

UPPER SWAN VALLEY LANDSCAPE ASSESSMENT

Prepared by:

Swan Ecosystem Center
(Swan Valley Ecosystem Management & Learning Center, Inc.)
6887 Highway 83
U.S. Forest Service Condon Work Center
Condon, Montana 59826

February 2004

This page intentionally left blank.

PREFACE

Swan Ecosystem Center

The Swan Ecosystem Center (SEC) is a nonprofit citizens' group in the Upper Swan Valley of northwestern Montana. People with diverse perspectives are learning about the ecosystem and participating in land management decision-making on public and private land. The Swan Ecosystem Center helps citizens work with the U.S. Forest Service, other public agencies, schools, and representatives of the timber industry on projects designed to maintain the valley's rural and wild characteristics and a sustainable economy.

Mission Statement

We, the citizens of the Upper Swan Valley, have a self-imposed sense of responsibility to maintain a strong, vital community, one involved in setting its own destiny through partnerships that encourage sustainable use and care of public and private land.

In this spirit, the Swan Ecosystem Center offers this Landscape Assessment as a means to help public and private landowners and managers develop and implement ecologically and economically sound stewardship plans for both the short-term and long-term ecosystem health of the Upper Swan Valley community.

Towards that goal, an invitation is extended to contact the Swan Ecosystem Center for additional information concerning this Landscape Assessment or to express comments, concerns, and/or proposed changes. Also, full-sized, original maps of many of those shown in this document are available for viewing at the Swan Ecosystem Center if the reader is so interested. The Landscape Assessment, including all maps, is on SEC's web site and can be downloaded as PDF files.

Swan Ecosystem Center

(Swan Valley Ecosystem Management & Learning Center, Inc.)

6887 Highway 83

U.S. Forest Service Condon Work Center

Condon, Montana 59826

(406) 754-3137

fax (406) 754-2965

swanec@blackfoot.net

www.swanecosystemcenter.com

ACKNOWLEDGEMENTS

The Upper Swan Valley Landscape Assessment is possible due to the contributions of many people. We extend our deep appreciation to all who helped for their assistance, guidance, vision, and dedication in making the Landscape Assessment a valued tool for the management of our cherished Upper Swan Valley. We are especially grateful for the people listed below for their exceptional contributions. If someone's name is not included, please know that it does not by any means diminish your valued contribution.

Rod Ash	Dave Owen
Allen Branine	Melanie Parker
Bob Cushman	Tom Parker
Anne Dahl	Barb Raible
Steve Ellis	Bob Reed
Beth Gardner	Pete Robinson
Max Greenough	Betsy Spettigue
Chuck Harris	Henning Stabins
Liz Hill	Swan Lake Ranger District Interdisciplinary Team
Vernon LaFontaine	Alan Taylor
Maria Mantas	Suzanne Vernon
Roger Marshall	Andy Vigil
Bud Moore	Don Wood

CONTENTS

PREFACE

ACKNOWLEDGEMENTS

LIST OF TABLES AND FIGURES ix

LIST OF PHOTOS x

EXECUTIVE SUMMARY Executive Summary / 1

CHAPTER 1: INTRODUCTION 1.1

Purpose..... 1.1

Area Covered in the Upper Swan Valley Landscape Assessment 1.2

Describing the Upper Swan Valley 1.3

What We Hope to Accomplish 1.5

Concepts of Ecosystem Management..... 1.5

Contents of This Report 1.6

How Landowners Can Use This Document 1.6

CHAPTER 2: UPPER SWAN VALLEY ECOSYSTEMS 2.1

Valley Bottom Ecosystem

General Description 2.3

Disturbances 2.6

Human Activity 2.6

Moderate Warm, Ponderosa Pine Ecosystem

General Description 2.7

Disturbances 2.9

Human Activity 2.9

Cool, Moist Ecosystem

General Description 2.10

Disturbances 2.12

Human Activity 2.12

Cold, Steep, Forested Ecosystem	
General Description	2.13
Whitebark Pine	2.14
Disturbances	2.16
Human Activity	2.16
Cold, Steep, Nonforested Ecosystem	
General Description	2.17
Disturbances	2.20
Human Activity	2.20
CHAPTER 3: LANDSCAPE AND HABITAT CONNECTIONS.....	3.1
Introduction	3.1
Habitat Connections across the Swan Valley	3.1
Swan-Clearwater Watershed Divide	3.3
Mid-Upper Valley Linkage	3.3
Mid-Valley Linkage.....	3.6
Lower Valley Linkage	3.6
Habitat Connections within the Swan Valley	
Major Creeks and Ridges	3.6
Wet Meadow – Pothole Complexes	3.7
Swan River Bottom	3.8
Known Wildlife Trails	3.8
Habitat Connections within Forest Stands	3.9
Disturbances to Connectivity	3.9
Keystone Species	3.10
Beaver	3.11
Whitebark Pine	3.11
CHAPTER 4: LANDSCAPE PATTERNS	4.1
Geology	4.1
Landforms and Soils	4.2
Climate	4.4
Hydrology	4.4
Vegetation Effects on Hydrology	4.7
Underground Hydrology	4.9
Water Quality Monitoring	4.9
Conditions of Aquatic Communities and Habitats	4.10

Vegetation Patterns	4.12
Historic Vegetation Patterns	4.12
Forest Type and Structure, All Lands	4.14
CHAPTER 5: DISTURBANCES ON THE LANDSCAPE	5.1
Fire	5.1
Disease	5.4
Insects	5.4
Noxious Weeds	5.5
Wind	5.6
Snow	5.7
Landslide	5.8
Flood	5.8
Seismic Activity	5.8
Human Activity	5.8
Hunting, Fishing, Trapping Activities	5.12
Human Development and Fire Protection	5.12
Historic Trails	5.13
Roads	5.14
Roads and Recreation	5.14
CHAPTER 6: LANDSCAPE TRENDS	6.1
Introduction	6.1
Background	6.1
Swan Valley Residents' Views of Trends	6.1
Trends by Issue from 2001 Questionnaire	
Noxious Weeds/Invasive Species	6.5
Sale of Plum Creek Lands	6.5
Conservation Education	6.6
Forest Management	6.6
Recreation	6.6
Montana Highway 83	6.7
Wildlife	6.7
Development	6.8
Economics	6.8
Roads	6.9

Garbage Disposal	6.9
Water Quality/Fishing	6.9
Future Public Meeting Agenda Items	6.9
2003 Follow-up Study	6.10
Overall Question	6.10
Landscape Committee	6.10
Ecosystem Trends	
Valley Bottom Ecosystem	6.12
Moderate, Warm Ponderosa Pine Ecosystem	6.14
Cool, Moist Ecosystem	6.14
Cold, Steep, Forested Ecosystem	6.14
Cold, Steep, Nonforested Ecosystem	6.15
Conclusion	6.16
CHAPTER 7: MANAGEMENT IMPLICATIONS AND SUMMARY	7.1
Ecosystem Management Principles	7.1
Application of Ecosystem Management	7.2
Major Management Implications	7.3
Summary	7.5
APPENDICES	
Appendix A Vascular Plant List for the Upper Swan Valley	A.1
Appendix B Birds, Fish, Mammals, Reptiles, and Amphibians of the Upper Swan Valley	B.1
Appendix C Noxious Weeds, Forest Insects, and Diseases	C.1
Appendix D Hydrology and Fisheries	D.1
Appendix E Outline for Ecosystem Cruisers: Field Work, Writing, and Project Validation	E.1
Appendix F Trends and Issues Survey Results	F.1
Appendix G Forest Management	G.1
GLOSSARY OF TERMS	Glossary / 1
REFERENCES	References / 1

LIST OF TABLES AND FIGURES

	PAGE
TABLES	
Table 1.1	Upper Swan Valley Landscape Assessment Area Ownership 1.3
Table 4.1	Landform Types and Characteristics 4.3
Table 4.2	Upper Swan Valley Drainage Area and Stream Densities 4.5
Table 4.3	Surface Water and Wet Areas..... 4.8
Table 4.4	Flathead National Forest Lands, Age Structure in 1998 4.16
FIGURES	
Figure 1.1	Upper Swan Valley in Montana 1.2
Figure 1.2	Upper Swan Valley Land Ownership Map 1.4
Figure 2.1	Upper Swan Valley Ecosystems Map 2.2
Figure 3.1	Grizzly Bear Linkage Zones Map 3.2
Figure 3.2	Upper Swan Valley Major Wildlife Connections Map 3.4
Figure 3.3	Upper Swan Valley Primary Winter Range Boundaries Map 3.5
Figure 4.1	Swan Valley Geology 4.2
Figure 4.2	Upper Swan Valley Streams, Lakes, and Wetlands Map 4.6
Figure 4.3	Upper Swan Valley Bull Trout Map 4.11
Figure 4.4	Upper Swan Valley – Ayres Map 4.15
Figure 5.1	Upper Swan Valley Fire History Map 5.3
Figure 5.2	Upper Swan Valley Roads and Trails Map 5.15

LIST OF PHOTOS

PHOTOS	PAGE
Cover	View of the Swan Range from Loon Lake. (<i>NwC</i>)
Photo 1.1	Looking southeast toward Swan Range. (<i>A. Dahl</i>) 1.1
Photo 2.1	Valley Bottom Ecosystem looking toward Cold, Steep Nonforested Ecosystem in the Swan Range. (<i>B. Spettigue</i>)..... 2.1
Photo 2.2	Cottonwood near pothole. (<i>R. Ash</i>) 2.3
Photo 2.3	Fen. (<i>NwC</i>) 2.4
Photo 2.4	Marsh, Dog Creek on Condon Loop Road. (<i>R. Ash</i>) 2.5
Photo 2.5	Pond off Cold Creek Rd, south of Peck Lake Rd junction. (<i>R. Ash</i>) .. 2.5
Photo 2.6	Pond off Cold Creek Road. (<i>R. Ash</i>) 2.5
Photo 2.7	Marsh on Condon Loop Road near Dog Creek. (<i>R. Ash</i>) 2.6
Photo 2.8	Ponderosa pine behind Condon Work Center. (<i>B. Raible</i>) 2.7
Photo 2.9	Ponderosa pine, larch, Douglas-fir near Smith Creek. (<i>B. Raible</i>)..... 2.8
Photo 2.10	Scree slope near Smith Creek. (<i>B. Raible</i>) 2.8
Photo 2.11	Brush gap near Smith Creek. (<i>B. Raible</i>)..... 2.8
Photo 2.12	Winter in the Upper Swan Valley. (<i>B. Spettigue</i>)..... 2.10
Photo 2.13	Elk Creek. (<i>R. Marshall</i>) 2.11
Photo 2.14	Holland Creek. (<i>R. Marshall</i>)..... 2.11
Photo 2.15	Hauling out logs in the Upper Swan Valley. (<i>R. Marshall</i>)..... 2.13
Photo 2.16	Cold, Steep Ecosystems. (<i>NwC</i>) 2.13
Photo 2.17	Whitebark pine in Swan Range. (<i>NwC</i>) 2.13
Photo 2.18	Bear den. (<i>NwC</i>)..... 2.14
Photo 2.19	Dead and dying whitebark pine. (<i>NwC</i>) 2.15
Photo 2.20	Whitebark pine on the Lion Creek-Palisade Divide with subalpine fir and spruce encroaching upon niches made available by dead and dying whitebark pine. (<i>NwC</i>) 2.15
Photo 2.21	Old trapper cabin in the Mission Mountains. (<i>NwC</i>) 2.16
Photo 2.22	Packing over Bartlett Pass Area. (<i>NwC</i>) 2.17
Photo 2.23	Cold, Steep, Nonforested Ecosystem on Cooney Basin Headwall. (<i>NwC</i>)..... 2.18
Photo 2.24	Scree slope in headwaters of Cooney Creek. (<i>NwC</i>) 2.19
Photo 2.25	Anchor pin on top of Hemlock Peak. (<i>A. Dahl</i>) 2.21

Photo 2.26	Holland Lookout cabin on top of Swan Range. (<i>NwC</i>)	2.21
Photo 3.1	Forest fragmentation in the Upper Swan Valley. (<i>NwC</i>)	3.10
Photo 3.2	Studying Whitebark Pine Ecosystems. (<i>NwC</i>)	3.11
Photo 4.1	Bull trout spawning in Lion Creek. (<i>NwC</i>)	4.10
Photo 5.1	Ponderosa pine. (<i>R. Marshall</i>)	5.1
Photo 5.2	Lodgepole pine near Smith Creek. (<i>B. Raible</i>)	5.1
Photo 5.3	Understory become ladder fuels. (<i>B. Raible</i>)	5.2
Photo 5.4	Whitebark pine. (<i>NwC</i>)	5.4
Photo 5.5	Spotted knapweed. (<i>MSU Extension Service</i>).....	5.5
Photo 5.6	Orange hawkweed. (<i>MSU Extension Service</i>)	5.6
Photo 5.7	Houndstongue. (<i>MSU Extension Service</i>).....	5.6
Photo 5.8	Purple loosestrife. (<i>MSU Extension Service</i>)	5.6
Photo 5.9	Windblown trees on forest edge. (<i>NwC</i>)	5.7

This page intentionally left blank.