Appendices

Appendix A

Public Scoping and Comments on Crabtree Watershed Issues and Concerns

The issue identification and scoping process are a two-phased approach. The first step involved scoping through the IDT of scientists and resource professionals. Primary team members were staff from within the Bureau of Land Management (BLM) Cascades Resource Area. During the spring of 2000, an informational scoping letter containing a questionnaire was sent out to watershed landowners, other local, county, and state agencies, and other interested individuals and organizations. These individuals, groups, and organizations were encouraged to complete the questionnaire and return it to our office. In addition, notification regarding ongoing watershed analyses was published in the Salem District Project Update, with contact names, email addresses and phone numbers. Contained within this appendix are a summary of comments, issues and concerns received on the Crabtree Watershed, **Notice of Crabtree and Quartzville Watershed Analysis, Watershed Analysis: Questions and Answers**, and a summary of the questionnaire that was sent out to the public.

Summary of Public Comments on Crabtree Watershed Analysis Issues and Concerns

Most Important Issues

Need more areas to ride ORVs.

Keep motorized access open to recreational areas in the watershed

Lack of rest rooms where overnight camping is allowed

Clearcutting has resulted in a great increase in water runoff and landslides

Pollution of creeks and streams

Increased stream sedimentation

Loss of private property due to flooding

Declining fishery resource

Not replanting trees after harvest

Support Law Enforcement efforts

Specific Locations of Particular Concern

The area from Y Line and Gainer to the top of Snow Peak

LaComb and Scio areas

Hunter/Church Creek closure

LaComb Irrigation District

T11S, R1E Secs 7-8 between river miles 16 & 17

The creek along Island Inn Road and East LaComb Road.

Lower end of the watershed at the foot of the hills

Area along Bergen Hollow and Roaring River

Berry farm on Crabtree Creek on Island Inn Drive

Protection from wildfire and disease

How Would You Like to See Federal Lands Managed in the Crabtree Watershed?

Positive management of the motorcycle riding area

Give all interest groups equal preference in how the lands are managed

No harassment of landowners; enforce rules already in place

For timber protection, creating a more natural range of forest conditions

No clearcutting

Manage lands for wildlife benefit

Streambank stabilization

Plant more trees on harvested land

More dams to control flooding

Keep roads and lands open to the public for recreational uses

Remove diseased spike tops and do more thinning

Maintain roads for fire control access using Legacy Road Maintenance Standards under the Oregon Salmon Plan

Maintain the Church Creek closure to control ORV activity and damage and to lessen the threat from fire

What Kind of Watershed Restoration Work Would You Like to See Planned in the Watershed?

Maintain motorcycle trails to eliminate erosion problems

Replant more trees in harvested areas

Keep streams at appropriate safe flow volumes

Dam about five miles up from Meridian Road on Crabtree Creek to make a nice recreation area lake

Spray the maple tree stumps

Other Comments, Issues, or Concerns

Disappointed with the level of funding and support the BLM contributes to the Forest Security Program through Linn Forest Protection Association and the Linn County Sheriff's Office. BLM should pay an equal share like the private landowners do.

Law enforcement is essential in maintaining and protecting a watershed; need more officers out there patrolling the watershed.

Waterways need to be better maintained and kept unplugged

Log jams in Crabtree Creek contribute to flooding on private property

Not enough money for enforcement of laws regarding vandalism, illegal ORV use etc.

Restrict access to the watershed during summer fire season

Notice of Crabtree and Quartzville Watershed Analysis

Dear Citizen:

The Bureau of Land Management(BLM), Cascades Resource Area, is currently analyzing the Crabtree and Quartzville Watersheds (see enclosed map). The Quartzville Watershed analysis is being conducted in cooperation with the U.S. Forest Service, Sweet Home Ranger District. You or your organization was identified as being potentially interested in the watershed analysis process for one or both of these watersheds. We are interested in any issues and comments that pertain to the management of these watersheds. Enclosed is additional information about the watershed analysis process and a questionnaire to help capture your input. Your involvement in this analysis process will be very helpful for future federal land management planning activities in these watersheds. Analysis of both watersheds will occur over the next several months and we hope to have them completed by June of 2000.

The Crabtree Watershed is located approximately 16 miles east of Albany and is just over 100,000 acres in size. The upper portion of the Crabtree Watershed includes private, state and BLM-administered lands in Crabtree Valley and the Snow Peak area. The lower portion of the watershed includes private agricultural/rural lands and the communities of Lacomb and Crabtree. **For more information about the Crabtree Watershed Analysis contact Jim England at (503) 315-5913 or at Jim_England@blm.gov**.

The Quartzville Watershed is located approximately five miles northeast of Sweet Home and is 95,500 acres in size. The watershed begins at Green Peter Dam and continues up the northern arm of Green Peter Reservoir and ends at the headwaters of Quartzville Creek. The watershed includes land managed by the BLM, the U.S. Forest Service and the U.S. Army Corps of Engineers, as well as state, county, and private lands. **For more information about the Quartzville Watershed Analysis contact Laura Graves at (503) 315-5908 or Laura_Graves@blm.gov.**

Please return the questionnaire or contact the individuals listed above by April 30th if you wish to remain on or add additional contacts to our mailing list. In an effort to reduce unwanted mailings, if you do not notify us of your continued interest in this project, your name will be removed from the mailing list. Thank you for your interest and assistance in this effort.

Sincerely yours,

Cascades Resource Area Manager

Watershed Analysis: Questions and Answers

What is a watershed analysis?

Watershed analysis simply tells the story of a particular watershed. It examines how major ecological processes are working together in the watershed. It is one of the principal assessment tools that will be used to meet the ecosystem management objectives of the BLM Salem District's Resource Management Plan standards and guidelines. It is not a planning or decision document. Watershed analysis will focus on collecting and compiling information about trends and conditions of the watershed that is essential for making sound management decisions. The findings and recommendations resulting from the watershed analysis process will provide guidance for future federal land uses and activities in the watershed. It will serve as a basis for developing project specific proposals and determining monitoring and restoration needs. It will not establish direction or regulations for state, tribal or private lands within the watershed.

How will a watershed analysis be used?

It will provide important baseline resource information to help federal resource specialists and land managers develop project-specific proposals for forest management, recreation, fisheries and wildlife habitat improvements, restoration and other activities and actions within the watershed. It will also help identify information gaps, monitoring and restoration needs for the watershed.

Is this a one time process?

Watershed analysis is an ongoing process. The analysis document, maps and files will be updated and expanded as new information is gathered and watershed conditions change.

Are non-federal lands analyzed and how are they affected?

The analysis will consider resource conditions of the entire watershed, regardless of land ownership or jurisdictional boundaries. **However, the watershed analysis process is not intended to be used to determine or direct management of non-federally owned lands.** The watershed analysis process can help encourage more coordination between landowners and other public land management agencies that have lands or jurisdiction within the watershed. It is our ultimate goal to work collaboratively with those sharing the watershed to ensure the continued health of the forest ecosystem, maintain water quality and meet resource management objectives.

Why spend money to do a watershed analysis in a drainage where the BLM and FS do not actually manage most of the land?

Federal lands account for over 18,000 acres in the Crabtree watershed and the majority of the land in the Quartzville Watershed. A watershed consists of many interacting ecosystems. To best manage public lands we need a clear and accurate picture of the condition of the entire watershed, not just specific locations or habitats.

How will the watershed analysis address water quality?

Available water quality will be analyzed, problem areas/sources and new data needs will be identified. As a result, opportunities for improving water quality conditions or changing certain management activities will be recommended for federal lands. Opportunities for improving water quality in cooperation with private land owners may also be identified.

How can I be involved?

The question is, how do you *wish* to be involved? Since the Watershed Analysis is not a formal decision process but an analytical tool, there are no requirements set forth for public involvement. However, input from the public is desired and encouraged. Many of you are familiar with the resource and know the watershed well. Your information and participation can help us paint a more accurate and detailed picture of the watershed and be more responsive to key issues and concerns. You could help us by filling out the attached questionnaire to ensure that we are addressing issues that are important to you.

Crabtree Watershed Questionnaire

Issue and information response sheet (modified from the original)

1. Yes, I want to be involved in the watershed analysis process and continue to receive mailings and information:

Name: _____ Date: _____

Address: _____

_____

Telephone: _____

Organization: _____

2. What do you see as the most important issues in this watershed? What do you think needs to be done to resolve these issues?

3. Are there any specific locations within this watershed of particular concern to you? What are those areas and what are your concerns?

4. How would you like to see federal lands managed in the Crabtree Watershed?

5. What kind of watershed restoration work would you like to see planned and specifically where would that work be?

6. How would you like to be involved in the watershed analysis currently underway in the Crabtree Watershed, and to what extent?

7. Other comments, issues or concerns?

Appendix B

Botanical Species

B.1 Botanical Species of Concern: Special Status Plants in the Crabtree Watershed

SPECIES & STATUS	HABITAT	ELEVATION (FT)	BEST I.D. SEASON
FEDERAL ENDANGERED (FE)			
LOMATIUM BRADSHAWII (Rose) Math. & Const. Bradshaw's lomatium	WV, Linn, Marion WET MEADOWS GRAVELLY STREAMBEDS	<750	APRIL-MAY
FEDERAL THREATENED (FT)			
HOWELLIA AQUATILLIS A. Gray howellia	VW, Clack, Marion, Mult. SHALLOW PONDS & MARSHES	<200	MAY
SIDALCEA NELSONIANA Piper Nelson's sidalcea	WV, Linn, Marion	<2000	JUNE-JULY
FEDERAL PROPOSED THREATENED (PT)			
CASTILLEJA LEVISECTA Greenm. Golden paintbrush	WV, Linn, Marion, Mult. WET OR VERNALLY WET MEADOWS	<1000	JUNE-EARLY JULY
FEDERAL CATEGORY 1 CANDIDATES (FC1)			
DELPHINIUM PAVONACEUM Ewan peacock larkspur	WV, Clack, Marion, Mult.	<1500	MAY-JUNE
ERIGERON DECUMBENS Nutt. VAR. *DECUMBENS* Willamette daisy	WV, Clack, Linn, Marion GRASSLANDS	<1000	JUNE-EARLY JULY
BUREAU SENSITIVE (BS)			
ASTER CURTUS Cronq. white-topped aster	WV, Clack, Linn, Marion, Mult.		
ASTER GORMANII (Piper) Blake Gorman's Aster	WC, Clack, Linn, Marion OPEN OR SPARSLEY TIMBERED, ROCKY RIDGETOPS & MEADOWS	>3500	LATE JULY-AUGUST
BRIDGEOPORUS NOBILISSIMUS W.B. Cooke giant polypore fungus, fuzzy sandozi	WC, Clack, Linn OLD GROWTH NOBLE FIR		

SPECIES & STATUS	HABITAT	ELEVATION (FT)	BEST I.D. SEASON
CIMICIFUGA ELATA Nutt. tall bugbane	WV, WC, Clack, Linn, Marion, Mult. MOIST WOODS	<2000	JUNE-MID JULY
CORYDALIS AQUAE-GELIDAE Peck & Wilson cold-water corydalis	WC, Clack, Linn, Marion, Mult. COLD SPRINGS & STREAMS	>1000	MID JUNE-JULY
DELPHINIUM LEUCAPHAEUM Greene white rock larkspur	WV, Clack, Marion, Mult.	<1000	MAY-EARLY JUNE
HORKELIA CONGESTA Douglas ssp. *CONGESTA* shaggy horkelia	WV, Linn OPEN SANDY OR ROCKY FLATS TO OPEN WOODS	LOW	APRIL-JUNE
LUPINUS SULPHUREUS *Douglas ssp. KINKAIDII* (Smith) Phillips Kincaid's lupine	WV, Linn, Marion WILLAMETTE VALLEY	<1500	MAY-JULY
MONTIA HOWELLII S. Watson Howell's montia	WV, WC, Clack, Linn, Mult. ROCKY RIVER BANKS ESP. IN DISTURBED SITES	<2500	APRIL-EARLY MAY

B.2 Survey & Manage and Protection Buffer Species in the Cascades Resource Area

The species listed below are included in the survey and manage and the protection buffer species portion of the Northwest Forest Plan. The species included on this list and their respective survey strategies could change in the future.

* Known sites of these species are the Crabtree Watershed Analysis area

Bryophytes (Survey Strategies)

** Antitrichia curtipendula*	(4)
Ptilidium californicum	(1,3)
Racomitrium aquaticum	(1,3)
** Ulota megalospora*	(PB)

Fungi

Asterophora lycoperdoides	(3)
**Bondarzewia montana*	(1,2,3)
**Bridgeoporus nobilissiuus*	(1,2,3)
**Cantharellus cibarius*	(3,4)
Cantharellus formosus	(1,3)
**Cantharellus subalbidus*	(3,4)
** Cantharellus tubaeformis*	(3,4)
**Clavariadelphus pistilaria*	(3,4)
Clavulina cinerea	(3,4)
Clavulina cristata	(3,4)
Cordyceps capitata	(3)
Cudonia monticola	(3)
**Gomphus floccosus*	(3)
**Gymnopilus puntifolius*	(1,3)
**Gyromitra esculenta*	(3,4)
**Gyromitra infula*	(3,4)
** Helvella compressa*	(1,3)
**Hydnum repandum*	(3)
**Hydnum umbilicatum*	(3)
Hypomyces luteovirens	(3)
**Leucogaster citrinus*	(1,3)
**Mycena overholtsii*	(1,3)
**Neournula pouchet*	(1,3)
** Omphalina ericitorium*	(3,4)
Otidea leporina	(3,PB)
Otidea onotica	(3,PB)
Oxyporous nobilissimus	
**Phaeocollybia californica*	(1,3)
*Phaeocollybia kauffmanii	(1,3)
**Plectania latahense*	(1,3)

** Plectania melastoma*	(3)
**Psuedo pletania*	(3)
**Ptilidium californicum*	
**Ramaria araiospora*	(1,3)
**Ramaria rubricarnata*	
**Ramaria stuntzii*	(1,3)
** Sarcosoma mexicana*	(3,PB)
**Sparassis crispa*	(3)
**Sowerbyella rhenana*	(1,3,PB)

Lichens

Calicium viride	(4)
Cetrelia cetrariodes	(4)
Chaenotheca chrysocephala	(4)
Chaenotheca ferruginea	(4)
Cyphelium inquinans	(4)
Lobaria hallii	(1,3)
** Lobaria oregana*	(4)
** Lobaria pulmonaria*	(4)
Lobaria scrobiculata	(4)
Loxospropsis coralifera	(1,3)
**Nephroma bellum*	(4)
Nephroma helveticum	(4)
Nephroma laevigatum	(4)
**Nephroma parile*	(4)
** Nephroma resupinatum*	(4)
** Pannaria saubinetii*	(4)
** Peltigera collina*	(4)
** Peltigera pacifica*	(4)
**Pilophorous nigricaulis*	(4)
** Platismatia lacunosa*	(4)
** Pseudocyphellaria anomola*	(4)
Pseudocyphellaria anthraspis	(4)
** Pseudocyphellaria crocata*	(4)
**Pseudocyphellaria rainierensis*	(1,2,3)
Ramalina thrausta	(4)
** Sticta fuliginosa*	(4)
** Sticta limbata*	(4)
**Usnea longissima*	(4)

B.3 Noxious Weeds in the Crabtree Watershed

PRIORITY I SPECIES - POTENTIAL NEW INVADERS * known populations in the Cascade Resource Area		
SCIENTIFIC NAME	**COMMON NAME**	**BEST ID. SEASON**
CARDUUS PYCNOCEPHALUS	Italian thistle	May - June
CARTHAMUS LANATUS	distaff thistle	
CARTHAMUS LEUCOCAULOS	whitestem distaff thistle	
CENTAUREA SOLSTITIALIS	yellow starthistle	
CENTAUREA VIRGATA	squarrose knapweed	
CHONDRILLA JUNCEA	rush skeleton weed	mid July - Frost
CENTAUREA CALCITRAPA	purple starthistle	
CENTAUREA IBERICA	Iberian starthistle	
CARDUUS TENUIFLORUS	slender flower thistle	
LYTHRUM SALICARIA	purple loosetrife	Aug. - Sept.
SILYBUM MARIANUM	milk thistle	Late April - Early June
PRIORITY II SPECIES - ERADICATION OF NEW INVADERS		
**** CENTAUREA DIFFUSA***	diffuse knapweed	July - Sept.
**** CENTAUREA MACULOSA***	spotted knapweed	July - Oct.
**** CENTAUREA PRATENSIS***	meadow knapweed	July - Oct.
**** POLYGONUM CUSPIDATUM***	Japanese knotweed	May-Sept.
**** ULEX EUROPARUS***	gorse	April - Sept.
PRIORITY III SPECIES - ESTABLISHED INFESTATIONS		
**** CIRSIUM ARVENSIS***	Canada thistle	July - Aug
**** CIRSIUM VULGARE***	bull thistle	July - Sept
**** CYTISUS SCOPARIUS***	Scotch broom	May - June
**** HYPERICUM PERFORATUM***	St. Johnswort	June - July
**** SENECIO JACOBAEA***	tansy ragwort	July - Sept

B.4 *Bridgeoporous nobilissimus*

from Management Recommendations for Survey and Manage Fungi, Version 2.0, Group 29 by Claire Hibler and Thomas E. O'Dell, July 1997.

Bridgeoporous (=Oxyoporous) nobilissimus

Bridgeoporous nobilissimus (noble polypore) is a massive polypore. It is a large shaggy tan conk with the upper surface reminiscent of a green pizza with a crew cut and is frequently covered with mosses, algae, lichens and debris. The combination of morphological features which differentiate *Bridgeoporous nobilissimus* from other polypores are the shaggy appearance of the pileal surface and the alternating white and brown tube layers in the fruiting body. The conspicuous and often extremely large size and fuzzy surface of the perennial conk makes *Bridgeoporous nobilissimus* easily noticed and identifiable in the field.

Little is known about the autecology of *Bridgeoporous nobilissimus*, but it is apparently a parasite (butt rot) or saprobe on *Abies*. Known sites are in a wide range of seral stages from a 35 year old plantation (on old-growth stumps) to old-growth forests with large diameter (109-208 cm) *A. procera* or *A amabilis*. Conks grow up to 122 centimeters (4 feet) off the ground on live trees, standing dead trees, snags and stumps. They are also found on the ground, growing off of the collars and root crowns within 2 meters of the base of the host.

The conks have been found in three general shapes. Hoof-shaped and shelf-like conks are found on the sides fo the hosts. Centrally substipitate conks are found growing on the collars and root crowns of the hosts and on the tip of host stumps. Maximum pileus measurements from the known sites are 750 mm long by 1010 mm high.

Management Goals

Management goals are to assist in maintaining viable populations on federal land within the assessment area. Known sites on federal land of this rare species should be protected until sufficient information is generated to suggest management can sustain taxon viability, particularly on federal land.

Maintain and develop mature, large diameter, declining *Abies* trees, snags, and stumps at known sites. Maintain and design *Bridgeoporous nobilissimus* management areas to protect habitat of known populations. The design of the management areas should be based on results of species oriented inventories and the availability of potential habitat over the long term.

Management Within Habitat Areas

Status of specific management activities is unknown for extant sites. However, at and around known sites, it is recommended that current habitat conditions and micro-climatic conditions be maintained, impacts from recreational activities minimized, and disruption to snags and stumps avoided.

- Maintain dominance of specific overstory tree associates.
- Minimize loss or disruption of host tree snags and stumps, particularly from management, road, trail and campground construction or recreational activities.
- Manage tree diseases in the area to minimize loss of overstory trees.
- This protection could include conservative silvicultural treatments to develop mature, large diameter declining *Abies* trees, snags, and stumps. The guiding objective of any such treatment could be to encourage the development of mature, large diameter, declining *Abies amabilis* and *Abies procera* trees, snags, and stumps over the long term. All known sites should be evaluated for the presence and health of *Abies amabilis* and *Abies procera* in the habitat area.

Sites not in land use allocations that protect the populations from timber management should have a 600 acre temporary reserve area around them until: (1) all of the potential habitat within the reserve is inventoried for additional *Bridgeoporous nobilissimus* conks and potential hosts and (2) a site specific *Bridgeoporous nobilissimus* management plan is prepared.

Silvicultural treatments within the Pacific Silver fir zone, in all land use allocations could promote the development of mature, large diameter *Abies procera*. For example, when designing a timber harvest unit in the matrix, the largest and oldest *Abies procera* could be selected as a major component of the required leave trees. Potential trampling and collection impacts may be mitigated by not developing trails and recreation sites in the vicinity of known *Bridgeoporous nobilissimus* sites.

Data Gaps and Information Needs

Revisit known sites and collect ecological data to more completely characterize habitat. Conduct surveys to locate additional populations of this taxon in Research Natural Areas and when appropriate, where management treatments or projects are scheduled or proposed. Conduct inventories to locate additional populations of *Bridgeoporous nobilissimus* in areas identified as potential habitat. Prioritize inventories where management treatments or projects are proposed in potential habitat and around known sites.

Data are lacking regarding the specific response of this taxon to management practices such as logging, road, trail, and campground construction, prescribed fire and collection of secondary forest products. Information is also needed on the area required to support viable populations, population age structure, dispersal requirements and maximum distance over which populations

interact.

Appendix C Wildlife Species

C.1. Vertebrate Wildlife List

The following is a list of vertebrate species known or suspected to occur in the Crabtree watershed. Occurrence codes for are based on records in the Salem District Wildlife Observation Database (WOBS), Oregon Natural Heritage Program (ONHP) and on extrapolation from literature specific to the Pacific Northwest region.

HABITAT & OCCURRENCE KEY:

V=Willamette Valley & Cascades Foothills
H=High Elevation Habitats
I=Introduced, L=local, B=Breeding (Birds), NB=Non-breeding (Birds),
BU= Breeding Status Uncertain(Birds), OU=Occurrence Uncertain, E=Extirpated

FEDERAL/STATE STATUS:

LE=Federal Endangered, SE=State Endangered,
LT=Federal Threatened, ST=State Threatened,
FP= Federal Proposed, FC=Federal Candidates,
SC=State Critical, SV=State Vulnerable, SU=State Undertermined Status,
SP=State Peripheral, BS=Bureau Sensitive, BA=Bureau Assessment,
BT=Bureau Tracking, SM=ROD Survey and Manage,
B=ROD Buffer or Extra Protection Species

CRABTREE WATERSHED - WILDLIFE LIST - HERPETOFAUNA

SPECIES	SPCODE	FEDERAL	STATE	BLM/FS	SA-ROD	OCC
Northwestern salamander	AMGR					
Long-toed salamander	AMMA					V-OU
Pacific giant salamander	DIEN					
Cascade torrent salamander	RHCA		SV	BT		L
Clouded salamander	ANFE		SU	BT		L
Oregon slender salamander	BAWR		SU	BT		
Ensantina	ENES					
Dunn's salamander	PLDU					
Western redback salamander	PLVE					L
Roughskin newt	TAGR					
Pacific tree frog	HYRE					
Tailed frog	ASTR		SV	BT		L
Red-legged frog	RAAU		SV	BT		
Foothill yellow-legged frog	RABO		SV	BT		OU
Spotted frog	RAPR	FC	SC	FC		E
Bullfrog	RACAT					V-I
Northwestern pond turle	CLMA		SC	BS		V-OU
Northern alligator lizard	ELCO					
Southern alligator lizard	ELMU					V-L
Western fence lizard	SCOC					V-L
Western skink	EUSK					L
Rubber boa	CHBO					L
Racer	COLCO					V
Ringneck snake	DIPU					V
Gopher snake	PIME					V
W. Terrestrial Garter Snake	THEL					V
Northwestern garter snake	THOR					
Common garter snake	THSI					
Western rattlesnake	CRVI		SV	BT		L-OU

CRABTREE WATERSHED - WILDLIFE LIST - BIRDS

SPECIES	SPCODE	FEDERAL	STATE	BLM/FS	SA-ROD	OCC
Common loon	GAIM			BA		OU
Pied-billed grebe	POPO					OU
Eared grebe	PODNI					OU
Western grebe	AEOC					NB
Great blue heron	ARHE					B
Green-backed heron	BUST					V-B
Canada goose	BRCA					B
Wood duck	AISP					B
Green-winged teal	ANCR					NB
Mallard	ANPL					B
Northern pintail	ANAC					NB
Cinnamon teal	ANCY					OU
Blue-wingedTeal	ANDI					OU
Northern shoveler	ANCL					NB
Gadwall	ANST					NB
American wigeon	ANAAM					NB
Ring-necked duck	AYCO					NB
Lesser scaup	AYAF					NB
Harlequin duck	HIHI		SU	BA		BU
Common goldeneye	BUCL					NB
Barrow's goldeneye	BUIS		SU	BT		NB
Bufflehead	BUAL		SU	BA		NB
Hooded merganser	LOCUC					B
Common merganser	MERME					B
Ruddy duck	OXJA					OU
Turkey vulture	CAAU					B
Osprey	PAHA					B
White-tailed Kite	ELLE			TS		V-OU
Bald eagle	HALE	LT	ST	LT		B
Northern harrier	CICY					BU
Sharp-shinned hawk	ACST					B
Cooper's hawk	ACCO					B
Northern goshawk	ACGE		SC	BS		H-BU
Red-tailed hawk	BUJA					B
Rough-legged hawk	BULA					NB

SPECIES	SPCODE	FEDERAL	STATE	BLM/FS	SA-ROD	OCC
Golden eagle	AQCH					BU
American kestrel	FASP					B
Merlin	FACO			BA		NB
Peregrine falcon	FAPE		SE	BS		BU
Ring-necked pheasant	PHCO					V-IL
Blue grouse	DEOB					H-B
Ruffed grouse	BOUM					B
Wild turkey - Merriam	MEGA					V-IL
California quail	CACAL					V-B
Mountain quail	ORPI					B
Virginia rail	RALI					B
American coot	FUAM					BU
Sandhill Crane	GRCATA		SV	BT		NB
Killdeer	CHVO					V-B
Greater yellowlegs	TRME			BT		V-NB
Solitary Sandpiper	TRSO			BT		V-NB
Spotted sandpiper	ACMA					B
Western sandpiper	CAMAU					V-NB
Least sandpiper	CAMI					V-NB
Dunlin	CAALP					V-NB
Common snipe	GAGA					V-B
Ring-billed gull	LADE					NB
California gull	LACAL					NB
Herring gull	LAAR					NB
Rock dove	COLI					B
Band-tailed pigeon	COFA					B
Mourning dove	ZEMA					V-B
Yellow-billed cuckoo	COAM		SC	BS		E
Common barn-owl	TYAL					V-B
Western screech-owl	OTKE					V-B
Great horned owl	BUVI					B
Northern pygmy-owl	GLGN					B
Northern spotted owl	STOC	LT	ST	LT		B
Barred owl	STVA					B
Short-eared owl	ASFL					V-BU

SPECIES	SPCODE	FEDERAL	STATE	BLM/FS	SA-ROD	OCC
Northern saw-whet owl	AEAC					B
Common nighthawk	CHMI		SC	BS		B
Vaux's swift	CHVA					B
Rufous hummingbird	SERUF					B
Belted kingfisher	CEAL					B
Lewis' woodpecker	MELE		SC	BS		NB
Acorn woodpecker	MEFO			BT		V-BU
Red-breasted sapsucker	SPRU					B
Downy woodpecker	PIPU					V-B
Hairy woodpecker	PIVI					B
Northern flicker	COAU					B
Pileated woodpecker	DRPI		SV	BT		B
Olive-sided flycatcher	COBO		SV	BT		B
Western wood-pewee	COSO					B
Willow flycatcher	EMTR		SV	BT		B
Hammond's flycatcher	EMHA					B
Pacific-slope flycatcher	EMDI					B
Western kingbird	TYVE					V-B
Horned lark	ERAL		SC	BS		V-BU
Purple martin	PRSU		SC	BS		V-BU
Tree swallow	TABI					B
Violet-green swallow	TATH					B
N.rough-winged swallow	STSE					V-B
Cliff swallow	HIPY					V-B
Barn swallow	HIRU					V-B
Gray jay	PECA					H-B
Steller's jay	CYST					B
Scrub jay	APCO					V-B
American crow	COBR					V-B
Common raven	CORCO					B
Black-capped chickadee	PAAT					V-B
Chestnut-backed chickadee	PARU					B
Bushtit	PSMI					V-B
Red-breasted nuthatch	SITCA					B
White-breasted nuthatch	SICAR					V-B

SPECIES	SPCODE	FEDERAL	STATE	BLM/FS	SA-ROD	OCC
Brown creeper	CEAM					B
Bewick's wren	THBE					V-B
House wren	TRAE					B
Winter wren	TRTR					B
American dipper	CIME					B
Golden-crowned kinglet	RESA					B
Ruby-crowned kinglet	RECA					NB
Western bluebird	SIME		SV	BT		B
Mountain bluebird	SICU					NB
Townsend's solitaire	MYTO					H-B
Swainson's thrush	CAUS					B
Hermit thrush	CAGU					H-B
American robin	TUMI					B
Varied thrush	IXNA					B
Cedar waxwing	BOCE					B
Northern shrike	LAEX					NB
American pipit	ANSP					NB
European starling	STVU					IB
Solitary vireo	VISO					V-B
Hutton's vireo	VIHU					B
Warbling vireo	VIGI					B
Red-eyed vireo	VIOL					V-BU
Orange-crowned warbler	VECE					B
Nashville warbler	VERU					NB
Yellow warbler	DEPE					V-B
Yellow-rumped warbler	DENCO					NB
Black-throated gray warbler	DENI					B
Townsend's warbler	DETO					NB
Hermit warbler	DEOC					B
MacGillivray's warbler	OPTO					B
Common yellowthroat	GETR					B
Wilson's warbler	WIPU					B
Yellow-breasted Chat	ICVI		SC	BS		V-B
Western tananger	PILU					B
Black-headed grosbeak	PHME					B

SPECIES	SPCODE	FEDERAL	STATE	BLM/FS	SA-ROD	OCC
Lazuli bunting	PAAMO					V-B
Rufous-sided towhee	PIER					B
Grasshopper sparrow	AMSA		SP	BT		BU
Chipping sparrow	SPPA					BU
Vesper Sparrow	POGR		SC	BS		V-B
Savannah sparrow	PASA					V-B
Fox sparrow	PAIL					V-NB
Song sparrow	MELME					B
Lincoln's sparrow	MELI					NB
Golden-crowned sparrow	ZOAT					V-NB
White-crowned sparrow	ZOLE					B
Dark-eyed junco	JUHY					B
Red-winged blackbird	AGPH					V-B
Western meadowlark	STUNE		SC	BS		V-B
Brewer's blackbird	EUCY					V-B
Brown-headed cowbird	MOAT					V-B
Northern oriole	ICGA					V-B
Purple finch	CARPU					B
House finch	CARME					V-B
Red Crossbill	LOCU					H-B
Pine siskin	CAPI					B
American goldfinch	CATR					V-B
Lesser goldfinch	CAPS					V-B
Evening grosbeak	COVE					B
House sparrow	PADO					I-B

CRABTREE WATERSHED- WILDLIFE LIST - MAMMALS

SPECIES	SPCODE	FEDERAL	STATE	BLM/FS	SA-ROD	OCC
Virginia opossum	DIVI					V-I
Pacific water shrew	SOBE					
Pacific shrew	SOPAC					
Trowbridge's shrew	SOTRO					
Vagrant shrew	SOVA					
Shrew-mole	NEGI					
Coast mole	SCOR					
Townsend's mole	SCTO					V
Big brown bat	EPFU					
Silver-haired bat	LANO				B	
Hoary bat	LACI					
California myotis	MYOCA					
Long-eared myotis	MYEV		SU	BT	B	
Little brown myotis	MYLU					
Long-legged myotis	MYVO		SU	BT	B	
Yuma myotis	MYYU			BT		
Townsend’s big-eared bat	PLTO		SC	BS	B	L
Coyote	CALAT					
Gray Wolf	CALU	LE	SE	LE		E
Gray fox	URCI					
Red fox	VUVU					V
Black bear	URAM					
Raccoon	PRLO					
California Wolverine	GUGU		ST	BS		H-OU
River otter	LUCA					
Pine Marten	MAAM		SV	BT		H
Fisher	MAPE		SC	BS		OU
Ermine	MUER					
Long-tailed weasel	MUFR					
Mink	MUVI					
Striped skunk	MEMEP					V
Spotted skunk	SPPU					
Mountain lion	FECO					
Lynx	LYCA	FP		FP	SM	E
Bobcat	LYRU					

SPECIES	SPCODE	FEDERAL	STATE	BLM/FS	SA-ROD	OCC
Elk	CEEL					
Black-tailed deer	ODHE					
Mountain beaver	APRU					
Northern flying squirrel	GLSA					
Western gray squirrel	SCIGR		SU	BT		V
California ground squirrel	SPBEE					
Townsend's chipmunk	TATO					
Douglas squirrel	TADO					
Camas pocket gopher	THBU					V
Western pocket gopher	THMA					H
Beaver	CASCAN					
Bushy-tailed woodrat	NECI					
Dusky-footed woodrat	NEFU					V
Deer mouse	PEMA					
Red tree vole	ARLO				SM	
Western red-backed vole	CLCA					
Gray-tailed vole	MICAN					
Long-tailed vole	MILO					
Creeping vole	MIOR					
Townsend's vole	MITO					V
Muskrat	ONZI					
House mouse	MUMU					V-I
Norway rat	RANO					V-I
Pacific jumping mouse	ZATR					
Porcupine	ERDO					
Nutria	MYCO					V-I
Pika	OCPR					H
Snowshoe hare	LEAM					H
European rabbit	ORCU					V
Brush rabbit	SYBA					V-L
Eastern cottontail	SYFL					V-I

C.2. Special Status/Special Attention Invertebrate Species that are documented or suspected to occur in the Crabtree Watershed

SPECIES	SPCODE	BLM/FS STATUS	ONHP LIST	GEOGRAPHIC RANGE or HABITAT NEEDS
MOLLUSKS Oregon megomphix	MEHE	SM/BS	1	CR,WV,WC: Conifer/hardwood forest with bigleaf maple, duff/litter at low/mid elevations. Common along Willamette Valley floor/Cascades foothills.
Blue-gray tail dropper (slug)	PHCO	SM/BT	2	CR,WC: Conifer/hardwood forest with ferns, mosses, hardwoods, and duff/litter at low/mid elevations. Locally common.
Papillose tail-dropper (slug)	PHDU	SM/BA	2	CR,WV,WC: Conifer/hardwood forest in association with ferns, hardwoods, mosses, and litter at low/mid elevations. Common to abundant.
EARTHWORMS Oregon giant earthworm	DRMA	BS	1	WV: Associated with undisturbed vegetation and uncultivated soils at low elevations
INSECTS California giant damselfly	ARCA	BT	4	KM,CR,WV: Associated with streams at lower elevations
California clubtail dragonfly	GOLY	BT	3	CR,WV, WC: Associated with streams, lakes and ponds
American boreostolus bug	BOAM	BT	3	KM,WC: Under rocks and in sandy substrates of streams
Mulsant's small water strider	MEMU	BT	3	CR,WV,WC,BR: Floating vegetation and water surface of ponds. Wide ranging.
Beer's false water penny beetle	ACBE	BT	4	WC: Rocky or gravelly stream margins
Cascades apatanian caddisfly	APTA	BT	3	WC,EC,BM: Found in small streams on coarse gravel and cobble in areas of low current at mid/high elevations
Vertree's ceraclean caddisfly	CEVE	BT	3	CR,WV: Found in large streams and river systems at low/mid elevation
Fender's rhyacophilan	RHFE	BT	4	KM,WV: Small to medium streams, primarily first order streams
Siskiyou caddisfly	TISI	BT	3	WC: Clear streams, Collection sites widely scattered thru Oregon

KEY:

WV=Western Valleys **WC**=Western Cascades **EC**=Eastern Cascades **CR=**Coast Range **KM**=Klamath Mtns **BR**=Harney Basin **BM**=Blue Mtns.

BS = Bureau Sensitive
SM=ROD Survey and Manage
BA=Bureau Assessment
BT=Bureau Tracking

C.3. Special Status/Special Attention Wildlife Species - Known or Suspected in Crabtree Watershed

	SPECIES & STATUS	HABITAT DESCRIPTION
	INVERTEBRATES	
D	MEGOMPHIX HEMPHILLI **SM/BS** Oregon megomphix (snail)	Conifer/hardwood forest floor, in association with bigleaf maple, duff /litter at low/mid elevations. Common along Willamette Valley floor/Cascades foothills.
D	PROPHYSAON COERULEUM **SM** blue gray tail-dropper (slug)	Coniferous forest floor in association with ferns, mosses, hardwoods and litter at low/mid elevations. Locally common.
D	PROPHYSAON DUBIUM **SM** papillose tail-dropper (slug)	Coniferous forest floor in association with ferns, mosses, hardwoods, and litter at low/mid elevations. Common to abundant.
	HERPETOFAUNA	
D	RHYACOTRITON CASCADAE **BT/SV** Cascade torrent salamander	Prefers small cold streams and springs with water seeping through moss-covered gravel. Most common in mature and old-growth conifer forests below 4000 feet.
D	ANEIDES FERREUS **BT/SU** clouded salamander	Prefers the spaces between loose bark on down logs in forests, forest edges, and clearings created by fire.
D	BATRACHOSEPS WRIGHTI **BT/SU** Oregon slender salamander	West slope of Cascades. Prefers down logs and woody material in more advanced stages of decay. Most common in mature and old-growth conifer forests.
D	ASCAPHUS TRUEI **BT/SV** tailed frog	Cold, fast-flowing permanent springs and streams in forested areas. Has a very narrow temperature tolerance.
D	RANA AURORA **BT/FS/SU/SV** red-legged frog (Willamette Valley)	Common in marshes, ponds, and streams with little or no flow, from the valley floor to about 3000 feet in the Cascades. Populations in the Willamette Valley are of greater concern than Cascades populations.

BIRDS

D	HISTRIONICUS HISTRIONICUS **BS/FS/SU** harlequin duck	Has been observed on Crabtree Creek, but breeding status is unknown. Could be a rare summer resident. Found in whitewater mountain rivers and streams during nesting season. Winters on rocky coasts.
S	BUCEPHALA ISLANDICA **BT/SU** Barrow's goldeneye	Breeding populations are of concern. Likely to occur in Crabtree only as a rare migrant and winter visitor on open water. Has been documented in adjacent watersheds.
S	BUCEPHALA ALBEOLA **BA/SU** bufflehead	Breeding populations are of concern. Highly likely to occur in Crabtree only as a migrant and winter visitor on open water. Has been documented in adjacent watersheds.
D	HALIAEETUS LEUCOCEPHALUS **LT/ST** bald eagle	Documented to occur in Crabtree during the nesting season. Suitable nesting/wintering habitat present in the lower Crabtree. Rare summer resident in Cascades. Uncommon winter resident in Willamette Valley. For nesting and perching, prefers large old-growth trees near major bodies of water and rivers.
D	ACCIPITER GENTILIS **BS/SC** northern goshawk	Has been observed in Crabtree Watershed, but breeding status is unknown. Rare Summer resident in Cascades. Prefers mature or old-growth forests with dense canopy cover at higher elevations. Winters at lower elevations.
S	FALCO COLUMBARIUS **BA** merlin	Breeding populations are of concern. Likely to occur in Crabtree only during migration and winter. Fields, open areas and edges.
S	FALCO PEREGRINUS **BS/SE** peregrine falcon	Suitable cliff habitat for nesting is present in upper Crabtree. Likely to occur as a transient/migrant and winter visitor Found in a variety of open habitats near cliffs or mountains. Prefers areas near larger bodies of water and rivers.
S	GRUS CANADENSIS **BT/FS/SV** sandhill crane	Breeding population s are of concern. Suspected as a rare spring/fall overhead migrant.
S	TRINGA MELANOLEUCA **BA** greater yellowlegs	Breeding populations are of concern. A common transient and uncommon winter resident in Willamette Valley. Wetlands, flooded fields, and mud flats. Suspected to occur in the lower end of Crabtree.
S	TRINGA SOLITARIA **BT** solitary sandpiper	Breeding populations are of concern. Uncommon spring/fall migrant and transient in Willamette Valley. Wetlands, flooded fields, and small water bodies. Suspected to occur in the lower end of Crabtree.
D	STRIX OCCIDENTALIS CAURINA **LT/ST** northern spotted owl	Permanent resident in Crabtree, especially the upper end (7 known sites). Prefers mature and old-growth conifer forests with large down logs, standing snags in various stages of decay, high canopy closure and a high degree of vertical stand structure.
D	CHORDEILES MINOR **BS/SC** common nighthawk (Willamette Valley)	Open habitats from the valley floor to high elevation clearcuts. Breeding populations of are concern, especially in the Willamette Valley.

S	MELANERPES LEWIS **BS/SC** lewis' woodpecker	Formerly a common summer resident and uncommon winter visitor in Willamette Valley. Today it is a rare transient and migrant. Oak woodlands and hardwood forests.
S	MELANERPES FORMICIVORUS **BT** acorn woodpecker (Willamette Valley)	Uncommon and local resident. Oak woodlands in the Willamette Valley.
D	DRYOCOPUS PILEATUS **BT/SV** pileated woodpecker	Common permanent resident in Crabtree Watershed. Prefers to nest in old-growth and mature forests. Also forages in younger forests containing mature or old-growth remnants. Requires larger snags and down wood.
D	CONTOPUS COOPERI **BT/SV** olive-sided flycatcher	Uncommon summer resident in more open coniferous forest and edge with prominent tall snags or trees that serve as foraging and singing perches.
D	EMPIDONAX TRAILLII BRESTERI little willow flycatcher **BT/SV**	Common summer resident in Crabtree Watershed. Riparian forests, valley brushlands, clearcuts and early seral forests.
S	EREMOPHILA ALPESTRIS **BT/SC** horned lark (Willamette Valley)	Suspected to occur in Crabtree as an uncommon non-breeding species. Breeding status is unknown. Rare and local breeder in Willamette Valley. Uncommon in winter. Open fields, grassy areas.
D	PROGNE SUBIS **BS/SC** purple martin (Willamette Valley)	Has been observed in the Crabtree Watershed, but breeding status is unknown. Known to occur as a local breeder in adjacent watersheds. Typically occurs along rivers and other water bodies. Nests colonially in cavities in snags, old buildings, and nest boxes.
D	SIALIA MEXICANA **BT/SV** western bluebird	Uncommon permanent resident in Willamette Valley and adjacent foothills. Open areas with standing snags, or small farms with diversified agriculture. Nests in natural woodpecker cavities or artificial nest boxes.
D	ICTERIA VIRENS **BS/SC** yellow-breasted chat (Willamette Valley)	Occurs as a local breeder in the lower Crabtree Watershed. Found in riparian vegetation, thick brush in the Willamette Valley.
S	AMMODRAMUS SAVANNARUM **BT/SP** grasshopper sparrow (Willamette Valley)	Suspected to occur in Crabtree, but breeding status is unknown. Occurs as a local breeder in adjacent watersheds. Found in nature grasslands, lightly grazed pastures and fallow fields dominated by moderate/tall grass in Willamette Valley.
D	POOECETES GRAMINEUS **BT/SC** vesper sparrow (Willamette Valley)	Occurs as a local breeder in the lower Crabtree Watershed. Rare and local summer resident in Willamette Valley. Rare in winter. Dry, grassy areas. Has been known to nest in Christmas tree farms. .
D	STRUNELLA NEGLECTA **BS/SC** western meadowlark (Willamette Valley)	Occurs as a local breeder in the lower Crabtree Watershed. Uncommon in winter. Grassy open habitat around the valley floor and foothills.

MAMMALS

S	LASIONYCTERIS NOCTIVAGANS **BT/B/SU** silver-haired bat	Highly likely to occur in the Crabtree Watershed. Associated with cliff/cave and snag habitat. Forages in a variety of forest habitats and riparian areas.
S	MYOTIS EVOTIS **BT/B/SU** long-eared myotis	Highly likely to occur in the Crabtree Watershed. Associated with snags and cave habitat. Prefers older forests. Forages over water and riparian areas.
S	MYOTIS VOLANS **BT/B/SU** long-legged myotis	Highly likely to occur in the Crabtree Watershed. Associated with cliff/cave and snag habitat. Prefers older forests. Forages over water and riparian areas.
S	MYOTIS YUMANENSIS **BT** yuma myotis	Highly likely to occur in the Crabtree Watershed. Associated with cliff/cave and snag habitat. More closely associated with riparian areas than the other myotis. Prefers older forests. Forages over water and riparian areas.
S	CORYNORHINUS TOWNSENDII **BS/FS/B/SC** Townsend's big-eared bat	Highly likely to occur in the Crabtree Watershed. Feeds on flying insects in a variety of habitats in forested areas. Primary habitat is caves, rock outcrops, buildings and abandoned mines.
S	MARTES AMERICANA **BT/SV** pine marten	Highly likely to occur in the Crabtree Watershed. Mature and old-growth forests containing large quantities of standing snags and downed logs, in the upper end of Crabtree. Prefers wetter forests, often near streams.
D	SCIURUS GRISEUS **BT/SU** Western gray squirrel (Willamette Valley)	Associated with mixed forest communities with a significant Oregon white oak component.
S	ARBORIMUS LONGICAUDUS **SM** red tree vole	Highly likely to occur in the Crabtree Watershed. This arboreal vole prefers mid to late seral forests with closed canopies.

Key following Appendix C.4.

C.4. Special Status/Special Attention Wildlife Species - Data Gaps in the Crabtree Watershed

	SPECIES & STATUS	DATA NEEDS/HABITAT DESCRIPTION
	INVERTEBRATES	
D	MEGOMPHIX HEMPHILLI **SM/BS** Oregon megomphix (snail)	Based on surveys performed to date, known to be common along Willamette Valley floor/Cascades foothills at low/mid elevations. Good distributional data is Lacking, especially in LSR where no surveys have been conducted.
D	PROPHYSAON COERULEUM **SM** blue gray tail-dropper (slug)	Based on surveys performed to date, known to be locally common at low/mid elevations. Good distributional data is Lacking, especially in LSR where no surveys have been conducted.
D	PROPHYSAON DUBIUM **SM** papillose tail-dropper (slug)	Based on surveys performed to date, known to be common to abundant at low/mid elevations. Good distributional data is Lacking, especially in LSR where no surveys have been conducted
OU	DRILOLEIRUS MACELFRESHI **BS** Oregon giant earthworm (Willamette Valley)	Associated with undisturbed vegetation and uncultivated soils at low elevations in the Willamette Valley.
	HERPETOFAUNA	
OU	RANA BOYLEI **BT/SV** foothill yellow-legged frog	Permanent streams and vicinity, with rocky, gravelly and sandy substrates. Crabtree Creek is a good candidate stream.
OU	CLEMMYS MARMORATA **BS/SC** western pond turtle	Marshes, ponds, lakes, slow rivers and streams, usually with an abundance of aquatic vegetation and emergent logs or boulders for basking. Associated with Willamette Valley. Has been documented in the past in adjacent watersheds.
OU	CROTALUS VIRIDUS **BT/SV** western rattlesnake (Willamette Valley)	Rocky, dry, sunny talus areas
	BIRDS	
D	HISTRIONICUS HISTRIONICUS **BS/FS/SU** harlequin duck	Has been observed on Crabtree Creek, but breeding status is unknown. Could be a rare summer resident. Surveys should target Crabtree Creek and its larger tributaries.
D	AQUILA CHRYSAETOS golden eagle	Has been observed in the Snow Peak area of the Crabtree Watershed. Nesting status is unknown. Surveys should target Snow Peak/Crabtree Lake areas.
D	ACCIPITER GENTILIS **BS/SC** northern goshawk	Has been observed in Crabtree Watershed, but breeding status is unknown. Rare Summer resident in Cascades. Surveys should target LSR in upper Crabtree.

S	FALCO PEREGRINUS **BS/SE** peregrine falcon	Surveys should target suitable cliff habitat for nesting in upper Crabtree.
E	COCCYZUS AMERICANUS **BS/SC** yellow-billed cuckoo (Willamette Valley)	Riparian areas, especially along larger rivers and streams. Likely extirpated.
D	CHORDEILES MINOR **BS/SC** common nighthawk (Willamette Valley)	Open habitats from the valley floor to high elevation clearcuts. Breeding populations of are concern, especially in the Willamette Valley.
S	EREMOPHILA ALPESTRIS **BT/SC** horned lark (Willamette Valley)	Suspected to occur in Crabtree as an uncommon non-breeding species. Breeding status is unknown. Rare and local breeder in Willamette Valley. Uncommon in winter. Open fields, grassy areas.
D	PROGNE SUBIS **BS/SC** purple martin (Willamette Valley)	Has been observed in the Crabtree Watershed, but breeding status is unknown. Known to occur as a local breeder in adjacent watersheds. Typically occurs along rivers and other water bodies. Nests colonially in cavities in snags, old buildings, and nest boxes.
D	SIALIA MEXICANA **BT/SV** western bluebird	Uncommon permanent resident in Willamette Valley and adjacent foothills. Open areas with standing snags, or small farms with diversified agriculture. Nests in natural woodpecker cavities or artificial nest boxes.
D	ICTERIA VIRENS **BS/SC** yellow-breasted chat (Willamette Valley)	Occurs as a local breeder in the lower Crabtree Watershed. Found in riparian vegetation, thick brush in the Willamette Valley.
S	AMMODRAMUS SAVANNARUM **BT/SP** grasshopper sparrow (Willamette Valley)	Suspected to occur in Crabtree, but breeding status is unknown. Occurs as a local breeder in adjacent watersheds. Found in nature grasslands, lightly grazed pastures and fallow fields dominated by moderate/tall grass in Willamette Valley
D	POOECETES GRAMINEUS **BT/SC** vesper sparrow (Willamette Valley)	Occurs as a local breeder in the lower Crabtree Watershed. Rare and local summer resident in Willamette Valley. Rare in winter. Dry, grassy areas. Has been known to nest in Christmas tree farms.
D	STRUNELLA NEGLECTA **BS/SC** western meadowlark (Willamette Valley)	Occurs as a local breeder in the lower Crabtree Watershed. Uncommon in winter. Grassy open habitat around the valley floor and foothills.

MAMMALS

S	LASIONYCTERIS NOCTIVAGANS **BT/B/SU** silver-haired bat	Highly likely to occur in the Crabtree Watershed. Associated with cliff/cave and snag habitat. Forages in a variety of forest habitats and riparian areas. Little information exists on bat species occurrence in the Crabtree Watershed.
S	MYOTIS EVOTIS **BT/B/SU** long-eared myotis	Highly likely to occur in the Crabtree Watershed. Associated with snags and cave habitat. Prefers older forests. Forages over water and riparian areas. Little information exists on bat species occurrence in the Crabtree Watershed.
S	MYOTIS VOLANS **BT/B/SU** long-legged myotis	Highly likely to occur in the Crabtree Watershed. Associated with cliff/cave and snag habitat. Prefers older forests. Forages over water and riparian areas. Little information exists on bat species occurrence in the Crabtree Watershed.
S	MYOTIS YUMANENSIS **BT** yuma myotis	Highly likely to occur in the Crabtree Watershed. Associated with cliff/cave and snag habitat. More closely associated with riparian areas than the other myotis. Prefers older forests. Forages over water and riparian areas. Little information exists on bat species occurrence in the Crabtree Watershed.
S	CORYNORHINUS TOWNSENDII **BS/B/SC** Townsend's big-eared bat	Highly likely to occur in the Crabtree Watershed. Feeds on flying insects in a variety of habitats in forested areas. Primary habitat is caves, rock outcrops, buildings and abandoned mines. Little information exists on bat species occurrence in the Crabtree Watershed.
OU	GULO GULO **BS/ST** wolverine	Found in higher elevation mountainous and isolated coniferous forests. Unlikely to occur in Crabtree Watershed.
OU	MARTES PENNANTI **BS/SC** fisher	Prefers mature and old-growth forests and riparian areas containing large quantities of dead and down wood. Likely extirpated.
D	SCIURUS GRISEUS **BT/SU** Western gray squirrel (Willamette Valley)	Associated with mixed forest communities with a significant Oregon white oak component.
S	ARBORIMUS LONGICAUDUS **SM** red tree vole	Highly likely to occur in the Crabtree Watershed. This arboreal vole prefers mid to late seral forests with closed canopies. Good distributional data is Lacking, especially in LSR where no surveys have been conducted.

Key to Appendices C.3 and C.4.

Occurrence:
OU=Occurrence Uncertain
S = Suspected
D = Documented
E=Extirpated

Status:
LE = Federal endangered
LT = Federal Threatened
BS = Bureau Sensitive
BA = Bureau Assessment
BT = Bureau Tracking
SM=ROD Survey and Manage
B=ROD Buffer or extra protection species
SE = State Endangered
ST = State Threatened
SC = State Critical
SV = State Vulnerable
SU = State Uncertain
SP = State Peripherial

Appendix D

Riparian Management Areas and Riparian Reserves

Oregon Forest Practices Act: Riparian Management Areas for Private Lands (1

Size (flow)	Type F (fish bearing)	Type D (domestic use)	Type N (all others)
Large(>10 cfs)	100 feet - Basal area target, minimum 40 conifers	70 feet - Basal area target, minimum 30 conifers	70 feet - Basal area target, minimum 30 conifers
Medium(2-10 cfs)	70 feet - Basal area target, minimum 30 conifers	50 feet - Basal area target, minimum 10 conifers	50 feet - Basal area target, minimum 10 conifers
Small (<2 cfs)	50 feet - Basal area target	20 feet - Basal area target	0 to 10 feet - non-merch conifers, understory vegetation

(1 Within specified riparian widths, there are basal area retention requirements that are based on harvest type and geographic region.

Northwest Oregon State Management Plan: Riparian Management Areas for State of Oregon Lands

Size (flow)	Type F (fish bearing)	Type N (all others)
Large(>10 cfs)	0 to 25 feet - No harvest 25 to 100 feet - Manage for mature forest condition 100 to170 feet - Retain 10 to 45 conifers/acre	0 to 25 feet - No harvest 25 to 100 feet - Manage for mature forest condition 100 to170 feet - Retain at least 10 conifers per acre
Medium(2-10 cfs)		
Small (<2 cfs)		(75% of reach): 0 to 25 feet - No harvest/maintain channel integrity 25 to 100 feet - retain 10 to 25 conifers/acre 100 to170 feet - Retain 0 to10 conifers/acre

Northwest Forest Plan: Riparian Reserves for Federal Lands

Size (flow)	Type F (fish bearing)	Type N (all others)
Large(>10 cfs)	Two site potential tree widths (320 to 360 feet slope distance was modeled) Manage for Late Seral Conditions and Aquatic Conservation Strategy Objectives	One site potential tree width (160 to 180 feet slope distance was modeled) Manage for Late Seral Conditions and Aquatic Conservation Strategy Objectives
Medium(2-10 cfs)		
Small (<2 cfs)		

Appendix E

Riparian Reserve Function and Role of Vegetation

Riparian Vegetation Function	Requirements for Proper Function
Shade • regulates instream temperatures for fish/amphibians/invertebrates • regulates terrestrial microclimate	• large trees and other vegetation with high % canopy closure
Allochthonous input • food resource for invertebrates/microbes (99% in 1st order streams)	• diverse species of trees and other vegetation
LWD source • provides habitat for fish, amphibians, invertebrates, and beaver • Helps frame stream geomorphology	• mature conifers in abundant supply
Nutrient/sediment filter • maintains high water quality	• connectivity of flood plain and stream(promotes denitrification) • trees and other vegetation to trap sediment
Bank stability • lowers erosion potential • maintains high water quality	• trees and other vegetation with good root strength
Habitat/Dispersal corridors • provides cover, forage, water • provides connectivity to dispersal areas	• mature to late-successional forest characteristics
Energy dissipation • lowers erosion potential • builds flood plains • maintains high water quality	• trees and other vegetation • connectivity of stream and flood plain
Regulate stream base flows • higher summer low flows/lower winter peak flows	• proper species composition

Appendix F

Transportation Management

Overview of the Western Oregon Transportation Management Plan

Both the *Northwest Forest Plan* (NFP) and each Western Oregon District's Resource Management Plan (RMP) direct each district to develop a road management plan. The NFP and the Salem RMP offer general guidance on road management and items to consider in the development of a transportation plan. This guidance was incorporated into the *Western Oregon Transportation Management Plan* (TMP) to provide consistency throughout the Western Oregon Districts and to communicate a common road management philosophy to other federal, state, or interested entities. The Western Oregon TMP, encompassing all the western Oregon districts, was completed in June 1996 and updated April 2000. The plan was not intended to be specific on a road by road basis. This level of detail was intended to be developed by each district, and would consider specifics unique to each district.

Road management in Western Oregon is complicated by BLM's checkerboard land ownership pattern and legal access agreements. The BLM has acquired access easements across adjacent lands, and has entered into numerous reciprocal right-of-way agreements. These agreements enable the BLM to use private roads and lands to access BLM lands, and in turn, allow private land owners to access their lands through BLM roads and ownership. As a result, the transportation system utilized to manage forested lands is formed by a combination of BLM, county, private, state and other federal roads. The rights of adjacent land owners to access their lands is often a prime consideration in transportation management.

Objectives of the Strategy for Implementing the Transportation Management Plan

The objectives of the strategy for implementing the TMP on the Salem District are to:

1. Detail how the Western Oregon TMP is to be implemented on the Salem District.

2. Meet Endangered Species Act (ESA) requirements for all federally listed or proposed aquatic and terrestrial species.

3. Meet Aquatic Conservation Strategy objectives (ACSO) in conducting road related activities and addresses specific items identified in the standards and guides of the NFP.

4. Explain the implementation strategy to the District's employees and external interested parties.

5. Ensure that roads are maintained efficiently and effectively.

The TMP outlines goals and objectives for transportation management with respect to various resource values, common definitions for maintenance levels and road closures, and key components for its implementation. Implementation of the TMP consists of three main components: transportation management objectives, an annual road maintenance operation plan, and monitoring of road related activities. The TMP and the process of how the various components relate to each other can best be illustrated by Figure 1.

Transportation Management Objectives (TMOs)

Criteria:

All resource areas have developed Transportation Management Objectives (TMOs) by assigning each road in the resource area a TMO classification. TMOs are specific management objectives considering multiple resources for both the short and long term access needs for each road under BLM management. The TMO itself is a recommendation which does not initiate an action, but is carried forth into a decision making process as part of project implementation. TMOs are developed and reviewed in conjunction with the watershed analysis process. TMOs may be updated/refined as additional information becomes available, such as collaboration with adjacent land owners and road managers. Figure 2 best illustrates the TMO process.

Compliance with the Aquatic Conservation Strategy (ACS) warrants a reduction of roads in some watersheds. In addition, each Districts' RMP recommends a reduction in the miles of road open to vehicles. The primary objectives are to reduce sedimentation, to restore hydrological processes, and to reduce impacts to wildlife, botanical resources, or special areas from a large, open road system. Roads controlled by BLM will be managed in varying states of accessibility. Many local or resource roads may be in a continual state of flux from open to closed to regulate motorized access.

Key items which the interdisciplinary team considers in making recommendations to upgrade, close or decommission roads include:

1. Closing or upgrading roads which pose substantial risk to riparian conditions in terms of landslide susceptibility and flood effects.

2. Closing or upgrading roads in order to minimize sediment delivery to streams from roads and reduce the need for routine maintenance. This can include seasonal restriction of use to reduce sedimentation from winter haul traffic.

3. Removing (road closure) or upgrading culverts to provide or maintain fish passage.

4. Closing or upgrading roads in order to minimize disruption of hydrologic flow paths. Examples include increasing the number of relief culverts and avoiding diversion of streamflow down road ditches.

5. The needs to upgrade or stabilize roads in sensitive soils or unstable areas.

6. Access for resource management in the short-term (<5yrs) and long-term (5-25 yrs). This may have an effect on the type and duration of a road closure.

7. The current/future use and constraints of each road, including the rights of adjacent land owners to access their lands. Access to adjacent private ownership and/or roads under reciprocal right-of-ways have constraints subject to review by the affected parties.

8. Road density criteria established by the RMP and the Biological Opinions between the BLM, USFS, and/or NMFS concerning anadromous fish species (NMFS, March 1997).

9. Reducing road densities according to the Salem District RMP and/or to reduce disturbance to big game and other wildlife species.

10. Closing roads to reduce disturbance sensitive areas and special habitats, including botanical resources.

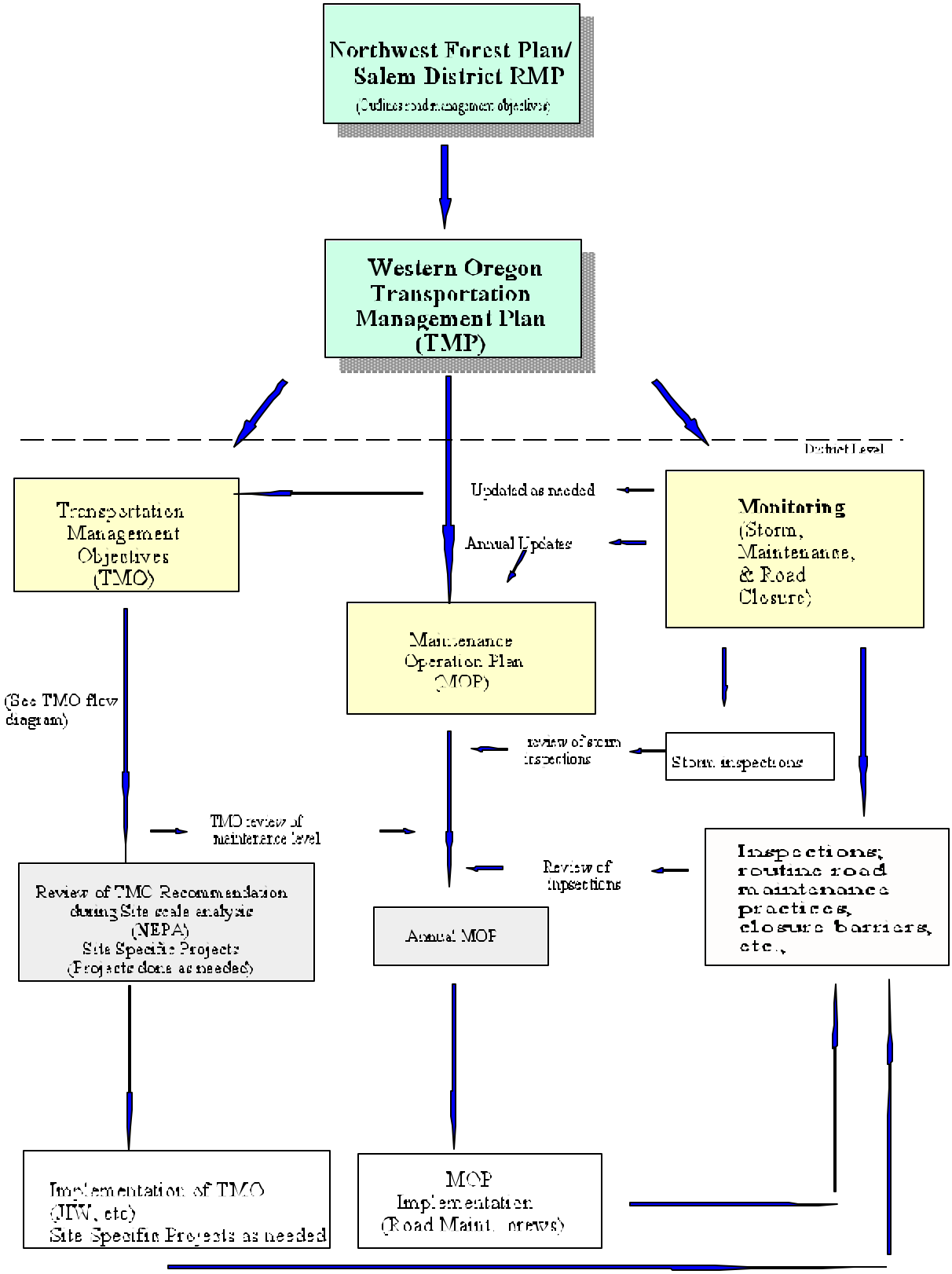
11. Reasonable and prudent measures, terms and conditions, and conservation measures as addressed in the current Biological Opinions received from USFWS and NMFS to protect proposed, threatened or endangered species.

On a project by project basis, budget and funding limitations have to be weighed against the risk of resource damage, long term and short term effects and viability of projects. More inexpensive methods may be employed to mitigate risks, address the greatest risk situations and maximize the efficient use of funding across project areas.

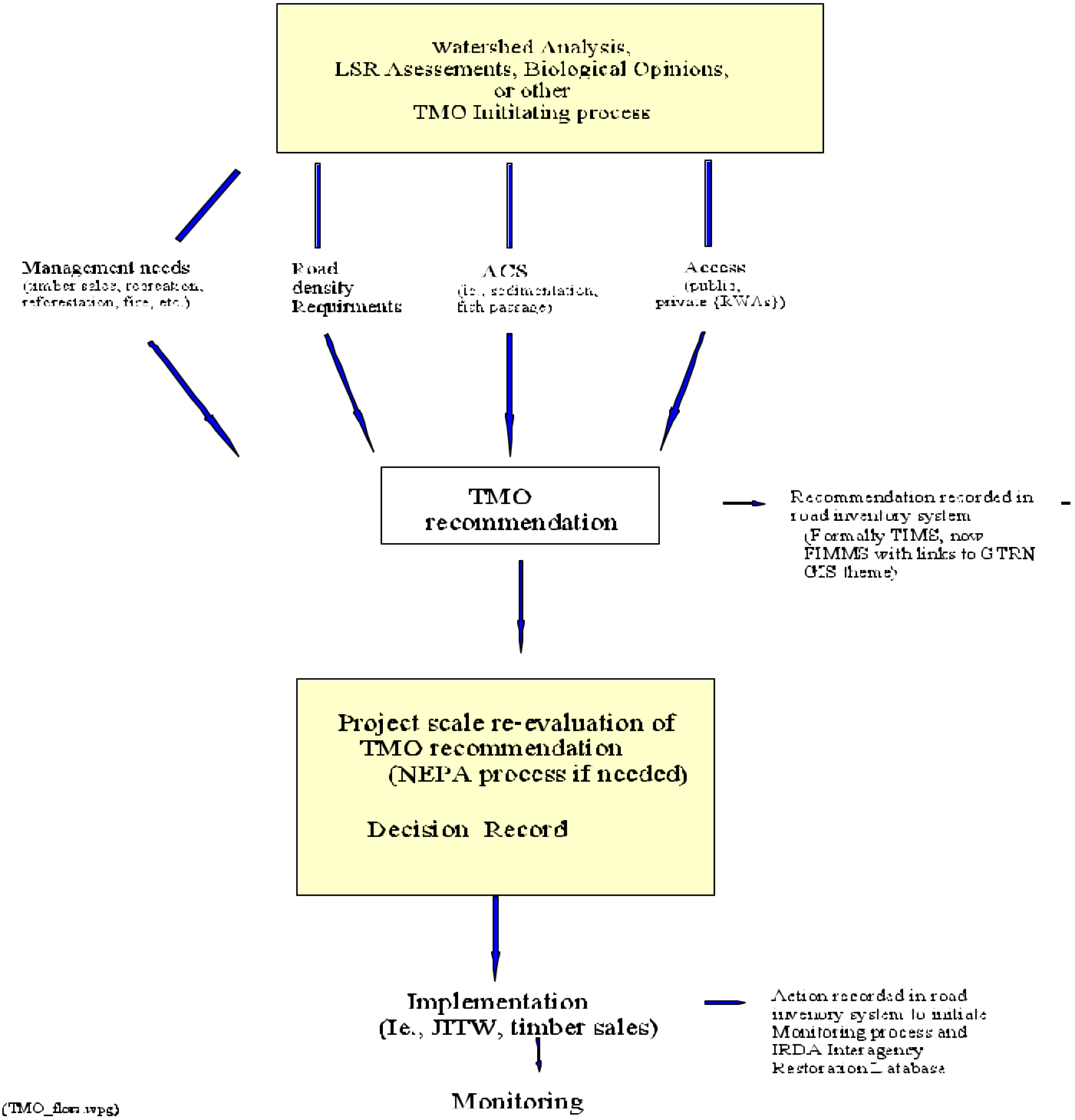
Figure 1. Flow Chart Describing Implementation of the Western Oregon Transportation Plan.

Figure 2. Flow Chart Describing the TMO Development Process.

(Following pages)


Northwest Forest Plan/
Salem District RMP
(Outlines broad management objectives)
Western Oregon
Transportation
Management Plan
(TMP)
District Level
Transportation
Management
Objectives
(TMO)
Updated as needed
Annual Updates
Monitoring
(Storm,
Maintenance,
& Road
Closure)
Maintenance
Operation Plan
(MOP)
(See TMO flow
diagram)
review of storm
inspections
Storm inspections
TMO review of
maintenance level
Review of TMO Recommendation
during Site scale analysis
(NEPA)
Site Specific Projects
(Projects done as needed)
Review of
inspections
Inspections,
routine road
maintenance
practices,
closure barriers,
etc.,
Annual MOP
Implementation of TMO
(JIW, etc)
Site Specific Projects as needed
MOP
Implementation
(Road Maint. crews)

Transportation Management Objectives



(TMO_flow.wpg)

Potential Road Restoration Areas

The following list of roads and road segments in the Crabtree Watershed are planned for decommissioning or closure based on the Western Oregon TMP, the strategy for implementation of the TMP on the Salem District and the Crabtree Watershed Analysis. Most of these roads have been assigned a TMO of 8, which are roads that are no longer needed for the overall transportation system.

Road #	Route Name	Miles	Sub basin
10-1W-25.2	ROGER RABBIT	0.08	RICHARDSON
10-1W-25.3	ROGER RABBIT	0.05	RICHARDSON
10-1E-33.5	BURMESTER CR SYS	0.22	ROARING
11-1E-1.2	ROARING RIVER 1.2 RD	0.10	ROARING
11-1E-1.6	ROARING RIVER 1.6 RD	0.37	ROARING
11-1E-1.7	ROARING RIVER 1.7 RD	0.25	ROARING
11-1E-1.8	ROARING RIVER 1.8 RD	0.06	ROARING
11-1E-1.9	ROARING RIVER 1.9 RD	0.79	ROARING
11-1E-5	ROARING RIVER ROAD	0.85	ROARING
11-1E-15.2	CHURCH CK	0.21	CHURCH
11-1E-15.4	CHURCH CK SYS RD	0.09	CHURCH
11-1E-15.5	CHURCH CK SYS RD	0.03	CHURCH
11-1E-15.6	CHURCH CK SYS RD	0.17	CHURCH
11-1E-15.7	CHURCH CK SYS RD	0.08	CHURCH
11-1E-17	BUZZARD BUTTE	0.50	CHURCH
11-1E-17.1	BUZZARD BUTTE	0.64	ROARING
11-1E-17.2	BUZZARD BUTTE	0.20	CHURCH
11-1E-22.3	HAMMOND HIGH	0.30	CHURCH
11-1E-23.2	HUNTER CR SYS	0.19	CHURCH
11-1E-23.3	HUNTER CK SYS (EXT) RD	0.41	CHURCH
11-1E-23.4	HUNTER CR SYS	0.71	CHURCH
11-1E-23.5	HUNTER CR SHORTY	0.07	CHURCH
11-1E-23.6	MOTO CROSS CLEANUP M	0.38	CHURCH
11-1E-23.7	MOTOCROSS P/2 SPUR	0.10	CHURCH
11-1E-25	GAINER RD	0.22	CHURCH
11-1E-25.2	WHO CARES	0.09	CHURCH
11-1E-26.2	HAMMOND SPUR	0.26	BEAVER/CHURCH
11-1E-27	HAMMOND STAR	0.50	BEAVER/CHURCH
11-1E-27.1	HAMMOND RD SYS	0.47	CHURCH
11-1E-35	GREEN MTN SPUR	1.11	BEAVER/CHURCH
11-1E-36.2	STRING BEAN	0.19	SOUTH FORK

Road #	Route Name	Miles	Sub basin
11-2E-2.5	11-2E-2.5	0.36	NORTH FORK
11-2E-3.3	11-2E-3.3	0.21	NORTH FORK
11-2E-3.4	11-2E-3.4	0.05	NORTH FORK
11-2E-5.2	SNOW PEAK TRAIL RD	0.50	CHURCH
11-2E-6.3	SEC 6.3 SPUR	0.23	ROARING
11-2E-6.4	SEC 6.4 SPUR	0.30	ROARING
11-2E-7	SEC 7 ROCK CR SPUR	0.55	CHURCH
11-2E-8.1	SNOW PEAK 8.1 SPUR	0.58	CHURCH
11-2E-8.2	SNOW PEAK 8.2 SPUR	0.17	CHURCH
11-2E-10	RED BANK RD	0.39	NORTH FORK
11-2E-10.1	RED BANK RD SPUR 1	0.18	NORTH FORK
11-2E-10.3	-10.3 ROAD	0.40	NORTH FORK
11-2E-10.6	SNOW PEAK SYS	0.24	NORTH FORK
11-2E-10.7	KNEE DEEP P	0.15	NORTH FORK
11-2E-10.8	KNEE DEEP P1	0.09	NORTH FORK
11-2E-10.9	DOUBLE SPLIT	0.09	NORTH FORK
11-2E-10.10	SPUD	0.05	NORTH FORK
11-2E-10.11	SPUD 2	0.04	NORTH FORK
11-2E-11.2	F 73	0.56	NORTH FORK
11-2E-11.3	11 2E 11.3	0.90	NORTH FORK
11-2E-12.1	HARRY SPUR	0.60	NORTH FORK
11-2E-12.2	F-3 LINE	0.18	NORTH FORK
11-2E-12.3	A 11	0.23	NORTH FORK
11-2E-12.4	WEEPING WAPITI	0.16	NORTH FORK
11-2E-12.6	SOUTH LINE	0.12	NORTH FORK
11-2E-12.7	WEEPING WAPITI	0.49	NORTH FORK
11-2E-12.8	11-2E-12.8	0.03	NORTH FORK
11-2E-13.1	F-3 LINE	1.45	NORTH FORK
11-2E-13.3	WHITE TOP	0.45	NORTH FORK
11-2E-14	F 322	1.48	NORTH FORK
11-2E-14.1	K-LINE	0.89	NORTH FORK
11-2E-14.1	K-LINE TOP	1.00	NORTH FORK
11-2E-16	NE 16 TO SE 9	0.21	NORTH FORK
11-2E-21	SNOW PK L O RD	0.87	NORTH FORK
11-2E-23	WHITE ROCK SWAMP	0.77	NORTH FORK
11-2E-24.1	WHITE ROCK CREEK	0.24	NORTH FORK
11-2E-24.2	WHITE ROCK CREEK	0.04	NORTH FORK
11-2E-25	R5 LINE	0.16	NORTH FORK
11-2E-25.1	R-10.2	0.24	NORTH FORK
11-3E-7	OFF K-32 LINE	0.04	NORTH FORK
11-3E-7.1	OFF 11-3E-7	0.08	NORTH FORK
11-3E-8.1	K-32 OVERLOOK	0.63	NORTH FORK

Road #	Route Name	Miles	Sub basin
11-3E-9.1	LONGSHOT	0.77	NORTH FORK
11-3E-9.2	11-3E-9.2	0.71	NORTH FORK
11-3E-9.3	LONGSHOT SPUR	0.07	NORTH FORK
11-3E-9.4	HARRY MOUNTAIN	0.49	NORTH FORK
11-3E-9.5	HARRY MOUNTAIN	0.03	NORTH FORK
11-3E-9.6	HARRY MOUNTAIN	0.04	NORTH FORK
11-3E-10.1	COUGAR CAMP SPUR	0.12	NORTH FORK
11-3E-16.3	CRABTREE SPUR	0.35	NORTH FORK
11-3E-17	F-36 LINE	1.10	NORTH FORK
11-3E-17.1	11-3E-17.1	0.18	NORTH FORK
11-3E-18	11-3E-18	0.35	NORTH FORK
11-3E-19	WHITE ROCK FEN	2.36	NORTH FORK
11-3E-20	-20.0 SPUR	0.23	NORTH FORK
11-3E-20.1	20.1 SPUR	0.21	NORTH FORK
11-3E-20.2	CRABTREE RIDGE SPUR	0.25	NORTH FORK
11-3E-29.2	WHITE ROCK BASIN SPUR	0.13	NORTH FORK
11-3E-30.1	YELLOWSTONE MTN SYS	0.16	SOUTHFORK
11-3E-30.2	BEAR TAIL RD	0.07	NORTH FORK
12-1E-1.1	GREEN MTN SYS	0.07	CHURCH
12-1E-3.4	ROUND MTN SYS	0.55	BEAVER
12-1E-5.1	SOUTH BEACH	1.48	BEAVER
12-1E-13.8	KEEL MTN	0.02	CHURCH
12-2E-3.2	SEC.3 TO SEC. 2 SPUR	0.09	SOUTHFORK
12-2E-20	UPPER BALD PETER CR	0.07	SOUTHFORK
12-2E-20.1	BALD PETER CR SYS	0.12	SOUTHFORK
12-2E-29.3	MAD DOG MAIN	0.25	SOUTHFORK
	TOTAL	**36.36**	

Appendix G

Recreation Opportunity Spectrum (ROS)

The Recreation Opportunity Spectrum (ROS) is the planning framework that was used to inventory both private and public lands in the Crabtree Watershed. Three major components that affect visitor use and preference are setting, activity, and desired experience. Visitors participating in the same activity may be seeking different settings and experiences. For example, one camper may desire a wilderness setting to experience solitude and challenge. Another camper may want highly developed facilities that offer more comfort and social opportunities. To meet these different needs, ROS is a system that is divided into seven major classes that provide a spectrum of opportunities, ranging from more primitive to more developed.

Primitive: Characterized by an unmodified natural environment of fairly large size where evidence of humans and human-induced restrictions and controls is essentially absent and motorized access is not permitted. Very low social interaction.

Semi-Primitive / Non-Motorized: Characterized by a predominantly natural environment of moderate to large size where evidence of humans and human controls is present but low. Motorized use is not permitted. Social interaction is low.

Semi-Primitive / Motorized: This class is similar to the previous one, however, motorized use is allowed.

Roaded Natural: Characterized with a predominantly natural environment with moderate evidence of human modification and control, that are in harmony with a natural setting. Moderate social interaction

Roaded Modified: Forest or other natural environment, with obvious modifications such as logging or mining, etc., road access and limited facility development, within an open space context. Moderate social interaction.

Rural: Characterized by an environment that is culturally modified to the point that it is dominant feature. Cultural modifications are usually associated with agricultural activities, residential activities, and utility corridors. Moderate social interaction.

Urban: This class is similar to rural however facility development is intensified and the environment though natural appearing is often landscaped. Modifications are designed to enhance specific recreational activities.

Appendix H

Bibliography

Agee, J.K. 1993. *Fire Ecology of Pacific Northwest Forests.* Island Press.

American Bird Conservancy. 2000. *Conservation Strategy for Land Birds in Lowlands and Valleys of Western Oregon and Washington.* Published for the Washington and Oregon Partners in Flight.

Applegarth, J. 1999. *Draft Management Recommendations for Terrestrial Mollusk Species, Megomphix hemphilli*, the Oregon Megomphix, Version 2.0, November, 1999.

Bailey, J.D, Tappeiner, J.C. 1996. *Effects of Thinning on Structural Development in 40-100 Year Old Douglas-fir Stands in Western Oregon*. Reprinted from Forest Ecology and Management 108 (1998) 99-113. Conclusions from BLM Retrospective Thinning Study, USDI, BLM.

Barbour, R.J., Johnston, S., Hayes, J., Tucker, G. 1997. *Simulated Stand Characteristics and Wood Product Yields from Douglas-fir Plantations Managed for Ecosystem Objectives*. In Forest Ecology and Management 91 (1997) 205-219.

Berg, D.R., Brown, T., Blessing, B. 1996. *Silvicultural Systems Design with Emphasis on the Forest Canopy*. Northwest Science, Vol. 70, Special Issue, 1996.

Biswell, B., Blow M., Finley L., Madsen S., Schmidt K. 2000. *Survey Protocol for the Red Tree Vole (Arborimus longicaudus).* Version 2.0.

Boyd, R. 1986. *Strategies of Indian Burning in the Willamette Valley*. Canadian Journal of Anthropology. 5:65-86.

Brown, E.R., et al. 1985. *Management of Wildlife and Fish Habitat in Forests of Western Oregon and Washington.* USDA Forest Service. Publ. No. R6-F&WL-192-1985. PNW Region, Portland, OR.

Burke, C.J. 1979. *Historic Fires in the Central Cascades*, Oregon. M.S. thesis, Oregon State University, Corvallis.

Burke, T. 1999. *Draft Management Recommendations for Terrestrial Mollusk Species, Prophysaon coeruleum*, the Blue-Gray Taildropper and *Prophysaon dubium*, the Papillose Taildropper, Version 2.0, November, 1999.

Burroughs, J., Edward R., Chalfant G., Townsend M. 1976. *Slope Stability in Road Construction. Bureau of Land Management, USDA*. Oregon State Office. Portland, OR.

Bury, R.B., Corn, P.S., Aubry, K.B., et al. 1991. *Aquatic Amphibian Communities in Oregon and Washington*. In: Wildlife and Vegetation of Unmanaged Douglas-Fir Forests. USDA Forest Service. General Technical Report PNW-GTR 285. Portland, OR.

Carey, A.B., Johnson, M.L. 1995. *Small Mammals in Managed, Naturally Young, and Old-Growth Forests.* Ecolgical Applications 5(2):336-352.

Carey, A.B. 1998. *Ecological Foundations of Biodiversity: Lessons from Natural and Managed Forests of the Pacific Northwest*. Northwest Science 72:127-133.

Carey, et.al. 1999. *Ecological Scale and Forest Development: Squirrels, Dietary Fungi, and Vascular Plants in Managed and Unmanaged Forests.* Wildlife Monographs 142:1-71.

Carey, A.B., Lippke, B.R., Sessions, J. 1999. *Intentional Ecosystem Management: Managing Forests for Biodiversity.* Journal of Sustainable Forestry 9(3/4): 83-125.

Corkran, Char C., Thoms, Chris. 1996. *Amphibians of Oregon, Washington and British Columbia*. Lone Pine Publishing, Edmonton, Alberta, Canada.

Curtis, R. 1982. *A Simple Index of Stand Density for Douglas-fir Stands*, Forest Science, Vol.28, No. 1, pp.92-94.

DeBell, D., Curtis, R., Harrington C., Tappeiner, J. 1997. *Shaping Stand Development Through Silvicultural Practices.* In Forest Ecology and Management, 1997.

Diaz, N., and Apostol, D. *Forest Landscape Analysis and Design*. USDA, Forest Service. Pacific Northwest Region. Portland, OR.

Dyrness, C. 1967. *Mass Soil Movement in the H.J. Andrews Experimental Forest*. USDA Forest Service. PNW Forest and Range Experimental Station. Research Paper PNW-42.

Ecosystem Analysis at the Watershed Scale: A Federal Guide for Watershed Analysis. 1995. Regional Ecosystem Office (updated March, 2000).

England, J., Brown, L., McCaull, A., Turner, S., LeComte, J., DeFord, S. 1991-2000. *Northern Spotted Owl Monitoring Reports,* Cascades Resource Area, Salem District, Bureau of Land

Management.

Evers, L. Hubbs, H. Crump, R., Colby, J. and Dobson, R. *Fire Ecology of the Mid-Columbia*. USDA Forest Service, Mt. Hood National Forest. Sandy, Oregon.

Farnell, J.E. 1979. *Santiam River Navigability Study*. Army Corps of Engineers.

Fahnestock, G.R. 1977. *Interactions of Forest Fire, Flora, and Fuels in Two Cascade Range Wilderness Areas*. PhD. Dissertation, University of Washington, Seattle.

Forest Ecosystem Management Team, [FEMAT]. 1993. *Forest Ecosystem Management: An Ecological, Economic, and Social Assessment*. Portland, OR.

Forsman, E., DeStefano S., Raphael, M., Gutierrez, R. 1993. *Demography of the Northern Spotted Owl*. Studies in Avian Biology No. 17. Cooper Ornithological Society.

Franklin, J., Kohm, K. 1997. *Creating a Forestry for the Twenty-First Century*: The Science of Ecosystem Management. Island Press, Washington, D.C.

Franklin, J.F., and Spies, T.A. 1991. *Ecological Definitions of Old-Growth Douglas-Fir forests. In: Wildlife and Vegetation of Unmanaged Douglas-Fir Forests.* USDA Forest Service. General Technical Report PNW-GTR 285. Portland, OR.

Furnish, Joseph, et. al. 1997. *Survey Protocol for Terrestrial C-3 Mollusk Species from the Northwest Forest Plan*. USDI, Bureau of Land Management and USDA, Forest Service, Portland, OR.

Garza, E.S. 1995. *Fire History and Fire regimes of East Humbug and Scorpion Creeks and Their Relation to the Range of Pinus lambertiana*. Doul. M.F. Project, Oregon State University, Corvallis, OR.

Gilbert, F.F., and Allwine, R. 1991. *Small Mammal Communities in the Oregon Cascade Range. In: Wildlife and Vegetation of Unmanaged Douglas-Fir Forests.* USDA Forest Service. General Technical Report PNW-GTR 285. Portland, OR.

Gilbert, F.F., and Allwine, R. 1991. *Spring Bird Communities in the Oregon Cascade Range. In: Wildlife and Vegetation of Unmanaged Douglas-Fir Forests.* USDA Forest Service. General Technical Report PNW-GTR 285. Portland, OR.

Gilbert, F.F., and Allwine, R. 1991. *Terrestrial Amphibian Communities in the Oregon Cascade Range. In: Wildlife and Vegetation of Unmanaged Douglas-Fir Forests.* USDA Forest Service. General Technical Report PNW-GTR 285. Portland, OR.

Gilligan, J., Smith, M., Rogers, D., Contreras, A. et. al. 1994. *Birds of Oregon: Status and Distribution.* Cinclus Publications, McMinnville, OR.

Hayes, J., Chan, S., Emmingham, W., Tappeiner, J., Kellogg, L.D., Bailey, J. 1998. *Wildlife Response to Thinning Young Forests in the Pacific Northwest*. Journal of Forestry, August, 1997.

Heinselman, M.L. 1981. *Fire Intensity and Frequency as Factors in the Distribution and Structure of Northern Ecosystems.* In Mooney, H.A. et al. (eds.): Fire regimes and ecosystems properties. pp. 7-57. USDA Forest Service General Technical Report WO-26.

Hitchcock, C.L., Cronquist, A., Ownbey, M., Thompson, J. 1994. *Vascular Plants of the Pacific Northwest*. University of Washington Press.

Hostetler, B., Ross, D. 1996. *Generation of Coarse Woody Debris and Guidelines for Reducing the Risk of Adverse Impacts by Douglas-fir Bark Beetle*. USDA, Forest Service.

Iaasacs, Frank. *Distribution and Productivity of Nesting Bald Eagles in Oregon 1979-1999.* 1999. Oregon Cooperative Wildlife Research Unit, Corvallis, OR.

Impara, P.C. 1997. *Spatial and Temporal Patterns of Fire in the Forests of the Central Oregon Coast Range.* PhD. Dissertation. Oregon State University.

Johannessen, Carl L., W.A. Davenport, A. Millet, and S. McWilliams. 1970. *The Vegetation of the Willamette Valley*. Annals of the Association of American Geographers, 61, 286-302.

Jones, J.A., Grant, G. 1996. *Peakflow Responses to Clearcutting and Roads, in Small and Large Basins, Western Cascades, Oregon.* Water Resources Research, Vol. 32 (4): 959-974.

Krusemark, F., Agee, J.K., and Berry, D. 1996. *The History of Fire in the Bull Run Watershed, Oregon.* USDA Forest Service Research Paper Final Report on Supplemental Agreement PNWE-92-0225.

Langridge, Russell W. 1987. *Soil Survey of Linn County Area, Oregon*. USDA, Soil Conservation Service in cooperation with USDA, Bureau of Land Management & Oregon Agricultural Experiment Station. 344 pages, 97 maps.

Lehmkuhl, J.F., and Ruggiero, L.F. 1991. *Forest Fragmentation in the Pacific Northwest and its Potential Effects on Wildlife.* In: Wildlife and Vegetation of Unmanaged Douglas-Fir Forests. USDA Forest Service. General Technical Report PNW-GTR 285. Portland, OR.

Leonard, W.P., Brown, H. A., et al. 1993. *Amphibians of Washington and Oregon*. Seattle Audubon Society, Seattle, WA.

Leonard, W.P., Storm, R.M.., et al. 1995. *Reptiles of Washington and Oregon*. Seattle Audubon Society, Seattle, WA.

Leopold, J.B., Wolman, M., Miller, J. 1964. *Fluvial Processes in Geomorphology*. W.H. Freeman, San Francisco, 522pp.

Long, C.J. 1996. *Fire History of the Central Coast Range, Oregon: a ca 9000 Year Record From Little Lake.* M.S. thesis. University of Oregon, Eugene.

Marshall, D.B., Chilcote, M.W., Weeks, H. 1996. *Species at Risk: Sensitive, Threatened, and endangered Vertebrates of Oregon.* 2nd edition. Oregon Dept. Fish and Wildlife, Portland, OR.

McIntosh, B., Clarke, S., Sedell, J. 1994. *Summary Report for the Bureau of Fisheries Stream Habitat Surveys, Willamette River Basin, 1934-1942.* Bonneville Power Administration.

McNutt, J., McGreer, D. 1985. *Pitfalls in the Strict Reliance on Expert Opinion in Assessing Slope Stability Hazard*. USDA Forest Service GTR - PNW - 180.

Means, J.E. 1980. *Dry Coniferous Forests in the Western Oregon Cascades*. PhD. thesis. Oregon State Univerisity. Corvallis, 268 pages.

Morris, William G. 1934. *Forest Fires in Western Oregon and Western Washington*. The Oregon Historical Quarterly 35:313-339.

Morrison, P., Swanson, F.J. 1990. *Fire History and Pattern in a Cascade Range Landscape*. USDA Forest Service General Technical Report PNW-GTR-254.

Nussbaum, R.A., Brodie, E.D. Jr., and Storm, R.M. 1983. *Amphibians and Reptiles of the Pacific Northwest*. University of Idaho Press, Moscow, ID.

Oregon Department of Environmental Quality. 1988. *1988 Oregon Statewide Assessment of Non-Point Sources of Water Pollution.*

Oregon Department of Forestry. *Clackamas-Marion District Interim Implementation Plan. Working Draft.*
Oregon Department of Forestry. 2000. *Northwest Oregon State Forests Management Plan. Final Draft, Sept. 2000.*

Oregon Department of Forestry. 2000. *Oregon Forest Practices Rules and Statutes*. Chapter 629, Forest Practices Administration.

Oregon Natural Heritage Program, March 1998. *Rare, Threatened, and Endangered Plants and Animals of Oregon*. Portland, OR.

Pagel, J.E. (Ed.) 1992. *Protocol for Observing Known and Potential Peregrine Falcon Eyries in the Pacific Northwest.* In: Proceedings - Symposium on Peregrine Falcons in the Pacific Northwest, Jan. 1991. Rogue River National Forest, OR.

Parsons, G., et. al. Invertebrates of the H.J. Andrews Experimental Forest, Western Cascade Range, Oregon. *An Annotated List of Insects and Other Arthropods*. USDA Forest Service, PNW Research Station, Portland, OR.

Power, W. E., Tausch, W. 1987. *TPCC Technical Guide*. USDI. Bureau of Land Management, Salem District - Oregon. 43 pages.

Rasmussen M. 1996. *Landscape Patterns of Pre-logging Forest Conditions in Western Oregon*. MS Thesis. Oregon State University, Corvallis, OR.

Ripple W. 1994. *Historic Spatial Patterns of Old Forests in Western Oregon*. Journal of Forestry, 92;11. November 1994, 45-48.

Rosgen, Dave. 1996. *Applied River Morphology.* Wildland Hydrology. Pagosa Springs, CO.

Schlottmann, D. et. al. 2000. *Salem District Forestry/Terrestrial Strategy* (FOTEST) Issue Paper. Salem District BLM.

Schowalter, T.D. 1989. *Canopy Arthropod Community Structure and Herbivory in Old-Growth and Regenerating Forests in Western Oregon*. Canadian Journal of Forest Research 19:318-22.

Schowalter, T.D. 1995. *Canopy Arthropod Community Responses to Forest Age and Alternative Harvest Practices in Western Oregon*. In Forest Ecology and Management 78:115-25.
Scott, S.L. 1987. *Field Guide to the Birds of North America*. National Geographic Society, Washington, D.C.

South Santiam Watershed Council, and Bischoff, J. (ed). 2000. *South Santiam Watershed Assessment.*

Spies, T. 1998. *Forest Structure: A Key to the Ecosystem*. Northwest Science, Vol. 72, Special Issue No. 2.

Tappeiner, J.C., Huffman, D., Marshall, D., Spies, T., Bailey, J. 1996. *Density, Ages, and Growth Rates in Old-Growth and Young Douglas-fir in Coastal Oregon*. Canadian Journal of Forest Resources 27: 638-646 (1997).

Taylor, G. 1992. Oregon Climate Service. Oregon State University, Corvallis, OR.

Teensma, P.D.A. 1987. *Fire History and Fire Regimes of the Central Western Cascades of Oregon.* PhD. Dissertation. University of Oregon, Eugene, OR.

Tetra Tech. 1993. *Willamette River Basin Water Quality Study*. Summary Report. TC8983-10. Tetra Tech, Inc., Redmond, WA

Thomas, J.W., Raphael, M.G., Anthony, R.G., et al. 1993. *Viability Assessments and Management Considerations for Species Associated with Late-Successional and Old-Growth Forests of the Pacific Northwest*. The Report of the Scientific Analysis Team. USDA Forest Service, National Forest System, and Forest Service Research, Portland, OR.

USDA. 1986. *Interim Definitions for Old-Growth Douglas-Fir and Mixed Conifer Forest in the Pacific Northwest and California*. Pacific Northwest Research Station, Research Note PNW-447. Portland, OR.

USDA. Forest Service. 2000. *Draft Guide to the Forested Plant Associations of Oregon's Central Cascades*. Technical Paper. USFS Pacific Northwest Region.

USDA. Forest Service. USDI. Bureau of Land Management. 1994. *Final Supplemental Environmental Impact Statement (FSEIS) and Record of Decision (ROD) FOR Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl*. Portland, OR.

USDA, Forest Service. USDI, Bureau of Land Management. 1999. *Draft Supplemental Environmental Impact Statement for the Amendment to the Survey and Manage, Protection Buffer, and Other Mitigating Measures Standards and Guidelines.*

USDA, Forest Service. USDI, Bureau of Land Management. 2000. *Management Recommendations for the Oregon Red Tree Vole (Arborimus longicaudus). Version 2.0*

USDA. Forest Service. USDI. Bureau of Land Management and U.S. Fish and Wildlife Service. 1998. *Mid-Willamette Late Successional Reserve Assessment.* Portland, OR.

USDC. National Ocenaic & Atmospheric Administration. National Weather Service. 1973. *Precipitation-Frequency Atlas of the United States.* NOAA Atlas No. 2. 40 pp.

USDC, NMFS. USDI, BLM. USDA, Forest Service. 1997. *Biological opinion and Conferncing Opinion, Implementation of Land Use Plans and Resource Management Plans, ESA Section 7 Consultations.*

USDI. Bureau of Land Management. 1990. *Oregon-Washington Special Species Policy*, BLM Instruction Memo No. OR-91-57. November 5, 1990 (updated Sept. 1999). Oregon State Office, Portland, OR.

USDI. Bureau of Land Management. 1995. *Salem District Record of Decision and Resource Management Plan and EIS*. Salem, OR.

USDI. Bureau of Land Management. 1995. *Special Status Invertebrate Species and Invertebrate Abstracts.* Oregon State Office, Portland, OR.

USDI. Bureau of Land Management. 1996. *Conclusions from BLM Retrospective Thinning Study*.

USDI. Bureau of Land Management. 1997. (*Interagency) Interim Guidance for Survey and Manage Component 2 Species: Red Tree Vole.* IM-OR-97-009, Nov. 4, 1997. Oregon State Office, Portland, OR.

USDI, Bureau of Land management. 1999. *Field Guide to Survey and Manage Terrestrial Mollusk Species from the Northwest Forest Plan.* Oregon State Office, Portland, OR.

USDI, Bureau of Land Management, 1994 *Hamilton Creek Watershed Analysis*. Salem District, Cascades Resource Area, Salem, OR.

USDI, Bureau of Land Management, 1997. *Little North Santiam Watershed Analysis*. Salem District, Cascades Resource Area, Salem, OR.

USDI, Bureau of Land Management, 1999. *Molalla River Watershed Analysis*. Salem District, Cascades Resource Area, Salem, OR.

USDI, Bureau of Land Management. 2000. *Special Status/Special Attention Species Database. Bureau of Land Management*, Salem District, Cascades Resource Area, Salem, OR.

USDI, Bureau of Land Management, 1996. *Thomas Creek Watershed Analysis*. Salem District,

Cascades Resource Area, Salem, OR.

USDI. U.S. Fish and Wildlife Service. 1986. *Recovery Plan for the Pacific Bald Eagle*. Portland, OR.

USDI. U.S. Fish and Wildlife Service. 1992. *Critical Habitat for the Northern Spotted Owl.* Portland, OR.

Verts, B. J., Carraway, L. N. 1998. *Land Mammals of Oregon*. University of California Press, Berkeley, Calif.

Walstad, J., Radosevich, S., Sandberg, D. 1990. *Natural and Prescribed Fire in Pacific Northwest Forests.* Oregon State University Press, Corvallis, OR.

Washington Forest Practices Board. 1993. *Standard Methodology for Conducting Watershed Analysis. Version 2.0*

Weisburg, P.J.. 1997. *Fire History in the Foothills of the Central Western Cascades*, U.S.A. Submitted to the Canadian Journal of Forest Research.

Wevers, M.J., Wetherbee, J, Hunt, W. 1992. *Santiam and Calapooia Subbasin Fish Management Plan*. Oregon Department of Fish and Wildlife.

Willis, R., Collins, M., Sams, R. 1960. *Environmental Survey Report Pertaining to Salmon and Steelhead in Certain Rivers of Eastern Oregon and the Willamette River and its Tributaries*. Part II. Survey Reports of the Willamette River and its Tributaries. Fish Commission of Oregon, Research Division, Clackamas, OR.

Appendix I

Acronyms

The following list of acronyms are used in this document:

ACEC Area of Critical Environmental Concern

ACS Aquatic Conservation Strategy

ACSO Aquatic Conservation Strategy Objectives

BLM Bureau of Land Management

BMPs Best Management Practices

BCA Bird Conservation Area

BCI Biotic Condition Index

CCC Civilian Conservation Corps

CFS Cubic Feet per Second

CONN Connectivity

CTQ Community Tolerant Quotient

CWD Coarse Woody Debris

DBH Diameter Breast Height

DEQ Department of Environmental Quality

ECA Equivalent Clearcut Acres

ERDT Existing Roads and Designated Trails

ESA Endangered Species Act

FEIS Final Environmental Impact Statement

FOI	Forest Operations Inventory
FPA	Forest Practices Act (State of Oregon)
GFMA	General Forest Management Area
GIS	Geographic Inventory System
GLO	Government Land Office
HJA	H.J. Andrews Experimental Forest
IDT	Interdisciplinary team
KOS	Known (spotted) Owl Site
LCFPA	Linn County Forest Protection Association
LEA	Law Enforcement Agreement
LHU	Lynx Habitat Unit
LSR	Late Successional Reserve
LSRA	Late Sucessional Reserve Assessment
LUA	Land Use Allocation
LWD	Large Woody Debris
MFRI	Mean Fire Return Interval
NEPA	National Environmental Protection Act
NFP	Northwest Forest Plan
NMFS	National Marine Fisheries Service
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife

OFPA	Oregon Forest Practices Act
OHV	Off Highway Vehicle
ONA	Outstanding Natural Area
ONHP	Oregon Natural History Program
OI	BLM Operations Inventory: Forest Cover Stand Condition and Management History
PCT	Precommercial Thinning
RD	Relative Density
REAP	Regional Ecological Analysis
RIA	Rural Interface Area
RMP	Salem District Resource Management Plan
RM	River Miles
RN	Roaded Natural
RNA	Research Natrural Area
RNV	Range of Natural Variation
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RR	Riparian Reserve
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCS	Soil Conservation Service
SEIS	Supplemental Environmental Impact Statement
SFP	Special Forest Products

SNC	Swiss Needle Cast
SRMA	Special Recreation Management Area
SSS	Special Status Species
SSSA	Special Status Special Attention Species
SWB	Sub-Watershed Basin
TMO	Transportation Management Objective
TMP	Transportation Management Plan
TPCC	Timber Production Capability Classification
TSZ	Transient Snow Zone
USDA	U.S. Department of Agriculture
USDC	U.S. Department of Commerce
USDI	U.S. Department of Interior
USGS	U.S. Geological Survey
USFS	U.S. Forest Service
USFWS	U.S. Fish & Wildlife Service
VRM	Visual Resource Management
WA	Watershed Analysis
WAA	Watershed Analysis Area
WAR	Water Available for Runoff
WFPB	Washington Forest Practices Board
WOBS	Wildlife Observations
WODIP	Western Oregon Digital Imagery Project

WQRP Water Quality Restoration Plan

WRB Willamette River Basin

WRD Water Resources Department

WRIS Water Rights Information System

Crabtree Map Packet