215.283(1)(k) through (n)

- Exploration for and production of geothermal, gas, oil, and other associated hydrocarbons, including the placement and operation of compressors, separators and other customary production equipment for an individual well adjacent to the well head

- Mining and processing of oil, gas, or other subsurface resources. as defined in ORS Chapter 520, and not otherwise permitted under OAR 660-06-025(3)(m) (e.g., compressors, separators and storage serving multiple wells), and mining and processing of aggregate and mineral resources as defined in ORS Chapter 517

- Temporary asphalt and concrete batch plants as accessory uses to specific highway projects

- Public road and highway projects as described in ORS 215.(1,(2)(q) through (s), 215.213(10), 215.283(2)(p) through (r) and 215.283(3)

  Activities involving utilization of a mineral resource cannot conflict with mineral and aggregate resource protection since the purpose of protecting a mineral resource is for its eventual use through mining.

- Expansion of existing airports

  There are no airports within the impact area.

- Destination resorts reviewed and approved pursuant to ORS 197.435 to ORS 197.465 and Goal 8

  A destination resort is not applicable to this analysis because the site is within 24 air miles of a UGB containing 100,000 population (which eliminates associated housing) and Multnomah County has not designated any eligible sites in the comprehensive plan [ORS 197.455(1)(a)&(2)].

(ii) EFU District. The following uses allowed in the Commercial Forest Use district are not applicable to the analysis:

- Operations for the exploration for and production of geothermal resources as defined by ORS 522.005 and oil and gas as defined by ORS 520.005, including the placement and operation of compressors, separators and other customary production equipment for an individual well adjacent to the well head

- Operations for the exploration for minerals as defined by ORS Chapter 517.750

- Operations conducted for mining and processing of geothermal resources as defined by ORS 522.005 and oil and gas as defined by ORS 520.005 not otherwise permitted under this rule

- Operations conducted for mining, crushing or stockpiling of aggregate and other mineral and other subsurface resources subject to ORS 215.298

- Processing as defined by ORS 517.750 of aggregate into asphalt or portland cement

- Processing of other mineral resources and other subsurface resources

- Public road and highway projects described under the heading "Transportation" in OAR 660-33-120

- Destination resort which is approved consistent with the requirements of Goal 8

  A destination resort is not applicable to this analysis because the site is within 24 air miles of a UGB containing 100,000 population (which eliminates associated housing) and Multnomah County has not designated any eligible sites in the comprehensive plan [ORS 197.455(1)(a)&(2)].

- Living history museum

  This use is not permitted in Multnomah County (allowed only in "Marginal Lands" Counties).

b. Allowed Uses that Will Not Conflict With the Aggregate Resource

(i) CFU District. The following uses allowed by the Commercial Forest Use district within the impact area would not conflict with, or be impacted by, protection or utilization of the significant aggregate resource:

- Forest operations or forest practices including, but not limited to, reforestation of forest land, road construction and maintenance, harvesting of a forest tree species, application of chemicals, and disposal of slash

- Temporary on-site structures which are auxiliary to and used during the term of a particular forest operation

- Physical alterations to the land auxiliary to forest practices including, but not limited to, those made for purposes of exploration, mining, commercial gravel extraction and processing, landfills, dams, reservoirs, road construction or recreational facilities

- Farm use as defined in ORS 215.203

- Local distribution lines (e.g., electric, telephone, natural gas) and accessory equipment (e.g., electric distribution transformers, poles, meter cabinets, terminal

boxes, pedestals), or equipment which provides service hookups, including water service hookups

- New electric transmission lines with right of way widths of up to 100 feet as specified in ORS 772.210. New distribution lines (e.g., gas, oil, geothermal) with rights-of-way 50 feet or less in width
- Temporary portable facility for the primary processing of forest products
- Towers and fire stations for forest fire protection
- Water intake facilities, canals and distribution lines for farm irrigation and ponds
- Water intake facilities, related treatment facilities, pumping stations, and distribution lines
- Reservoirs and water impoundments
- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources
- Uninhabitable structures accessory to fish and wildlife enhancement
- Private hunting and fishing operations without any lodging accommodations
- Permanent facility for the primary processing of forest products
- Permanent logging equipment repair and storage
- Log scaling and weigh stations
- Disposal site for solid waste that has been ordered established by the Environmental Quality Commission under ORS 459.049, together with the equipment, facilities or buildings necessary for its operation
- Disposal site for solid waste approved by the governing body of a city or county or both and for which the Oregon Department of Environmental Quality has granted a permit under ORS 459.245, together with equipment, facilities or buildings necessary for its operation
- Television, microwave and radio communication facilities and transmission towers
- Fire stations for rural fire protection
- Utility facilities for the purpose of generating power

- Aids to navigation and aviation

- Cemeteries

These uses do not satisfy the DEQ definition of noise sensitive property. There is no available information that they would be impacted by potential dust or traffic resulting from mining activity. These uses, if allowed within the impact area, would pose no threat to quarry operations or force a significant change in future mining activities.

(ii) EFU District. The following uses allowed by the Exclusive Farm Use district within the impact area would not conflict with, or be impacted by, protection or utilization of the significant aggregate resource:

- Farm use as defined in ORS 215.203 and other buildings customarily provided in conjunction with farm use (except residences)

- Commercial activities in conjunction with farm use

- Farm stands

- The propagation, cultivation, maintenance and harvesting of aquatic species

- Dog kennels and the breeding, kenneling and training of greyhounds for racing

- Propagation or harvesting of a forest product

- Forest management research and experimentation facilities accessory to forest operations

- A facility for the primary processing of forest products

- Utility facilities necessary for public service

- A site for the disposal of solid waste that has been ordered to be established by the Environmental Quality Commission under ORS 459.049, together with the equipment, facilities or buildings necessary for its operation

- A site for the disposal of solid waste approved by the governing body of a city or county or both and for which a permit has been granted under ORS 459.245 by the Department of Environmental Quality together with equipment, facilities or buildings necessary for its operation

- Commercial utility facilities for the purpose of generating power for public use by sale

- Golf courses

- Cemeteries

These uses do not satisfy the DEQ definition of noise sensitive property. There is no available information that they would be impacted by potential dust or traffic resulting from mining activity. These uses, if allowed within the impact area, would pose no threat to quarry operations or force a significant change in future mining activities.

c. Allowed Uses that May Conflict, but are Unlikely to Occur

(i) CFU District. The following uses allowed by the Commercial Forest Use district within the impact area either meet the DEQ definition of noise sensitive property, or are uses that could be adversely affected by dust or traffic resulting from mining activities. They could conflict with, or be impacted by mining activities, but are unlikely to be sited within the impact area.

- Temporary forest labor camps

- Caretaker residences for fish hatcheries

The locational requirements for labor camp housing and fish hatcheries are not present within the impact area. The proximity to the Portland Metropolitan Area would indicate no need for temporary forest labor housing at this site. Steep terrain preclude the construction of fish hatcheries and, therefore, a caretaker residence within the impact area.

- Parks and campgrounds

- Caretaker residences for public parks

"Minor Community Facilities," including parks, can only be sited on property with direct access to a collector street (Comprehensive Plan Policy 31). No property within the impact area has frontage on a collector street.

The uses listed above will not be considered further in this analysis. Any subsequent resource protection program provisions should not list these uses as permitted uses in the impact area.

(ii) EFU District. The following uses allowed by the Exclusive Farm Use district within the impact area could conflict with, or be impacted by mining activities, but for site specific reasons are unlikely to be sited within the impact area:

- Public or private schools, including all buildings essential to the operation of a school

- Churches

- Parks, including the following:

  Private parks, playgrounds, hunting and fishing preserves and campgrounds
  Parks, playgrounds or community centers owned and operated by a governmental agency or a nonprofit community organization

  "Minor Community Facilities," including schools, churches and parks, can only be sited on property with direct access to a collector street (Comprehensive Plan Policy 31). No property within the impact area has frontage on a collector street.

- A winery as described in ORS 215.452

  A winery could be adversely affected by an associated "batch plant" or dust resulting from mining activities. However, the higher elevation of the site and the colder winter Eastern Oregon climactic influences that funnel into the Columbia River Gorge result in too few frost free days to support this type of agriculture on the scale defined in the State Statute.

The uses listed above will not be considered further in this analysis. Subsequent resource protection program provisions should not list these uses as permitted uses in the impact area.

d. Allowed Uses that May Conflict

(i) CFU District. The following uses allowed by the Commercial Forest Use district within the impact area may conflict with or be impacted by mining activities on the resource site:

- Residential uses including the following as provided by the Administrative Rules:

  Forestland dwellings
  Alteration, restoration or replacement of a lawfully established dwelling
  A mobile home in conjunction with an existing dwelling as a temporary use for the term of a hardship suffered by the existing resident or a relative
  Private accommodations for fishing occupied on a temporary basis
  Private seasonal accommodations for fee hunting operations

  Residences are defined by the Oregon Department of Environmental Quality (DEQ) as "noise sensitive property." OAR 340-35-015(38) reads:

  > "Noise Sensitive Property" means real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries. Property used in industrial or agricultural activities is not Noise Sensitive Property unless it meets the above criteria in more

than an incidental manner.

In the CFU zoned portion of the impact area there are six existing residences and one unexpired approval for a residence. The closest residences to the aggregate resource are two houses north of the west end of the resource. The two houses are approximately 400 and 500 feet away from the aggregate resource and are located along the private access drive connecting to Knieriem Road.

The CFU zoned portion of the impact area covers portions or all of sixteen different tax lots that do not contain a dwelling. More than one-half of those tax lots are under the same ownership. Under the OAR provisions adopted by LCDC on February 18, 1994, only one dwelling is allowed per "tract." A "tract" means all contiguous parcels under the same ownership. There appears to be a maximum potential for seven more houses. The more realistic estimate may actually be only four more houses when considering the various new OAR approval criteria. Regardless, the existing and potential residential uses both impact and are impacted by aggregate extraction activities.

(ii) EFU District.

- Residential uses including the following as provided by the Administrative Rules:

  Dwelling customarily provided in conjunction with farm use
  A dwelling on property used for farm use occupied by relative whose assistance in management of the farm is required by farm operator
  One single-family dwelling on a lawfully created lot or parcel (optional provision using date of ownership, soil productivity ratings, and other criteria)
  A mobile home in conjunction with an existing dwelling as a temporary use for the term of a hardship suffered by the existing resident or a relative
  Single family residential dwelling, not provided in conjunction with farm use
  Seasonal farmworker housing as defined in ORS 197.675
  Alteration, restoration or replacement of a lawfully established dwelling

  All of the above residential uses are "noise sensitive property" [OAR 340-35-015(38)]. In the EFU zoned portion of the impact area there are five existing residences. The closest residence is approximately 850 feet away from the aggregate resource.

  There are two tax lots within the EFU zoned portion of the impact area that do not contain a residence. The existing and potential residential uses both impact and are impacted by aggregate extraction activities.

e. Other Goal 5 Resources

The following Goal 5 resources are within the impact area:

(i) Big Creek

(ii) Knieriem/Ross Creek

(iii) Howard Canyon Creek

These inventoried significant Goal 5 streams are within the impact area. Harm to fish habitat could result if there was inadequate soil erosion control measures associated with mining activities because drainages from the ridgetop aggregate resource location flow to the north and west into the Big and Knieriem/Ross Creeks and to the south into the Howard Canyon Creek. Consequently, extraction activities are considered to be a conflict with these Goal 5 resources.

4. ESEE ANALYSIS

OAR 660-16-005 (2) Determine the Economic, Social, Environmental, and Energy Consequences: If conflicting uses are identified, the economic, social, environmental and energy consequences of the conflicting uses must be determined. Both the impacts on the resource site and on the conflicting use must be considered in analyzing the ESEE consequences. The applicability and requirements of other Statewide Planning Goals must also be considered, where appropriate, at this stage of the process. A determination of the ESEE consequences of identified conflicting uses is adequate if it enables a jurisdiction to provide reasons to explain why decisions are made for specific sites.

The Goal 5 Rule requires that if conflicting uses to the resource are identified, the economic, social, environmental, and energy (ESEE) consequences of the conflicts must be identified. Both the impacts on the resource site and on the conflicting use must be considered in analyzing the ESEE consequences. The applicability and requirements of other Statewide Planning Goals must also be considered, where appropriate, at this step.

The ESEE consequences will be analyzed by examining: (1) the effect on use of the aggregate resource if conflicting uses are allowed fully without restriction, and (2) the effect on conflicting uses if development of the aggregate resource is allowed fully without restriction. The conflicting uses to be considered include:

Residential Uses (all residential uses listed in B.3.d. above)

Big, Knieriem/Ross, and Howard Canyon Creeks (Significant Goal 5 Resources)

a. Economic Effects

(i) Economic Effect on Use of the Aggregate Resource if Conflicting Uses are Fully Allowed

- Residential Uses

If residential uses were allowed on the resource area or in close proximity to the resource area, it would effectively prevent economic use of the aggregate resource. Although a residential use close to an aggregate site does not have a measurable effect on the resource itself, extraction of the resource can be curtailed or prohibited by complaints from neighbors. Allowing a residential use on top of the resource itself would, of course, take a sizable area out of potential production.

Even assuming that use of an aggregate resource is not totally precluded, constraints on mining operations to eliminate conflicts with nearby residential uses may be costly. Economic use of certain portions of the quarry may be curtailed, or the mining operator would have to put in place additional measures to eliminate or sufficiently reduce conflicts with those neighbors. Additional measures to reduce conflicts with quarrying activities increases the cost of surface mining. The increased cost of mining results in higher costs for raw materials. However, the more probable consequence on the resource from allowing conflicting residential uses on or near the site would be the loss of the resource. It would be extremely difficult, if not impossible, to design an extraction plan which would allow aggregate operations to proceed if conflicting residential uses were allowed to locate on or in close proximity to the resource site.

Countywide Effects

In Multnomah County, quality rock is considered by the State Highway Division to be "extremely scarce." The availability of quality aggregate as close as possible to the construction site is very important. In 1990, the cost of hauling aggregate by truck was $46 per hour, and as a result any haul distance requiring an extra hour per trip would add $4.60 per ton to the cost. The effect on the State Highway program is described as follows:

> The hauling costs start to add up in Multnomah County, where half of the high quality aggregate must be imported from sources outside the county. Even with the economics of barge and freeway transport we pay an extra $1.50 to $2.75 to haul each ton of aggregate. Last year, projects in Multnomah County used some 375,000 tons of aggregate for which we paid $796,875 in added transportation costs.[12]

An example of the large amounts of rock material used in asphalt paving is the 16,000 tons of aggregate used to produce one mile of typical 30-foot-wide, two lane road with standard road base and safety shoulders.[13]

Based upon the above it is concluded that allowing conflicting residential uses would result in adverse economic effects in the potential cost of roads in the County.

Local East County Effects

The closest existing aggregate source for unincorporated East Multnomah County is Gresham Sand and Gravel. Unlike the rock materials available at Howard Canyon, Gresham Sand and Gravel does not sell base rock that can be used for road construction. In addition, the President of Gresham Sand and Gravel has stated that:

> ... for a trip to the Corbett area, we have to allot one to one and one-half hours of truck time for one delivery. ... The length of the trip directly adds to the cost of the rock taken to the Corbett area. It costs approximately $45.00 per hour for truck time. This adds $50.00 to $70.00 to the cost of a ten-yard load delivered to the Corbett area. Transportation costs delivered to that area equals or exceeds the cost of the rock material.[14]

Deliveries farther east of Corbett would, by the same factors, require even more transportation costs to be added. The aggregate deliveries to the East County area do not just include materials for public roads, but also include rock for concrete building foundations, driveways, patios, septic and sewer systems, drainage control systems, and embankment rip rap material.

In consideration of the above, the economic effect of allowing conflicting residential uses would not only likely prevent the extraction of a significant amount of aggregate with a certain (undetermined) dollar value, but the resulting economic effect will also be higher costs for this material for most of the unincorporated East Multnomah County.

- Big, Knieriem/Ross, and Howard Canyon Creeks

If the interpretation of "fully allowed" for these conflicting significant Goal 5 resources was "zero tolerance" of any adverse drainage impacts from an extraction operation, then the resulting economic effect on the aggregate resource would most likely be total prohibition of extraction activities. This concept is, however, unrealistic and improperly selective in not considering that several other land uses along the creeks such as forestry and farming practices, and residentially associated activities, like runoff from driveways, contribute some amount of erosion into the waters entering the creeks.

Staff from the Department of Geology and Mineral Industries has verified that they are confident that there is enough separation between the extraction area

and these significant Goal 5 streams to accommodate holding ponds that would catch enough soil to ensure that the drainage that leaves the ponds would meet applicable water quality control standards.

The resulting economic effect of "zero tolerance" or severely strict erosion control standards would be the same as found in (a) above.

(ii) Economic Effect on Conflicting Uses if Development of the Aggregate Resource is Fully Allowed

- Residential Uses

During public hearings in 1990 there were strong opinions expressed by several property owners near this aggregate site that the value of their homes would be reduced due to operation of the quarry so close to their property. Also, on record in the County Planning Offices are letters from four property owners on Howard Road within the 1,200 foot impact area who commented on the property value issue. In each of the four letters the property owner stated that they have "no doubt" that "definite" and "significant" reduction in property values will result from extraction and rock transport activities. The basis for the residents concerns were primarily about the noise and dust from a mining operation and noise and safety concerns about truck traffic passing their properties on the inadequately improved Howard Road.

Even though the property owners were sincere in their feeling that the resale value of their homes would be significantly affected, there exists no convincing evidence in support of that position (ie. studies, reduction in appraised valuation or Board of Equalization petitions). See LCDC Remand Order Issue #2 and section C.2.h. of this chapter. In addition to the evidence requirement in Remand Order #2, the directive in the LCDC Remand Order "Issue #3 – No Impact Test" is that Multnomah County cannot use as a basis for denial of protection of the aggregate resource a finding of any impact. In other words, denial of protection based upon a requirement of no impact is not a valid interpretation of the Goal 5 Rule – some amount of conflict is to be expected. Local governments must work to resolve those conflicts by a balancing of the competing values. Although none exists at this time, any proven data on property value loss would also have to be balanced against loss of the value of the resource and, most importantly, could not be the basis for denial of protection of the resource unless it can also be shown that no measures are possible to mitigate the conflict and that the impact was significant.

The issue of noise effects was responded to by a report by a Registered Acoustical Engineer that concluded that the "results of the analysis show that typical commercial rock quarry equipment could be used at Howard Canyon Quarry and the appropriate noise standards could be met with certain procedures followed."[15] The sound tests were taken at the east-west mid-point of the aggre-

gate resource on the north side and south sides of the ridgeline. Only at the initial excavation points, before the extraction process progressed far enough into the ridge, would there need to be constructed earthen berms to control sound radiating from mining and crushing activities. Once the extraction moved horizontally into the ridge, all subsequent activity would always be below the top elevation, often as much as 40 feet below. At that time, "if a rock ridge is left at the perimeter of the resource area, all residences will be protected from sound levels in excess of that allowed at all hours of the day" (DEQ noise standard levels).[16]

Expert testimony has demonstrated that noise levels, (from blasting and typical on-site equipment), associated with a mining plan which starts at the present extraction points which incorporates acoustic berms, will produce noise levels at any nearby existing residence well below the DEQ noise standards. The State of Oregon DEQ standards are deemed appropriate standards by which to judge noise impacts on adjoining properties, and it is concluded that under DEQ standards there will not be a significant economic impact on existing dwellings in the area. As a result, the expressed large reductions in resale value attributed to noise impacts is determined to be speculative and not an economic effect from extraction activities that would occur.

The rock crusher to be used at the site has an existing DEQ Minimal Source Air Contaminant Discharge Permit which requires control of dust from crushing activities. The county roads in the area are paved which will further reduce dust. The evidence at hand indicates that the Howard Canyon aggregate resource site can be developed without significant adverse economic effects on the resale value of existing homes in the area attributable to dust.

A protection program to allow full development of the aggregate resource may have the economic effect of prohibiting new residential uses to be built over or near the resource area and require new residences in the impact area to assume a portion of the obligation to mitigate conflicts. Mitigating surface mining impacts typically involves building design and orientation considerations, sound insulation, and visual and noise screening. The costs of such measures will impact the builder of a new home in the impact area.

- Big, Knieriem/Ross, and Howard Canyon Creeks

  The County has no knowledge of any adverse economic impact that a mineral extraction operation would have on these streams if all extraction and processing activities met State operational requirements.

b. Social Effects

(i) Social Effect on Use of the Aggregate Resource if Conflicting Uses are Fully Allowed

- Residential Uses

  The addition of approximately nine new residences in the impact area would increase the potential for complaints to the mining operator regarding noise, dust, vibration, etc. (The number of potential residences cannot be definite because of the complexity of the new OAR's for farm and forest lands; the potential may actually be fewer.) If the new residences were located on top of or too near the aggregate resource the result would either be severe modification of mining operations or outright prohibition of mining.

- Big, Knieriem/Ross, and Howard Canyon Creeks

  Any mining must be conducted in a manner that does not impact these Significant Goal 5 resources.

(ii) Social Effect on Conflicting Uses if Development of the Aggregate Resource is Fully Allowed

- Residential Uses

  For the dozen existing residences in the impact area the social consequences resulting from full development could be a perceived reduction in the quality of home life from any noise and dust produced during mining operating hours.

  Registered Professional Engineer (acoustical) Mr. Standlee has determined that noise from blasting, machinery and rock crushing will be well within DEQ standards as measured at existing dwellings in the area. The County accepts Mr. Standlee's report as credible expert testimony. The County further accepts the State of Oregon DEQ standards as providing an appropriate basis for determining whether or not noise is an adverse social impact. DEQ has established noise standards which are measured at the point of reception and, therefore, we conclude they are designed to protect adjacent properties. It is understood that DEQ standards are designed to meet the legislative policy to protect the health, safety and welfare of Oregon citizens. Because DEQ standards will be met by the proposed use at the quarry, it is concluded that social impacts of the resource are minimal on the conflicting use.

  Crushing equipment previously used at the site has a DEQ air contaminant discharge permit which requires the crushing machinery to control dust. DEQ permit limits are designed to protect the health, safety and welfare of the citizens of Oregon and, therefore, it is concluded that DEQ standards present an appropri-

ate basis for determining whether the impact would have an adverse effect on the conflicting use.

Dust can be expected to be produced from aggregate truck traffic on either of the long unpaved private access drives that connect the public road and the resource site. To ensure minimal dust effects on homes in the impact area, concerns regarding truck traffic speed limits on the drive and the type of driveway improvements would be appropriate issues to address in developing any operational standards for the site. Measures, such as retention of vegetative buffers, and watering, oiling, or paving the private drive that is used are options to be considered to minimize dust.

The social effect on new residential uses in the impact area if the aggregate resource is developed fully would also include the above discussion. In addition, the new residences, under full resource use (protection), may not be permitted to build and live at this location at all or at least will have fewer choices on home location, orientation, design, and views.

- Big, Knieriem/Ross, and Howard Canyon Creeks

  There may be some social perception that the "natural state" of the stream is compromised by noise arriving from extraction and processing activities, but that noise, at expected levels, will have no impact on fish habitat.

c. Environmental Effects

(i) Environmental Effect on Use of the Aggregate Resource if Conflicting Uses are Fully Allowed

- Residential Uses

  The addition of approximately nine new residences in the impact area, if sited in a manner that causes the quarry to violate noise control standards, would force a mining operator to either make severe modifications in mining operations or would result in an outright prohibition of mining. The result of these situations are discussed above as economic consequences.

- Big, Knieriem/Ross, and Howard Canyon Creeks

  "Allowing fully" these Significant Goal 5 creeks is accepted to mean maintaining the attributes of the creeks that qualified them as "Class 1 waters" as defined in the State Forest Practices Act. The effect on the aggregate resource is the requirement to put operational measures in place to ensure the fish habitat will not be adversely affected. Multnomah County can request that mining operation plans at the application stage with DOGAMI also be reviewed by other state agencies such as the Oregon Fish and Wildlife.

(ii) Environmental Effect on Conflicting Uses if Development of the Aggregate Resource is Fully Allowed

- Residential Uses

Fully allowing development of the mineral resource could result in increased noise, dust and vibration. The majority of the existing conflicting residential uses that would experience these effects are located at the western end of the resource site. Such development, however, would have to be conducted in compliance with environmental control standards. The consequences of those effects are discussed above as social issues. No adverse environmental impacts, that cannot be operationally mitigated, are foreseen.

- Big, Knieriem/Ross, and Howard Canyon Creeks

There would be no adverse environmental effect on the creeks to the south, west, and north of the aggregate resource by an "allowed fully" mining activity if the mining were conducted under current state environmental control measures. The larger the mining extraction activities occurring at one time, the more difficult it would be to meet those environmental standards. Based upon submitted expert testimony there is confidence that mining at this site, at least at a rate of one to two acres per year, would be able to meet required environmental standards to preserve the "Class 1 waters" qualities of the creeks. Dr. Robert H. Ellis, an Aquatic Ecologist with Beak Consultants, Inc. surveyed the site and after reviewing a preliminary extraction plan concluded that the quarry can be developed without harm to the trout population in the creeks. The basis for this conclusion, in part, is as follows:

1. Runoff from the quarry site would be limited due to a development plan which calls for mining of only a small percentage (e.g., one to two acres) of the quarry site at any one time. As the site is mined, the mined portion would be continually reclaimed by backfilling and replanting with native vegetation. Thus the potential for erosion and runoff would be minimal.

2. Drainage from the quarry site could be easily controlled since the mined area would be surrounded by a berm that would direct all of the drainage to a single point. No drainage is expected to be discharged to the north of the site since the development plan calls for leaving a strip of unmined rock along the north border of the site. On the south side of the quarry site, there are several relatively flat benches of land between the quarry site and Howard Canyon Creek that provide adequate space for construction of a sediment pond. Drainage from the quarry could be channeled to a properly sized detention pond on one of the benches, thus insuring

> that all but the finest sediment components would be prevented from reaching Howard Canyon Creek. Since logging and associated road building is presently occurring in both drainage basins and is expected to continue, it is doubtful that any increases in sediment loading from the quarry site would be detectable above existing background levels. No measurable impact on the fishery resources of either stream or on downstream areas would be anticipated if the above precautions are incorporated as part of the development permit for the quarry.[17]

The conclusions of Dr. Ellis were based upon a tentative plan where extraction activities would enter the south side of the ridge and the operation would use the private drive leading to Howard Canyon Road as the "main access road." An extraction plan which entered the north side of the ridge instead, and used the driveway to Knieriem Road, could also be expected to match the above described lack of environmental effects if a similar system of holding ponds on the north side were put into place.

- Other Perceived Conflicts

Written and oral testimony has been presented to Multnomah County by some residents in the surrounding area as to the existence of wetlands and deer and elk habitat in the impact area. The wetlands referred to are along only the very edge of the banks of the above creeks. Because of the extreme proximity to the Significant Goal 5 creeks, the wetlands are considered to essentially be part of the inventoried stream description.

The big game habitat in the impact area has not been inventoried as a significant Goal 5 resource. Under current Goal 5 procedural direction from DLCD, in order for a Goal 5 resource, such as deer and elk habitat, to be considered to be a conflict with the aggregate resource, the habitat must also be on the County's Goal 5 inventory. The deer and elk habitat within the impact area is not on the Goal 5 inventory and from available information would not qualify for inclusion on the inventory.

Although it is believed that deer and elk are, at times, present in the impact area, the closest acknowledged critical winter range is over one mile and several canyons to the southwest. The top of the ridge of the aggregate resource is mostly a relatively flat grass field used for cattle grazing. Dr. Ellis found no evidence that the ridgetop is providing important forage for either deer or elk. Forests on the north and south slopes of the ridge are comprised primarily of mature red alder. Such forests do not provide thermal cover for deer and elk and, therefore, are not critical winter refuge areas.[18]

d. Energy Effects

(i) Energy Effect on Use of the Aggregate Resource if Conflicting Uses are Fully Allowed

- Residential Uses

  Allowing conflicting residential uses too close to the resource will alter the manner, location and extent of extraction activities and result in a greater use of energy by the operator. As stated above, allowing these conflicting uses on or near the site will likely prevent use of the resource altogether (also see economic discussion).

  Allowing residential uses to prevent use of the aggregate resource would result in the aggregate material that is needed in the "Corbett area" to only be supplied by out-of-state quarries, out-of-county quarries, a quarry on the west side of the county, or locations in the county where material is transshipped from outside the county. These longer distance deliveries use additional energy that would not be consumed if material was available from the Howard Canyon resource.

- Big, Knieriem/Ross, and Howard Canyon Creeks

  Energy effects of allowing fully (protection) these creeks will be the energy the operator will expend in meeting State DEQ water quality and erosion standards.

(ii) Energy Effect on Conflicting Uses if Development of the Aggregate Resource is Fully Allowed

- Residential Uses

  Operation of the aggregate resource on the site is not expected to increase or decrease energy consumption for existing residential uses.

  Allowing full development of the aggregate resource, besides prohibit some homes from occurring, could require new homes that are approved to expend energy in constructing buffering measures such as earthen berms or require more energy in the need for additional sound insulation in the construction of the home.

- Big, Knieriem/Ross, and Howard Canyon Creeks

  No energy effects are foreseen.

e. Other Applicable Statewide Planning Goals

OAR 660-16-005(2): " ... The applicability and requirements of other Statewide Planning Goals must also be considered, where appropriate, at this stage of the process. ..." The following additional Statewide Planning Goals apply to this ESEE analysis:

(i) Goal 3 – Agricultural Land

Goal 3 applies to those lands zoned Exclusive Farm Use: Tax lots 16 and 43, Section 1, T. 1 S., R. 4 E.; and tax lots 1, 51, 55, 60, 61, 63, and 64, Section 2, T. 1 S., R. 4 E., WM. Only tax lot 16 in Section 1, on which a small portion of the aggregate resource is mapped, is of sizable acreage (34 acres). All of the other tax lots range in area from 4 to 8 acres and can not be expected to be any more than part-time farm endeavors by the property owners.

Counties may authorize those nonfarm uses defined by commission rule that will not have significant adverse effects on accepted farm or forest practices. The review standards for aggregate mining are given in OAR 660-33-130(5)(a)&(b). Mining may be approved only where the use:

- Will not force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; and
- Will not significantly increase the cost of accepted farm or forest practices on lands devoted to farm or forest use.

There are letters in the record from property owners, located in the southwest area of the impact area, which expressed concern that an expanded mining operation would adversely affect their farm animals. The County understands the property owners concerns. However, under the above State Rule criteria, there is no evidence that normal mining operations would force a significant change in the property owners farm animal husbandry practices. There are many farms adjacent to areas of high sound decibels, such as along highways, that experience not only as high or higher sound levels, but also experience noise levels of longer duration than an aggregate operation would produce. In addition, there is no indication that mining at this site would force a significant change in any other accepted farming or forest practices on surrounding agriculture or forest lands (also see Goal 4 below).

(ii) Goal 4 – Forest Lands

The Forest Goal and Rule designate mining and processing of mineral and aggregate resources as locationally dependent uses. Such uses may be allowed when it is found that:

- The proposed use will not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands;

- The proposed use will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel; and

- A written statement recorded with the deed or written contract with the county or its equivalent is obtained from the land owner which recognizes the rights of adjacent and nearby land owners to conduct forest operations consistent with the Forest Practices Act and Rules for uses authorized in OAR 660-06-025(4)(e), (l), (r), (s) and (v).

Under exemption provisions, mining has been occurring at the site and there is no indication that an expansion of those mining activities would force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands. Most of the properties surrounding the existing operation have been used for forest resource production without recorded adverse impact (for farming discussion see Goal 3 above). An expanded operation should similarly have no impact. Also, there is no indication that an expanded mining operation would increase fire hazard or the costs and risks associated with fire suppression.

The last Rule criteria does not apply to aggregate resources.

(iii) Goal 5 – Open Spaces, Scenic and Historic Areas, and Natural Resources

Direction from the Department of Land Conservation and Development staff, as part of the Remand Order, requires that only those Goal 5 resources that have been inventoried and determined to be significant are appropriate to be included in the ESEE analysis. Therefore, the creeks that are in this analysis are the only Goal 5 issues that are considered to be a conflict with the aggregate resource. Also see discussion in section B.4.c.(ii), Chapter III of this report.

(iv) Goal 6–Air, Water and Land Resources

Goal 6 requires "All waste and process discharges from future development, when combined with such discharges from existing developments shall not threaten to violate, or violate applicable state or federal environmental quality statutes, rules or standards."

A State of Oregon DEQ permit is currently in place for the existing rock crusher in use on the site. There is no evidence that the existing crusher has not been in full compliance with all state permit requirements. Other effects on air, water and land resources resulting from mining operations, (such as noise, runoff, and dust from other activities), will be required to be mitigated by mining and reclamation techniques and be in full compliance with DEQ standards. Direction from DLCD staff is that compliance with this Goal can be shown if the proposed use can meet environmental standards via conditions on extraction and processing operations.

(v) Goal 7 – Areas Subject to Natural Disasters and Hazards

Goal 7 requires "Developments subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards." The conduct of a mining operation is defined in the Statewide Planning Goal Definitions as a "development."

Direction from DLCD staff is that compliance with this Goal, as in Goal 6, can be shown if the proposed use can meet environmental standards via conditions on extraction and processing operations.

Because there are steep slopes and potential soil instability problems, the north and south slopes of this aggregate resource ridge are designated as potential development hazard areas on the "Slope Hazard Map" made part of the County Comprehensive Plan. The basis for the inclusion on the map is from a study that included the following findings about the Boring Lava where it overlies the Troutdale formation:

> Where fresh, the lavas will stand in near vertical cuts, and in natural slopes of up to 100 percent. However, weathering along joint surfaces generally has produced a clayey residium along joint blocks which, with moisture, significantly reduces the strength of the lava in some outcrops. Such slopes, or slopes underlain by any depth of weathered basalt may be unstable at more than 50 percent.
>
> In addition, several of the steepest slopes in the Boring Lava have been produced by failure of the underlying Troutdale silts or gravels. Consequently in cases where significant vertical exposures of Troutdale and Boring occur together, we consider that slopes of the overlying Boring are controlled in the long term by the stability of the Troutdale. Many such slopes are shown as potentially hazardous ... .[19]

Even though there is reason for extra diligence in reviewing extraction and road construction plans, there has been no site specific information provided that extraction activities and the necessary haul roads up the sides of the ridge could not be built with the correct construction design and construction methods. Therefore, the County should make known to the State of Oregon Department of Geology and Mineral Industries (DOGAMI) what geologic information and concerns exist concerning development of mining at this site. The timing of this coordination should be at the initial review of a mining reclamation and operation plan submitted to DOGAMI.

(vi) Goal 9 – Economic Development

Nearly all of the Goal provisions, guidelines, and implementation directives pertain only to urban areas. In a general sense, any aggregate resource located so as to

reduce transportation costs would have the beneficial economic effect of lowering the cost of aggregate materials used in roads and the affordability of homes. [See B.4.a.(i) above.]

(vii) Goal 12 – Transportation

To date, during the time period of Multnomah County's Periodic Review, people that have testified in public forums or submitted letters in opposition to mining at this site were virtually unanimous on one belief – the existing rural road system is not safe for nor can it stand up to truck traffic of the size and frequency that would be expected from a mining operation at this site.

The issue has been raised that transportation issues are only to be addressed in the aggregate development application to occur after the ESEE Analysis is completed. Multnomah County disagrees and includes the following transportation discussion for three reasons.

First, to ignore transportation issues raised by citizens of the local area would not be in compliance with Statewide Planning Goal Number 1 – Citizen Involvement, Subpart 5. "Feedback Mechanisms - - To assure that citizens will receive a response from policy-makers."

Secondly, there are two different local roads that are in the designated surrounding 1,200 foot impact area. The choice of which road will be used will dictate which private drive will be used for hauling to the respective public road and, also determine if extraction activities will proceed into the ridge from the north or the south. The north or south extraction decision will be a major factor in designing a future mining operation and reclamation plan for DOGAMI. In addition to the surrounding impact area, section B.2. of this report contains the rational for considering road segments and points of impact for inadequate bridges.

The last reason is that Goal 5 OAR, subpart 660-16-020(1) requires the involvement of property owners at the earliest possible opportunity to " ... avoid problems or disagreements later in the process in the development of the plan and implementing measures." Specifically, it would be a disservice to the present or future property owner to provide no forewarning of information that could either limit or prohibit the immediate extraction and use of the aggregate resource at the "development application" stage after the Goal 5 analysis is completed.

In taking the above position, Multnomah County also acknowledges that, pursuant to the DLCD Director's instruction in 1989, potential road maintenance and traffic problems should not be a basis for not protecting the resource under the Goal 5 process. However, as also stated in the same review of the County's Goal 5 work, after completion of the Goal 5 process "The county can always invoke regulations under its 'police powers' to <u>limit</u> the quarry activities at this site to assure the health, safety and welfare of citizens living in the area" (underlining in original letter).[20]

Therefore, the information on transportation given in section B.2. of this report is needed information to assist all involved parties in latter development reviews. Derived from that same information in section B.2., it is also concluded that:

- Serious deficiencies exist in the adequacy of three bridges in East Multnomah County to handle Type 3 trucks: The Corbett Hill Viaduct, the Stark Street Bridge over the Sandy River, and the Stark Street Viaduct. Eliminating these three points from truck passage would have two major results:

  One: To enter Interstate 84 for travel to the Gresham/Portland market, trucks must travel from Littlepage Road the length of the Crown Point Highway (Columbia River Scenic Highway) until reaching the freeway entrance north of the Lewis and Clark State Park. Entering I-84 at Corbett would require crossing the inadequate Corbett Hill Viaduct.

  Two: To cross the Sandy River in Multnomah County for travel to the Gresham/Portland market trucks must also travel the same above route to either get to the bridge across the Sandy River just west of the Lewis and Clark State Park or cross the Sandy River on I-84 after entering the freeway north of the Park.

- All three of the closest roads that must be traveled from the Howard Canyon aggregate resource site are classified local roads and are inadequate in their structural sections to accommodate forecasted Type 3 truck traffic at a rate of extraction of one acre per year.

- Knieriem Road and Littlepage Road from Knieriem south to Hurlburt Road are designated Bikeway Routes on the County Bicycle Master Plan. Conflicts between large truck traffic and bicycles will occur until wider or any bike lanes are added.

- Littlepage Road is the better improved of Knieriem and Littlepage Roads. Therefore, wear on the local roads in the area would be reduced if travel to the Corbett Rural Center area and Crown Point Highway (Columbia River Scenic Highway) to the north from the resource site used Littlepage Road instead of Knieriem Road when possible. For example, from the northerly haul road to Knieriem, trucks could travel south to Littlepage Road before heading north to the Crown Point Highway.

- The nearest "Rural Collector" roads as designated on the Classification of Trafficways are further to the west of Littlepage Road. The two Rural Collectors that also travel to the Crown Point Highway are Evans and Hurlburt Roads. Travel to the Springdale Rural Center and travel to Gresham that resulted in the fewest mileage on the Columbia River Scenic Highway would use Hurlburt Road. The nearest and only Rural Collector west of the Sandy River that travels south is Gordon Creek Road.

(viii) Goal 13 – Energy Conservation

Energy conservation benefits depend upon the spatial relationship of the aggregate resource to the locations that the aggregate material will be used. For serving the local market east of the Sandy River there are opportunities to conserve energy by the protection and use of the Howard Canyon aggregate site. [See B.4.a.(i) and B.4.d.(i) above.]

5. RESOURCE ANALYSIS SUMMARY

a. General Conclusions

(i) The preceding Section A "Significance Determination" confirmed that the Howard Canyon site is a significant Goal 5 resource.

(ii) In this Section B "Resource Analysis," it is explained why two different impact areas are appropriate for the Howard Canyon aggregate resource:

- A mapped 1,200 foot area surrounding the entire known aggregate resource; and

- For needed information to the aggregate property owner and post ESEE Analysis operational planning use, a description of bridges and road segments leading from the resource site that are inadequate to safely handle the anticipated heavy truck traffic (points of impact).

(iii) The list of land uses under the heading of "allowed uses not applicable to the analysis" (section B.3.a.) are determined to not conflict with protection (for extraction) of the aggregate resource.

(iv) The list of conflicting uses that are described as "allowed uses that may conflict, but are unlikely to occur" (section B.3.c.) should not be included in the list of allowed uses in the mapped impact that may be made part of any subsequent aggregate resource protection program; thereby, assuring that there will be no conflict.

(v) Residential uses are found to conflict with full protection of the aggregate resource. The lists of residential uses, by zoning district, are as follows:

- Commercial Forest Use District:

  Forestland dwellings
  Alteration, restoration or replacement of a lawfully established dwelling
  A mobile home in conjunction with an existing dwelling as a temporary use for the term of a hardship suffered by the existing resident or a relative
  Private accommodations for fishing occupied on a temporary basis
  Private seasonal accommodations for fee hunting operations

- Exclusive Farm Use District:

  Dwelling customarily provided in conjunction with farm use
  A dwelling on property used for farm use occupied by relative whose assistance in management of the farm is required by farm operator
  One single-family dwelling on a lawfully created lot or parcel (optional provision using date of ownership, soil productivity ratings, and other criteria)
  A mobile home in conjunction with an existing dwelling as a temporary use for the term of a hardship suffered by the existing resident or a relative
  Single family residential dwelling, not provided in conjunction with farm use
  Seasonal farmworker housing as defined in ORS 197.675
  Alteration, restoration or replacement of a lawfully established dwelling

(vi) The number of existing and estimated potential permanent new residential uses in the mapped impact area are as follows:

- Commercial Forest Use District: six existing; 1 unexpired approval; 7 potential

- Exclusive Farm Use District: five existing; 2 potential

(vii) Within the impact area there are inventoried significant Goal 5 streams to the north, west, and south that are found to be potential conflicts with the aggregate resource.

(viii) For the area of the aggregate resource site subject to any future Oregon Department of Geology and Mineral Industries (DOGAMI) operational permit, Multnomah County deems Oregon Department of Environmental Quality (DEQ) standards for noise levels, air quality, and water quality to be appropriate to protect the health, safety and welfare of citizens and to be appropriate to protect the land and water resources within the impact area. The County requests participation by DEQ and the Oregon Department of Fish and Wildlife in the review of any new DOGAMI operational mining permit at this site.

b. Synopsis of ESEE Consequences

(i) Residential

<u>Consequences if Residential Uses are not allowed (in impact area)</u>
Economic: Lower value of property; protection of aggregate resource
Social: Loss of opportunity for rural homes and lifestyle
Environmental: Insignificant
Energy: Insignificant

Consequences if Residential Uses are allowed in a limited manner (in impact area)

Economic: New homebuilder assumes a portion of the obligation and costs to mitigate conflicts with mining; protection of aggregate resource

Social: Reduced options for location of home on an existing lot; some potential for additional complaints to any mining operator

Environmental: Potential for some increase in soil erosion and fire hazard

Energy: Additional energy in mitigating mining conflicts by new homebuilder

Consequences if Residential Uses are allowed fully (in impact area)

Economic: More choices of new home location on existing lots; curtailment of area of extraction or more likely the total loss of aggregate resource and associated value from sales, jobs,taxes; increased cost to consumers for aggregate

Social: Increase of complaints to any mining operator

Environmental: New homes could be sited as to cause mining operator to violate DEQ noise standards; new homes could be sited on top of aggregate resource which would result in loss of resource

Energy: New homes could be sited as to cause quarry to alter mining methods which use more energy; energy used to transport other aggregate to local area will be increased

(ii) Mining

Consequences if Mining is not allowed

Economic: Loss of aggregate resource and associated value from sales, jobs,taxes; increased cost to consumers for aggregate; more choices for new home location on existing lots in impact area

Social: Potentially more choice of new rural homesite settings in impact area (ie. higher elevation views); no conflicts from noise and dust from mining activities

Environmental: No consequence

Energy: Increase in energy expended to transport aggregate to East County

Consequences if Mining is allowed in a limited manner

Economic: Aggregate available at lower cost; all new home builders in impact area assume a portion of the obligation and costs to mitigate conflicts with mining

Social: Mining noise and dust conflicts, to the extent allowed by DEQ standards, will be experienced by existing nearby residents; fewer location (siting) choices for new homes on existing lots in the impact area

Environmental: Noise, dust, and erosion effects, to the extent allowed by DEQ standards, will occur in the impact area

Energy: Reduction in energy expended to transport aggregate to East County

Consequences if Mining is allowed fully

Economic: Aggregate available at lower cost; all new home builders in impact area assume a portion of the obligation and costs to mitigate conflicts with mining

Social: Mining noise and dust conflicts, to the extent allowed by DEQ standards, will be experienced by existing nearby residents; fewer location (siting) choices for new homes on existing lots in the impact area

Environmental: Noise, dust, and erosion effects, to the extent allowed by DEQ standards, will occur in the impact area

Energy: Reduction in energy expended to transport aggregate to East County

(iii) Streams

Consequences if Streams are not protected

Economic: Some loss of value of recreational fishing related attraction to the area; costs of remedying adverse erosion effects at a downstream point before they might enter the Sandy River which is recognized as significant by the County, the State of Oregon, and the Federal Government; same economic consequences as listed in "allowed fully" for residential and mining

Social: Potential loss of recreational amenity

Environmental: If erosion from mining and processing activities is not subject to sufficient control measures or disruption of the stream occurs from the effects of aggregate haul roads then severe disruption or loss of streams and their fish habitat is possible; potential effects downstream at the Sandy River

Energy: Insignificant

Consequences if Streams are protected in a limited manner (State DEQ standards)

Economic: Some costs for new homes associated with regulation of house location, erosion control methods utilized, and sanitation systems; costs for mining operator to employ sufficient control measures to meet DEQ standards

Social: Some reduction in quality of recreational experience along stream from noise of mining operation

Environmental: Some erosion effects, to the extent allowed by DEQ standards, will occur to the streams; potential for some increase in soil erosion from new homes too near the streams

Energy: Insignificant

Consequences if Streams are protected fully (zero tolerance of adverse impacts)

Economic: No mining – loss of aggregate resource and associated value from sales, jobs,taxes; increased cost to consumers for aggregate;
No new homes in stream drainage areas – lower value of property

Social: No mining impacts from noise, dust, or erosion perceptible at streams for residents or visitors along streams; no new homes would help to preserve the degree of perceived natural experience that presently exists along the streams

Environmental: No new erosion impacts from mining or new homes

Energy: Insignificant

6. FOOTNOTES

a. Footnotes in Section B. Resource Analysis:

[1] H. G. Schlicker & Associates, Inc., Geologic Reconnaissance, Howard Canyon Quarry, East Multnomah County, Oregon, Technical Report prepared for Mr. Raymond Smith, Project #88-416, January 9, 1989, p.2.

[2] Throop, Allen H., "Report of On-Site Inspection," a two page report under the State of Oregon Department of Geology and Mineral Industries letterhead, regarding site ID No. 26-0065, date of inspection and report was September 9, 1993, p. 1.

[3] Multnomah County Planning Commission, "Decision in the Matter of: CU 7-87," decision regarding a Conditional Use request for approval for the sale of rock from a private quarry, May 11, 1987, page 4.

[4] Schnitzer, E. Frank, "Report of On-Site Inspection," a two page report under the State of Oregon Department of Geology and Mineral Industries letterhead, regarding site ID No. 26-0065, date of inspection was December 8, 1986, p. 1.

[5] Standlee, Kerrie G., P.E., & Gardner, David, 17 page report, Attn: Paul Hribernick, Re: Howard Canyon Quarry Noise Assessment, From: Daly-Standlee & Associates, Inc., 11855 SW Ridgecrest Drive, Suite 201, Beaverton, OR, dated February 19, 1990, p. 13.

[6] Wortman, Ed, two page memorandum to John Dorst, subject: "Howard Canyon Quarry, Truck Traffic on County Bridges," Multnomah County Department of Environmental Services letterhead, dated March 17, 1994, p. 1.

[7] Kirby, Gregory, two page memorandum to Chuck Henley and John Dorst, subject: "Traffic study on NE Little Page Road and E Knieriem Road," Multnomah County Department of Environmental Services letterhead, dated March 18, 1994, p. 1.

[8] Nelson, Burt, one page memorandum to Lorna Stickel, subject: "Request for permit to haul quarry rock on Howard Road," Multnomah County Department of Environmental Services letterhead, dated May 4, 1987 which stated that the existing structural section was 2 inches of road mix AC. From verbal communication with John Dorst, Multnomah County Division of Transportation, on May 5, 1994 it was confirmed that in the intervening time 2 additional inches of road mix have been overlaid on the road.

[9] Kirby, p. 1.

[10] Multnomah County Planning Commission, "Decision in the Matter of: CU 7-87," p. 4.

[11] Kirby, p. 2.

[12] Forbes, Donald E, P.E., State Highway Engineer, two page letter to Susan Brody, Director of DLCD, subject: "Oregon Land Use Planning Goal, Resource Planning," Highway Division, Department of Transportation letterhead, dated February 22, 1990, p. 1.

[13] Joint authorship of David Evans and Associates, Oregon Concrete and Aggregate Producers Assn., Inc., and Asphalt Pavement Association of Oregon, publication entitled: Future Aggregate Resources and Land Use Planning in Oregon, Rev. 8/89, p. 6.

[14] Ekstrom, Roger, two page letter to Lorna Stickel, Multnomah County Planning Director, subject: "Multnomah County, Howard Canyon Quarry," Gresham Sand and Gravel letterhead, 1339 NW Eastwood Ave., Gresham, OR , dated February 15, 1990, p. 1.

[15] Standlee, p. 7.

[16] Ibid., p. 6.

[17] Ellis, Robert H., Ph.D, 10 page letter from Robert H. Ellis to Paul Hribernick, letter under letterhead of Beak Consultants, Inc., 317 SW Alder, Suite 800, Portland, OR 97204, dated February 19, 1990, p. 1.

[18] Ibid., p. 2.

[19] Shannon & Wilson, Inc., Geotechnical Consultants, Geologic and Engineering Slope-Hazard Studies, Unincorporated Multnomah County, Oregon, Technical Report prepared for Multnomah County Department of Environmental Services, January 9, 1989, p. 15.

[20] Department of Land Conservation and Development, Susan Brody, Director, "Review of the Multnomah County Proposed Periodic Review Order," dated June 9, 1989, p. 8.

b. Footnotes in Appendix

[1] Department of Land Conservation and Development, four page letter from Steve Oulman to R, Scott Pemble, dated April 25, 1994, p. 1.

[2] Land Conservation and Development Commission, Remand Order 93-RA-876,

Attachment A, p. 9.

[3] Standlee, Kerrie G., P.E., & Gardner, David, 17 page report, Attn: Paul Hribernick, Re: Howard Canyon Quarry Noise Assessment, From: Daly-Standlee & Associates, Inc., 11855 SW Ridgecrest Drive, Suite 201, Beaverton, OR, dated February 19, 1990, p. 4, 12.

[4] Standlee, Kerrie G., P.E., & Gardner, David, 2 page addendum to the February 19, 1990 report, Attn: Paul Hribernick, Re: Howard Canyon Quarry Noise Assessment, From: Daly-Standlee & Associates, Inc., 11855 SW Ridgecrest Drive, Suite 201, Beaverton, OR, dated March 13, 1990, p. 2.

C. APPENDIX

1. SUMMARY OF WRITTEN PUBLIC COMMENTS ON THE MARCH 11, 1994 RESOURCE SIGNIFICANCE DETERMINATION REPORT (SECTION A OF THIS CHAPTER) WITH A RESPONSE TO THOSE COMMENTS

a. Comparative Assessment of Aggregate Location, Quality, and Quantity

ISSUE: The site location description should include some comparison of the site to other similar resources and geographic proximity to potential consumers. The site quantity description should include consideration of the relative abundance of the resource at other sites in Multnomah County. The site quality description should include some comparative assessment of the quality of the resource with other sites in Multnomah County.

ISSUE RAISED BY: Department of Land Conservation and Development (DLCD) staff

DISCUSSION: Additional comparative information has been added to the sections on location, quantity, and quality. The Administrative Rule [OAR 660-16-000(3)] on quality determination requires consideration of the relative value of the site as compared with "other examples of the same resource in at least the jurisdiction itself." There is only one other site in unincorporated Multnomah County for which such specific information is available. Information on that other site has been added and what little, and outdated, information available on the closest other site (in the City of Gresham) has also been added.

2. SUMMARY OF WRITTEN PUBLIC COMMENTS ON THE APRIL 11, 1994 RESOURCE ANALYSIS REPORT (SECTION B OF THIS CHAPTER) WITH A RESPONSE TO THOSE COMMENTS

a. DLCD Staff Review of Aggregate Resource Analysis

ISSUE: Does the Resource Analysis meet the requirements of the Land Conservation and Development Commission Remand Order.

ISSUE RAISED BY: DLCD staff

DISCUSSION: The resource analysis drafted and available for public comment on April 11, 1994 is the work in Section B., Chapter III of this report. Completion of the discussion and findings regarding conflicts with the Goal 5 significant streams was at that time delayed until the analysis in Chapter IV of this document was done.

DLCD review of the work in Section B., Chapter III contained no criticism of the report. DLCD staff made the statement that, except for the forthcoming stream conflict analysis which was not ready for review, the county had extensively deliberated the ESEE consequences of conflicts to the aggregate resource.[1] County staff notes that such a posi-

tive review is a sharp contrast to the extensive criticism by the Land Conservation and Development Commission of the prior adopted ESEE Analysis for this resource site (LCDC Remand Order, Attachment A, pages 9 and 10).

The 1990 Decision to classify the aggregate resource as a "3B" site (not protect the resource) was deemed by LCDC to not comply with Goal 5 requirements for four main reasons: (1) Cannot deny protection of the resource on assertions of a lack of present "need' for the resource, (2) The analysis was "replete with unsupported conclusions," (3) Cannot use a "no impact test" – conflicts are to be resolved by a balance of competing values, and (4) Potential transportation effects cannot be the basis for denial of protection of the resource, (however, later verbal clarification from DLCD staff confirmed that this issue and specific standards of the operational permit can be addressed in the post ESEE Analysis regulatory stage of review). Those four reasons will be cited below, where appropriate, in response to issues raised.

b. Impact Area

ISSUE: The 1,200 foot impact area surrounding the aggregate resource is inadequate in area and conflicts encompassed.

ISSUE RAISED BY: Peter F. Fry, Klaus Heyne for the Guardians of Larch Mountain

DISCUSSION: The need to designate as small an impact area as will include the verified conflicts is emphasized in section B.2.a. All subsequent protection programs for the aggregate resource must limit conflicting land uses, such as homes, within the impact area used in the analysis. An excessively large impact area will serve only to unnecessarily restrict future land uses on properties inappropriately included if the Goal 5 process results in a "3C" designation for the aggregate resource.

Also, the LCDC Remand Order in Issue #3 directed use of a "no impact" standard in the analysis was an invalid Goal 5 test. In other words, an impact area large enough to encompass all properties that would experience any impact at all from the quarry operation is not meeting the directive of OAR 660-16-010 to resolve conflicts with specific sites in a balancing of competing values.[2] It is inappropriate to include all properties that, for example, could hear any mining activity. Some standard of the extent of conflict has to be adopted. The standard used by all other jurisdictions for noise is State DEQ standards. Therefore, at a distance in which there is shown that DEQ standards will be met, there is no need, nor is it justified, to include more distant properties inside the impact area because of noise concerns (sound diminishes with distance).

The submitted noise impact study used seven different receiver points which were to the north, west, and south of the aggregate resource. Two noise generating points were used at the east-west midpoint of the resource: one on the north side of the ridge and one on the south side. Six of the seven receiver points are located within the area used as the Resource Analysis impact area. The noise study determined that, with berming techniques, DEQ noise standards can be met at all seven of the receiver

points including those half the distance of the 1,200 feet.[3] The 1,200 foot distance was used in this analysis because at that distance DEQ standards could be met without any earth berm noise reduction measures. Once a quarry operation entered into the ridge the activity would be below the ridgetop, resulting in a reduction of the noise leaving the site.

A statement has been added to the analysis that the Standlee report [4] concluded that DEQ standards for blasting could be met with earth berming at the initial entry into the ridge (at B.2.a.).

It is appropriate to base an impact area on other verified conflicts. The Goal 5 streams in the vicinity of the aggregate resource are identified as conflicts that must be resolved. If the 1,200 foot distance derived from the noise standard had not included the streams, then a greater distance would have been used. However, the 1,200 feet does include the streams. It is not necessary to include the whole stream inside the impact area – water quality standards for part of the stream are the same as for all of the stream. By not including more of the stream length, fewer surrounding property owners may experience land use restrictions from any future Goal 5 aggregate protection program.

The 1,200 foot distance is justified because there is confidence that based upon an acoustical engineering study, contracted for by the property owner, DEQ noise standards will be met at that distance. The 1,200 foot distance also matches the distance determined by another acoustical engineering study, done for the Angell Brothers Quarry, to be an adequate distance at which DEQ standards can be met for exposure to noise sensitive properties. The Angell Brothers study found that noise violations would occur in an area that was closer than 600 feet to a noise sensitive property, but in an area that was 600 to 1,200 feet away DEQ noise standards would be met.

Another location of comparison is the closest operating aggregate extraction and processing operations on SE 190th Avenue in the City of Gresham. On that site an operating rock crusher borders the north property line of Multnomah County Yeon Shops. Within 1,200 feet of that crusher there are 30 dwelling units for which the mining operator meets DEQ noise standards. The crusher is at the same elevation as the residences with no intervening obstructions.

A second type of impact area has been included for the road conflicts. Further discussion is presented below in addressing the property owner's opposition to this concept. As stated in section B.4.e.(vii), DLCD staff have made it clear that transportation issues cannot be the basis for denial of protection of an aggregate resource (limiting conflicting uses on and surrounding the resource in the impact area). The road impact issues are in the Resource Analysis only to be on record for post-Goal 5 analysis use in reviewing any specific operating permit application. Extending the 1,200 foot impact area to include all road concerns would serve no purpose in the ESEE analysis because such concerns cannot be used as a basis for determining if the site should be protected.

c. Noise Sensitive Land Uses

ISSUE: The question was raised why some land uses were identified as not being noise sensitive.

ISSUE RAISED BY: Peter F. Fry

DISCUSSION: In section B.3.d.(i), which follows a couple pages after the list of land uses in question, is a quote of the relevant Oregon Administrative Rule definition of "noise sensitive property." Because of it's wide use statewide, staff is of the opinion that the OAR definition is the only defensible one.

d. Crown Point Highway (Columbia River Scenic Highway)

ISSUE: The road impacts discussion did not include use of Crown Point Highway by gravel trucks as a conflict.

ISSUE RAISED BY: Peter F. Fry

DISCUSSION: Mention of Crown Point Highway as a National Scenic Highway has been added. Based upon the understanding by staff of Remand Order issue #4, transportation issues cannot be a basis for denial of protection of the resource. Adequacy of the Crown Point Highway was not examined because the highway is under the jurisdiction of the State. Road segments cited in the April 11th Resource Analysis report included only those under the control of Multnomah County. Any restriction of a special class of traffic on the Scenic Highway would have to be initiated on the part of the State Department of Transportation. County staff can find no policy in the NSA Management Plan that would restrict one class of motorized vehicle where motor vehicles are allowed. All public notices and copies of all reports have been sent to the Oregon Dept. of Transportation section with responsibility for this highway.

A related issue is the proximity of the Howard Canyon aggregate resource to the Columbia River Gorge National Scenic Area (NSA). The site is just less than one-half mile to the south of the NSA and there has been expressed some concerns regarding impacts from mining activities and truck traffic generated that would be seen or would travel into the NSA. However, prohibiting or limiting protection of this aggregate on the basis of proximity to the NSA may be in violation of Oregon Revised Statute 196.125. That statute prohibits local governments from exercising any regulatory power for the purpose of establishing a scenic buffer around the NSA. Specifically the statute defines such regulatory power to include: "Adopting ordinances or land use plans that prohibit or limit the use of land."

e. Wineries

ISSUE: Why should uses in the EFU District be limited to allow the aggregate to be mined without mining mitigating its impact on such uses (such as wineries)?

ISSUE RAISED BY: Peter F. Fry

DISCUSSION: Wineries are the only agricultural or forest use that would not be included in any list of permitted uses in a protection program that would possibly be put in place in the impact area. Wineries are considered to fit into the category of zoning permitted uses that are "allowed uses that may conflict, but are unlikely to occur." For those uses that fit into this category, no further analysis is necessary. Including wineries in this list does not prevent the growing of grapes by any property owner, only the establishment of a winery as defined in ORS 215.452. Such an establishment would be an on-site commercial production facility of wine, with a minimum vineyard of at least 15 acres. Of the EFU zoned properties in the impact area only the aggregate owners property is greater than 8.2 acres. In addition, in view of the shorter frost free growing season due to the higher elevation than, for example, the wineries in Washington County and in recognition of the colder Eastern Oregon climatic influences from the Columbia River Gorge, there is determined to be no further justification for analyzing this land use as a conflict.

f. Market Studies

ISSUE: No study was done of the importance of the proximity of the aggregate resource to it's ultimate destination and relationship to other sources of aggregate.

ISSUE RAISED BY: Peter F. Fry

DISCUSSION: A market study of the consumers of this resource would be good information to have. However, a type of market study, admittedly not of the thoroughness outlined by the commentator, was included in the 1990 ESEE analysis adopted by the Board of County Commissioners. In that ESEE analysis was information on other available sites within a 25 mile radius of the Howard Canyon site as justification that the aggregate was not "needed" and the need for aggregate could be met by these other sites. This line of argument or similar reasoning based upon a more complete market study was not attempted again because of the direction of the Land Conservation and Development Commission in the Remand Order. This was the first issue of denial of the previous analysis and reads in part:

1. "The county concluded that existing sites within a 25 mile radius of the Howard Canyon site were sufficient to meet the market needs of the county for the planning period. This conclusion is flawed. ... Goal 5 requires protection for future generations, not simply a planning time frame between periodic reviews."

2. "... the sites referenced by the county are outside its jurisdiction; nothing in the record shows that these sites are protected for future use."

If there were many other aggregate sites in the vicinity of the Howard Canyon site for which sufficient location, quantity, quality information was available, possibly that factor

could be a part of the analysis. However, there is only one site, and a market study, although it would have many uses, would not be a factor in the decision to protect or not protect the resource.

g. Wildlife

ISSUE: Wildlife was not included as a conflicting use.

ISSUE RAISED BY: Peter F. Fry, Klaus Heyne, Michael & Debra Taylor

DISCUSSION: Also see B.4.c.(ii) & B.4.e.(iii). Based on written and oral testimony of nearby property owners as to the presence of big game and other wildlife on and near the aggregate site, the 1990 ESEE Analysis adopted by the Board of County Commissioners included wildlife as a conflict and one of the reasons for denial of protection of the aggregate resource. The LCDC Remand Order specifically rejected this argument because the record did not support the conclusion and such a finding used a "no impact test" without any attempt at a resolution of any conflict there might be. In order for Multnomah County to support the conclusion that wildlife is a conflict, wildlife at the site must be determined to be significant through the same Goal 5 process that the aggregate is undergoing. The question of whether the Administrative Rule allows Goal 5 resources that are not significant to be a conflict has been debated with the LCDC and DLCD staff. This is a point of argument that many people will disagree with, but County staff have drafted this analysis to conform with the Remand Order and DLCD directive.

If there is sufficient information for a particular resource that meets the Goal 5 requirements on location, quality, and quantity that is presented to the County then the OAR requires proceeding through the ESEE Analysis. To date, what little information that is available is either lacking in scientific data or indicates the area is not significant at least as a big game wintering habitat.

h. Property Values

ISSUE: Property values would decrease on surrounding properties.

ISSUE RAISED BY: Peter F. Fry, Klaus Heyne

DISCUSSION: One of the principal arguments of the 1990 ESEE Analysis designation of "3B" (no protection of the aggregate resource) was the effect on property values of surrounding lands. The LCDC Remand Order specifically addresses that issue in Issues #2 and #3. In Issue #2, the Order stated: "The county also concluded that developing the site would lessen surrounding property values, but provided no evidence to support this conclusion." Therefore, an assumption or speculation that property values would be reduced cannot be used in the analysis, only verified proof. Of more importance is the direction given by LCDC in "Issue #3 – No Impact Test." A determination of "no impact" with conflicting uses in order to protect a resource is an erroneous interpretation of the Administrative Rules. The Rule requires "local governments to

'resolve' conflicts at specific sites." This "resolution of conflicts involves balancing competing values. The Goal 5 process is a conflict resolution tool."

Any verified and quantified study which attempted to prove some property value reduction could most likely still not be the basis for denial of protection of the resource. The study would, of course, add to the conclusion already found that there are conflicts and would reinforce the desirability to mitigate conflicts, but, under the Goal 5 Rules, it would not be the foundation for denial of protection.

i. Road System Impacts

ISSUE: Request that the discussion of transportation impacts area/impact points be eliminated from the Goal 5 analysis.

ISSUE RAISED BY: Paul R. Hribernick, Counsel for the aggregate property owner

DISCUSSION: This issue was the fourth subject of the Remand Order. From the LCDC Remand Order language and subsequent discussions with DLCD staff, the directive is that protection of the resource in the Goal 5 analysis cannot be denied by transportation concerns. However, those concerns are a valid subsequent operational review issue that might limit the quarry activities. Nowhere in this report is the statement made that transportation issues will be the basis for denial of Goal 5 protection. In fact, it is made clear that it is not to be an argument for denial of protection.

After the decision on protection of the resource is made, transportation is a issue at this site because the road system near the aggregate resource consists of only local roads (as classified in the Multnomah County Classification of Trafficways). This being the only access raises concerns because all other land uses which would produce a large amount of frequent heavy truck traffic **over an extended time period** would require direct access to at least a collector street and would not be permitted to have direct access to a local street (ie. Comprehensive Plan Policy No. 30 on Industrial Location requirements). At the time of permit review this is valid information that might be used to "limit" the extent of quarry activities at the site. See B.4.e.(vii).

The point is made that logging activities have as large or larger trucks and log trucks use the same roads. In response, while aggregate production and and logging may be comparable in a short term generation of heavy truck traffic, logging does not continue at a site after the timber is removed. Logging operations are significantly shorter in duration and after logging is finished there are several decades before the same site would again be producing truck traffic. In contrast, the property owner has made the statement that this aggregate resource could serve the East County market for a hundred years without interruption. That kind of continued frequency has a greater impact on the durability of a road system than a few years of clear cutting at any particular location on the transportation system.

j. Need for Independent Studies

ISSUE: Multnomah County should have contracted for separate noise impacts, wildlife, property values, and market studies.

ISSUE RAISED BY: Peter F. Fry, Klaus Heyne

DISCUSSION: Studies relied upon as the basis of this analysis are (1) the only reliable and available information; (2) they were done by reputable consultants with more than acceptable credentials; (3) there is no reason to disbelieve the findings; (4) and the studies have been part of the record for more than four years with no challenge made to their acceptability. Review of that same information contributed to the concerns raised by LCDC Remand Order "Issue #2 – Lack of Reasons to Support Decisions" where conclusions in the 1990 analysis were made that were contradicted by these same studies.

CHAPTER IV

CONFLICT RESOLUTION AND PROTECTION PROGRAM FOR HOWARD CANYON AREA GOAL 5 RESOURCES

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A. INTRODUCTION

1. INTENT OF CHAPTER IV

Preceding Chapters II and III have determined that the Big, Knieriem/Ross, and Howard Canyon Creeks are significant Goal 5 resources and that the Howard Canyon aggregate resource is also a significant Goal 5 resource. Uses that would conflict with these resources have been identified as follows:

Streams (Big, Knieriem, and Howard Canyon Creeks)
- Forestry
- Residential Uses (homes)
- Conditional and Community Service Uses
- Agriculture
- Transportation Facilities
- Mining

Mining of Howard Canyon Aggregate (Conflicts within designated impact area)
- Residential Uses (homes, including all residential uses listed in B.3.d. of Chapter III)
- Streams

Chapters II and III have also determined the economic, social, environmental, and energy (ESEE) consequences that allowing conflicting uses would have on the significant resources, and the consequences if the conflicting uses were not allowed. Decisions to allow, not allow, or limit conflicting uses must be based upon this analysis of ESEE consequences. However, each of the significant resources does not stand alone as each of the designated impact areas overlap. Any decisions about allowing conflicts must consider the results of the ESEE analysis for both the resources and reconcile any differences.

Section B of this chapter will examine the previously identified ESEE consequences for each conflicting use and reconcile any differences to reach a conclusion as to whether that particular *use* should be allowed, not allowed, or allowed in a limited manner.

Section C of this chapter will then reach a determination as to whether each significant *resource* should be fully protected by not allowing conflicting uses (designate "3-A"), not protected because conflicting uses are of such importance that they should be allowed fully (designate "3-B"), or protected by allowing conflicting uses in a limited manner (designate "3-C").

2. OAR 660-16-010

This OAR 660-16-010 requires, based on the determination of the economic, social, environmental and energy consequences, that a jurisdiction must "develop a program to achieve the Goal." Assuming there is adequate information on the location, quality, and quantity of the resource site as well as on the nature of the conflicting uses and ESEE consequences, a jurisdiction is expected to "resolve" conflicts with specific sites in any of the

following three ways:

> *(1) Protect the Resource Site: Based on the analysis of the ESEE consequences, a jurisdiction may determine that the resource site is of such importance, relative to the conflicting uses, and the ESEE consequences of allowing conflicting uses are so great that the resource site should be protected and all conflicting uses prohibited on the site and possibly within the impact area identified in OAR 660-16-000(5)(c). Reasons which support this decision must be presented in the comprehensive plan, and plan and zone designations must be consistent with this decision.* (This is a "3-A" designation for the Goal 5 resource.)
>
> *(2) Allow Conflicting Uses Fully: Based on the analysis of ESEE consequences and other Statewide Goals, a jurisdiction may determine that the conflicting use should be allowed fully, not withstanding the possible impacts on the resource site. This approach may be used when the conflicting use for a particular site is of sufficient importance, relative to the resource site. Reasons which support this decision must be presented in the comprehensive plan, and plan and zone designations must be consistent with this decision.* (This is a "3-B" designation for the Goal 5 resource.)
>
> *(3) Limit Conflicting Uses: Based on the analysis of ESEE consequences, a jurisdiction may determine that both the resource site and the conflicting use are important relative to each other, and that the ESEE consequences should be balanced so as to allow the conflicting use but in a limited way so as to protect the resource site to some desired extent. To implement this decision, the jurisdiction must designate with certainty what uses and activities are allowed fully, what uses and activities are not allowed at all and which uses are allowed conditionally, and what specific standards or limitations are placed on the permitted and conditional uses and activities for each resource site. Whatever mechanisms are used, they must be specific enough so that affected property owners are able to determine what uses and activities are allowed, not allowed, or allowed conditionally and under what clear and objective conditions or standards. Reasons which support this decision must be presented in the comprehensive plan, and plan and zone designations must be consistent with this decision.* (This is a "3-C" designation for the Goal 5 resource.)

The "goal to be achieved," according to Goal 5, is protection of significant resources for future generations. This does not simply mean that a use which adversely impacts the resource should not be allowed if the ESEE analysis has shown that protection is more important than the conflicting use (a "3-A" designation). The conflict resolution process should also take into consideration whether adverse impacts can be mitigated. If mitigation is possible, the appropriate designation is "3-C," and clear and objective standards should be adopted which will allow the conflicting use in a manner that also protects the resource.

If the use of development standards would resolve conflicts by both allowing the use and protecting the resource, then "3-C," limit conflicting uses, is the appropriate Goal 5 level of protection.

B. CONFLICT RESOLUTION

COMPILATION OF CONFLICTS AND THE CONSEQUENCES OF NOT ALLOWING, ALLOWING IN A LIMITED MANNER, OR ALLOWING FULLY THE CONFLICTS

The following is compiled from the Summary subsections of section B, Resource Analysis, in Chapters II and III and is a combined synopsis of all the ESEE consequences.

1. FORESTRY

Forestry activities have been identified as a conflicting use to significant streams. A synopsis of the identified ESEE consequences is as follows:

Consequences if Forestry is not allowed

Economic: Lost jobs, reduced tax revenues, increased transport costs, regulatory burden
Social: Reduced property rights, impact to"timber" lifestyle, no more local sources
Environmental: Insignificant
Energy: More energy use for transporting materials and building infrastructure, shortage of goods
Goal 4: County cannot prohibit forest practices on forest lands

Consequences if Forestry is allowed in a limited manner

Economic: Possible loss of some jobs, tax revenue; regulatory burden
Social: Reduced property rights, impact on "timber" lifestyle, reduced local sources
Environmental: Insignificant
Energy: Some increase in energy use for transporting materials to market, shortage of goods
Goal 4: County cannot limit or regulate forest practices on forest lands

Consequences to Streams if Forestry is allowed fully

Economic: Reduced water quality for use, change in water quantity for use
Social: Loss of flood storage capacity
Environmental: Loss of riparian vegetation, reduced water quality
Energy: Insignificant

DISCUSSION: The significant streams are bordered by lands in three zoning districts, EFU, CFU and RR. Forestry is unlikely to occur on areas zoned EFU (the impacts of agriculture are discussed in a separate section). Four properties adjacent to Big Creek are zoned RR. However, the ESEE analysis showed there would be no impacts to Big Creek if forestry is allowed. Consequently, only the impacts of forestry on CFU zoned lands adjacent to Knieriem Canyon and Howard Canyon streams must be considered.

The Oregon Forest Practices Act (FPA) governs forestry activities on lands zoned CFU. The FPA contains rules to provide for the overall maintenance of water resources, fish, and wildlife by requiring buffer areas along streams, where logging is not allowed. In addition to these protections, ORS 527.722 restricts the county from prohibiting, limiting or regulating forest practices on forest lands.

CONCLUSION: The FPA provides protections to streams from logging activities, and the county cannot regulate or prohibit forestry activities on forest lands. Forestry activities should be allowed fully within the impact area of the significant streams.

2. RESIDENTIAL USES (HOMES)

Residential Uses (new homes) in the mapped aggregate impact area or in the stream riparian impact area have been identified as a conflict to the listed significant streams and mining of the Howard Canyon aggregate resource.

Consequences if Residential Uses are not allowed (in impact areas)

Economic: Lower value of property; less tax revenue; regulatory burden; change in customary practice; protection of aggregate resource

Social: Reduced availability of amenities; loss of opportunity for rural lifestyle

Environmental: Transfer of environmental impacts to another site

Energy: Potentially greater distance between destinations (build further away); increased cost of infrastructure

Consequences if Residential Uses are allowed in a limited manner (in impact areas)

Economic: Partial loss of property value if required to setback greater distance from stream; regulatory burden; change in customary practice; new homebuilder assumes a portion of the obligation and costs to mitigate conflicts with mining; protection of aggregate resource

Social: Reduced availability of amenities; some potential for additional complaints to any mining operator

Environmental: Transfer of environmental impacts to another location; potential for some increase in soil erosion and fire hazard

Energy: Additional energy in mitigating mining conflicts by new homebuilder

Consequences if Residential Uses are allowed fully (in impact areas)

Economic: Curtailment of area of extraction or the total loss of aggregate resource and associated value from sales, jobs,taxes; increased cost to consumers for aggregate

Social: Increase of complaints to any mining operator

Environmental: Loss of riparian vegetation; loss of water quality; more disturbance of wildlife habitat in riparian vegetation; new homes could be sited as to cause mining operator to violate DEQ noise standards; new homes could be sited on top of or too close to aggregate resource which would result in loss of resource

Energy: New homes could be sited as to cause quarry to alter mining methods which use more energy; increased energy used to transport aggregate from another source to East County area

DISCUSSION: Residential uses pose a significant conflict with the Goal 5 inventoried significant stream resources and the Howard Canyon significant aggregate resource. Due to the low density of permitted dwellings in the rural zoning districts, the greatest concern for conflict with the resources as is the proximity of the homes to the Goal 5 resources. Only residential uses inside the impact areas would potentially affect the resources.

The impact areas of the streams are the adjacent riparian zones along the streams. The riparian zones are as follows: Big Creek, an area ranging from 80-200 feet of the stream bank; Knieriem/Ross Creek, 0-160 feet of the stream bank; and Howard Canyon Creek, 10-200 feet of the stream bank.

The impact area of the aggregate resource is the area within 1,200 feet of the mapped aggregate resource. Based upon the ESEE analysis there is confidence that outside that distance all DEQ standards for noise and dust from mining activities will be met for new homes.

CONCLUSION: There would be significant adverse consequences to the two Goal 5 resources if residential uses were allowed fully. There would also be adverse consequences to property owners if residential uses were prohibited. A balanced approach which protects the resource while allowing residential uses which are sited to minimize the adverse impacts on the resources is the desired solution to this issue.

The specific limitations on residential development which may be adopted to protect the stream resources and the aggregate resource must be carefully crafted to prevent a total prohibition on the ability to site a residence on any particular lot of record. This is a concern where the individual resource protection measures or the combination of the two resource protection measures might result in too severe restriction of the buildable portion of a property. For example, requiring the siting of a proposed home a certain distance from one of the streams may also overlap into a building prohibited setback area established to protect the aggregate resource.

3. COMMUNITY SERVICE AND CONDITIONAL USES

Community service and conditional uses have been identified as uses that would conflict with significant streams. The identified ESEE impacts are:

<u>Consequences if Community Service and Conditional Uses are not allowed</u>
Economic: Regulatory burden, changes in customary practices
Social: Reduced availability of amenities
Environmental: Transfer of impacts to another site
Energy: Insignificant

<u>Consequences if Community Service and Conditional Uses are allowed in a limited manner</u>
Economic: Regulatory burden, changes in customary practices

Social: Reduced availability of amenities
Environmental: Transfer of impacts to another site
Energy: Insignificant

Consequences to Streams if Community Service and Conditional Uses are allowed fully
Economic: Insignificant
Social: Insignificant
Environmental: Deterioration of water quality, increased disturbance of wildlife
Energy: Insignificant

DISCUSSION: Several factors limit the number and type of community service and conditional uses likely to be allowed, including a lack of public utilities such as sewer and water; no direct access to a collector street as required by Comprehensive Plan Policy 31; and limited population in the area which makes any commercial activity unfeasible. However, there is a potential for a few uses such as utility facilities, campgrounds, or forest or farm processing facilities.

The impacts to streams if community service and conditional uses are allowed fully are environmental in nature, as compared to the economic and social impacts if these uses are not allowed. If the uses are allowed, but in a limited manner that requires protection of riparian vegetation and prevents runoff into streams, the impacts to the significant resources will be minimal. Community service and conditional use approval criteria include a provision that the use "will not adversely affect natural resources" (MCC .7015(B) and .7120(A)(2)). This may be adequate to provide protection to the stream resources.

CONCLUSION: Community service and conditional uses should be allowed in a limited manner by requiring the use to not adversely affect the stream corridor.

4. AGRICULTURE

Identified as a conflict to streams. The synopsis of ESEE consequences is as follows:

Consequences if Agriculture is not allowed
Economic: Lost jobs, reduced tax revenues, increased transport costs
Social: Loss of farming lifestyles, reduced property rights, reduced local sources of farm products
Environmental: Transferring environmental impacts to another site.
Energy: Increase in costs to bring more distant farm products to market, shortage of goods

Consequences if Agriculture is allowed in a limited manner
Economic: Regulatory burden, potential for loss of jobs and tax revenues
Social: Loss of aesthetically pleasing open space, burden of regulation, reduced farm lifestyle, reduced local sources of farm products
Environmental: Transfer of some environmental impacts to another site
Energy: Some increase in energy use for transporting materials to market, shortage of goods

Consequences if Agriculture is allowed fully

Economic: Reduced water quality for use, change in water quantity for use

Social: Insignificant

Environmental: Loss of riparian vegetation, reduced water quality, greater wildlife disturbance

Energy: Insignificant

DISCUSSION: The analysis for significant streams (Chapter II) identifies specific conflicts with agricultural activities, such as misuse of pesticides, degradation of stream quality, and removal of riparian vegetation, which have negative consequences upon streams.

Regulation and restriction of agricultural activities to protect Goal 5 natural resources is theoretically possible for Multnomah County. ORS 215.253 states: *No State Agency, City, County, or Political Subdivision of this state may exercise any of its powers to enact local laws or ordinances or impose restrictions or regulations affecting any farm use land situated within an exclusive farm use zone established under ORS 215.203 ...in a manner which would unreasonably restrict or regulate farm structures or that would unreasonably restrict or regulate accepted farming practices because of noise, dust, odor, or other materials carried in the air or other conditions arising therefrom... ..."Accepted Farming Practice" as used in this subsection shall have the meaning set out in ORS 215.203.*

Nothing in this section is intended to limit or restrict the lawful exercise by any state agency, city, county or political subdivision of its power to protect the health, safety, and welfare of the citizens of this state.

As this language seems to indicate, regulation of agricultural activities by Multnomah County is feasible under state law.

However, it is not desirable or necessary for the County to institute a regulations for agricultural activities or practices, for the following reasons:

1. Regulation of agricultural activities and practices would require a major effort by Multnomah County in order to study and adopt appropriate regulatory mechanisms and would require significant expenditure in order to enforce them.

2. The regulatory burden of mandatory restrictions on agricultural practices would be considered onerous by many if not most farmers.

3. Measures to protect streams are already practiced by many farmers, and are considered to be beneficial not only to the natural resources involved, but also to the agricultural activity or practice.

4. The U.S. Soil and Water Conservation Service and the East Multnomah Soil and Water Conservation District have as one of their primary missions the promotion of sound agricultural practices which protect streams from degradation due to agricultural activities and

practices.

CONCLUSION: For the reasons listed above, Multnomah County should not institute a regulatory scheme for agricultural activities. As an alternative, Multnomah County should work cooperatively with the U.S. Soil Conservation Service and the East Multnomah Soil and Water Conservation District to promote agricultural practices which protect streams. Joint programs should promote the following measures:

-- Fencing should be used to keep domestic livestock from degrading streams and adjacent riparian habitat. Design standards for fences could be used which ensure that fences do not block passage for a wide range of wildlife species.

-- Application of fertilizers and pesticides could be limited, especially outside of cultivated farming areas.

-- Uncultivated riparian "buffer" areas should be maintained along streams in order to maintain fish and wildlife habitat values and maintain water quality.

5. TRANSPORTATION/PUBLIC IMPROVEMENTS

Identified as a conflict to streams. The synopsis of ESEE consequences is as follows:

Consequences if Transportation/Public Improvements are not allowed:
- Economic: Increased cost of material transport, regulatory burden, changes in practices
- Social: Insignificant
- Environmental: Insignificant
- Energy: Increased energy expenditure on infrastructure

Consequences if Transportation/Public Improvements are allowed in a limited manner:
- Economic: Increased cost of material transport, regulatory burden, changes in practices
- Social: Insignificant
- Environmental: Insignificant
- Energy: Increased energy expenditure on infrastructure

Consequences if Transportation/Public Improvements are fully allowed:
- Economic: Insignificant
- Social: Loss of education & recreation associated with wildlife habitat
- Environmental: Loss of riparian vegetation, loss of water quality, more disturbance of wildlife
- Energy: Decreased water flow for energy use

DISCUSSION: Transportation facilities and Public Improvements have the potential to adversely impact significant streams wherever such an existing facility is modified or a new facility is constructed within the riparian zone of the stream. The County has no regulatory authority over logging roads constructed in accordance with the Forest Practices Act, and

driveways are more appropriately considered under the category of the development they are proposed to serve (residential, community service, etc.). Although no major proposed public improvements, such as utility extensions, or road widenings were identified in the Howard Canyon area, such improvements may be proposed in the future.

Transportation facilities and public improvements which are located within a stream's impact area are too vital in most cases to be prohibited in order to protect the stream. However, such facilities can generally be constructed in a manner which can minimize the impacts to streams.

CONCLUSION: Clearly, there would be significant adverse consequences to Goal 5 resources if transportation facilities and public improvements were allowed fully, and to the community if such uses were prohibited. A balanced approach, which protects the resources while allowing improvements to roads and public facilities which minimizes impacts upon these resources, is the optimal solution for this issue.

6. MINING OF THE MAPPED AGGREGATE RESOURCE

Consequences if Mining is not allowed

Economic: Lost jobs; increased transportation costs for obtaining aggregate; loss of aggregate resource and associated value from sales; increased cost to consumers for aggregate

Social: No local source for aggregate; reduced property rights for aggregate owner; no conflicts from noise and dust from mining activities to noise and dust sensitive uses

Environmental: Insignificant

Energy: Increase in energy expended to transport aggregate to East County

Consequences if Mining is allowed in a limited manner

Economic: Potential for some lost jobs; aggregate available at lower cost; new home builders in impact area assume a portion of the obligation and costs to mitigate conflicts with mining

Social: Reduced amount of local source of aggregate; mining noise and dust conflicts, (to the extent allowed by DEQ standards), will be experienced by residents of the impact area; fewer siting choices for new homes on existing lots in the impact area

Environmental: Noise, dust, and erosion effects, (to the extent allowed by DEQ standards), will occur in the impact area

Energy: Some reduction in energy expended to transport aggregate to East County

Consequences if Mining is allowed fully

Economic: Jobs created for extracting, processing and transporting aggregate; aggregate available at lower cost; new home builders in impact area assume a portion of the obligation and costs to mitigate conflicts with mining

Social: Mining noise and dust conflicts, (to the extent allowed by DEQ standards), will be experienced by residents of the impact area; fewer siting choices for new

homes on existing lots in the impact area

Environmental: Noise, dust, and erosion effects, (to the extent allowed by DEQ standards), will occur in the impact area

Energy: Reduction in energy expended to transport aggregate to East County

DISCUSSION: Mining activities pose a significant potential conflict with the Goal 5 inventoried significant stream resources and residential uses in the designated impact area. There are significant streams to the north, west and south of the aggregate resource which are within the impact area of the aggregate and which would potentially receive any erosion problems that might occur from mining activities. Also within the aggregate impact area are 11 existing homes, 1 unexpired approval of a home, and the estimated maximum potential for 9 additional homes which would receive the impacts of noise and dust resulting from aggregate extraction and processing.

The impact areas of the streams are the adjacent riparian zones along the streams. The riparian zones are: Big Creek, an area ranging from 80 to 200 feet of the stream bank; Knieriem/Ross Creek, 0 to 160 feet of the stream bank; and Howard Canyon Creek, 10 to 200 feet of the stream bank.

The aggregate resource is not located within any of the impact areas (riparian zones) of the significant streams and, therefore, impacts from mining on the streams will not be from extraction of aggregate, but from other mining effects. Those effects could potentially include erosion into the streams, construction within the riparian zone of holding ponds to reduce erosion, construction and maintenance of private haul roads, and dust. Of those effects State DEQ standards are in place and compliance by any mining operator is required for the amount of soil erosion and dust that reaches the streams.

The impact area of the aggregate resource is the area within 1,200 feet of the mapped aggregate resource. That distance was based upon both the impacts to residential uses from potential noise and the distance also included the aforementioned streams. Based upon the ESEE analysis, for residential uses there is confidence that outside that distance all DEQ standards for noise and dust from mining activities will be met.

Within that impact area,(and outside the impact area), a mining operation is required by the State of Oregon Department of Geology and Mineral Industries to also meet DEQ standards for impacts to noise and dust sensitive land uses, if those standards are not met then mining does not take place.

CONCLUSION: There would be significant adverse economic consequences if the Goal 5 aggregate resource was not protected (mining not allowed). There would also be adverse consequences to streams and residential uses if mitigating measures were not required of a mining operation to reduce where practicable or necessary. A balanced approach which protects the aggregate resource for mining while requiring a mining operation to minimize adverse effects on the streams and residential uses is the desired solution to this issue.

C. PROTECTION OF RESOURCES

1. STREAMS

a. Designated Level of Protection

The designated level of protection for the three Significant Streams in the Howard Canyon area (Big Creek, Howard Canyon Creek, and Knieriem Creek) is 3.C. -- Limit Conflicting Uses.

b. Conflicting Uses to be allowed fully

(i) Forestry/timber
(ii) Farm Use

c. Conflicting Uses to be allowed conditionally

(i) Community Service/Commercial Uses

- Wood Processing(limited, sawmills, etc.)
- Wholesale/retail for farm/forest products
- Playgrounds, Churches, Schools
- Parks/Golf Courses
- Dog Kennels
- Aircraft Landing Area
- Cottage Industries
- Rural Service/Commercial
- Other Community Service Uses

(ii) Transportation/Public Improvements

(iii) Residential Uses

- Single-family Residential
- Farm/Forest Worker Housing

(iv) Mining/Geothermal Uses

d. Conflicting Uses not allowed

None

e. Program to achieve the goal

Standards for protection of stream resources should consider erosion control, native vegetation maintenance and enhancement, and fish and wildlife maintenance and

enhancement for any of the conflicting uses proposed for development within the riparian zone which are designated above as uses to be allowed conditionally. This protection can best be accomplished through placement of an "overlay" zone similar in concept to the Significant Environmental Concern(SEC)-Streams overlay currently within the Multnomah County Zoning Ordinance.

The riparian zone for the three Howard Canyon Creeks has been generally measured as part of the stream survey conducted by SRI/Shapiro. The area where the SEC overlay zone should be placed is within the riparian area, defined as follows in the SRI/Shapiro Report:

"A riparian area is comprised of an aquatic ecosystem and associated upland area. Water in the aquatic system influences upland vegetation and microclimate. Upland areas affect the aquatic ecosystem by providing thermal regulation, biomass, and structure."

Since measurement of the riparian zone was very generalized in the Streams study, provisions should be made for an applicant under the SEC provisions to provide evidence as to a more precise boundary of the riparian zone on the property which meets the above-listed definition.

Specific protection measures for streams which will be used with the SEC overlay zone provisions include the following:

-- Maximum provision of landscaped area, scenic and aesthetic enhancement, open space, or vegetation between any use and a stream.

-- Preservation of agricultural and forest land adjacent to streams for farm and forest use.

-- Building, structure, or use located so as to best preserve and protect the riparian zone area

-- Minimum conflict between recreational uses and the riparian zone area

-- Protection of public safety and private property from vandalism and trespass to the maximum extent practicable considering environmental values of the riparian zone

-- Protection and enhancement of opportunities for fish and wildlife to live in and travel through the riparian zone

-- Protection and enhancement of natural vegetation along streams

-- Retention of areas of annual flooding and wetlands in their natural state

-- Limit development to portions of a site located away from steep slopes, soils,

and other unstable geological conditions

-- Protection of areas within and adjacent to the riparian zone from erosion

-- Regulation of construction practices and schedules in order to minimize erosion into streams from water runoff and soil erosion

-- Minimization of impervious surface area in order to reduce pollution of stream waters

2. AGGREGATE RESOURCE

Based upon the ESEE Analysis in Chapter III, and the reconciliation of the interrelationships of the relevant resources and conflicts in Chapter IV, the Howard Canyon significant aggregate resource is to be protected under the provisions of OAR 660-16-010(3), Limit Conflicting Uses (also referred to as **a "3C" designation**). This designation is a determination that both the aggregate resource and the conflicting uses are important relative to each other, and that the ESEE consequences should be balanced so as to allow conflicting uses but in a limited way, so as to protect the resource site. To implement this decision, the jurisdiction must designate with certainty what uses and activities are allowed fully, what uses and activities are not allowed at all and which uses are allowed conditionally, and what specific standards or limitations are placed on the permitted and conditional uses and activities for each resource site. Reasons which support this decision must be presented in the comprehensive plan, and plan and zone designations must be consistent with this decision.

a. Uses Fully Allowed – The following uses should be allowed fully in the aggregate resource impact area:

(i) Commercial Forest Use Zoning District:

- Exploration for mineral and aggregate resources as defined in ORS Chapter 517

- Widening of roads within existing rights-of-way in conformance with the transportation element of acknowledged comprehensive plans including public road and highway projects as described in ORS 215.213(1)(m) through (p) and ORS 215.283(1)(k) through (n)

- Exploration for and production of geothermal, gas, oil, and other associated hydrocarbons, including the placement and operation of compressors, separators and other customary production equipment for an individual well adjacent to the well head

- Mining and processing of oil, gas, or other subsurface resources. as defined in ORS Chapter 520, and not otherwise permitted under OAR 660-06-025(3)(m) (e.g., compressors, separators and storage serving multiple wells), and mining

and processing of aggregate and mineral resources as defined in ORS Chapter 517

- Temporary asphalt and concrete batch plants as accessory uses to specific highway projects

- Public road and highway projects as described in ORS 215.(1,(2)(q) through (s), 215.213(10), 215.283(2)(p) through (r) and 215.283(3)

- Forest operations or forest practices including, but not limited to, reforestation of forest land, road construction and maintenance, harvesting of a forest tree species, application of chemicals, and disposal of slash

- Temporary on-site structures which are auxiliary to and used during the term of a particular forest operation

- Physical alterations to the land auxiliary to forest practices including, but not limited to, those made for purposes of exploration, mining, commercial gravel extraction and processing, landfills, dams, reservoirs, road construction or recreational facilities

- Farm use as defined in ORS 215.203

- Local distribution lines (e.g., electric, telephone, natural gas) and accessory equipment (e.g., electric distribution transformers, poles, meter cabinets, terminal boxes, pedestals), or equipment which provides service hookups, including water service hookups

- New electric transmission lines with right of way widths of up to 100 feet as specified in ORS 772.210. New distribution lines (e.g., gas, oil, geothermal) with rights-of-way 50 feet or less in width

- Temporary portable facility for the primary processing of forest products

- Towers and fire stations for forest fire protection

- Water intake facilities, canals and distribution lines for farm irrigation and ponds

- Water intake facilities, related treatment facilities, pumping stations, and distribution lines

- Reservoirs and water impoundments

- Uses to conserve soil, air and water quality and to provide for wildlife and fisheries resources

- Uninhabitable structures accessory to fish and wildlife enhancement
- Private hunting and fishing operations without any lodging accommodations
- Permanent facility for the primary processing of forest products
- Permanent logging equipment repair and storage
- Log scaling and weigh stations
- Disposal site for solid waste that has been ordered established by the Environmental Quality Commission under ORS 459.049, together with the equipment, facilities or buildings necessary for its operation
- Disposal site for solid waste approved by the governing body of a city or county or both and for which the Oregon Department of Environmental Quality has granted a permit under ORS 459.245, together with equipment, facilities or buildings necessary for its operation
- Television, microwave and radio communication facilities and transmission towers
- Fire stations for rural fire protection
- Utility facilities for the purpose of generating power
- Aids to navigation and aviation
- Cemeteries

(ii) Exclusive Farm Use District:

- Operations for the exploration for and production of geothermal resources as defined by ORS 522.005 and oil and gas as defined by ORS 520.005, including the placement and operation of compressors, separators and other customary production equipment for an individual well adjacent to the well head
- Operations for the exploration for minerals as defined by ORS Chapter 517.750
- Operations conducted for mining and processing of geothermal resources as defined by ORS 522.005 and oil and gas as defined by ORS 520.005 not otherwise permitted under this rule
- Operations conducted for mining, crushing or stockpiling of aggregate and other mineral and other subsurface resources subject to ORS 215.298
- Processing as defined by ORS 517.750 of aggregate into asphalt or portland

cement

- Processing of other mineral resources and other subsurface resources
- Public road and highway projects described under the heading "Transportation" in OAR 660-33-120
- Farm use as defined in ORS 215.203 and other buildings customarily provided in conjunction with farm use (except residences)
- Commercial activities in conjunction with farm use
- Farm stands
- The propagation, cultivation, maintenance and harvesting of aquatic species
- Dog kennels and the breeding, kenneling and training of greyhounds for racing
- Propagation or harvesting of a forest product
- Forest management research and experimentation facilities accessory to forest operations
- A facility for the primary processing of forest products
- Utility facilities necessary for public service
- A site for the disposal of solid waste that has been ordered to be established by the Environmental Quality Commission under ORS 459.049, together with the equipment, facilities or buildings necessary for its operation
- A site for the disposal of solid waste approved by the governing body of a city or county or both and for which a permit has been granted under ORS 459.245 by the Department of Environmental Quality together with equipment, facilities or buildings necessary for its operation
- Commercial utility facilities for the purpose of generating power for public use by sale
- Golf courses
- Cemeteries

c. **Uses Conditionally Allowed** – The following uses should be allowed conditionally in the aggregate resource impact area:

(i) Commercial Forest Use Zoning District:

- Residential uses including the following as provided by the Administrative Rules:

  Forestland dwellings
  Alteration, restoration or replacement of a lawfully established dwelling
  A mobile home in conjunction with an existing dwelling as a temporary use for the term of a hardship suffered by the existing resident or a relative
  Private accommodations for fishing occupied on a temporary basis
  Private seasonal accommodations for fee hunting operations

(ii) Exclusive Farm Use District:

- Residential uses including the following as provided by the Administrative Rules:

  Dwelling customarily provided in conjunction with farm use
  A dwelling on property used for farm use occupied by relative whose assistance in management of the farm is required by farm operator
  One single-family dwelling on a lawfully created lot or parcel (optional provision using date of ownership, soil productivity ratings, and other criteria)
  A mobile home in conjunction with an existing dwelling as a temporary use for the term of a hardship suffered by the existing resident or a relative
  Single family residential dwelling, not provided in conjunction with farm use
  Seasonal farmworker housing as defined in ORS 197.675
  Alteration, restoration or replacement of a lawfully established dwelling

d. **Uses Not Allowed** – The following uses should not be allowed in the aggregate resource impact area:

(i) Commercial Forest Use Zoning District:

- Expansion of existing airports
- Destination resorts reviewed and approved pursuant to ORS 197.435 to ORS 197.465 and Goal 8
- Temporary forest labor camps
- Caretaker residences for fish hatcheries
- Parks and campgrounds
- Caretaker residences for public parks

(ii) Exclusive Farm Use District:

- Destination resort which is approved consistent with the requirements of Goal 8
- Living history museum
- Public or private schools, including all buildings essential to the operation of a school
- Churches
- Parks, including Private parks, playgrounds, hunting and fishing preserves and campgrounds and Parks, playgrounds or community centers owned and operated by a governmental agency or a nonprofit community organization
- A winery as described in ORS 215.452

d. **Program to Achieve the Goal** – OAR 660-16-010 requires, based on the determination of the economic, social, environmental and energy consequences, that a jurisdiction must "develop a program to achieve the Goal." Following is the program for protection of the Howard Canyon aggregate resource in accordance with the determination to "Limit Conflicting Uses" (3C level of resource protection).

(i) Comprehensive Framework Plan Policy 16-B and the Zoning Code shall be amended to include items required by the LCDC Remand Order.

(ii) Multnomah County shall amend Comprehensive Framework Plan Policy 16-B to identify the Howard Canyon aggregate resource as 3C and acknowledge the impact area identified in the ESEE Analysis as the appropriate area for regulation of conflicting uses. All of the following quarry development conditions shall also be made a part of the Plan Policy language specific to this site.

(iii) A mapped plan designation and overlay zoning district "extraction zone" shall be adopted to protect the actual aggregate resource area. Within this area only aggregate extraction and processing, land reclamation, farming and forestry activities would be permitted.

(iv) A plan designation and overlay zoning district "impact area" extending 1,200 feet around the "extraction zone" shall be adopted. Within the "impact area" overlay zone some future conflicting uses would not be allowed and other conflicting uses such as new homes would be required to address certain setbacks and orientation requirements so as not to cause approved mining activities within the "extraction zone" to violate State standards for noise levels, air quality, etc.

(v) For the area of the aggregate resource site subject to an Oregon Department of Geology and Mineral Industries (DOGAMI) operational permit, Multnomah County deems Oregon Department of Environmental Quality (DEQ) standards for noise levels, air quality, and water quality to be appropriate to protect the health, safety and welfare of citizens and to be appropriate to protect the land and water resources within the impact area. The County will request participation by DEQ and the Oregon Department of Fish and Wildlife in the review of any DOGAMI operational mining permit at this site.

(vi) As a condition of approval, and within a specified time frame, another acoustical study shall be required to verify that DEQ noise standards are being met at all the existing homes in the impact area once quarrying activities are in full operation. That study shall be by an independent consultant hired by the mining operator and acceptable to the Planning Director. All quarry operations and vehicles shall continue to comply with applicable DEQ noise control standards.

(vii) As a condition of approval, and within a specified time frame, an erosion sampling study, should be required for waters entering the Goal 5 streams to verify that DEQ water quality standards are being met once quarrying activities are in full operation. Obtaining that information will be the responsibility of the mining operator and could be from either State DEQ reports or from an independent consultant hired by the mining operator and acceptable to the Planning Director. All quarry operations shall continue to comply with applicable DEQ erosion control standards to ensure continuing water quality in the streams.

(viii) Multnomah County in its participation in the review of any proposed DOGAMI mining permit plan should inform the state agency of the need for special notice of mining operational methods and haul road construction at the interface of the Basalt and Troutdale formations where there may be a potential for stability problems.

(ix) All haul roads to be used as part of a DOGAMI operational permit shall be paved or treated with dust suppression emulsion to control dust.

(x) Except for aggregate extraction areas, holding ponds, and haul roads, vegetation that functions as a visual screen and retains dust should be retained. Holding ponds shall not be constructed in the stream riparian zone.

(xi) No operation shall commence without approval of all applicable state agency permits.

(xii) All overburden stockpiles shall be stabilized from erosion as required by DOGAMI.

(xiii) Blasting shall be restricted to the hours of 9:00 a.m. to 5:00 p.m., Monday through Friday. No blasting shall occur on Saturdays, Sundays, or the following legal holidays: New Year's Day, Memorial Day, July 4, Labor Day, Thanksgiving Day, or Christmas Day. Notice of blasting events shall be given by the mining operator to all

residents within the impact area in a manner that will ensure receipt of the notice at least 48 hours prior to the blasting event.

(xiv) Noise deflecting berms and vegetative screening are features that are encouraged to be incorporated into the DOGAMI reviewed operational plan.

(xv) Reclamation of the site should be done in a manner to ensure the establishment of either forestry at Oregon Department of Forestry forest practices standards or the establishment of accepted farm practices.

3. CONCLUSION

a. The aggregate resource at the Howard Canyon site is being designated to be protected for future aggregate expansion, subject to the limitations set forth above in subsection 2 of section C, Chapter IV. These limitations include 1) prohibition of certain conflicting uses on the aggregate site itself, 2) requiring construction of new noise sensitive uses within the "impact area" (1200 feet around the "extraction zone") to demonstrate that they will not conflict with mining operations to extract the aggregate resource, 3) on-going demonstration by the mining operator (with independent validation) that Oregon Department of Environmental Quality (DEQ) standards regarding noise levels, air quality, and water quality are maintained, and 4) various and other standards.

b. The three significant streams in the Howard Canyon area which would be affected by the Howard Canyon quarry operation are being designated to be protected from degradation, subject to the conditions set forth above in subsection 1 of section C, Chapter IV. These limitations involve regulating conflicting uses in the riparian zone of the stream in order to maintain and enhance stream and stream bank economic, educational, public safety, recreational, and fish & wildlife habitat values.

c. In weighing the relative merits of the Howard Canyon quarry aggregate resource and the streams resources, the Program to Achieve the Goal would protect both resources. The potential impacts to streams from the quarry site would be eliminated by the protection measures, which include 1) verification that DEQ standards relating to water quality which protect the health, safety and welfare of Oregonians are met for mine runoff into the streams, and 2) prohibition of holding pond construction (holding ponds are used to reduce pollutants from mine runoff to acceptable levels) within the riparian zone of either Knieriem or Howard Canyon Creeks.