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Appendix 1

LSR/MLSA Analysis Modules

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Introduction

One of the important objectives of this assessment was to develop an understandable, consistent and streamlined process for assessing each LSR/MLSA. The LSR Team developed a series of what they have called "modules" to lay out and standardize this process. Each module may consist of a flow diagram or a dichotomous key. Some modules refer to submodules.

These modules were used to develop the LSR/MLSA specific sections in this assessment. They will also be used in developing future LSR/MLSA assessments on the Wenatchee National Forest. In addition to using the modules to develop LSR/MLSA assessments, the modules are also designed to be used to evaluate new project proposals to ensure projects are consistent with management goals and objectives for LSR/MLSA areas.

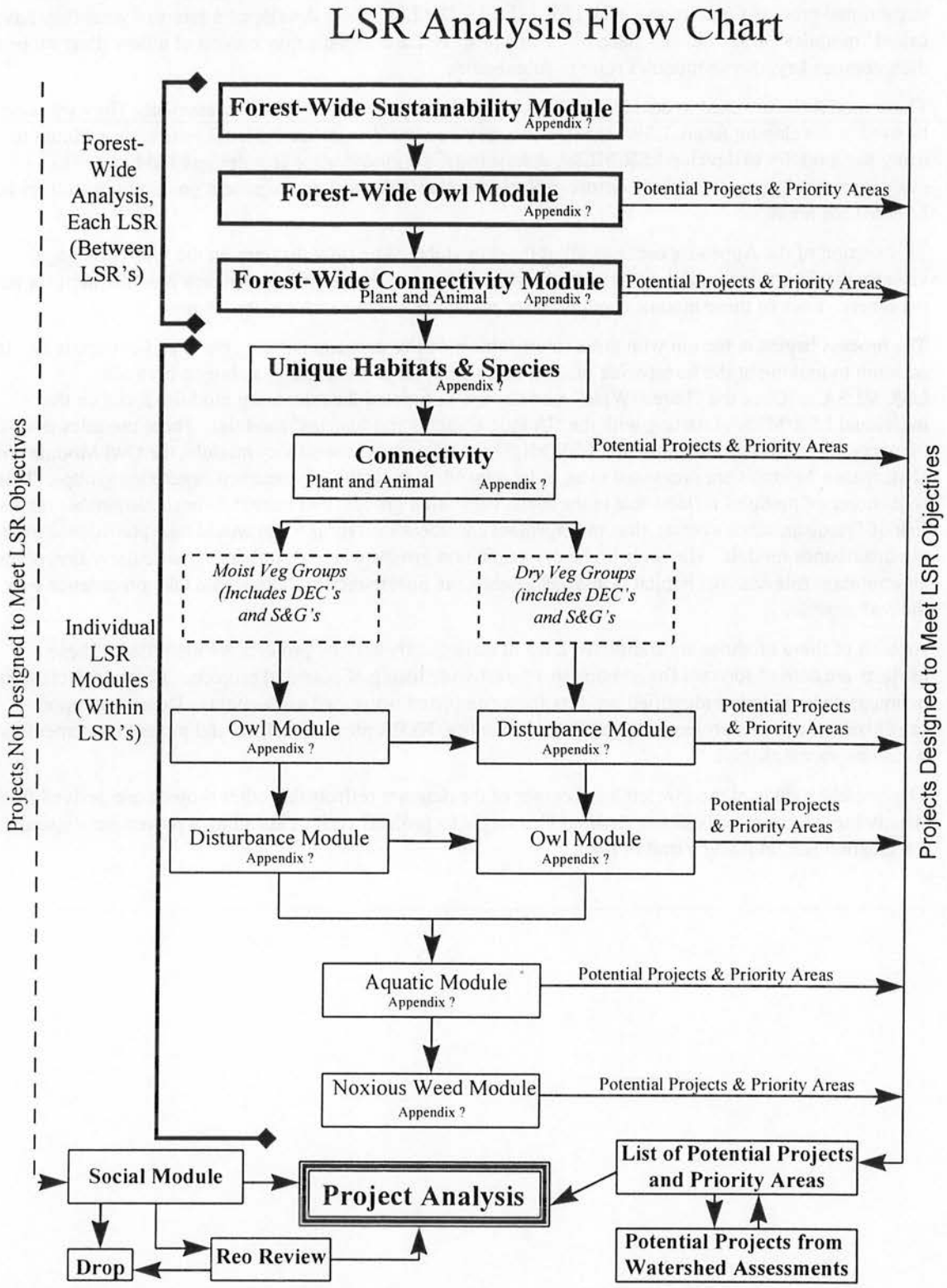
This section of the Appendix contains all of these modules. The flow diagram on the following page visually displays these modules, the order in which they are processed and how each module interacts with the others. Each of these modules are discussed in their respective order in this chapter.

The process begins at the top with three forest-wide modules on sustainability, owls, and connectivity. In addition to looking at the forest-wide picture, these modules analyze things going on between LSR/MLSA's. Once the "Forest-Wide" modules are completed the remaining modules focus on the individual LSR/MLSA (starting with the "Unique Habitats and Species" module). These modules analyze things going on within the individual LSR/MLSA's. After the Connectivity module, the Owl Module and Disturbance Modules are processed in an order dependent upon the predominant vegetation groups. This sequencing of modules reflects that in the moist vegetation groups, owl habitat is more sustainable (at less risk of fire disturbance events), thus management considerations for the owl would take precedence over the disturbance module. However in the dry vegetation groups where disturbance, particularly fire, plays an important role and owl habitat is less sustainable, the disturbance module would take precedence over the owl module.

As each of these modules are completed a list of ecologically derived projects are identified. These projects are carried forward for addition to a forest-wide listing of potential projects. These projects would be integrated with other identified projects from completed watershed assessments. Dependent upon prioritization of these projects and funding availability, NEPA planning efforts and project implementation would be accomplished.

The Social Module, at the low left hand corner of the diagram reflects that other projects are derived from strictly human based activities or desires. This might be projects such as installing a powerline, expanding a recreation site, building a trail or road.

Figure 1, Forest LSR Analysis Flow Chart



Forest-Wide Sustainability Module

See LSR Vegetation Photo Mapping Key (in Appendix) for Code Description

Susceptibility of Dry Forest to Stand Replacement Fire

Step 1) Determine the acres within the following vegetation types:

Dry Forest dense successionally advanced (code 12)

Dry forest partial cut (code 13)

Mesic forest single layered (Code 21)

Mesic layered mature (code 22)

Display the total acres within these codes.

Susceptibility of Other Vegetation Groups to stand replacement fire

Step 2) Determine the acres within the following vegetation types:

Moist grand fir single layered (code 31)

Moist grand fir layered mature (code 32) Moist grand fir partial cut (code 33) Mesic Hemlock layered mature (code 36) Subalpine fir layered canopy (code 42)

Estimate the acres within these codes that are adjacent to Dry forest or in close proximity (1 mile or less, upslope or downwind) to dry forest.

Step 3) Total the acres of Step 1 and 2. This represents the total acres within the LSR that are in high risk of a stand replacement fire in the next 20 years, ie. vegetation not sustainable in its current condition. Display this as a percent of the total acres within the LSR or MLSA.

Step 4) Determine the amount (acres) of current late successional forest at risk and the amount (acres) of current late successional forest not at risk.

At Risk

Dry Forest dense successionally advanced (Code 12)

Mesic Layered Mature (Code 22)

Moist grand fir layered mature (Code 32 portion calculated in Step 1) Mesic Hemlock Layered mature (Code 36 portion calculated in Step 1) Subalpine Fir layered canopy (Code 42 portion calculated in Step 1)

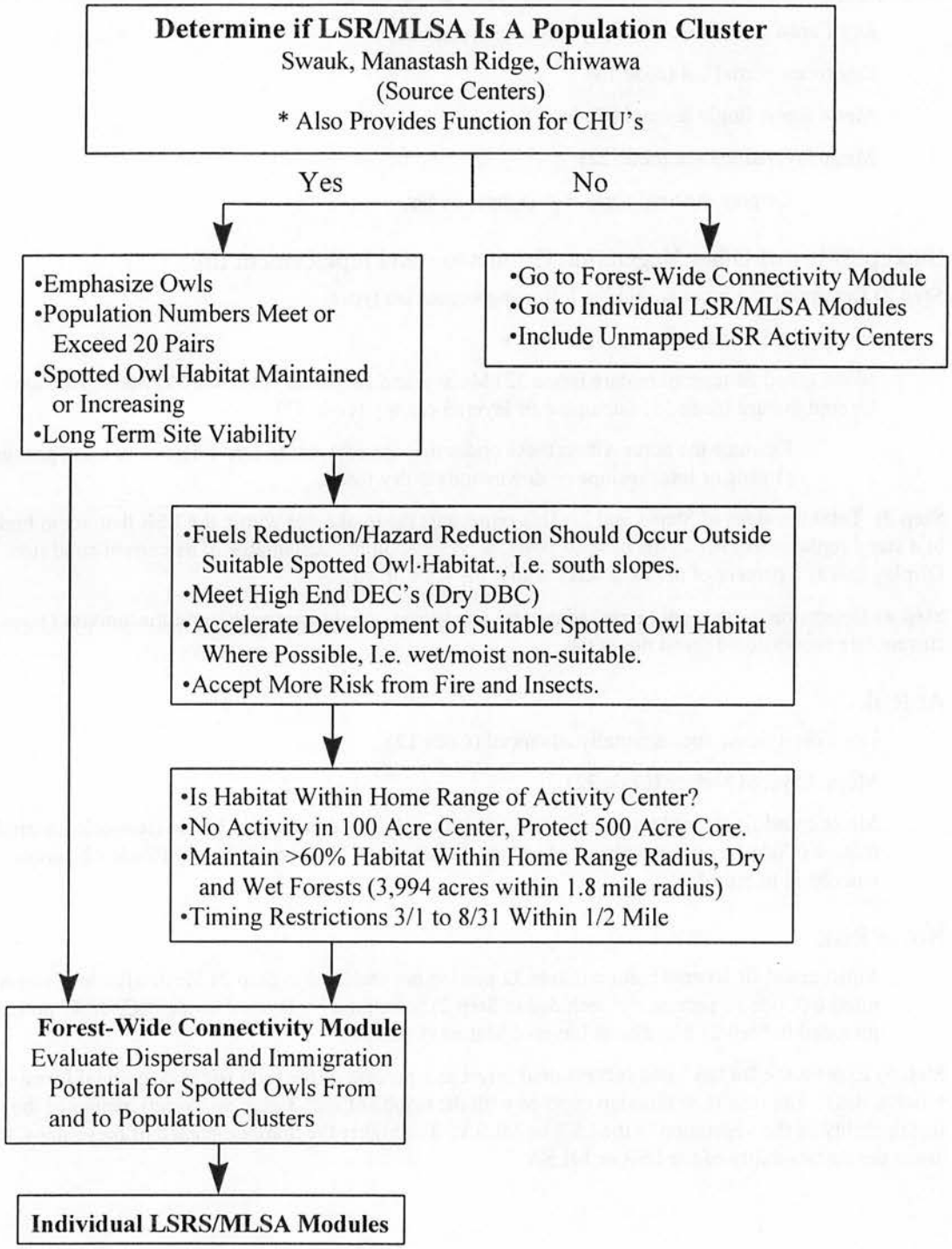
Not at Risk

Moist grand fir layered mature (Code 32 portion not included in Step 2) Mesic Hemlock Layered mature (Code 36 portion not included in Step 2) Subalpine Fir layered canopy (Code 42 portion not included in Step 2) Wet Forest Layered Mature (Code 62)

Step 5) Express the "at risk" late successional forest as a percent of the total late successional forest (at risk + not at risk). The results of this step coupled with the results of step 3 give an overall picture of the sustainability of the vegetation in the LSR or MLSA. The higher the number in each of these steps, the lower the sustainability of the LSR or MLSA.

Forest-Wide Owl Module

Forest-Wide Spotted Owl Module



Forest-Wide Connectivity Module

Dispersion Index to Assess Habitat Connectivity for LS Assoc. Species

A Dispersion Index To Assess Habitat Connectivity For Late-Successional Associated Species On The Wenatchee National Forest.

Introduction

The movement of wildlife species between habitat patches has been the subject of much scientific discussion in the past few years (Lindenmayer and Nix 1993, Harrison 1992, Bennett 1990, Noss 1987). The ability of species to move between habitat patches is important because it reduces the vulnerability of insular populations to stochastic extinction from environmental disturbance, demographic fluctuation, or genetic deterioration. In addition, it provides a means by which recolonization could occur should any local extinctions take place, such as after a high intensity disturbance (Shaffer 1981, Simberloff and Cox 1978).

While much of the discussion regarding the appropriate size, juxtaposition and effectiveness of habitat connections has been theoretical, a few studies have been completed showing the potential benefits and use of corridors. Some examples include studies of small mammal use of habitat corridors (Bennett 1990), and use of wildlife corridors by arboreal marsupials (Lindenmayer et al. 1993). Both of these studies showed that movement between habitat patches could be facilitated by habitat corridors. These studies and other authors (Lindenmayer and Nix 1993, Harrison 1992, Lehmkuhl 1984) have offered several items to consider when determining if wildlife species can move between habitat patches including: distance between patches, width of corridor, suitability of habitat between patches (including human interactions), and the mobility of the species.

The ability of species associated with late-successional forests to move between habitat patches identified as Late-Successional Reserves (LSR) or Managed Late-Successional Areas (MLSA) was an issue raised during the forest wide LSR/MLSA assessment. In order to evaluate the ability of species to disperse between these habitat patches, given the time and resources available, a simple approach needed to be devised. In this paper the approach used is presented. It is important to remember that this is only an initial attempt at determining the dispersion of species across the late-successional network on the Wenatchee National Forest. Hopefully, by describing this methodology and the assumptions, better and more sophisticated models can be developed in the future to address this important issue.

Methods

The method used to evaluate dispersal of wildlife species between LSR/MLSAs involved a four step approach. Each of these steps are described below.

STEP 1. Late-Successional Associated Wildlife Species.

The initial step was to determine which species would be addressed in this evaluation. A list of all wildlife species that were believed to be present on the Wenatchee National Forest and were associated with late-successional forests was developed from available literature (mainly Thomas et al. 1993) and the professional experience of the forest biologists. This list is provided in Table 1.

STEP 2. Dispersal Ability of Wildlife Species.

As was previously mentioned, important to determining if wildlife species disperse between LSR/MLSAs, is the distance that a particular species or group of species are able to disperse. In

order to determine dispersal abilities of the list of species to be addressed, a literature search was completed. The literature that was used to determine a species dispersal ability is provided in Table 2. From the literature, a species was then placed into one of the following three dispersal categories shown in Table 3. For some species, dispersal information could not be found or was not available. In these cases professional judgment and consultation with recognized experts were used to determine the appropriate dispersal category.

STEP 3. Identification of Dispersal Barriers.

Also important in identifying the ability of species to disperse between LSR/MLSA's is the potential for natural and human created barriers. Dispersal barriers vary depending on the mobility of the particular wildlife species. To determine what kinds of natural and human created features may be a barrier for a particular species, a literature review was completed (see Table 2). However, relatively little of this kind of information was found for many of the species on the list. As a result, professional judgment and consultation with recognized experts were heavily relied upon. Species were then placed into one of the dispersal categories described in Table 3.

STEP 4. The Dispersion Index.

The final step was to apply the information gathered in the previous steps in order to determine the likelihood that wildlife species within each dispersal group could move from a LSR/MLSA to the adjacent LSR/MLSAs. In order to accomplish this, LSR/MLSA were overlaid onto 1"/mile maps and the following information was recorded for each LSR/MLSA in the forest network: distance to the nearest LSR/MLSA; if low, moderate, and or high dispersal species were likely to move between the LSR/MLSA, and determining the dispersion index. The dispersion index was assigned by determining which dispersal groups were likely to be able to disperse from the LSR/MLSA and to adjacent ones. If the high, moderate, and low dispersal species were likely to be able to disperse than an index of 3 was assigned. If only high and moderate dispersal groups were likely to be able to disperse than an index of 2 was assigned. If only the high dispersal group were likely to disperse than and index of 1 was assigned. The overall dispersal index for a particular LSR/MLSA was determined by adding up all of the assigned dispersal values (1-3) and dividing by the total number of potential linkages that were evaluated (up to 4).

Results And Discussion

A total of 39 potential linkages throughout the LSR/MLSA network were evaluated for the likelihood that the species within each mobility category could successfully disperse. All of these potential linkages were likely to be useable by high mobility species. It appears as though the current LSR/MLSA network provides a high level of connectivity with one possible exception. Additional human development along the Interstate 90 corridor has the potential to fracture populations of even high mobility species.

Twenty three (59%) of the potential linkages that were evaluated would likely provide for dispersal of moderate mobility species. This provides a relatively high level of connectivity. Again, though the area along Snoqualmie Pass provides an important linkage to north/south populations. The potential for dispersal of moderate mobility species has already been greatly reduced but could be improved with better highway under passes.

Only eight (21%) of the potential linkages were likely to provide conditions suitable for dispersal of the more sessile, low mobility species. The effects of this fragmentation are beyond the ability of this team to evaluate in this assessment. Little information is available about the biology and distribution of a number of these species. However, connectivity for these species could be improved by closer evaluation of some of the linkages with and index of 2. It is possible that some of these linkages could be reconnected through some restoration activities.

Table 1, Dispersal categories for wildlife species assessed in the Wenatchee National Forest Late-Successional Reserve and Managed Late-Successional Area assessment.

Low Dispersal:	Capable of dispersal up to 1 km and/or forest roads, open ridges and rock present barriers.	Warty jumping slug, blue-gray tail-dropper, papillose tail-dropper.
Moderate Dispersal:	Capable of dispersal between 1 and 3 km and/or major highways, open ridges, or cliffs present barriers.	Rough-skinned newt, tailed frog, spotted frog, Cascades frog, northern flying squirrel, Douglas squirrel, western gray squirrel, Townsend chipmunk, forest deer mouse, deer mouse, shrew mole, redbacked vole.
High Dispersal:	Capable of dispersal greater than 3 km and/or major highways with associated human development present barriers.	Barrow's goldeneye, wood duck, common merganser, Harlequin duck, northern goshawk, bald eagle, barred owl, spotted owl, pygmy owl, pileated woodpecker, hairy woodpecker, red-napped sapsucker, northern flicker, willow flycatcher, Hammond's flycatcher, vaux's swift, chestnutback chickadee, brown creeper, red-breasted nuthatch, white-breasted nuthatch, pygmy nuthatch, winter wren, golden crowned kinglet, hermit thrush, varied thrush, Townsen's warbler, Wilson's warbler, red crossbill, olive-sided flycatcher, red-tailed hawk, little brown myotis, big brown bat, silver haired bat, long-legged myotis, hoary bat, elk, lynx, fisher, marten.

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S.Sovern pers. comm.

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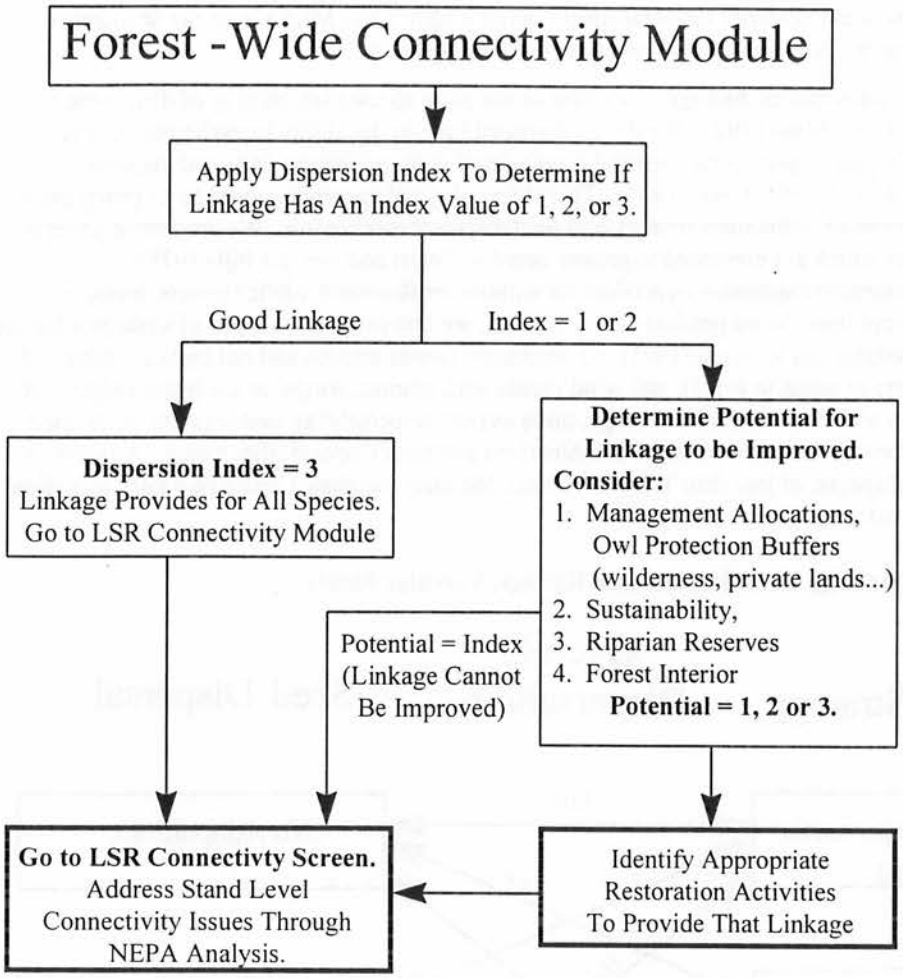
Figure 2, Forest-Wide Connectivity Module



Plant Forest-Wide Connectivity Module

The literature is infused with studies which describe the importance of connectivity between habitat patches for wildlife species. Few, if any, specifically describe connectivity for plant species. We attempt to provide an analysis of connectivity for plant species among LSR's and MLSA's on the Wenatchee National Forest. Here, we provide a general overview of our approach.

A critical question in conservation biology is whether or not plant species are capable of dispersing to new, suitable sites (Primack and Miao 1992). We define dispersal here as the ability to exchange genetic material. For vascular plants, gene flow potential is correlated with pollination and seed dispersal mechanisms (Hamrick et al. 1991, Given 1994). Therefore, a logical approach would be to group plant species by a combination of pollination strategy and seed dispersal mechanism. We used three general pollination syndromes which are explained in greater detail in Fragri and van der Pijl (1979): autogamous(self-fertilization)/apomixis (reproduction without fertilization); biotic (insects, birds, or mammals); and anemophilous (wind pollination). Likewise, we identified three types of strategies for seed dispersal similar to Ashton and Monaco (1991): no adaptation (seeds smooth and not bioticly dispersed); biotic (seeds with burrs or seeds in fruits); and wind (seeds with plumes, wings, or are light-weight). By combining pollination with seed dispersal strategy, three overall dispersability rankings can be defined. The figure and table below shows the strategy combinations and their dispersability rating. A rating of Low would indicate dispersal of less than 1 mile (1.6 km), Medium less than 3 miles (4.8 km), and High less than 5 miles (8 km).

Figure 3, Dispersal Strategy Combinations and Ratings, Vascular Plants

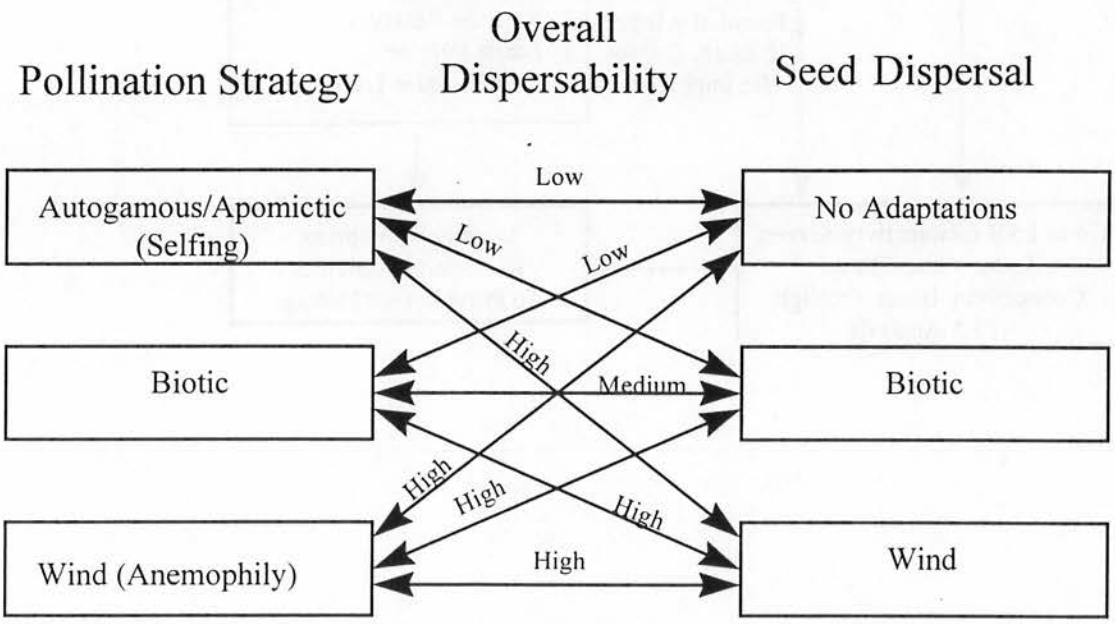


Table 2, Overall Dispersability Rankings, Vascular Plants

Gene Dispersal	Overall Dispersability	Dispersal Class	Overall Dispersability
Apomictic/No Adaptations	Low	1	Low
Apomictic/Biotic	Low	1	Low
Apomictic/Wind	High	3	High
Biotic/No Adaptation	Low	1	Low

Gene Dispersal	Overall Dispersability	Dispersal Class	Overall Dispersability
Biotic/Biotic	Medium	2	Medium
Biotic/Wind	High	3	High
Wind/No Adaptations	High	3	High
Wind/Biotic	High	3	High
Wind/Wind	High	3	Hi

Low = <1 mile; Medium = Up to 3 miles; High = Up to 5 miles

It should be noted that this approach is an over simplification of overall dispersal capability of vascular plants. For example, Gandawijaja and Arditti (1983) and Close et al. (1978) have suggested that orchid seeds can travel perhaps thousands of kilometers in wind because of their light weight. It would be logically assumed that such seeds should rate as having a high dispersal ability. The overall dispersability of this species would be assumed high since this species is an obligate out-crosser (Harrod and Knecht 1994). Harrod and Everett (in press), however, have found that *Cypripedium fasciculatum* seed travel short distances from parent plants even in moderate winds. A determination of high dispersability is likely inappropriate for this species, but our approach would consider this species as high. In contrast, a species which rates Low, such as Autagomous/Apomictic - Biotic seed dispersal, may in actuality be Medium or High because of long-distance seed dispersal by birds. So, our approach is most useful as a discussion tool and not an absolute. . An attempt will be made to point out such distinctions. The following is a brief discussion of connectivity forest-wide by habitat type (i.e. vegetation group). A list of species associated with each of the forest groups is provided in Appendix ?

Unique Habitats and Species Module

This module covers landscape level unique ecosystems, and microsite unique habitats and species. Basically, it is a check list of habitats and species, that will over-ride other modules, risks and activities. See Forest Wide LSR Unique Habitat Table __ for habitats, species and amounts.

The DEC (Desired Ecological Condition) for unique habitats is to perpetuate habitats over time, to highlight these habitats in management actions, and to tie to connectivity for TES, S&M, P&B, and MIS species. See "Species With Special Status Module" for further information on unique species. During project analysis and management activities, locate these unique habitats on a site-specific basis. Apply appropriate recommendations, as noted.

A. Is LSR/MLSA within landscape scale unique ecosystems?

1. Distribution Centers of Species Rarity and Endemisim for plants and/or animals

The Interior Columbia Basin Ecosystem Management Project (1995) identified terrestrial plant and animal endemism and rarity areas (distribution centers) throughout the 3+ state area. These distribution centers provide a landscape view at the relevence of species and habitats within, together and adjacent to each other. Habitats and the relative abundance on a larger scale can be analyzed. Fringe habitats are viewed for genetic interchange of pioneering, expanding or declining species.

a) **Spine of the Cascades** - Plant and Animal species occur along the Cascades, representing more western forest species in the high country of the eastern slopes:

   Little Wenatchee LSR, Icicle LSR, Twin Lakes MLSA; portions of Chiwawa LSR, Teanaway LSR, Lucern LSR.

b) **Wenatchee Mountains** - Plant species occur along the east-west ridge lines between from Cascade Crest east, Chelan County and Kittitas County:

   Swauk LSR, Deadhorse LSR, Natapoc MLSA, Eagle MLSA, Tumwater MLSA, Boundary Butte LSR, Camas MLSA, Sand Creek MLSA, ; portions of Shady Pass LSR, Chiwawa LSR,

c) **Yakima Firing Center, Oak Creek Big Game** - Animal species richness in this arid space.

   Rattlesnake LSR, Russell Ridge MLSA; portions of Tieton LSR

d) **Northern Glaciated Mountains** - A few wildlife species barely overlap from the northern boreal country, southern expansion of ranges and winter irruptives.

2. Wenatchee National Forest Research Natural Area

The Wenatchee Forest Land and Resource Management Plan (pg Ch II 29-30) provides RNAs as: baselines against to measure effects of human disturbance; study the natural process in undisturbed ecosystems; and provide gene pool preserves for all types of organisms, especially rare and endemic.

a) **Meeks Table RNA** - Ponderosa pine, pine grass plant community without co-dominance of Douglas-fir. Now within W.O.Douglas Wilderness, adjacent to Haystack MLSA.

b) **Thompson Clover RNA** -Plant community charactrized by Thompson clover. No LSR/MLSAs are near.

c) **Eldorado Creek Proposed RNA** - Plant community found on serpentine derrived soils. Within Teanaway LSR.

d) **Fish Lake Bog Proposed RNA** - Floating bog plant community. Near Chiwawa LSR.

e) **Cedar Creek Potential RNA** - Mixed old growth conifer/shrub in the Pacific silver fir series. Now within W.O.Douglas Wilderness, adjacent to Bumping LSR.

f) **Icicle/Frosty Potential RNA** - Western red cedar/western hemlock forests. Now within Alpine Lakes Wilderness, adjacent to Icicle LSR.

g) **Chiwaukum Creek Potential RNA** - Grand fir/mixed conifer/conifer shrub community. Within ALW, near Deadhorse LSR.

h) **Drop Creek Potential RNA** - Engleman Spruce/Subalpine fir forests. Within Swauk LSR.

i) **Big Chief/Millbrook Additional Potential RNA** - Old growth Pacific silver fir, upland wetlands, wet sedge meadows, huckleberry shrub meadows, mountain hemlock forests (personal communications T.Lillybridge, WN Forest Ecologist). Within Little Wenatchee LSR.

3. Wenatchee National Forest Unique Ecosystems

Unique botanical and geological ecosystems on the Forest were noted in the LRM Plan (Ch II 28) as follows:

a) **Tumwater Botanical Area** - Protect plant species in a near natural area, *Hackelia venusta, Silene selyi, Chaenactis ramosa.* Within Tumwater MLSA.

b) **Camas Potential Botanical Area** - for *Delphinium viridescens*. Adjacent to Sand Creek MLSA.

c) **Gene Creek Potential Botanical Area** - For ponderosa pine ecosystems containing old growth dependant species. On Entiat R.D., no LSR/MLSAs are near.

d) **Hornet Ridge Potential Botanical Area** - Protection of park-like stands of ponderosa pine, containing old growth dependant animal and plants. Within Chiwawa LSR.

e) **Lake Creek Potential Botanical Area** - Protection of plants associated with undisturbed wetland habitat. Adjacent to Shady Pass LSR.

f) **Kloochman Rock Potential Geological Area** - Unique geological feature. Within and adjacent to Lost Lake MLSA.

g) **Goose Egg Mountain Potential Geological Area** - Unique geological feature. Adjacent to Lost Lake MLSA and Russell Ridge MLSA.

h) **Rimrock Potential Geological Area** - Unique geological feature. Within Tieton LSR.

i) **Blue Slide Potential Geological Area** - Unique geological feature. Within Tieton LSR.

B. Does LSR/MLSA have unique habitats or species?

xB. Does LSR/MLSA have unique habitats or species?

		Unique Habitat Feature	Recommendations	Activities	References
1.		**Riparian Reserves**	**Watershed Assessment**		**NWFP B 9-17,**
				Meet ACSO	**C 30-38; WNFP iv 84-88**
	a.	Rivers and Streams, Fish-bearing	300 feet buffer	Protect & enhance	C 30
	b.	Permanent streams, Nonfish-bearing	150 feet buffer	Protect & enhance	C 30
	c.	Lakes and ponds	300 feet buffer	Protect & enhance	C 31
	d.	Wetlands		Protect & enhance	

		* Greater than 1 ac	150 feet buffer	Protect & enhance	C 30
		* Less than than 1 ac	Outer edge of riparian vegetation	Protect & enhance	C 31
	e.	Intermittent streams	100 feet buffer	Protect & enhance	C 31
	f.	Unstable or potentially unstable soils	Extent of unstable areas	Protect & enhance	C 31
	g.	Dispersal corridors, terristrial connectivity	Possible increase of intermittent width	Protect & enhance	B 14
2.		**Non-Forested**	**Survey & locate habitats**	**Maintain & enhance**	**WNFP pg iv 80-82,104,149; C 19-21, 43-44**
	a.	Subalpine meadows	Protect 300 feet around.	Reduce encroach	C 11,21
	b.	Wet meadows			B 16-17, C30
	c.	Dry meadows			
	d.	Shrub/brushfields		Maintain fire	
	e.	Shrubs - huckleberry		Maintain fire	
	f.	Avalanche chutes			
	g.	Hardwoods: aspen, Big-leaf maple		Maintain fire	
	h.	Oak forest			
	i.	Talus		Remove Roads	C 4-5
	j.	Rock boulders	Protect tree cover		
	k.	Cliffs, rimrock	Protect tree cover		"
	l.	Caves	Protect tree cover		C 43-44
	m.	Ice/glaciers			
	n.	Cirques	Winter Track Surveys	Reduce Rec	
	o.	Burrows/dens	Maintain or enhance		IV 80
3.		**Forest Groups**	**Retain contiguous forest patches**	**Link patches with corridors**	**WNFP IV 104 NWFP C 44**
	a.	Disjunct forest groups, unexpected forest plant communities for the forest type (ie White-bark pine at Lake Wenatchee), Pacific Yew, Alska Yellow Cedar, etc.	Maintain or enhance	Rx fire	
	b.	Large contiguous forest-interior patches	Protect or enhance	Remove Roads	C 16, 67-68
	c.	Dry forest old-growth patches	Meet DEC	Rx Fire	
	d.	Pacific Yew stands	Maintain biodiversity	Protect/enhance	WNFP IV-104
	e.	Snag concentrations	Maintain snag/log levels	Improve hab.	C 14-15,41-42
			Maintain snag areas	Create log dens	WNFP IV 82
4.		**Survey and Manage**	**Standards & Guidelines**		B 64, D34, C 4-6, 11, 19-20, 26-28, 45, 49-61
5.		**Protection & Buffer**	**Standard & Guideline**		B 64,C 3,11,19-21,23-28,43-

					48, WNFP IV 82, IV 149
	a.	Great Gray Owl	Protect (nest unmapped LSR), 1/4 mi nest sites, 300' of meadows	Survey prior '97	C 4-5,11,19-21
	b.	Mollusks Warty Jumping Slug Blue-gray Taildropper Papillose Taildropper	Survey and Manage (1 & 2)	Protect from from grazing	C 4-6,59-60, C6
	c.	Amphibians: Larch Mtn Salamander, Van Dyke Salamander	Survey and Manage (2) prior to 1997		C 4-6,20,28,59-60
	d.	Lynx	Survey and Manage (3) 3/8/96 RF	Survey 1 TWN	C 5,45,47-48
			Protect denning habitat	< 1,500 ac SAF	SAT 298-299
			Develop Road Mgt. Plan, Develop Timber Harvest Plan	Minimize/Close Rds., Thin/accelerate OG, Create open < 300', Leave snags/logs	FEMAT III-22, IV 27 Ruggiero '94
	e.	Known plant sites	Survey and Manage sites		C 4-6,19-20
		Vascular plants (___ spp)	Survey and Manage sites		C 60-61
		Bryophytes (___ spp)	Survey and Manage sites		C 26-27,58-59
		PTCA	Unmapped LSR		
		TEGE & BRRO	Unmapped MLSA		
		Fungi (___ spp)	Survey and Manage sites	Manage recreation	C 6,26-27,49-56
		ALRH, OTLE, OTON, OTSM, POMU & SAME	Unmapped LSR's & MLSA's		
		Lichens		Manage recreation	C 6,56-58
	f.	Arthropods	None listed for Washington State	N/A	C 61 & J2
	g.	Birds	Protect Nest Sites	1-2 tree lengths	
		White-headed woodpecker	100% population potential	Snag Levels	C 40-42, 45-47,
		Black-backed woodpecker	100% population potential	800 ac +, Snag Sites	C 45-47
		Pygmy nuthatch	Apply white-headed woodpecker guides		C 46
		Flammulated owls	Follow snag guidelines		C 46-47
	h.	Bats: Fringed myotis Silver-haired bat Long-eared myotis Long-legged myotis Pallid bat Townsend's big-eared bat	Protect caves, cliff-caves 250'	Survey	C 42-44, D 10-11
	i.	S.owl Activity Centers Unmapped LSR in Matrix etc	Unmapped LSR in Matrix etc.	Retain 100 ac	C3,10-11, 39, 45, D9
	j.	marbled murrelet	Survey 2 years preproject	Protect .5 mi site,	C 10,D 9,

				Unmapped LSR	
6.		**Other Unique Species**	**Standard and Guidelines**	**Protect Maintain, or Enhance**	WNFP IV 78-81, FSM 2670, NWFP A2, C1, FSEIS App G
	a.	PETS Plant Sites (_*_ Spp)	Follow S&G for plants	Protect/enhance	FSM 2670
		Other Special Plants:			
		Lichen and fungi species tied to large diameter trees	Follow WNF Plan Biodiversity	Microsite,	WNFP IV 104
	b.	PETS Animal Sites (31 Spp) 2 fish, 10 mammals, 12 birds, 5 herptiles, 2 mollusks	Follow S&G for animals	Protect/enhance	FSM 2670
		Other Special Animals			
		Raptor Nest Sites	Follow WNF Plan	Protect Nest Roost	WNFP IV 81
		Colonial Nesting Species	WNFP & NWFP	Protect for GGO	IV 81,Hayward
		Bird Nest Sites	Protect Nest Tree		Migratory Bird Treaty Act
		Neotropical Migratory Bird	Protect Nest Sites		
		Boreal Owl	Protect Nest Sites		Hayward
	c.	MIS (16 Spp)	Follow WNF Plan	Maintain/enhance	WNFP IV 26, 80-84
		4 fish,(chinook salmon, sockeye salmon, summer steelhead, cutthroat trout)		Follow WNF Plan	
		5 mammals (mule deer, elk, mountain goats, beaver, marten)			
		7 birds (ruffed grouse, bald eagle, peregrine falcon, spotted owl, pileated woodpecker, N. 3 toed woodpecker, primary cavity excavators)			
	d.	American Indian			NWFP c 16, E 9-10
		Traditional Food Sites (bitterroot, huckleberry, chokecherry, etc.)	Provide habitat and access	Maintain and Enhance habitat	
		Other Use Sites (talus, ridges, petroglyphs, pictographs, lithic scatters, etc.)	Protect site	Access for Quests	

Individual Lsr/Mlsa Analysis

Snag/Downed Log/Green Tree Recruitment

LSR/MLSA Quality Rating

The quality rating for each LSR/MLSA is done on a landscape basis, these principles can be applied to Subwatersheds (FPU) and to stand level analysis. See each LSR/MLSA chapter for rating. Actual snag, downed log and green tree recruitment numbers, sizes, stages of decay and species is not practical to analysis on a landscape basis. When data is available, incorporate actual availability data into the analysis. Snag and Downed Log levels are based on WNF Snag Levels, Fire Recover y Snag Levels, Everett et al Spotted owl and Snag studies, and wildlife needs. Qualitative ratings are based on habitat needs for snag, downed log, and recruitment tree wildlife and plant species needs (see Table _ Wildlife Use of Snags/Logs). Species using these habitats include:

pileated woodpecker	spotted owl	hoary bat
black-backed woodpecker	flammulated owl	silver-haired bat
white-headed woodpecker	great gray owl	big brown bat
olive-sided flycatcher V	Vaux's swift	voles, shrewmole
marten & fisher	flying squirrel	bald eagle
tailed frog	lynx	NW & PG salamander
land snails	lichens & fungi	

HIGH QUALITY	MEDIUM QUALITY	LOW QUALITY
Moist & Wet Veg Groups	Subalpine Fir & Mesic Veg	Dry & Whitebark Veg
>60% LS (non-dry) Habitat	15% - 60% LS Habitat	<15% LS Habitat
80% - 100% LS (all) Habitat	40% - 80% LS/M Habitat	<40% LS/M Habitat
> 30% Forest Interior (non-dry)	15% -29% Forest Interior Non-dry	<15% Forest Interior ND
>10% Forest Interior Dry	5% - 9% Forest Interior Dry	< 5% Forest Interior Dry
>16% in Riparian Reserves	10% to 16% in Riparian Reserves	<10% in Rip Res
0 Mi/Sq Mi Any Rds in Rip Res	0 to 1 Mi/Sq Mi Rds in Rip Res	> 1 Mi/Sq Mi Rd Rip Res
< 1 Mi/Sq Mi Open Roads	1 Mi to 2.5 Mi/Sq Mi Roads	> 2.5 Mi/Sq Mi Roads
>70% Security Habitat	50% to 70% Security Habitat	<50% Security Habitat
>10% in Past Burns	--	<10% in Past Burns
>50% Insect/Pathogens	25% - 50% Insect/Pathogens	< 25% Insect/Pathogens (see Insect/Disease Write Up)
<10% Past CC Harvest	11% - 25% Past CC Harvest	>25% Past CC Harvest
<10% Past PC Harvest	11% - 50% Past PC Harvest	>50% Past PC Harvest

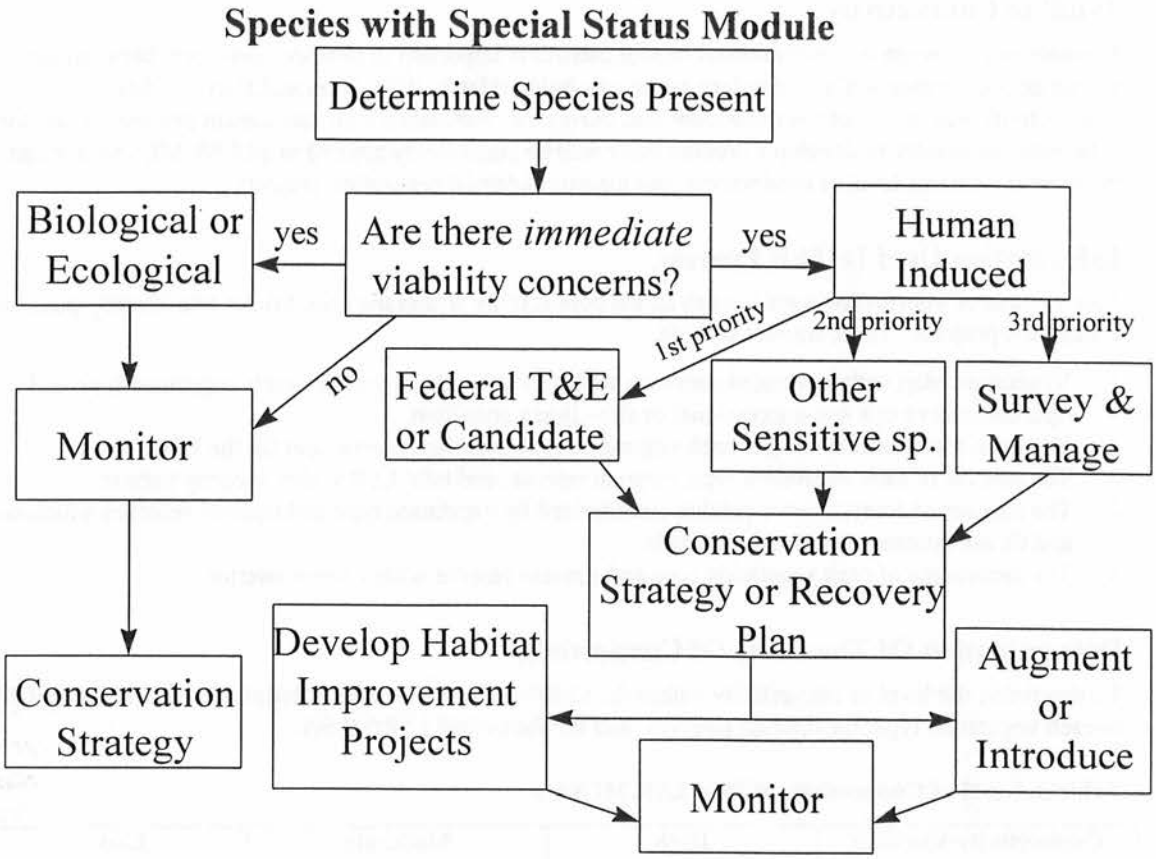
Potential Treatments:

- Reduce roads in riparian reserves;
- Reduce Roads in Forest Interior Patches
- Retain Snags at High End of Range; and
- Incorporate Healty Insect/Disease Levels.

Species With Special Status Module

Within each LSR or MLSA, information is gathered regarding species with special status (i.e. federal candidate, sensitive species, or survey and managed species: refer to "Late Succesional Associated Species" section above) to determine potential maintainence or restorations projects and priorities (Fig. ?). The analysis begins by determining if there are *immediate* viability concerns. Obviously, viability concerns exist for those species that have special status, but it is important to determine if individual species are nearing extirpation in the near future (<10 years). If there are immediate viability concerns, it is important to distinguish between biological/ecological (maladaptedness) and human induced causes for speices decline. Extinction is a natural process, but extinction as a result of human activities is not desireable. This is because rare (candidate or sensitive) species may represent a step in diversification that is critical to the survival and/or maintenance of species or species groups (Harrod et al. 1996a). It will be important to ascertain whether or not rare species are newly evolved or represnt maladapted relic species nearing extinction. If species decline is human induced, federal candidate species receive first priority for project consideration (Fig ?). A conservation strategy or recovery plan will need to be developed to document thought process and address related issues. When no immediate viability concerns exist, monitor species populations and develop conservation strategies as time and money allow. Projects that are outlined in conservation strategies are divided into two types: habitat improvement and augmentation/introduction. Habitat improvement projects improve environmental conditions for species with several populations. Examples include, but are not limited to: burning, improving hydrologic condition, eradicating competitive weeds, changing canopy closure, and managing human activities (off-road use, climbing, collecting, and grazing). Habitat improvement for *Delphinium viridescens* through thinning and burning provides an example of this type of project (information available at the Leavenworth RD). Knowledge of the species biological and ecological requirements will be necessary to determine appropriate habitat improvement. Augmentation/introduction projects are used as a last resort. Species with only one or few populations that are imperiled should receive top priority for augmentation/introduction. This will require recovery plans which are developed with interagency cooperation. Introduction of *Hackelia venusta* provides an example of this type of project (information available at the Leavenworth RD).

Figure 4, Species with Special Status Module



Connectivity Module - Within LSR/MLSA

Wildlife Connectivity

Connectivity between late-successional habitat patches is important to provide movement between patches, minimize local extinction's, and reduce genetic isolation (Harris 1984, Noss and Harris 1986). Connectivity was an important issue identified during the Wenatchee LSR assessment process. Therefore it became neccessary to develop a process that could be consistently applied to all LSR/MLSAs in order to evaluate the current level of connectivity and identify potential restoration projects.

Information Used In This Process

Five sources of information were used to assess connectivity within the LSR/MLSA and identify possible restoration projects. These sources include:

1. Vegetation Map with associated summary tables showing the amount of each vegetation type and riparian reserve in a late-successional or fire-climax condition.
2. The open road densities within each vegetation type, riparian reserve, and for the LSR.
3. The percent of each vegetation type, riparian reserve, and total LSR within security habitat.
4. The number of forest interior patches summarized by vegetation type and riparian reserves which do and do not contain open or closed roads.
5. The percentage of each vegetation type and riparian reserve within forest interior.

Determination Of The Level Of Connectivity

To determine the level of connectivity within the LSR/MLSA the following definitions should be applied to each vegetation type, for riparian reserves, and for the overall LSR/MLSA.

Table 3, Level of Connectivity Within LSR/MLSA's

Connectivity Variable	High	Moderate	Low
%Late-success or Fire-climax	>70%	50-70%	<50%
Open Road Density (mi./sq.mi.)	<1	1-2	>2
Security Habitat	>70%	50-70%	<50%
Forest Interior Roads	No Roads	Roads	
% Forest Interior	>66%	33-66%	<33%

Following the ranking of each connectivity variable will be a discussion of the juxta-position of the vegetation groups and forest interior patches to identify important linkages. It should be noted that a site specific analysis of the level of connectivity for low mobility species should be conducted during the NEPA process. This course/moderate filter approach does not adequately address these species.

Restoration Activities

Potential restoration activities that address improving the connectivity within the LSR/MLSA will be listed with each LSR/MLSA assessment. These may include thinning, prescribed burning, and road closures to improve habitat security and reduce fragmentation of forest interior habitat.

Plant Connectivity within LSR/MLSA's (see Forest-Wide Plant Connectivity Discussion)

Disturbance Module

Risk Analysis for Fire, Insects and Pathogens

Information used in analyzing the fire, insect and pathogen risk for each LSR includes the following:

- maps of vegetation composition and structure;
- annual insect damage detection aerial surveys (1940's - 1995) produced by Region 6 Forest Insect and Disease Group;
- district maps and records of past harvesting activities;
- district and forest silviculturists' site-specific knowledge; and
- extensive search of the literature relating to fire ecology, and insect and pathogen biology and ecology in eastern Washington forests (see Appendix)

We identified catastrophic wildfires and mortality from heavy infestations and outbreaks of pathogens and insects as posing the greatest threat to sustaining late-successional habitat within LSRs and MLSAs. Therefore, the disturbance module analyzes the risk of habitat loss from these disturbance agents, realizing that other types of disturbances, such as windthrow, snow and ice damage, and grazing are locally important and may need to be addressed at the project level.

Information used in this module was synthesized and analyzed by a four person team consisting of a Research Forest Ecologist, Area Forest Pathologist, Area Forest Entomologist, and District Silviculturist to determine the risk to fire and to a suite of insects and pathogens, for each vegetation type and structure within each LSR. The results of these analyses are displayed for each LSR/MLSA as a matrix of different disturbance types by each vegetation type.

The risk to catastrophic wildfire was developed using both the forest-wide sustainability module and the juxtaposition of vegetation types within each LSR/MLSA. Additionally, each vegetation type on each LSR was rated as either low, moderate, high, or no risk with respect to the insects and pathogens associated with each type of vegetative composition and structure. As far as possible, we discriminated between dry forest types in ponderosa pine, Douglas-fir and grand fir series, since these will have different suites of insects and pathogens.

The goal of this analysis was to assess the overall risk of loss of late-successional habitat to catastrophic wildfire, realizing the potential for insects and pathogens to greatly increase the risk of catastrophic fires. Additionally, we addressed the potential for some pathogens to reduce species diversity by selectively eliminating host species.

Once the overall disturbance risk for each LSR/MLSA was established, management objectives for protecting, maintaining, or enhancing late-successional forest habitat were developed. These objectives and the silvicultural and fuels treatment options for attaining them are summarized for each LSR/MLSA. We identified thirteen objectives important for protecting, maintaining, or enhancing late-successional forest habitat within LSRs. Many objectives can be met with a variety of options. The goals and options listed below are not all-inclusive. Specific projects may have unique objectives, for instance the enhancement or protection of unique habitats or threatened, endangered, or sensitive species. Unique objectives may require modifying listed management options, or may require entirely different options.

Management Objectives for Protecting, Maintaining, or Enhancing Late-Successional Forest Habitat within LSRs

1. Reduce stand density.
2. Alter species composition.
3. Reduce fuel loads

4. Protect stand from fires originating outside the stand
5. Maintain low density
6. Increase mean quadratic diameter
7. Increase vertical structural diversity
8. Maintain of enhance presence of white-bark pine
9. Reforest created openings
10. Maintain desired fuel levels
11. Reduce stand potential to support mountain pine beetle outbreak
12. Reduce host continuity for insects and pathogens
13. Maintain native grass and shrub communities

Options for achieving management objectives

a) Precommercial thinning or commercial thinning (PCT / CT)

b) Thin to reduce adjacency of potential brood trees

c) Pruning to reduce vertical continuity of fuels

d) Favor seral / fire tolerant species

e) Favor insect-disease resistant species

f) Favor native undergrowth in woodland / steppe transition zone

g) Rx fire

h) Fuelwood collection

i) Favor diversity of species to reduce host continuity for insects and pathogens

j) Treat adjacent stands as appropriate

k) Develop or enhance fuel-breaks (shaded or otherwise)

l) Group selection harvest to promote gap dynamics

m) Underplant to increase age classes and canopy layers

n) Create snags and logs

o) Mechanical fuels treatment

p) Handpiling fuels

Treatment Options, Diagnostic Criteria for Treatment Selection, and Anticipated Post-treatment Results

Precommercial thinning or commercial thinning (PCT / CT)

Commercial Thinning

Diagnostic Criteria for Prescribing Treatment:

(CT): Current basal area (ba) exceeds
- 120-180 square feet per acre (dry forest); or,
- 200+ square feet per acre (moist grand fir/mesic w. hemlock).

(PCT): Number of trees per acre (tpa) exceeds
- 150 tpa in very dry forest types (ex. PSME/AGSP);
- 250 tpa in rest of dry forest types; or
- 300 tpa in moist grand fir/mesic western hemlock forests

PCT-Post-treatment Results (dry forest): In very dry forests, the number of trees per acre should be between 90 and 110; spacing should be about 22' between trees or small groups of trees (spacing can vary by up to 50% to accomodate retention of small groups of healthy, vigorous trees). On more mesic sites, the number of trees per acre should be between 115 and 135, with higher numbers on the most mesic sites.

CT-Post-treatment Results (dry forest): Target basal areas between 30 and 80 square feet per acre in very hot, dry forest types and between 80 and 120 square feet per acre elsewhere within the dry forest group, with the higher basal area targets appropriate for the more mesic sites within the dry forest (ex. PSME/SYAL/CARU; PSME/VACA; ABGR/SYAL/CARU); Post-treatment growth targets should be about 8 to 13 annual rings /inch; thin from below and favor fire-resistant ponderosa pine, large Douglas-fir and, where possible, western larch; reduce mistletoe infestation, especially in upslope Douglas-fir likely to disperse seeds downslope/downwind.

PCT-Post-treatment Results (moist grand fir/mesic w. hemlock): Target numbers of trees per acre should be between 135 and 170; spacing should average 16 to 18' and can vary by 50% to accomodate retention of small groups of trees.

CT-Post-treatment Results (moist grand fir/mesic w. hemlock): Target basal areas between 140 and 160 square feet per acre. Multiple canopy layers can be developed; thinning should be primarily from below; favor large trees of any species, and strive for a mixture of species and sizes. Where insect and disease problems exist, favor retention of resistant species.

Post-treatment Results (wet forest): Thinning should be done primarily in young stands or dense stands of small trees (< 10" dbh). Goal should be to increase quadratic mean diameter by favoring dominant trees to increase diameter growth; favor mix of species to enhance biodiversity and reduce root-to-root contact of pathogen host species. Thin from below and strive to develop multiple canopy structure. Where root disease pockets occur, thinning out susceptible species and

replacing them with resistant species is an option.

Thinning to reduce adjacency of potential mountain pine beetle brood trees in young lodgepole pine stands
Diagnostic Criteria: Current stand composed of lodgepole pine 20 to 50 years; basal area > 80 square feet. Treatment will be most effective if done on stands between 20 and 30 years of age.
Post-treatment Results: Basal area reduced to less than 50 square feet. Treating stands older than 50 years frequently results in heavy windthrow mortality in residual trees; therefore, it is not recommended within LSRs. Older stands in which mountain pine beetles are successfully attacking will likely suffer heavy mortality. In such cases, salvage harvesting of the pine may be warranted; replant with western larch or a mixture of species to avoid future insect infestations.

Pruning / Shaded fuelbreaks
Diagnostic Criteria: Branches of dominant and codominant trees link ground fuels with crown OR severe Douglas-fir dwarf mistletoe infestation including large brooms exist in lower third of infected trees.
Post-treatment Results: Disrupt linkages between ground and crown fuels by pruning to about 16' to prevent crowning of fires with flame lenghts of up to 12'.

Prescribed Fire (at 3 to 20 year intervals, depending on fuel accumulation rates)
Diagnostic Criteria: Following treatments that restore pre-Eurosettlement ecosystem structure within dry forest types.
Post-treatment Results: Maintain between 3 and 5 tons of fine fuels (less than 3" in diameter) per acre; re-establish thermal effects of fires on forest soils and understory vegetation (restore ecosystem function). Fires should kill most seedlings and saplings, and restore vigorous herbaceous and shrub understories.

Firewood Collection
Diagnostic Criteria: Dense stands near campgrounds and other high-use recreation areas, especially those in which dead fuels are vertically continuous.
Post-treatment Results: Reduction in amount and vertical continuity of fuels in high-use areas. Collection should be restricted to times that will not disrupt mating/breeding of target wildlife species.

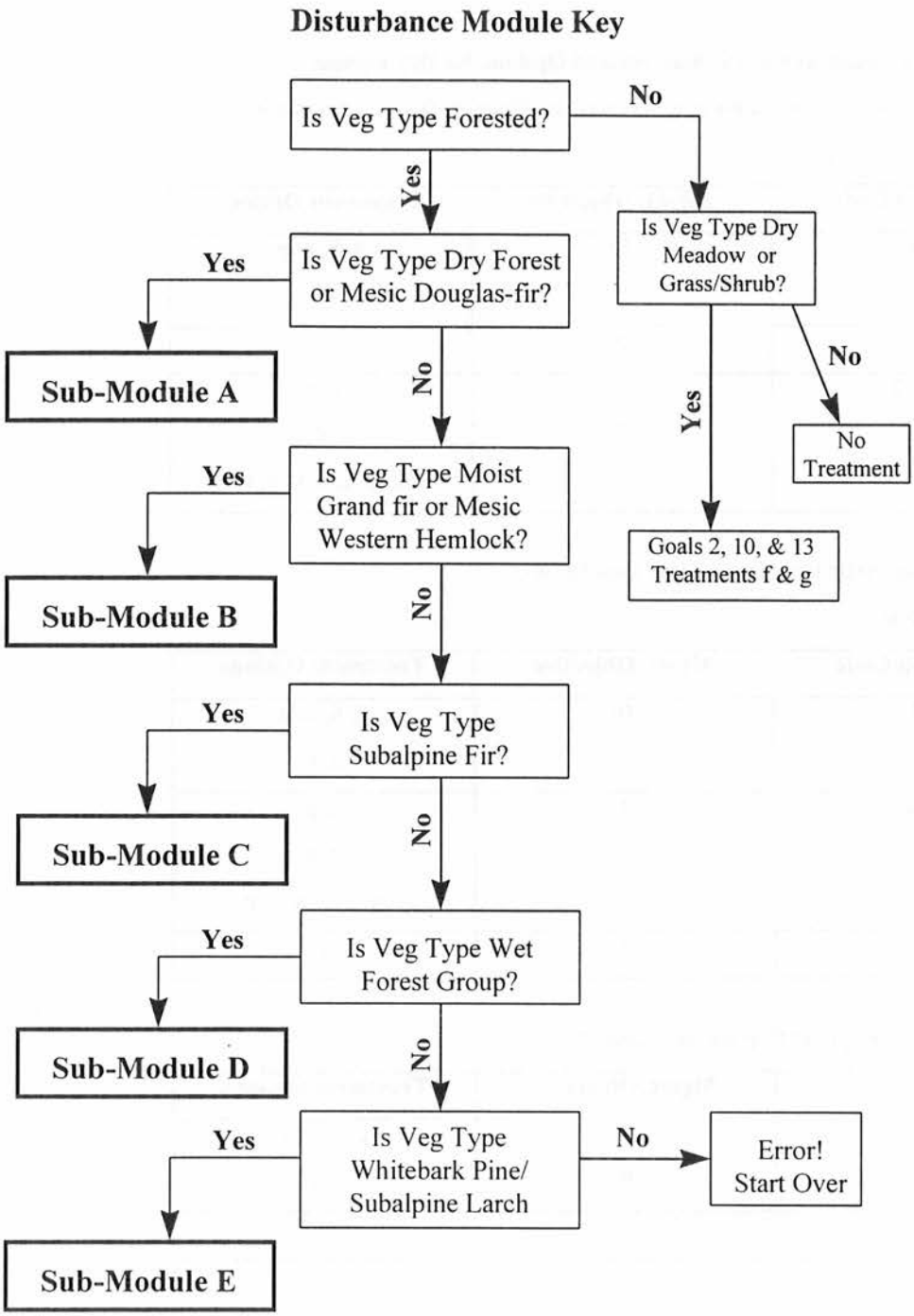
Group selection harvest: To promote gap phase dynamics and increase vertical structure
Diagnostic criteria: Stands in moist grand-fir / mesic hemock or wet forest groups that have
a) little vertical structure or
b) extensive mortality from root pathogens that threatens habitat quality.
Post-treatment Results: Create openings of between .25 and 5 acres. Reforestation of these created openings should favor fast-growing / disease resistant seral species such as ponderosa pine and western larch to insure future high-quality large trees and eventually coarse woody debris (snags and logs).

Fuels Treatments

Diagnostic Criteria: Fuel levels are more than 25% greater than what would occur under the inherent disturbance regime for the stand.

Post-treatment Results: Will vary by stand; but should reduce fuel levels to within 25% of what would occur under the inherent disturbance regime. These treatments will be further refined when information on pre-settlement fuel levels for different forest types is known. Several studies are currently addressing this issue for the Wenatchee NF.

Figure 5, Disturbance Module Key



Disturbance Submodules

Sub-Module A - Management Objectives and Options for Dry Forests

Project within ponderosa pine series or dry Douglas-fir plant association?

N - go to 2

Vegetation Code	Mgmt. Objective	Treatment Options
10	10	g, h, o, p
	9	d
11	5	f, g
12, 13	1	a, g
	2	d
	3	a, c, g, h, k, o, p

2. Project within mesic Douglas-fir plant association?

N - go to 3

Vegetation Code	Mgmt. Objective	Treatment Options
20	10	g, h, o, p
	9	d, e
21, 22	1	a, g
	2	d, e
	3	a, c, g, h, k, o, p
23	5	g

3. Project within dry grand fir plant association?

Vegetation Code	Mgmt. Objective	Treatment Options
10	10	g, h, o, p
	9	d, e
11	5	g
12, 13	1	a, g
	2	d, e
	3	a, c, g, h, k, o, p

NOTE: On the Chelan and Entiat RDs, there is the potential for lodgepole pine stands to occur on mesic Douglas-fir association sites. Stand-replacing fires are within the inherent disturbance regime for this stand type. The following management objective and treatment options may be appropriate:

Mgmt Objective	Treatment Option
4	b,k

Sub-Module B - Management Objectives and Options for Moist Grand Fir and Mesic Western Hemlock Forests

1. Project within moist grand fir or mesic western hemlock plant association?

Vegetation Code	Mgmt. Objective	Treatment Options
30, 34	10	g, h, o, p
	9	i
31, 35	6	a
	7	a, l, m, n
	2	i
	10	c, h, o, p
32, 33, 36, 37	4	j, k

NOTE: There is the potential for lodgepole pine stands to occur on some of these plant associations. Stand-replacing fires are within the inherent disturbance regime for this stand type. The following management objective and treatment options may be appropriate:

Mgmt Objective	Treatment Option
4	b,k

Sub-Module C - Management Objectives and Options for Subalpine Fir Forests

1. Project within subalpine fir series?

Vegetation Code	Mgmt. Objective	Treatment Options
40	10	g, h, o, p
	9	i
40A		No Treatment Necessary
41, 41A	6	a
	7	a, l, m, n
	2	i
	10	c, h, o, p
42	4	j, k
43		No Treatment Necessary
44	4	j, k

NOTE: Where opportunities exist for increasing or enhancing whitebark pine communities (Management Objective = 8), Rx fire may be appropriate.

Sub-Module D - Management Objectives and Options for Wet Forests

1. Project within the western hemlock, Pacific silver fir, or mountain hemlock series?

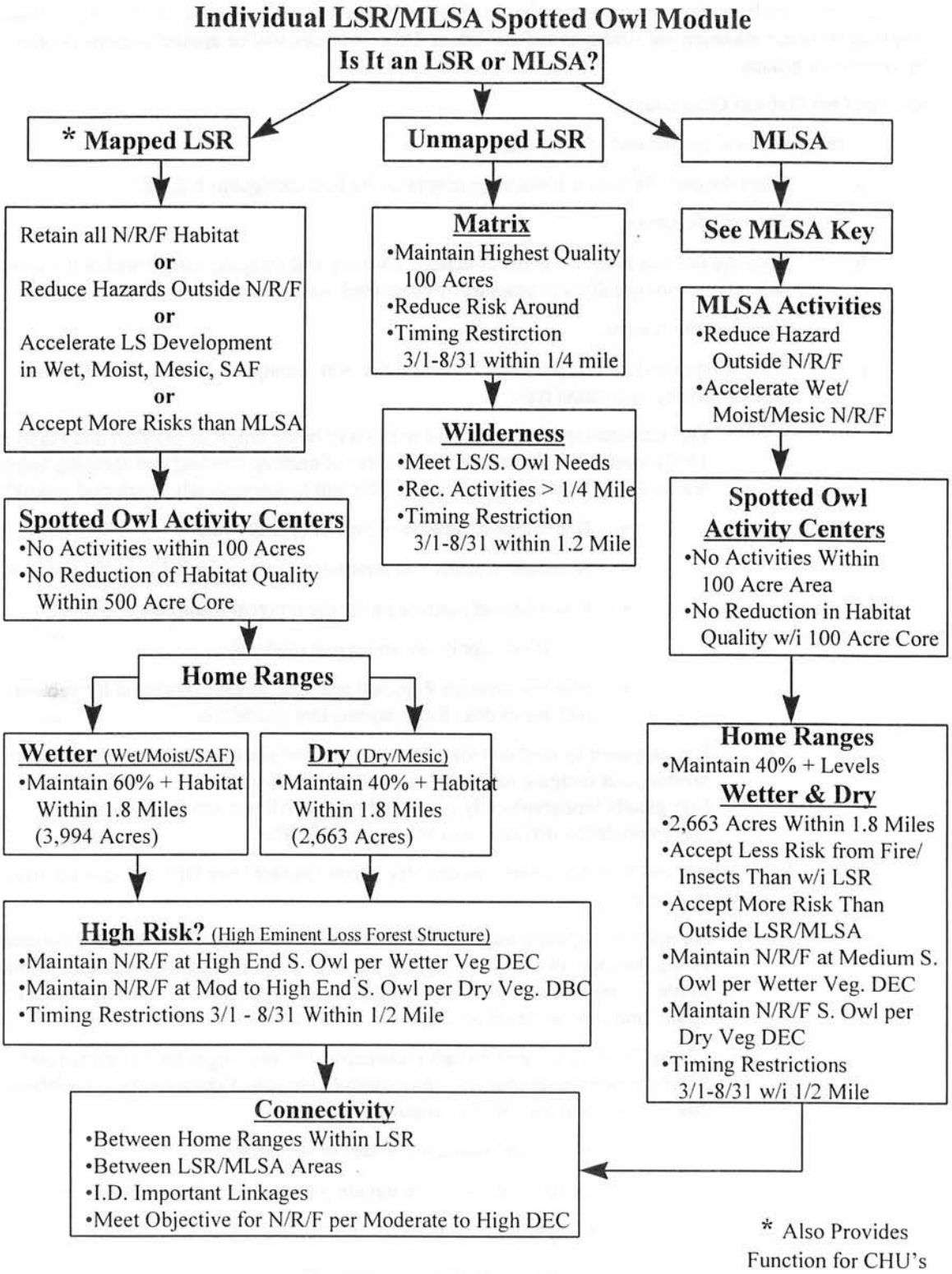
Vegetation Code	Mgmt. Objective	Treatment Options
60	10	g, h, o, p
	9	i
60A		No Treatment Necessary
61, 61A	6	a
	7	a, l, m, n
	2	i
	10	c, h, o, p
62	4	j, k
63		No Treatment Necessary
64	7	a, l, m, n
	2	i
	4	j, k
65, 65A		No Treatment Necessary

Sub-Module E - Management Objectives and Options for Whitebark Pine/ Subalpine Larch Forests and Parklands

1. Project within the whitebark pine or subalpine larch series?

Vegetation Code	Mgmt. Objective	Treatment Options
70		No Treatment Necessary
71	8	g

Northern Spotted Owl Module, Individual LSR/MLSA



During project analysis and management activities, field verify spotted owl habitat on a site-specific basis. Apply appropriate management strategies and document. Other modules will be applied in priority order by vegetation groups.

Spotted Owl Habitat Questions:

1. Is there a known spotted owl activity center?

   a. Does the owl site have a 100 acre core area of the best contiguous habitat?

   Protect this habitat.

   b. Does the owl site have 500 acres of nesting, roosting and foraging habitat within 0.7 miles radius (or a biologically/topographically connected reach)?

   Maintain this habitat.

   c. Is the spotted owl habitat primarily in wet (moist, wet, subalpine) habitat? See DEC for spotted owls by vegetation type.

      c.a. For minimum spotted owl viability (40% of home range, as per Bart and Forsman 1992), does the owl site have 2,663 acres of nesting, roosting and foraging habitat within 1.8 miles radius (or a biologically and topographically connected reach)?

      - If not: restore, maintain, protect or accelerate.
      - If habitat is below this minimum, monitor for habitat effectiveness.
      - Is this habitat sustainable for the inherent disturbance regime?

        If not: apply fire and insect modules.

      - Monitor, through Regional analysis, acreage threshold for spotted owl use of drier forest stypes, Dry and Mesic.

      c.b. For long-term spotted owl viability, does the owl site have 3,994 acres of nesting, roosting and foraging habitat within 1.8 miles radius (or a biologically/topographically connected reach)? All wet site spotted owls and mega-population owl sites will have a goal of 60%.

   d. Is the spotted owl habitat primarily in dry (dry, mesic) habitat? See DEC for spotted owls by vegetation type.

      d.a. For minimum spotted owl viability (40% of home range, as per Bart and Forsman 1992), does the owl site have _,___ acres of nesting, roosting and foraging habitat within _._ miles radius (or a biologically and topographically connected reach)? (radius and acreage needs are higher in dry/mesic spotted owls).

      *These figures are based on radio telemetry of home ranges for 11 spotted owl activity centers in dry/mesic forest groups (King et al Yakama Tribe, unpublished data; Sovern et al Swauk FSL, unpublished data).

      - If not: restore, maintain, protect or accelerate.

      - If habitat is below this minimum, monitor for habitat effectiveness.

      - Is this habitat sustainable for the inherent disturbance regime?

      - If not: apply fire and insect modules.

      - Monitor, through Regional analysis, acreage threshold for spotted owl use of drier forest stypes, Dry and Mesic.

d.b. For long-term spotted owl viability, does the owl site have _,___ acres of nesting, roosting and foraging habitat within _._ miles radius (or a biologically/topographically connected reach)? All mega-population owl sites will have a goal of 60%.

2. Outside spotted owl home ranges, is there suitable spotted owl habitat for nesting, roosting or foraging?

   If not: restore, maintain, protect or accelerate by vegetative type.

3. Have surveys been conducted to USFS 1994 Protocol for spotted owls?

   If not: survey to protocol and apply above standards.

4. Is there dispersal habitat for spotted owls, within LSR and between LSRs? -

   If not: design strategic connectivity corridors for long-term.

5. Is there potential for forest to grow into suitable spotted owl habitat? -

   If not: restore, maintain, protect or accelerate.

6. Is the habitat sustainable within the inherent disturbance regime for the vegetative type?

   If not: apply disturbance modules.

   Balance the short-term with the long-term desired ecological conditions for site specific and for landscape scale.

7. Are activities going to occur within 0.25 miles of a spotted owl activity center? Within 0.5 miles of an activity center?

   Biologist determines effects of activities and reviews with USFWS.

   Management actions near activity centers will occur after August 31 and before March 1.

For dry and mesic groups use a wider radius and more acres than presently used. for evaluation (numbers to be determined).

Based upon AMLP H.R. estimates from King et al. 1993, and Sovern Et al. 1994

3545 = 40%

5320 = 60%

Step 1

Determine acres of suitable within Wet Forest Group (WFG) and Moist Grand Fir (MGF) (includes mesic hemlock).

IF:	Acres of WFG + MGF => DEC	Proceed to other modules
IF:	Acres of WFG + MGF > DEC	Go to Step 2

Step 2

Determine acres of suitable in Mesic Sites (MS).

IF:	Acres of WFG + MGF + MS => DEC	Proceed to other modules
IF:	Acres of WFG + MGF + MS < DEC	Go to Step 3

Step 3

Determine acres of suitable in Dry Forest Group (DFG)

IF:	Acres of WFG + MGF + MS +DFG => **DFC**	Evaluate risk associated with DFG suitable owl habitat and identify restoration strategy to reduce risk.
IF:	Acres WFG + MGF + MS + DFG < DFC	Identify restoration activirties that focus on habitat development in WFG, MGF and MS.

Step 4

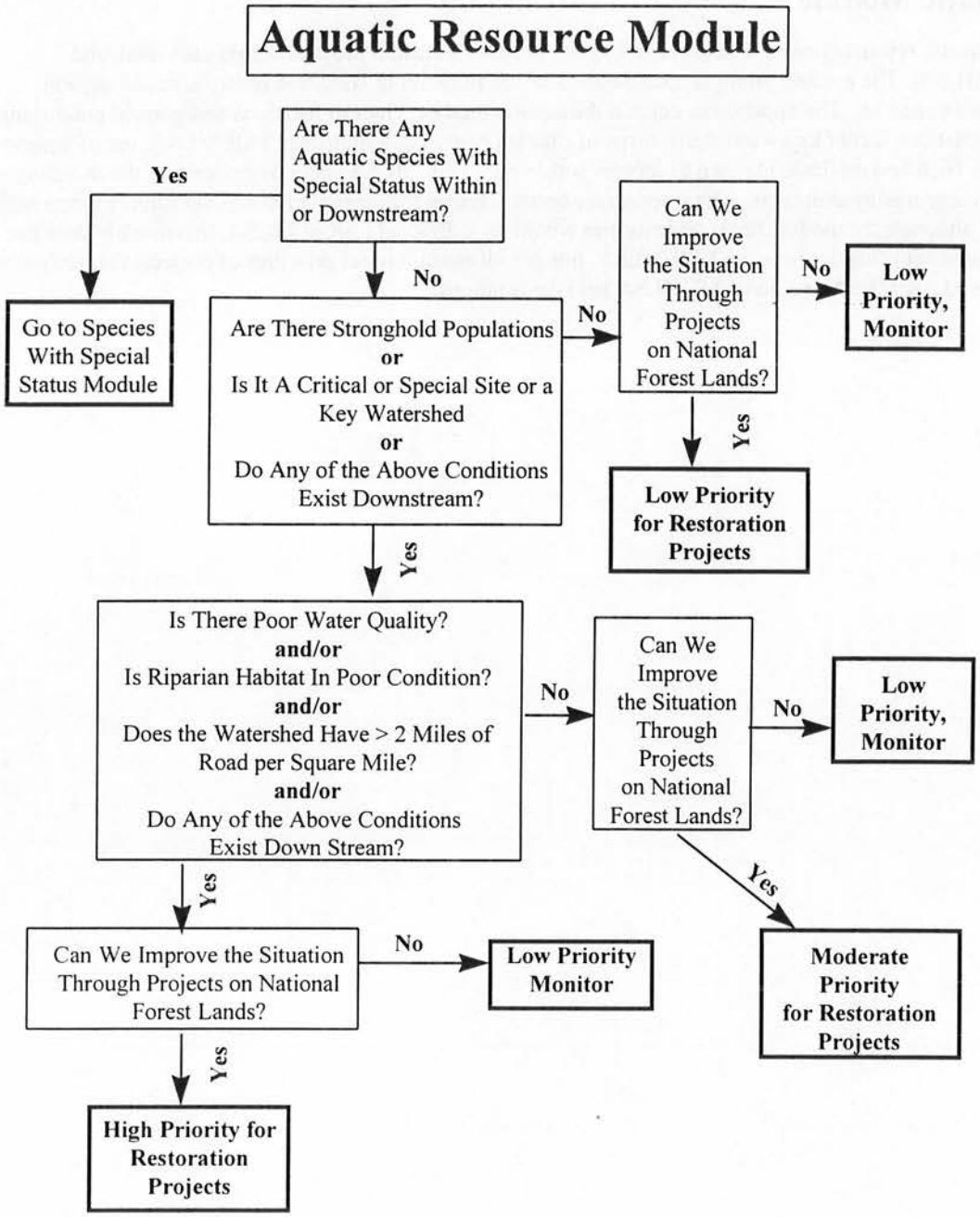
Subalpine Fir - To be developed

Note This section has not been adapted to the Wenatchee LSR's. It was included to show the format we are considering.

Aquatic Module

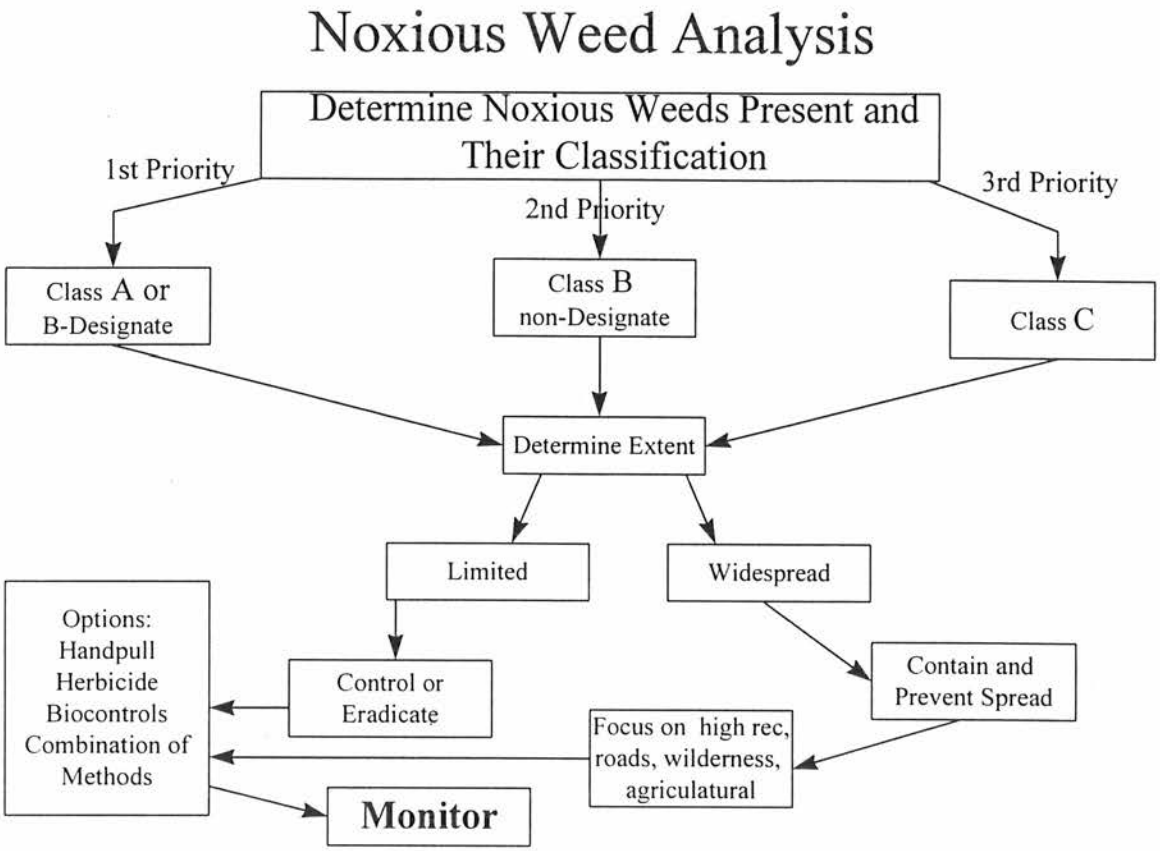
The aquatic resources module helps prioritize the need for potential projects within each analyzed LSR/MLSA. The module prompts consideration of the situation or condition of key areas of aquatic resource concerns. The appendices contain the aquatic module, chart of locations and general conditions of populations, list of key watersheds, maps of riparian resources within each LSR/MLSA, list of aquatic species (fish and mollusks) known to species within each LSR/MLSA and a description of the Washington state water quality standards. These resources become useful for planning tools. One subject worth noting is that although the module helps set priorities within an individual LSR or MLSA, this module does not attempt to set priorities between LSR/MLSA, nor does it attempt to set priorities of projects that are needed between LSR/MLSA and non-LSR/MLSA land designations.

Aquatic Resource Module, Flow Diagram



Noxious Weed Module

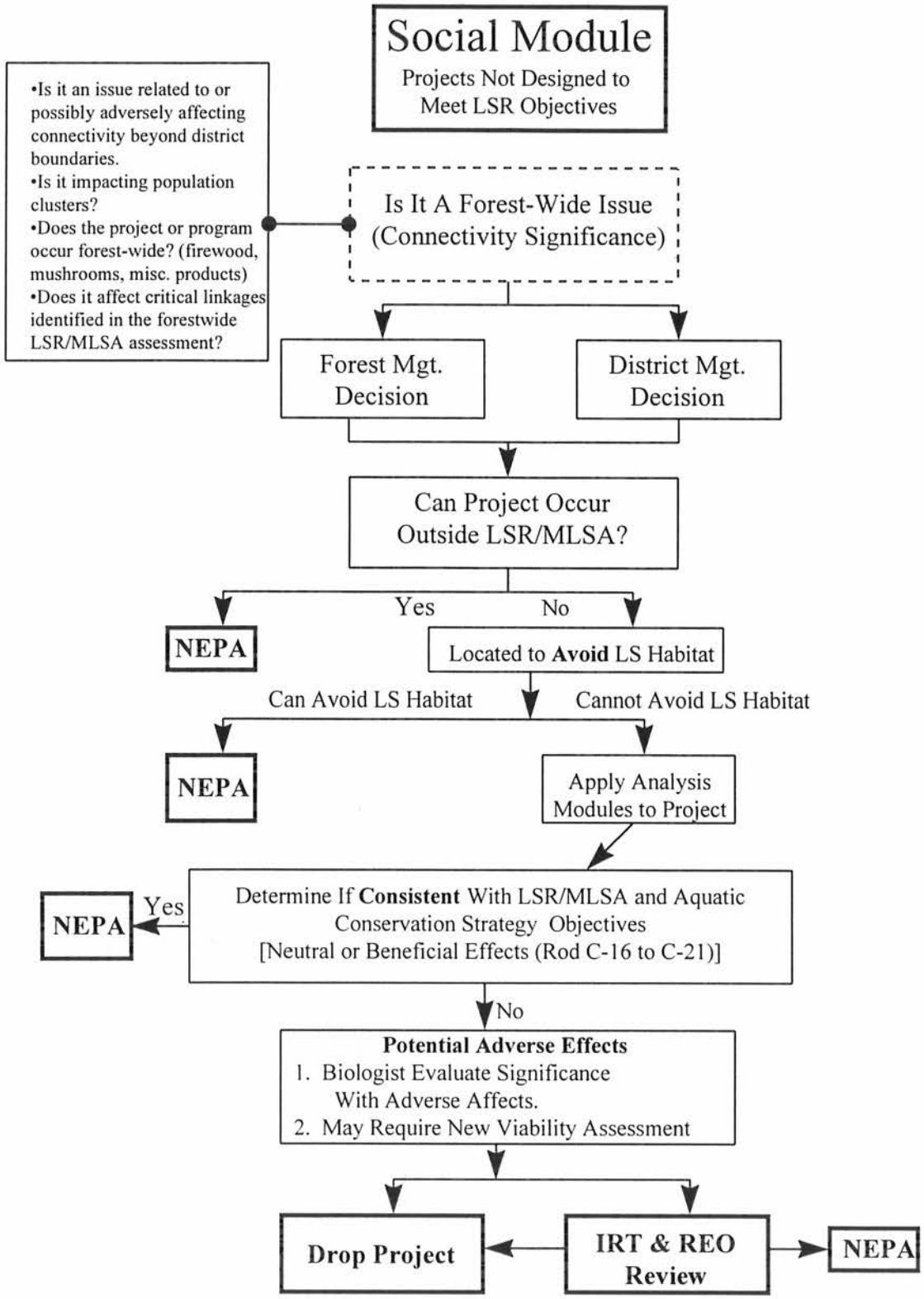
The noxious weed analysis format for individual LSR's or MLSA's was developed with the intent of devising a priority for treatment strategy. The analysis utilizes the Washington State classification system which ranks weed species based on their extent and the ability for control. A list of weed species and their classification is provided in the Wenatchee National Forest Noxious Weed Action Plan (1990). An inventory of noxious weeds present and their individual extent is the first step in the process. Species which are limited in extent are highest in priority for control; focus on class A species first. For species that are widespread, concentrate control efforts at trailheads, near wilderness, in riparian areas, near agricultural lands, meadows, or near sensitive plant populations. Develop project analysis (NEPA) based on the results of this analysis and the Wenatchee National Forest Noxious Weed Action Plan. Once projects are initiated monitoring will be an important activity to determine the effectiveness of control efforts and identify additional control.



Social Module

Once a project is proposed this module is used to identify how socially driven projects are to be processed. The module ensures that any decisions are made at the appropriate level (forest or district reflecting whether other LSR's/MLSA's or the network is effected). It also requires appropriate analysis and consideration be given to management direction, standards and guidelines and objectives for these areas. Dependent upon the effects of the project on the LSR/MLSA, further analysis may be required to determine if the project can proceed or be dropped. Final project approval requires REO review.

Figure 6, Social Module, Flow Diagram



Appendix 2

GIS Vegetation Model

Dry Forest

Series = Douglas Fir (21), Oregon White Oak (22), and Ponderosa Pine (19) below 6,200
Series = Grand Fir (5) and <= 30" precip and <= 3700 ' elev
Series = Grand Fir (5) and <= 30" precip and elev 3700-6200' on S, SE, SW, W, E aspects
Series = Grand Fir (5) and 35-45" precip and on S, SE, SW, W aspects below 6,200'

10	Created Opening	Crown Closure <= 10%
11	Low Density	Crown Closure 10% - 50%
12	Dense/Successionally Advanced	Crown Closure > 70%

Moist Grand Fir

Series = Grand Fir (5) and <= 30" precip and elev 3700-6200' on N, NE, NW aspects
Series = Grand Fir (5) and 35-45" precip and on N, NE, NW, E aspects and below 6,200'
Series = Grand Fir (5) and >= 50" Precip and below 6,200'

30	Created Opening:	Sz/Str = Nonforest & SS Seed/Sap/Pole
31	Single Layered	Sz/Str = SS EXCEPT Seed/Sap/Pole
32	Layered/Mature	Sz/Str = All MS

Subalpine Fir

Series = Subalpine Fir (10) below 6,200'

40	Created Opening:	Sz/Str = Nonforest & SS Seed/Sap/Pole
41	Single Layered	Sz/Str = SS < medium, EXCEPT Seed/Sap/Pole
42	Layered Canopy	Sz/Str = SS >= medium and All MS

Wet Forest

Series = Western Hemlock (24), Silver Fir (2), and Mountain Hemlock (27) below 6,200'
Series = Mountain Hemlock (27) and >= 80" and > 6200 on S, SE, SW, W, E aspects

60	Created Opening:	Sz/Str = Nonforest & SS Seed/Sap/Pole
65	Single Layered (SSP)	Sz/Str = SS Pole
61	Single Layered (Pole)	Sz/Str = SS Pole Small, SS Small, SS Small-Medium
62	Layered/Mature	Sz/Str = SS >= medium, and All MS
63	Parkland	Series = Mt. Hemlock above 6,200' on S, SE, SW, E, W aspects

Whitebark Pine/Subalpine Larch

Series = Whitebark Pine (17) and Subalpine Larch (16)
Series = NOT Mountain Hemlock (27) above 6,200'
Series = Mountain Hemlock (27) and >= 80" and > 6200 on N, NE, NW aspects

70	Created Opening:	Sz/Str = SS Seed/Sap/Pole
71	Not a Created Opening	Sz/Str = Nonforest, SS EXCEPT Seed/Sap/Pole, and all MS

Appendix 3

LSR/MLSA Vegetation Photo Mapping Key

General Guidelines

Minimum polygon size.....10 acres except 5 acres for meadows or deciduous forests.
Polygon inclusions.....75% of area should meet stand definition with up to 25% other inclusions.
Stand structure..... As viewed from aerial photos, not from the ground.
Riparian vegetation....generally too narrow in width to map.

Non-Forest <10% tree canopy closure

0	**Agricultural/Pasture/ Residential**	
1	**Water**	
2	**Ice or Snow**	
3	**Cliff**	Rock with steep face. (>60%)
4	**Bedrock**	Exposed rock, not a cliff.
5	**Talus**	Boulder field
6	**Scree**	Cobbles, gravel or sand. May have some vegetation but not dominated by vegetation.
7	**Upland meadow**	High elevation meadows includes heather and dwarf huckleberry.
8	**Wet meadow**	May dry out in late summer. Often indicated by topography which holds water.
8A	**Dry meadow**	Low elevation to mid-montane, often next to wet meadows. Dry for large part of year.
9	**Brushfield**	Deciduous shrubs in riparian areas or other lowlands.
99	**Grassland/Shrubland**	Usually adjacent to dry forest group. Steppe vegetation.

Forest Groups 10% or greater tree canopy closure

98	**Deciduous forest**	Aspen, cottonwood, or oak.

Dry Forest Group Ponderosa pine series and dry Douglas-fir and grand fir plant associations (also includes small mesic Douglas-fir inclusions). These group is largely mapped under 3700', but occurs on southerly slopes in the moist grand fir zone, except for areas where hemlock is present.

10	**Created opening**	Includes seedling/sapling stands or recent pre- commercial thinning stands. May have scattered remnants from previous stand. Includes heavily partial cut areas where over-story has been removed and residual pole-size size trees occupy up to 30% or area.
11	**Low density**	Less than 55% canopy closure with no significant understory on at least 75% of area. Trees generally 12" dbh and larger. Includes remnant open parklike stands where tree invasion has been slow due to harsh site conditions. Includes areas that have been thinned from below.
12	**Dense/successionally advanced (high density)**	Generally over 55% canopy closure, usually with layered structure. Includes stands that have been lightly partial cut...less than 25% of stand is comprised of small openings, the result of tree cutting.
13	**Partial cut**	Moderate cutting intensity (too many residual trees retained to meet the created open criteria and too many trees cut to meet the dense/successionally advanced criteria). Usually the timber harvest only removed the larger trees.

Mesic Sites Generally located within the dry forest group, but may include some dry grand fir sites. Generally steep north slopes (aspect 340 to 30 degrees, slope >50%), but can be very moist benches or bottomlands. Steep north slope sites sites must appear to support dense canopy closure. Minimum size is 10 acres. Map only those sites which have high probability of being mesic sites, do not map marginal sites.

20	**Created opening**	Includes seedlings, saplings, or recent pre- commercial thinning stands (may have scattered remnants from pervious stand).
21	**Single layered**	Usually dense stand with trees 5 to 16" dbh. Remnants occupy <15% of stand. Appears fine textured on photo.
22	**Layered/mature**	Layered canopy, but also include single layered stands of large trees over 16" dbh.
23	**Open parklike**	Same as dry forest group.

Moist Grand Fir/Mesic Western Hemlock Group Generally found above 3700' and below 4900' elevation. Includes the more moist associations of the grand fir series and the more mesic associations within the hemlock series. The dry forest group may be mapped on southerly aspects within this elevation band which are on slopes generally >50%, mostly on the north-end of the forest.

30	**Created opening**	Includes seedling, sapling, or precommercially thinned stands. May have scattered remnants from previous stand.
31	**Single layered**	Usually dense pole sized stands. Remnants occupy less than 15% of stand. Appears fine textured.
32	**Layered/Mature**	Layered canopy, obvious tree understory.
33	**Partial cut**	Moderate cutting intensity (too many residual trees retained to meet the created opening criteria and too many tees cut to meet the singlelayered or layered/mature criteria).

Mesic Western Hemlock Stands occur primarily on northerly aspects intermixed with the Moist Grand Fir Group. Found on the Naches RD.

34	**Created Opening**	Includes seedling, sapling or precommercially thinned stands. May have scattered remnants from previous stand.
35	**Single layered**	Usually dense pole sized stands. Remnants occupy less than 15% of stand. Appears fine textured.
36	**Layered/Mature**	Layered canopy, obvious tree understory.
37	**Partial cut**	Moderate cutting intensity (too many residual trees retained to meet the created opening criteria and too many tees cut to meet the single layered or layered/mature criteria).

Valley Bottom Mixed Conifer Group This group contains stand which are co-dominated by grand fir, western hemlock, and/or subalpine fir. These communities occur in valley bottoms or flat benches where cold air drains and/or moisture is not limiting.

80	**Created opening**	Includes seedling, sapling, or precommercially thinned stands. May have scattered remnants from previous stand. Approximate age: 0-25 yrs.
81	**Single layered**	Sapling/pole stands that have not become dense (canopy closure <70%). Remnants may occupy up to 15% of stand. Approximate age: 26-65 yrs.
82	**Singled layered**	Pole stands with remnants occupying less than 15% of stand. Appears fine textured. Generally dense with canopy closure >70%, often closed canopy. Approximate age: 66-130 yrs.
83	**Layered/mature**	Mature stands may not appear layered but are not fine textured. Approximate age: >130 yrs

Subalpine Fir Series This series is generally found above 4900' elevation.

40	**Created opening**	Stand age 0-30 years. May include some scattered remnants.
40A	**Avalanche origin**	Created opening as a result of avalanche.
41	**Single layered**	Stand age 30 to 120 years. Remnants occupy less than 15% of stand. Generally appears fine textured as a result of lodgepole pine.
41A	**Avalanche origin**	Single layered as a result of avalanche.
42	**Layered canopy**	Stand age greater than 130 years. Lodgepole may or may not be present.
43	**Subalpine parkland**	Canopy closure 10-40%. Small clumps of trees or individual trees in meadow setting. Site capable of growing trees with moderate to large crowns...not limited to dwarf, brushlike forms (krummholtz). Includes whitebark pine/subalpine larch inclusions.
44	**Droughty sites**	Stand density and tree size limited by soil moisture. Not to be confused with early successional stands in more moist sites.

Lodgepole Pine Sites Lodgepole pine dominated sites that may not be seral to other climax series.

50	**Created opening**	
51	**Single layered**	
52	**Layered canopy**	Probably not common.

Wet Forest Group Western hemlock, Pacific silver fir, and mountain hemlock series. May include moist grand fir, subalpine fir, and Douglas-fire inclusions.

60	**Created opening**	Includes seedling, sapling, or precommercially thinned stands. May have scattered remnants from previous stand. Approximate age: 0-25 yrs.
60A	**Avalanche origin**	Created opening as a result of avalanche.
65	**Single layered**	Sapling/pole stands that have not become dense (canopy closure <70%). Remnants may occupy up to 15% of stand. Approximate age: 26-65 yrs.
65A	**Avalanche origin**	Single layer as a result of avalanche.
61	**Singled layered**	Pole stands with remnants occupying less than 15% of stand. Appears fine textured. Generally dense with canopy closure >70%, often closed canopy. Approximate age: 66-130 yrs.
61A	**Avalanche origin**	Single layer as a result of avalanche.
62	**Layered/mature**	Mature stands may not appear layered but are not fine textured. Approximate age: >130 yrs
63	**Parkland**	Canopy closure 10-40%. Small clumps of trees in meadow setting. Usually moist but not drought sites. Mature trees have moderate to large crowns. Includes some whitebark pine/subalpine larch inclusions.
64	**Riparian forest**	Canopy closure less than 60%. Not seedling/ sapling stand. Riparian setting.

Whitebark Pine/Subalpine Larch Group Includes some subalpine fir inclusions.

70	**Created opening**	Recent burn, seedling/saplings.
71	**Not a created opening.**	

CHIWAWA LSR GUIDELINES

Map dry forest group and mesic sites on west side of Entiat Ridge from southern boundary of LSR north to Beaver Creek. On east side of Entiat Ridge follow mapping guidelines for attributing.

North of Beaver Creek on west side of Entiat Ridge, map as moist grand fir group on all aspects, except valley bottoms and steep (>50% slope) southerly aspects (SW to SE), to Basalt Peak Ridge. Valley bottoms are to be mapped valley bottom mixed conifer and southerly aspects are mapped as dry forest group.

Valley bottom mixed conifer is not to be mapped further south than Deep Creek and no further east than Entiat Ridge.

Northern limit of dry forest group is Chickamin Creek on west side of Entiat Ridge.

On the west side of the Chiwawa River, map the wet forest group on all aspects. One exception is the strong south aspect in Raging Creek which should be mapped as moist grand fir.

On the east side of the Chiwawa River, map the wet forest group north of Basalt Peak ridge below 4900' elevation. One exception is the strong south aspect on Estes Butte, which should be mapped as moist grand fir (maybe dry forest group if visible).

Appendix 4

Vegetation in Wenatchee National Forest's Late Successional Reserves

Vegetation in Wenatchee National Forest's Late Successional Reserves

		Bumping	Chiwawa	Deadhorse	Icicle
Nonforest					
00	Ag./Residential/Developed	5	72	305	0
01	Water	1,375	700	170	1
02	Ice or Snow	0	3	0	0
03	Cliff	0	328	86	264
04	Bedrock	187	85	0	580
05	Talus	49	875	0	310
06	Scree	0	2	213	4
07	Upland Meadow	0	966	0	454
08	Wet Meadow	9	243	22	0
08A	Dry Meadow	73	0	8	0
09	Brushfield	3	1,203	209	453
98	Deciduous Forest	0	0	62	0
99	Grassland/Shrubland	30	193	393	0
Total Nonforest		1,731	4,669	1,468	2,066
Percent of LSR		*12%*	*4%*	*8%*	*14%*
Dry Forest					
10	Created Opening	0	2,183	864	1
11	Low Density	132	5,860	4,384	835
12	Dense/Successionally Advanced	165	14,290	6,377	1,268
13	Partial Cut	0	4,363	369	0
Total Dry Forest		296	26,696	11,994	2,103
Percent of LSR		*2%*	*25%*	*65%*	*15%*
Mesic Sites					
20	Created Opening	0	17	190	0
21	Single Layered	0	1,016	331	0
22	Layered/Mature	0	1,055	1,945	0
Total Mesic Sites		0	2,089	2,466	0
Percent of LSR		*0%*	*2%*	*13%*	*0%*
Moist Grand Fir / Mesic Western Hemlock					
30	Created Opening (Grand Fir)	97	5,625	608	452
31	Single Layered (Grand Fir)	91	3,021	173	404
32	Layered/Mature (Grand Fir)	1,793	8,494	1,521	2,755
33	Partial Cut (Grand Fir)	333	1,584	89	0
34	Created Opening (W. Hemlock)	7	0	0	0
35	Single Layered (W. Hemlock)	838	0	0	0
36	Layered/Mature (W. Hemlock)	2,143	0	0	0
37	Partial Cut (W. Hemlock)	100	0	0	0
Total Moist Grand Fir / Mesic W. Hemlock		5,402	18,724	2,391	3,610
Percent of LSR		*36%*	*17%*	*13%*	*25%*

Vegetation in Wenatchee National Forest's Late Successional Reserves

		Bumping	Chiwawa	Deadhorse	Icicle
Valley Bottom Mixed Conifer					
80	Created Opening	0	28	0	0
Total Valley Bottom Mixed Conifer		0	28	0	0
Percent of LSR		*0%*	*0%*	*0%*	*0%*
Subalpine Fir					
40	Created Opening	0	4,521	0	0
41	Single Layered	0	4,798	0	178
41A	Avalanche Origin	0	0	0	0
42	Layered/Mature	0	7,377	0	1,093
43	Subalpine Parkland	0	222	0	125
44	Droughty Sites	0	426	0	126
Total Subalpine Fir		0	17,344	0	1,523
Percent of LSR		*0%*	*16%*	*0%*	*11%*
Lodgepole Pine Sites					
50	Created Opening	0	21	0	0
51	Single Layered	0	1,143	0	0
52	Layered Canopy	0	16	0	0
Total Lodgepole Pine		0	1,179	0	0
Percent of LSR		*0%*	*1%*	*0%*	*0%*
Wet Forest					
60	Created Opening	78	2,342	0	928
65	Single Layered (Sapling/Pole)	0	235	0	0
65A	Avalanche Origin	0	0	0	0
61	Single Layered (Poles)	2,267	6,876	0	143
62	Layered/Mature	4,964	24,853	0	3,460
63	Parkland	0	92	0	43
64	Riparian Forest	250	0	0	0
66	Droughty Sites	0	0	0	0
66A	Avalanche Origin	0	0	0	0
Total Wet Forest		7,559	34,398	0	4,573
Percent of LSR		*50%*	*32%*	*0%*	*32%*
Whitebark Pine / Subalpine Larch					
70	Created Opening	0	0	0	0
71	NOT a Created Opening	0	1,893	0	413
Total Whitebark Pine / Subalpine Larch		0	1,893	0	413
Percent of LSR		*0%*	*2%*	*0%*	*3%*
TOTAL acres in LSR		**14,989**	**107,020**	**18,319**	**14,289**

Vegetation in Wenatchee National Forest's Late Successional Reserves

	Bumping	Chiwawa	Deadhorse	Icicle
Total Created Opening in LSR[1]	182	14,736	1,663	1,380
Percent of LSR	*1%*	*14%*	*9%*	*10%*
Low Sustainability[2]				
Dry Forest				
Acres	165	18,653	6,746	1,268
Percent of Veg. Group	*56%*	*70%*	*56%*	*60%*
Percent of LSR	*1%*	*17%*	*37%*	*9%*
Mesic				
Acres	0	2,072	2,276	0
Percent of Veg. Group		*99%*	*92%*	
Percent of LSR	*0%*	*2%*	*12%*	*0%*
Moist Grand Fir / Mesic W. Hemlock				
Acres	4,360	13,099	1,783	3,159
Percent of Veg. Group	*81%*	*70%*	*75%*	*87%*
Percent of LSR	*29%*	*12%*	*10%*	*22%*
Subalpine Fir				
Acres	0	7,377	0	1,093
Percent of Veg. Group		*43%*		*72%*
Percent of LSR	*0%*	*7%*	*0%*	*8%*
Total Low Sustainability Acres	4,525	41,201	10,804	5,519
Percent of LSR	*30%*	*38%*	*59%*	*39%*
Late Successional Habiatat[3]				
Dry Forest (Acres)	165	15,361	8,322	1,268
Percent of LSR	*1%*	*14%*	*45%*	*9%*
Moist Forest (Acres)	9,149	33,347	1,521	6,215
Percent of LSR	*61%*	*31%*	*8%*	*43%*
High (Acres)	0	12,267	0	1,314
Percent of LSR	*0%*	*11%*	*0%*	*9%*
Total Late Successional Habitat	9,314	60,975	9,843	8,797
Percent of LSR	*62%*	*57%*	*54%*	*62%*

NOTES:

[1] Created Openings include vegetation codes: 10, 20, 30, 34, 80, 40, 50, 60, 70.

[2] Low Sustainability includes vegetation codes: dry - 12, 13; mesic - 21, 22; moist grand fir / mesic western hemlock - 31, 32, 33, 36; subalpine fir - 42.

[3] Late Successional Habitat includes vegetation codes: dry - 66, 52, 12, 22; moist - 32, 62, 36, 64; high - 41, 42, 63.

Vegetation in Wenatchee National Forest's Late Successional Reserves

		Lucerne	Little Wen	Manastash	Rattlesnake
Nonforest					
00	Ag./Residential/Developed	0	0	37	0
01	Water	272	54	60	3
02	Ice or Snow	0	0	0	0
03	Cliff	0	138	130	210
04	Bedrock	0	302	738	20
05	Talus	0	91	2,307	859
06	Scree	0	0	1	0
07	Upland Meadow	106	222	856	0
08	Wet Meadow	72	1,073	297	203
08A	Dry Meadow	0	0	50	43
09	Brushfield	124	4,931	197	0
98	Deciduous Forest	105	0	8	0
99	Grassland/Shrubland	191	32	2,689	57
Total Nonforest		871	6,843	7,371	1,396
Percent of LSR		*10%*	*13%*	*7%*	*13%*
Dry Forest					
10	Created Opening	1,828	0	518	206
11	Low Density	109	4	2,519	128
12	Dense/Successionally Advanced	4,509	0	3,638	557
13	Partial Cut	0	0	0	1,480
Total Dry Forest		6,446	4	6,676	2,371
Percent of LSR		*75%*	*0%*	*6%*	*23%*
Mesic Sites					
20	Created Opening	0	0	24	0
21	Single Layered	0	0	0	0
22	Layered/Mature	0	0	46	0
Total Mesic Sites		0	0	69	0
Percent of LSR		*0%*	*0%*	*0%*	*0%*
Moist Grand Fir / Mesic Western Hemlock					
30	Created Opening (Grand Fir)	17	19	2,582	283
31	Single Layered (Grand Fir)	30	129	5,953	193
32	Layered/Mature (Grand Fir)	71	172	18,773	2,433
33	Partial Cut (Grand Fir)	0	0	174	122
34	Created Opening (W. Hemlock)	0	0	1,695	0
35	Single Layered (W. Hemlock)	0	0	242	0
36	Layered/Mature (W. Hemlock)	0	0	10,170	0
37	Partial Cut (W. Hemlock)	0	0	102	0
Total Moist Grand Fir / Mesic W. Hemlock		118	319	39,692	3,031
Percent of LSR		*1%*	*1%*	*38%*	*29%*

Vegetation in Wenatchee National Forest's Late Successional Reserves

		Lucerne	Little Wen	Manastash	Rattlesnake
Valley Bottom Mixed Conifer					
80	Created Opening	0	0	0	0
Total Valley Bottom Mixed Conifer		0	0	0	0
Percent of LSR		*0%*	*0%*	*0%*	*0%*
Subalpine Fir					
40	Created Opening	207	56	361	1
41	Single Layered	24	196	2,885	334
41A	Avalanche Origin	0	0	0	0
42	Layered/Mature	375	964	10,316	1,856
43	Subalpine Parkland	0	0	260	146
44	Droughty Sites	0	0	131	0
Total Subalpine Fir		606	1,216	13,952	2,337
Percent of LSR		*7%*	*2%*	*13%*	*22%*
Lodgepole Pine Sites					
50	Created Opening	0	0	0	0
51	Single Layered	0	0	0	0
52	Layered Canopy	0	0	0	0
Total Lodgepole Pine		0	0	0	0
Percent of LSR		*0%*	*0%*	*0%*	*0%*
Wet Forest					
60	Created Opening	158	5,750	7,186	23
65	Single Layered (Sapling/Pole)	0	14	920	0
65A	Avalanche Origin	0	0	0	0
61	Single Layered (Poles)	43	9,930	1,303	197
62	Layered/Mature	258	28,297	26,368	1,080
63	Parkland	0	3	46	19
64	Riparian Forest	0	0	223	5
66	Droughty Sites	0	0	742	0
66A	Avalanche Origin	0	0	25	0
Total Wet Forest		459	43,994	36,813	1,324
Percent of LSR		*5%*	*84%*	*35%*	*13%*
Whitebark Pine / Subalpine Larch					
70	Created Opening	0	0	7	0
71	NOT a Created Opening	144	147	71	26
Total Whitebark Pine / Subalpine Larch		144	147	78	26
Percent of LSR		*2%*	*0%*	*0%*	*0%*
TOTAL acres in LSR		**8,643**	**52,524**	**104,652**	**10,484**

Vegetation in Wenatchee National Forest's Late Successional Reserves

	Lucerne	Little Wen	Manastash	Rattlesnake
Total Created Opening in LSR[1]	2,210	5,825	12,373	512
Percent of LSR	*26%*	*11%*	*12%*	*5%*
Low Sustainability[2]				
Dry Forest				
Acres	4,509	0	3,638	2,037
Percent of Veg. Group	*70%*	*0%*	*54%*	*86%*
Percent of LSR	*52%*	*0%*	*3%*	*19%*
Mesic				
Acres	0	0	46	0
Percent of Veg. Group			*66%*	
Percent of LSR	*0%*	*0%*	*0%*	*0%*
Moist Grand Fir / Mesic W. Hemlock				
Acres	101	301	35,071	2,748
Percent of Veg. Group	*86%*	*94%*	*88%*	*91%*
Percent of LSR	*1%*	*1%*	*34%*	*26%*
Subalpine Fir				
Acres	375	964	10,316	1,856
Percent of Veg. Group	*62%*	*79%*	*74%*	*79%*
Percent of LSR	*4%*	*2%*	*10%*	*18%*
Total Low Sustainability Acres	4,984	1,265	49,070	6,641
Percent of LSR	*58%*	*2%*	*47%*	*63%*
Late Successional Habiatat[3]				
Dry Forest (Acres)	4,509	0	4,451	557
Percent of LSR	*52%*	*0%*	*4%*	*5%*
Moist Forest (Acres)	329	28,469	55,534	3,518
Percent of LSR	*4%*	*54%*	*53%*	*34%*
High (Acres)	399	1,163	13,247	2,209
Percent of LSR	*5%*	*2%*	*13%*	*21%*
Total Late Successional Habitat	5,236	29,632	73,232	6,284
Percent of LSR	*61%*	*56%*	*70%*	*60%*

NOTES:

[1] Created Openings include vegetation codes: 10, 20, 30, 34, 80, 40, 50, 60, 70.

[2] Low Sustainability includes vegetation codes: dry - 12, 13; mesic - 21, 22; moist grand fir / mesic western hemlock - 31, 32, 33, 36; subalpine fir - 42.

[3] Late Successional Habitat includes vegetation codes: dry - 66, 52, 12, 22; moist - 32, 62, 36, 64; high - 41, 42, 63.

Vegetation in Wenatchee National Forest's Late Successional Reserves

		Sawtooth	Shady Pass	Slide Peak	Swauk
Nonforest					
00	Ag./Residential/Developed	0	0	0	0
01	Water	30	60	0	11
02	Ice or Snow	0	29	0	0
03	Cliff	160	3,075	0	139
04	Bedrock	85	718	0	1,677
05	Talus	728	1,552	0	1,173
06	Scree	0	0	0	127
07	Upland Meadow	1,554	2,059	0	452
08	Wet Meadow	125	448	0	769
08A	Dry Meadow	0	0	0	5
09	Brushfield	78	1,337	0	147
98	Deciduous Forest	0	0	0	0
99	Grassland/Shrubland	0	315	0	2,147
Total Nonforest		2,761	9,593	0	6,646
Percent of LSR		*18%*	*13%*	*0%*	*6%*
Dry Forest					
10	Created Opening	13	4,004	533	5,168
11	Low Density	168	617	88	19,944
12	Dense/Successionally Advanced	681	12,744	145	32,845
13	Partial Cut	0	98	695	109
Total Dry Forest		861	17,462	1,462	58,065
Percent of LSR		*6%*	*23%*	*88%*	*54%*
Mesic Sites					
20	Created Opening	0	0	0	0
21	Single Layered	0	0	0	343
22	Layered/Mature	0	0	196	1,151
Total Mesic Sites		0	0	196	1,495
Percent of LSR		*0%*	*0%*	*12%*	*1%*
Moist Grand Fir / Mesic Western Hemlock					
30	Created Opening (Grand Fir)	0	397	0	895
31	Single Layered (Grand Fir)	0	201	0	4,122
32	Layered/Mature (Grand Fir)	0	4,566	0	12,318
33	Partial Cut (Grand Fir)	0	0	0	86
34	Created Opening (W. Hemlock)	0	0	0	0
35	Single Layered (W. Hemlock)	0	0	0	0
36	Layered/Mature (W. Hemlock)	0	0	0	0
37	Partial Cut (W. Hemlock)	0	0	0	0
Total Moist Grand Fir / Mesic W. Hemlock		0	5,164	0	17,421
Percent of LSR		*0%*	*7%*	*0%*	*16%*

Vegetation in Wenatchee National Forest's Late Successional Reserves

		Sawtooth	Shady Pass	Slide Peak	Swauk
Valley Bottom Mixed Conifer					
80	Created Opening	0	0	0	0
Total Valley Bottom Mixed Conifer		0	0	0	0
Percent of LSR		*0%*	*0%*	*0%*	*0%*
Subalpine Fir					
40	Created Opening	486	2,183	0	1,846
41	Single Layered	1,129	1,456	0	6,943
41A	Avalanche Origin	0	0	0	0
42	Layered/Mature	1,653	22,999	0	15,047
43	Subalpine Parkland	0	0	0	0
44	Droughty Sites	0	0	0	79
Total Subalpine Fir		3,268	26,638	0	23,915
Percent of LSR		*21%*	*35%*	*0%*	*22%*
Lodgepole Pine Sites					
50	Created Opening	0	0	0	0
51	Single Layered	0	0	0	0
52	Layered Canopy	0	0	0	0
Total Lodgepole Pine		0	0	0	0
Percent of LSR		*0%*	*0%*	*0%*	*0%*
Wet Forest					
60	Created Opening	19	925	0	1
65	Single Layered (Sapling/Pole)	0	4	0	0
65A	Avalanche Origin	0	0	0	0
61	Single Layered (Poles)	44	249	0	0
62	Layered/Mature	80	8,100	0	41
63	Parkland	0	0	0	0
64	Riparian Forest	0	0	0	0
66	Droughty Sites	0	0	0	0
66A	Avalanche Origin	0	0	0	0
Total Wet Forest		144	9,279	0	41
Percent of LSR		*1%*	*12%*	*0%*	*0%*
Whitebark Pine / Subalpine Larch					
70	Created Opening	42	0	0	0
71	NOT a Created Opening	8,171	8,365	0	371
Total Whitebark Pine / Subalpine Larch		8,213	8,365	0	371
Percent of LSR		*54%*	*11%*	*0%*	*0%*
TOTAL acres in LSR		**15,246**	**76,502**	**1,658**	**107,954**

Vegetation in Wenatchee National Forest's Late Successional Reserves

	Sawtooth	Shady Pass	Slide Peak	Swauk
Total Created Opening in LSR[1]	559	7,510	533	7,910
Percent of LSR	*4%*	*10%*	*32%*	*7%*
Low Sustainability[2]				
Dry Forest				
Acres	681	12,841	841	32,954
Percent of Veg. Group	*79%*	*74%*	*57%*	*57%*
Percent of LSR	*4%*	*17%*	*51%*	*31%*
Mesic				
Acres	0	0	196	1,495
Percent of Veg. Group			*100%*	*100%*
Percent of LSR	*0%*	*0%*	*12%*	*1%*
Moist Grand Fir / Mesic W. Hemlock				
Acres	0	4,767	0	16,526
Percent of Veg. Group		*92%*		*95%*
Percent of LSR	*0%*	*6%*	*0%*	*15%*
Subalpine Fir				
Acres	1,653	22,999	0	15,047
Percent of Veg. Group	*51%*	*86%*		*63%*
Percent of LSR	*11%*	*30%*	*0%*	*14%*
Total Low Sustainability Acres	2,334	40,608	1,036	66,021
Percent of LSR	*15%*	*53%*	*63%*	*61%*
Late Successional Habiatat[3]				
Dry Forest (Acres)	681	12,744	341	33,996
Percent of LSR	*4%*	*17%*	*21%*	*31%*
Moist Forest (Acres)	80	12,666	0	12,358
Percent of LSR	*1%*	*17%*	*0%*	*11%*
High (Acres)	2,782	24,455	0	21,990
Percent of LSR	*18%*	*32%*	*0%*	*20%*
Total Late Successional Habitat	3,543	49,864	341	68,344
Percent of LSR	*23%*	*65%*	*21%*	*63%*

NOTES:

[1] Created Openings include vegetation codes: 10, 20, 30, 34, 80, 40, 50, 60, 70.

[2] Low Sustainability includes vegetation codes: dry - 12, 13; mesic - 21, 22; moist grand fir / mesic western hemlock - 31, 32, 33, 36; subalpine fir - 42.

[3] Late Successional Habitat includes vegetation codes: dry - 66, 52, 12, 22; moist - 32, 62, 36, 64; high - 41, 42, 63.

Vegetation in Wenatchee National Forest's Late Successional Reserves

		Teanaway	Tieton	Upper Nile	ALL LSRs
Nonforest					
00	Ag./Residential/Developed	0	0	0	419
01	Water	3	68	0	2,806
02	Ice or Snow	0	0	0	32
03	Cliff	1,390	277	0	6,198
04	Bedrock	1,120	731	0	6,243
05	Talus	1,273	2,982	501	12,699
06	Scree	0	255	0	603
07	Upland Meadow	496	0	0	7,165
08	Wet Meadow	73	318	2	3,655
08A	Dry Meadow	0	48	71	298
09	Brushfield	144	0	0	8,827
98	Deciduous Forest	0	141	0	316
99	Grassland/Shrubland	0	821	369	7,237
Total Nonforest		4,499	5,641	943	56,498
Percent of LSR		*13%*	*14%*	*10%*	*9%*
Dry Forest					
10	Created Opening	3,034	418	101	18,870
11	Low Density	1,548	314	0	36,650
12	Dense/Successionally Advanced	3,740	3,131	259	84,349
13	Partial Cut	0	317	299	7,728
Total Dry Forest		8,322	4,180	659	147,598
Percent of LSR		*24%*	*10%*	*7%*	*24%*
Mesic Sites					
20	Created Opening	0	0	0	231
21	Single Layered	0	0	0	1,691
22	Layered/Mature	0	0	0	4,393
Total Mesic Sites		0	0	0	6,315
Percent of LSR		*0%*	*0%*	*0%*	*1%*
Moist Grand Fir / Mesic Western Hemlock					
30	Created Opening (Grand Fir)	737	1,455	877	14,045
31	Single Layered (Grand Fir)	2,188	647	23	17,175
32	Layered/Mature (Grand Fir)	6,492	10,146	1,986	71,518
33	Partial Cut (Grand Fir)	0	1,174	68	3,632
34	Created Opening (W. Hemlock)	0	535	5	2,243
35	Single Layered (W. Hemlock)	0	469	0	1,549
36	Layered/Mature (W. Hemlock)	0	2,709	867	15,889
37	Partial Cut (W. Hemlock)	0	395	14	611
Total Moist Grand Fir / Mesic W. Hemlock		9,417	17,530	3,841	126,662
Percent of LSR		*28%*	*44%*	*42%*	*21%*

Vegetation in Wenatchee National Forest's Late Successional Reserves

		Teanaway	Tieton	Upper Nile	ALL LSRs
Valley Bottom Mixed Conifer					
80	Created Opening	0	0	0	28
Total Valley Bottom Mixed Conifer		0	0	0	28
Percent of LSR		*0%*	*0%*	*0%*	*0%*
Subalpine Fir					
40	Created Opening	1,941	229	230	12,061
41	Single Layered	710	54	27	18,734
41A	Avalanche Origin	0	2	0	2
42	Layered/Mature	5,073	3,793	1,477	72,022
43	Subalpine Parkland	0	0	264	1,018
44	Droughty Sites	0	0	0	762
Total Subalpine Fir		7,725	4,077	1,997	104,598
Percent of LSR		*23%*	*10%*	*22%*	*17%*
Lodgepole Pine Sites					
50	Created Opening	0	0	0	21
51	Single Layered	0	0	0	1,143
52	Layered Canopy	0	0	0	16
Total Lodgepole Pine		0	0	0	1,179
Percent of LSR		*0%*	*0%*	*0%*	*0%*
Wet Forest					
60	Created Opening	967	935	64	19,376
65	Single Layered (Sapling/Pole)	4	1	0	1,178
65A	Avalanche Origin	0	11	0	11
61	Single Layered (Poles)	203	261	0	21,517
62	Layered/Mature	2,817	6,723	1,686	108,726
63	Parkland	0	0	0	204
64	Riparian Forest	0	320	0	797
66	Droughty Sites	0	0	0	742
66A	Avalanche Origin	0	0	0	25
Total Wet Forest		3,991	8,251	1,750	152,575
Percent of LSR		*12%*	*21%*	*19%*	*25%*
Whitebark Pine / Subalpine Larch					
70	Created Opening	0	0	0	49
71	NOT a Created Opening	89	319	0	20,009
Total Whitebark Pine / Subalpine Larch		89	319	0	20,058
Percent of LSR		*0%*	*1%*	*0%*	*3%*
TOTAL acres in LSR		**34,043**	**39,997**	**9,191**	**615,510**

Vegetation in Wenatchee National Forest's Late Successional Reserves

	Teanaway	Tieton	Upper Nile	ALL LSRs
Total Created Opening in LSR[1]	6,679	3,572	1,278	66,924
Percent of LSR	*20%*	*9%*	*14%*	*11%*
Low Sustainability[2]				
Dry Forest				
Acres	3,740	3,448	558	92,077
Percent of Veg. Group	*45%*	*82%*	*85%*	*62%*
Percent of LSR	*11%*	*9%*	*6%*	*15%*
Mesic				
Acres	0	0	0	6,084
Percent of Veg. Group				*96%*
Percent of LSR	*0%*	*0%*	*0%*	*1%*
Moist Grand Fir / Mesic W. Hemlock				
Acres	8,680	14,676	2,945	108,214
Percent of Veg. Group	*92%*	*84%*	*77%*	*85%*
Percent of LSR	*25%*	*37%*	*32%*	*18%*
Subalpine Fir				
Acres	5,073	3,793	1,477	72,022
Percent of Veg. Group	*66%*	*93%*	*74%*	*69%*
Percent of LSR	*15%*	*9%*	*16%*	*12%*
Total Low Sustainability Acres	17,494	21,916	4,980	278,397
Percent of LSR	*51%*	*55%*	*54%*	*45%*
Late Successional Habiatat[3]				
Dry Forest (Acres)	3,740	3,131	259	89,525
Percent of LSR	*11%*	*8%*	*3%*	*15%*
Moist Forest (Acres)	9,309	19,897	4,539	196,930
Percent of LSR	*27%*	*50%*	*49%*	*32%*
High (Acres)	5,783	3,848	1,504	90,962
Percent of LSR	*17%*	*10%*	*16%*	*15%*
Total Late Successional Habitat	18,832	26,876	6,302	377,416
Percent of LSR	*55%*	*67%*	*69%*	*61%*

NOTES:

[1] Created Openings include vegetation codes: 10, 20, 30, 34, 80, 40, 50, 60, 70.

[2] Low Sustainability includes vegetation codes: dry - 12, 13; mesic - 21, 22; moist grand fir / mesic western hemlock - 31, 32, 33, 36; subalpine fir - 42.

[3] Late Successional Habitat includes vegetation codes: dry - 66, 52, 12, 22; moist - 32, 62, 36, 64; high - 41, 42, 63.

Appendix 5

Vegetation in Wenatchee National Forest's Managed Late Successional Areas

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

		Camas	Crow	Eagle	Haystack
Nonforest					
00	Ag./Residential/Developed	0	0	21	131
01	Water	0	0	0	47
02	Ice or Snow	0	0	0	0
03	Cliff	0	0	2	4
04	Bedrock	0	545	7	1,094
05	Talus	0	632	0	862
06	Scree	0	0	0	102
07	Upland Meadow	0	0	0	0
08	Wet Meadow	0	0	9	15
08A	Dry Meadow	0	81	0	49
09	Brushfield	10	0	0	0
98	Deciduous Forest	0	12	0	141
99	Grassland/Shrubland	72	10	262	426
Total Nonforest		82	1,281	301	2,871
Percent of MLSA		*5%*	*10%*	*6%*	*12%*
Dry Forest					
10	Created Opening	382	0	215	600
11	Low Density	139	0	986	293
12	Dense/Successionally Advanced	926	412	1,786	10,871
13	Partial Cut	9	0	273	3,215
Total Dry Forest		1,457	412	3,260	14,979
Percent of MLSA		*94%*	*3%*	*62%*	*61%*
Mesic Sites					
20	Created Opening	0	0	233	0
21	Single Layered	0	0	29	0
22	Layered/Mature	6	0	378	0
23	Open Parklike	0	0	8	0
Total Mesic Sites		6	0	647	0
Percent of MLSA		*0%*	*0%*	*12%*	*0%*
Moist Grand Fir / Mesic Western Hemlock					
30	Created Opening (Grand Fir)	0	140	22	589
31	Single Layered (Grand Fir)	0	40	6	71
32	Layered/Mature (Grand Fir)	0	2,816	1,029	4,862
33	Partial Cut (Grand Fir)	0	25	0	639
34	Created Opening (W. Hemlock)	0	355	0	93
35	Single Layered (W. Hemlock)	0	126	0	0
36	Layered/Mature (W. Hemlock)	0	4,845	0	421
37	Partial Cut (W. Hemlock)	0	7	0	87
Total Moist Grand Fir / Mesic W. Hemlock		0	8,354	1,057	6,763
Percent of MLSA		*0%*	*67%*	*20%*	*27%*

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

		Camas	Crow	Eagle	Haystack
Subalpine Fir					
40	Created Opening	0	0	0	0
41	Single Layered	0	0	0	0
42	Layered/Mature	0	11	0	0
43	Subalpine Parkland	0	0	0	0
Total Subalpine Fir		0	11	0	0
Percent of MLSA		*0%*	*0%*	*0%*	*0%*
Lodgepole Pine Sites					
50	Created Opening	0	0	0	0
51	Single Layered	0	0	0	0
52	Layered Canopy	0	0	0	0
Total Lodgepole Pine		0	0	0	0
Percent of MLSA		*0%*	*0%*	*0%*	*0%*
Wet Forest					
60	Created Opening	0	370	0	0
61	Single Layered (Poles)	0	0	0	0
62	Layered/Mature	0	1,980	0	0
64	Riparian Forest	0	71	0	31
Total Wet Forest		0	2,421	0	31
Percent of MLSA		*0%*	*19%*	*0%*	*0%*
TOTAL acres in MLSA		**1,545**	**12,479**	**5,266**	**24,644**

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

	Camas	Crow	Eagle	Haystack
Total Created Opening in MLSA1	382	865	470	1,283
Percent of MLSA	*25%*	*7%*	*9%*	*5%*
Low Sustainability[2]				
Dry Forest				
Acres	936	412	2,059	14,086
Percent of Veg. Group	*64%*	*100%*	*63%*	*94%*
Percent of MLSA	*61%*	*3%*	*39%*	*57%*
Mesic				
Acres	6	0	407	0
Percent of Veg. Group	*100%*	--	*63%*	--
Percent of MLSA	*0%*	*0%*	*8%*	*0%*
Moist Grand Fir / Mesic W. Hemlock				
Acres	0	7,726	1,035	5,994
Percent of Veg. Group	--	*92%*	*98%*	*89%*
Percent of MLSA	*0%*	*62%*	*20%*	*24%*
Subalpine Fir				
Acres	0	11	0	0
Percent of Veg. Group	--	*100%*	--	--
Percent of MLSA	*0%*	*0%*	*0%*	*0%*
Total Low Sustainability Acres	942	8,149	3,502	20,080
Percent of MLSA	*61%*	*65%*	*66%*	*81%*
Late Successional Habiatat[3]				
Dry Forest (Acres)	932	412	2,164	10,871
Percent of MLSA	*60%*	*3%*	*41%*	*44%*
Moist Forest (Acres)	0	9,712	1,029	5,315
Percent of MLSA	*0%*	*78%*	*20%*	*22%*
High (Acres)	0	11	0	0
Percent of MLSA	*0%*	*0%*	*0%*	*0%*
Total Late Successional Habitat	932	10,135	3,194	16,186
Percent of MLSA	*60%*	*81%*	*61%*	*66%*

NOTES:

[1] Created Openings include vegetation codes: 10, 20, 30, 34, 80, 40, 50, 60, 70.

[2] Low Sustainability includes vegetation codes: dry - 12, 13; mesic - 21, 22; moist grand fir / mesic western hemlock - 31, 32, 33, 36; subalpine fir - 42.

[3] Late Successional Habitat includes vegetation codes: dry - 66, 52, 12, 22; moist - 32, 62, 36, 64; high - 41, 42, 63.

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

		Lost Lake	Milk Creek	Natapoc	Russell Ridge
Nonforest					
00	Ag./Residential/Developed	0	0	20	0
01	Water	25	26	9	108
02	Ice or Snow	0	0	0	0
03	Cliff	22	0	6	71
04	Bedrock	469	14	0	534
05	Talus	321	1,001	0	559
06	Scree	0	72	0	0
07	Upland Meadow	0	0	0	0
08	Wet Meadow	104	114	0	67
08A	Dry Meadow	56	15	0	35
09	Brushfield	0	0	0	10
98	Deciduous Forest	100	60	0	10
99	Grassland/Shrubland	177	33	0	242
Total Nonforest		1,273	1,335	35	1,637
Percent of MLSA		*18%*	*9%*	*3%*	*13%*
Dry Forest					
10	Created Opening	434	1,103	0	659
11	Low Density	0	107	183	13
12	Dense/Successionally Advanced	3,156	1,098	500	4,048
13	Partial Cut	127	768	23	703
Total Dry Forest		3,717	3,075	706	5,423
Percent of MLSA		*54%*	*20%*	*66%*	*44%*
Mesic Sites					
20	Created Opening	0	0	0	0
21	Single Layered	0	0	112	0
22	Layered/Mature	0	0	119	0
23	Open Parklike	0	0	0	0
Total Mesic Sites		0	0	232	0
Percent of MLSA		*0%*	*0%*	*22%*	*0%*
Moist Grand Fir / Mesic Western Hemlock					
30	Created Opening (Grand Fir)	170	1,096	0	578
31	Single Layered (Grand Fir)	3	137	44	0
32	Layered/Mature (Grand Fir)	1,676	6,359	51	2,114
33	Partial Cut (Grand Fir)	48	1,056	0	438
34	Created Opening (W. Hemlock)	0	149	0	0
35	Single Layered (W. Hemlock)	0	1	0	0
36	Layered/Mature (W. Hemlock)	0	2,014	0	0
37	Partial Cut (W. Hemlock)	0	84	0	0
Total Moist Grand Fir / Mesic W. Hemlock		1,897	10,896	96	3,130
Percent of MLSA		*27%*	*69%*	*9%*	*25%*

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

		Lost Lake	Milk Creek	Natapoc	Russell Ridge
Subalpine Fir					
40	Created Opening	0	0	0	0
41	Single Layered	0	0	0	0
42	Layered/Mature	59	0	0	424
43	Subalpine Parkland	0	15	0	0
Total Subalpine Fir		59	15	0	424
Percent of MLSA		*1%*	*0%*	*0%*	*3%*
Lodgepole Pine Sites					
50	Created Opening	0	0	0	0
51	Single Layered	0	0	0	0
52	Layered Canopy	0	0	0	0
Total Lodgepole Pine		0	0	0	0
Percent of MLSA		*0%*	*0%*	*0%*	*0%*
Wet Forest					
60	Created Opening	0	0	0	267
61	Single Layered (Poles)	0	0	0	0
62	Layered/Mature	0	41	0	1,454
64	Riparian Forest	0	348	0	0
Total Wet Forest		0	389	0	1,721
Percent of MLSA		*0%*	*2%*	*0%*	*14%*
TOTAL acres in MLSA		**6,946**	**15,710**	**1,068**	**12,335**

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

	Lost Lake	Milk Creek	Natapoc	Russell Ridge
Total Created Opening in MLSA1	604	2,348	0	1,505
Percent of MLSA	*9%*	*15%*	*0%*	*12%*
Low Sustainability[2]				
Dry Forest				
Acres	3,283	1,866	524	4,751
Percent of Veg. Group	*88%*	*61%*	*74%*	*88%*
Percent of MLSA	*47%*	*12%*	*49%*	*39%*
Mesic				
Acres	0	0	232	0
Percent of Veg. Group	--	--	*100%*	--
Percent of MLSA	*0%*	*0%*	*22%*	*0%*
Moist Grand Fir / Mesic W. Hemlock				
Acres	1,727	9,565	96	2,551
Percent of Veg. Group	*91%*	*88%*	*100%*	*82%*
Percent of MLSA	*25%*	*61%*	*9%*	*21%*
Subalpine Fir				
Acres	59	0	0	424
Percent of Veg. Group	*100%*	*0%*	--	*100%*
Percent of MLSA	*1%*	*0%*	*0%*	*3%*
Total Low Sustainability Acres	5,069	11,431	851	7,726
Percent of MLSA	*73%*	*73%*	*80%*	*63%*
Late Successional Habiatat[3]				
Dry Forest (Acres)	3,156	1,098	620	4,048
Percent of MLSA	*45%*	*7%*	*58%*	*33%*
Moist Forest (Acres)	1,676	8,761	51	3,568
Percent of MLSA	*24%*	*56%*	*5%*	*29%*
High (Acres)	59	0	0	424
Percent of MLSA	*1%*	*0%*	*0%*	*3%*
Total Late Successional Habitat	4,890	9,859	671	8,040
Percent of MLSA	*70%*	*63%*	*63%*	*65%*

NOTES:

[1] Created Openings include vegetation codes: 10, 20, 30, 34, 80, 40, 50, 60, 70.

[2] Low Sustainability includes vegetation codes: dry - 12, 13; mesic - 21, 22; moist grand fir / mesic western hemlock - 31, 32, 33, 36; subalpine fir - 42.

[3] Late Successional Habitat includes vegetation codes: dry - 66, 52, 12, 22; moist - 32, 62, 36, 64; high - 41, 42, 63.

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

		Sand Creek	Tumwater	Twin Lakes	ALL MLSAs
Nonforest					
00	Ag./Residential/Developed	0	8	0	180
01	Water	0	115	298	630
02	Ice or Snow	0	0	0	0
03	Cliff	0	673	60	838
04	Bedrock	110	61	0	2,834
05	Talus	0	16	9	3,401
06	Scree	0	31	0	206
07	Upland Meadow	0	0	0	0
08	Wet Meadow	0	0	0	309
08A	Dry Meadow	0	0	0	236
09	Brushfield	33	111	344	509
98	Deciduous Forest	0	0	0	323
99	Grassland/Shrubland	484	14	64	1,784
Total Nonforest		628	1,029	776	11,249
Percent of MLSA		*7%*	*25%*	*14%*	*11%*
Dry Forest					
10	Created Opening	445	843	0	4,681
11	Low Density	2,078	595	0	4,392
12	Dense/Successionally Advanced	4,630	696	0	28,124
13	Partial Cut	11	0	0	5,129
Total Dry Forest		7,163	2,134	0	42,326
Percent of MLSA		*78%*	*52%*	*0%*	*43%*
Mesic Sites					
20	Created Opening	0	0	0	233
21	Single Layered	77	0	0	218
22	Layered/Mature	1,280	26	0	1,809
23	Open Parklike	0	0	0	8
Total Mesic Sites		1,357	26	0	2,260
Percent of MLSA		*15%*	*1%*	*0%*	*2%*
Moist Grand Fir / Mesic Western Hemlock					
30	Created Opening (Grand Fir)	0	106	46	2,747
31	Single Layered (Grand Fir)	14	26	150	491
32	Layered/Mature (Grand Fir)	63	332	117	19,421
33	Partial Cut (Grand Fir)	0	0	0	2,207
34	Created Opening (W. Hemlock)	0	0	0	597
35	Single Layered (W. Hemlock)	0	0	0	127
36	Layered/Mature (W. Hemlock)	0	0	0	7,280
37	Partial Cut (W. Hemlock)	0	0	0	178
Total Moist Grand Fir / Mesic W. Hemlock		77	464	314	33,048
Percent of MLSA		*1%*	*11%*	*6%*	*33%*

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

		Sand Creek	Tumwater	Twin Lakes	ALL MLSAs
Subalpine Fir					
40	Created Opening	0	370	5	375
41	Single Layered	0	2	4	6
42	Layered/Mature	0	0	50	543
43	Subalpine Parkland	0	0	0	15
Total Subalpine Fir		0	373	58	940
Percent of MLSA		*0%*	*9%*	*1%*	*1%*
Lodgepole Pine Sites					
50	Created Opening	0	31	0	31
51	Single Layered	0	0	0	0
52	Layered Canopy	0	23	0	23
Total Lodgepole Pine		0	54	0	54
Percent of MLSA		*0%*	*1%*	*0%*	*0%*
Wet Forest					
60	Created Opening	0	0	690	1,328
61	Single Layered (Poles)	0	0	1,140	1,140
62	Layered/Mature	0	0	2,596	6,071
64	Riparian Forest	0	0	0	450
Total Wet Forest		0	0	4,426	8,989
Percent of MLSA		*0%*	*0%*	*79%*	*9%*
TOTAL acres in MLSA		**9,225**	**4,079**	**5,574**	**98,864**

Vegetation in Wenatchee National Forest's *Managed Late Successional Areas*

	Sand Creek	Tumwater	Twin Lakes	ALL MLSAs
Total Created Opening in MLSA1	445	1,350	741	9,991
Percent of MLSA	*5%*	*33%*	*13%*	*10%*
Low Sustainability[2]				
Dry Forest				
Acres	4,640	696	0	33,253
Percent of Veg. Group	*65%*	*33%*	--	*79%*
Percent of MLSA	*50%*	*17%*	*0%*	*34%*
Mesic				
Acres	1,357	26	0	2,027
Percent of Veg. Group	*100%*	*100%*	--	*90%*
Percent of MLSA	*15%*	*1%*	*0%*	*2%*
Moist Grand Fir / Mesic W. Hemlock				
Acres	77	358	268	29,398
Percent of Veg. Group	*100%*	*77%*	*85%*	*89%*
Percent of MLSA	*1%*	*9%*	*5%*	*30%*
Subalpine Fir				
Acres	0	0	50	543
Percent of Veg. Group	--	*0%*	*85%*	*58%*
Percent of MLSA	*0%*	*0%*	*1%*	*1%*
Total Low Sustainability Acres	6,074	1,080	317	65,221
Percent of MLSA	*66%*	*26%*	*6%*	*66%*
Late Successional Habiatat[3]				
Dry Forest (Acres)	5,910	745	0	29,956
Percent of MLSA	*64%*	*18%*	*0%*	*30%*
Moist Forest (Acres)	63	332	2,714	33,222
Percent of MLSA	*1%*	*8%*	*49%*	*34%*
High (Acres)	0	2	54	550
Percent of MLSA	*0%*	*0%*	*1%*	*1%*
Total Late Successional Habitat	5,973	1,079	2,767	63,727
Percent of MLSA	*65%*	*26%*	*50%*	*64%*

NOTES:

[1] Created Openings include vegetation codes: 10, 20, 30, 34, 80, 40, 50, 60, 70.

[2] Low Sustainability includes vegetation codes: dry - 12, 13; mesic - 21, 22; moist grand fir / mesic western hemlock - 31, 32, 33, 36; subalpine fir - 42.

[3] Late Successional Habitat includes vegetation codes: dry - 66, 52, 12, 22; moist - 32, 62, 36, 64; high - 41, 42, 63.

Appendix 6

Threatened, Endangered, Sensitive, Candidate, Survey/Manage, and Other Plants of Concern Associated with Late-Successional Forests on the Wenatchee National Forest

Threatened, endangered, sensitive, candidate, survey/manage, and other plants of concern associated with late-successional forest on WNF

LATIN NAME	COMMON NAME	FED	ST*	FS*	FOREST TYPE								LSR																MLSA										
													K=Known S=Suspected A=Absent U=Unknown																										
					dry	mesic	moist gf / mesic hemlock	valley bottom mixed cnifer	wet forest group	riparian	subalpine fir	whitebark pine/subalp. larch	Lucerne	Sawtooth	Shady Pass	Slide Peak	Chiwawa	Little Wenatchee	Deadhorse	Icicle	Boundary Butte	Teanaway	Swauk	Manastash	Bumping	Rattlesnake	Tieton	Upper Nile	Twin Lakes	Natapoc	Tumwater	Eagle Creek	Camas Creek	Sand Creek	Milk Creek DM-9	Haystack DM-10	Russell Ridge DM-11	Lost Lake DM-12	Crow DM-14
FUNGI																																							
Percent of LSR Surveyed																																							
Albatrellus avellaneus				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Albatrellus caeruleoporus				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Albatrellus ellisii				SM			X	X	X				U	U	U	U	K	S	S	U	S	U	S	U	U	U	U	U	S	S	S	U	U	U	U	U	U	U	U
Albatrellus flettii				SM			X	X					U	U	U	U	K	S	S	U	S	U	S	U	U	U	U	U	U	U	S	U	U	U	U	U	U	U	U
Aleuria rhenana				SM		X	X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Aleurodiscus farlowii				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Alpova alexsmithii				SM			X	X	X		X	X	U	U	U	U	S	S	U	S	U	U	U	U	U	U	U	U	S	U	S	U	U	U	U	U	U	U	U
Alpova olivaceotinctus				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Alpova sp. nov. #Trappe 1966				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Alpova sp. nov. #Trappe 9730				SM		X							U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Arcangeliella crassa				SM		X	X	X	X		X		U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	S	S	U	S	U	U	U	U	U	U
Arcangeliella sp. nov. #Trappe 12359				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Arcangeliella sp. nov. #Trappe 12383				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Arcangeliella lactarioides				SM					X		X		U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Asterophora lycoperdoides				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Asterophora parasitica				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Baeospora myriadophylla				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Balsamia nigrens				SM	X	X	X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Boletus piperatus (Chalciporus)				SM		X	X		X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Boletus pulcherrimus				SM		X	X	X					U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Boletus haematinus				SM				X	X		X		U	U	U	U	S	S	U	S	U	U	U	S	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Bondarzewia montana (=B.mesenterica)				SM		X	X		X		X		U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Bryoglossum gracile				SM							X	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

*SP=Species of Concern, C=Candidate, S=Sensitive, T=Threatened, E=Endangered, M3=Monitor, SM=Survey Manage

Threatened, endangered, sensitive, candidate, survey/manage, and other plants of concern associated with late-successional forest on WNF

LATIN NAME	COMMON NAME	FED	ST*	FS*	FOREST TYPE								LSR															MLSA										
													K=Known S=Suspected A=Absent U=Unknown																										
					dry	mesic	moist gf / mesic hemlock	valley bottom mixed cnifer	wet forest group	riparian	subalpine fir	whitebark pine/subalp. larch	Lucerne	Sawtooth	Shady Pass	Slide Peak	Chiwawa	Little Wenatchee	Deadhorse	Icicle	Boundary Butte	Teanaway	Swauk	Manastash	Bumping	Rattlesnake	Tieton	Upper Nile	Twin Lakes	Natapoc	Turnwater	Eagle Creek	Camas Creek	Sand Creek	Milk Creek DM-9	Haystack DM-10	Russell Ridge DM-11	Lost Lake DM-12	Crow DM-14
Galerina atkinsoniana				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Galerina cerina				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Galerina heterocystis				SM			X	X					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Galerina sphagnicola				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Galerina vittaeformis				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gastroboletus imbellus				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gastroboletus ruber				SM					X		X		U	U	U	U	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gastroboletus sp. nov. #Trappe 2897				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gastroboletus sp. nov. #Trappe 7515				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gastroboletus subalpinus				SM					X		X	X	U	U	U	U	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gastroboletus turbinatus				SM			X		X		X		U	U	U	U	S	U	S	S	S	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Gastrosuillus sp. nov. #Trappe 7516				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gastrosuillus sp. nov. #Trappe 9608				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gautieria magnicellaris				SM			X	X	X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gautieria otthii				SM				X	X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gelatinodiscus flavidus				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Glomus radiatum				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gomphus bonarii				SM			X	X					U	U	U	U	K	S	U	U	U	U	U	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Gomphus clavatus				SM			X		X				U	U	U	U	K	S	S	S	S	U	S	U	U	U	U	U	S	S	S	S	S	U	U	U	U	U	U
Gomphus floccosus				SM			X	X	X				U	U	U	U	K	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Gomphus kauffmanii				SM			X	X	X				U	U	U	U	K	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Gymnomyces sp. nov. #Trappe 7545				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gymnomyces sp. nov. #Trappe 1690,1706,1710				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gymnomyces sp. nov. #Trappe 4703, 5576				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gymnopilus punctifolius				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gyromitra californica (Helvella)				SM				X	X				U	U	U	U	S	S	U	S	U	U	U	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U

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					dry	mesic	moist gf / mesic hemlock	valley bottom mixed cnifer	wet forest group	riparian	subalpine fir	whitebark pine/subalp. larch	Lucerne	Sawtooth	Shady Pass	Slide Peak	Chiwawa	Little Wenatchee	Deadhorse	Icicle	Boundary Butte	Teanaway	Swauk	Manastash	Bumping	Rattlesnake	Tieton	Upper Nile	Twin Lakes	Natapoc	Tumwater	Eagle Creek	Camas Creek	Sand Creek	Milk Creek DM-9	Haystack DM-10	Russell Ridge DM-11	Lost Lake DM-12	Crow DM-14
Gyromitra esculenta (Helvella)				SM	X	X		X	X				U	U	U	U	K	K	S	S	S	U	S	U	U	U	U	U	S	S	S	S	S	U	U	U	U	U	U
Gyromitra infula (Helvella)				SM			X	X	X				U	U	U	U	K	K	U	S	U	U	S	U	U	U	U	U	S	S	U	U	U	U	U	U	U	U	U
Gyromitra melaleucoides (Helvella)				SM		X	X		X				U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Gyromitra montana (=G.gigas)				SM	X	X	X	X	X				U	U	U	U	K	K	K	S	S	U	S	U	U	U	U	U	K	K	S	S	S	U	U	U	U	U	U
Hebeloma olympiana				SM									U	U	U	U	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Helvella compressa				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Helvella crassitunicata				SM									U	U	U	U	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Helvella elastica				SM				X	X				U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	S	U	U	U	U	U	U	U	U
Helvella maculata				SM				X					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hydnotrya sp. nov. #Trappe 787,792				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hydnotrya subnix sp. nov. #Trappe 1861				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hydnum repandum (Dentinum)				SM		X	X	X	X				U	U	U	U	K	K	S	S	S	U	S	U	U	U	U	U	S	S	S	S	S	U	U	U	U	U	U
Hydnum umbilicatum (Dentinum)				SM		X	X	X	X				U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Hygrophorus caeruleus				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hygrophorus karstenii				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hygrophorus vernalis				SM									U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hypomyces luteovirens				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Leucogaster citrinus				SM		X	X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Leucogaster microsporus				SM		X							U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Macowanites chlorinosmus				SM		X	X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Macowanites lymanensis				SM					X				U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Macowanites mollis				SM		X	X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Marasmius applanatipes				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Martellia fragrans				SM					X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Martellia idahoensis				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Martellia monticola				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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Martellia sp. nov. #Trappe 1700				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Martellia sp. nov. #Trappe 311				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Martellia sp. nov. #Trappe 5903				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Martellia sp. nov. #Trappe 649				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mycena hudsoniana				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mycena lilacifolia				SM		X	X	X					U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	S	U	U	U	U	U	U	U	U
Mycena marginella				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mycena monticola				SM					X		X		U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	S	U	U	U	U	U	U	U	U
Mycena overholtsii				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mycena quinaultensis				SM		X	X	X					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mycena tenax				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mythicomyces corneipes				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Neolentinus adherens				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Neolentinus kauffmanii				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Neornula pouchetii				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Nivatogastrium nubigenum				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Octavianina macrospora				SM		X	X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Octavianina papyracea				SM		X							U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Octavianina sp. nov. #Trappe 7502				SM		X			X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Otidea leporina				SM		X	X	X					U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Otidea onotica				SM		X		X					U	U	U	U	S	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Otidea smithii				SM		X		X					U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Oxyporus nobilissimus				SM			X		X		X		U	U	U	U	S	S	U	U	U	U	U	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Phaeocollybia attenuata				SM			X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia californica				SM		X							U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia carmanahensis				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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Phaeocollybia dissiliens				SM				X	X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia fallax				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia gregaria				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia kaufmanii				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia olivacea				SM				X	X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia oregonensis				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia piceae				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia pseudofestiva				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia scatesiae				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia sipei				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phaeocollybia spadicea				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phellodon atratus				SM			X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phlogiotis helvelloides				SM		X	X	X					U	U	U	U	K	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Pholiota albivelata				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Phytoconis ericetorum (Omphalina)				SM					X		X	X	U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pithya vulgaris				SM			X		X				U	U	U	U	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Plectania latahensis (Sarcosoma)				SM			X		X		X		U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Plectania melastoma (Sarcosoma)				SM				X					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Plectania milleri (Sarcosoma)				SM			X	X	X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Podostroma alutaceum				SM			X	X					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Polyozellus multiplex				SM			X	X	X				U	U	U	U	S	K	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Pseudaleuria quinaultiana				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria abietina				SM		X	X	X					U	U	U	U	U	U	S	S	S	U	S	U	U	U	U	U	S	S	S	U	U	U	U	U	U	U	U
Ramaria amyloidea				SM		X	X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria araiospora				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria aurantiisiccescens				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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Ramaria botrytis var. aurantiiramosa				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria celerivirescens				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria claviramulata				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria concolor f. marri				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria concolor.f. tsugina				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria coulterae				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria cyaneigranosa				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria fasciculata var. sparsiramosa				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria geltatiniaurantia				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria gracilis				SM		X							U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria hilaris var. olympiana				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria largentii				SM			X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria lorithamnus				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria maculatipes				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria rainierensis				SM				X					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria rubella var. blanda				SM		X		X					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria rubribrunnescens				SM			X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria rubrievanescens				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria rubripermanens				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria spinulosa				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria stuntzii				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria suecica				SM	X								U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria thiersii				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramaria verlotensis				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon abietis				SM	X	X					X	X	U	U	U	U	S	S	S	S	S	U	S	U	U	U	U	U	S	S	S	S	S	U	U	U	U	U	U
Rhizopogon atroviolaceus				SM	X	X					X	X	U	U	U	U	S	S	S	S	S	U	S	U	U	U	U	U	S	S	S	S	S	U	U	U	U	U	U

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Rhizopogon brunneiniger				SM		X	X	X	X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon evadens var. subalpinus				SM					X			X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon exiguus				SM		X	X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon flavofibrillous				SM	X	X	X						U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon inquinatus				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon sp. nov. #Trappe 1692				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon sp. nov. #Trappe 1698				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon sp. nov. #Trappe 9432				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhizopogon truncatus				SM					X		X	X	U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhodocybe nitida (Entoloma)				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rhodocybe speciosa (Entoloma)				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Rickenella setipes				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Russula mustelina				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sarcodon fuscoindicum (Hydnum)				SM	X								U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sarcodon imbricatum (Hydnum)				SM		X	X	X	X				U	U	U	U	K	K	S	S	S	U	S	U	U	U	U	U	S	S	S	U	U	U	U	U	U	U	U
Sarcosoma mexicana				SM		X	X	X	X				U	U	U	U	S	K	U	S	U	U	U	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Sarcosphaera eximia (=S.crassa)				SM	X	X							U	U	U	U	K	S	S	U	S	U	S	U	U	U	U	U	S	S	U	S	S	U	U	U	U	U	U
Sedecula pulvinata				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sparassis crispa				SM		X	X	X					U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U
Spathularia flavida				SM	X	X		X					U	U	U	U	K	S	S	S	S	U	S	U	U	U	U	U	S	S	S	U	U	U	U	U	U	U	U
Stagnicola perplexa				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Thaxterogaster pingue				SM		X	X		X		X		U	U	U	U	S	S	S	S	S	U	S	U	U	U	U	U	S	S	S	S	S	U	U	U	U	U	U
Thaxterogaster sp. nov. #Trappe 4867,6242,7427,7962,8520				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tricholoma venenatum				SM				X					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tricholomopsis fulvescens				SM					X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tuber sp. nov. #Trappe 12493				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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Tuber sp. nov. #Trappe 2302				SM									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tylopilus pseudoscaber				SM			X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
LICHENS																																							
Percent of LSR Surveyed																																							
Bryoria tortuosa					X	X	X			X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Calicium abietinum						X	X		X	X	X		U	U	U	U	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Calicium adaequatum						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Calicium adspersum						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Calicium glaucellum						X	X		X		X		U	U	U	U	S	U	S	U	S	U	U	U	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U
Calicium viride						X	X		X		X		U	U	U	U	K	K	S	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Cetrelia cetrariodies						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chaenotheca brunneola							X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chaenotheca chrysocephala							X		X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chaenotheca ferruginea							X		X	X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chaenotheca furfuracea						X	X		X	X	X		U	U	U	U	S	K	U	S	U	U	U	U	U	U	U	U	S	S	U	U	U	U	U	U	U	U	U
Chaenotheca subroscida						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chaenothecopsis pusilla							X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Cladonia norvegica							X		X	X	X		U	U	U	U	U	S	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Collema nigrescens					X	X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Cyphelium inquinans					X	X	X		X	X	X		U	U	U	U	K	U	K	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	X	X	U	U	U
Dendriscocaulon intricatulum									X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Dermatocarpon luridum										X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hydrothyria venosa						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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Hypogymnia duplicata										X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hypogymnia oceanica										X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Leptogium cyanescens							X	X	X	X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Leptogium rivale										X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Leptogium saturninum													U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Leptogium teretiusculum													U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Lobaria hallii						X	X			X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Lobaria linita											X		U	U	U	U	U	K	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Lobaria oregana						X	X			X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Lobaria pulmonaria						X	X		X	X	X		U	U	U	U	U	K	U	S	U	U	U	U	U	U	U	U	K	U	U	S	U	U	U	U	U	U	U
Lobaria scrobiculata						X	X		X	X	X		U	U	U	U	U	K	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Microcalicium arenarium						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mycocalicium subtile						X	X		X	X	X		U	U	U	U	S	S	U	S	S	U	S	U	U	U	U	U	S	S	S	U	U	U	U	U	U	U	U
Nephroma bellum						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Nephroma helveticum						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Nephroma laevigatum						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Nephroma occultum									X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Nephroma parile					X	X	X		X	X	X		U	U	U	U	S	S	U	S	U	U	U	U	S	U	U	U	U	S	U	S	U	U	U	U	U	U	U
Nephroma resupinatum						X	X		X	X	X		U	U	U	U	K	K	U	U	U	U	U	U	U	U	U	U	U	K	U	U	U	U	U	U	U	U	U
Pannaria leucostictoides						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pannaria mediterranea						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pannaria saubinetii						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Peltigera collina					X	X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Peltigera neckeri					X	X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Peltigera pacifica						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pilophorus nigricaulis											X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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Platismatia lacunosa											X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pseudocyphellaria anomala					X	X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pseudocyphellaria anthrapsis						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pseudocyphellaria crocata						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pseudocyphellaria rainierensis									X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramalina pollinaria									X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ramalina thrausta									X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Stenocybe clavata						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Stenocybe major						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sticta artica									X		X	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sticta beauvoisii						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sticta fuliginosa						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sticta limbata						X	X		X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tholurna dissimilis									X		X		U	U	U	U	S	S	U	S	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Usnea longissima									X	X	X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
BROPHYTES																																							
Percent of LSR Surveyed																																							
Bartramiopsis lescurrii							X		X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Brotherella roelli							X		X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Diplohyllum albicans							X		X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Diplophyllum plicatum							X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Douinia ovata							X		X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Encalypta brevicolla crumiana							X?		X?		X?		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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Iwatsuklella leucotricha							X?		X?		X?		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Kurzia makinoana							X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Orthodontium gracile							X?		X?		X?		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Plagiochila satol							X?		X?		X?		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Plagiochila semidecurrens							X?		X?		X?		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pleuroziopsis ruthenica							X		X		X?		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ptilidium californicum							X		X				U	U	U	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Racomitrium aquaticum							X?		X?		X?		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Radula brunnea							X?		X?		X?		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Scouleria marginata							X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetraphis geniculata							X		X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tritomaria exsectiformis							X		X		X		U	U	U	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tritomaria quinquedentata							X		X		X		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
VASCULAR PLANTS																																							
Percent of LSR Surveyed																																							
Achlys triphylla	vanilla leaf						X		X				U	U	A	A	A	A	S	K	K	K	K	U	K	K	K	K	A	A	U	U	K	K	K	K	K	K	K
Adenocaulon bicolor	trail plant				X	X	X		X		X		U	U	K	S	K	K	K	K	K	K	U	K	K	K	K	K	K	K	U	K	K	U	K	K	K	K	K
Adiantum pedatum	maidenhair fern								X				U	U	U	U	K	K	U	K	U	U	U	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Agoseris elata	tall agoseris		S		X		X						S	S	S	S	U	U	U	U	U	K	K	S	U	S	S	K	U	U	U	U	U	S	S	S	S	U	U
Allotropa virgata	sugarstick			SM		X	X						S	U	S	S	K	K	U	K	U	U	U	U	S	U	S	U	U	U	U	U	U	U	U	U	U	S	S
Anemone nuttalliana	pasqueflower		S				X				X		U	S	S	S	U	S	U	U	U	K	K	U	U	U	S	S	U	U	U	U	U	U	U	U	U	U	U
Antennaria parvifolia	Nutall's pussytoes		S		X								U	U	U	S	U	U	U	U	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	S	S	S	U
Arnica latifolia	broadleaf arnica										X		U	U	K	K	K	K	U	U	U	U	K	K	K	K	K	K	U	U	U	K	A	U	K	K	K	K	K

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Asarum caudatum	wild ginger					X	X		X		X		U	U	U	A	K	K	U	K	U	U	U	S	K	U	U	U	U	U	U	U	A	U	U	U	U	U	K
Astragalus arrectus	Palouse milk-vetch		S		X								S	S	S	S	A	A	U	U	U	U	S	S	U	S	S	U	A	A	U	U	U	U	U	S	S	U	U
Botrychium lanceolatum	lance-leaved grapefern						X	X	X				U	U	U	U	K	K	U	U	U	U	U	U	U	U	U	U	K	U	U	U	U	U	U	U	U	U	U
Botrychium lunaria	moonwort							X	X	X			U	U	U	U	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Botrychium minganense	Victorin's grape-fern			SM				X	X	X			S	S	S	U	K	K	U	S	A	U	U	S	U	U	S	U	K	K	U	U	A	A	U	U	U	S	S
Botrychium montanum	mountain moonwort		S	SM				X	X	X			S	S	S	S	K	K	U	S	A	U	U	S	U	U	S	U	K	K	U	U	A	A	U	U	U	S	S
Botrychium paradoxum	two-spiked moonwort		S						X	X			U	U	U	U	K	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Botrychium pinnatum	St. John's moonwort		S							X	X		U	U	U	U	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Botrychium simplex	little grape-fern		S						X	X			S	K	S	U	S	S	U	S	A	U	U	S	U	U	S	U	U	U	U	U	A	A	U	U	U	S	S
Calypso bulbosa	calipso orchid					X	X		X				U	U	U	U	K	U	S	K	U	U	S	K	K	K	K	K	U	K	U	S	S	U	K	K	K	K	K
Campanula lasiocarpa	Alaska harebell		S								X		U	U	U	U	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Carex buxbaumii	Buxbaum's sedge		S							X			U	U	K	U	K	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Carex comosa	bristly sedge		S						X	X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	S	U	S	U	U	U	A	U	S	U	U	S	S
Carex interrupta	green-fruited sedge		M3						X	X			U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	U	S	S	U	U	K
Carex proposita	smoky mountain sedge		S								X		U	U	U	U	S	K	U	U	U	U	U	S	U	U	S	S	U	U	U	U	A	U	U	U	U	U	U
Carex saxatilis var. major	russet sedge		S							X			U	U	U	U	U	K	U	U	U	U	U	U	U	U	S	S	U	U	U	A	A	U	U	U	U	S	U
Carex scopulorum var. prionophy	saw-leaved sedge		M3								X		U	U	U	U	U	K	U	U	U	U	U	S	S	U	S	S	U	U	U	U	A	U	U	U	U	S	S
Carex stylosa	long styled sedge		S							X			U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Castilleja cryptantha	obscure indian paintbrush	SP	S				X		X				U	U	U	U	U	U	U	U	U	U	U	U	U	S	U	U	U	U	U	U	A	U	U	U	U	U	U
Cephalanthera austineae	phantom orchid		M3		X	X	X						U	U	U	U	K	K	K	S	K	U	U	U	S	U	S	U	U	K	U	U	A	U	U	U	U	U	S
Chaenactis thompsonii	Thompson's chaenactis		S				X				X		U	U	S	U	U	U	U	U	U	K	K	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Chamaecyparis nootkatensis	Alaska yellow cedar								X				U	U	A	A	U	K	U	K	U	U	U	K	S	K	K	K	U	U	U	A	A	U	K	S	K	K	K
Chimaphila menziesii	pipsissewa					X	X				X		U	U	K	U	K	K	K	K	K	K	K	K	K	K	K	K	U	U	U	K	A	U	K	K	K	K	K
Chimaphila umbellata	common pipsissewa				X	X	X						U	U	K	K	K	K	K	K	K	K	K	K	K	K	K	K	U	U	U	K	K	U	K	K	K	K	K
Cicuta bulbifera	bulb-bearing water-hemlock		S							X			U	U	U	U	K	U	U	U	U	U	U	U	U	S	S	U	U	U	U	U	A	U	U	S	U	S	U
Clintonia uniflora	queenscup beadlily					X	X	X			X		S	S	K	S	K	K	U	K	U	K	K	K	K	K	K	K	K	K	U	A	A	U	K	K	K	K	K

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Coptis aspleniifolia	spleenwort-leaved goldthread			SM					X	X			U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Corallorrhiza maculata	spotted coral-root					X	X		X				U	U	S	S	K	K	S	K	U	K	K	S	S	S	S	S	U	U	U	K	U	U	S	S	S	S	S
Corallorrhiza mertensiana	western coral-root						X	X	X				U	U	S	S	K	K	S	S	U	U	U	K	K	K	K	K	U	U	U	U	U	U	K	K	K	K	K
Corallorrhiza striata	striped coral-root						X	X	X				U	U	A	A	K	U	K	S	U	U	U	S	S	S	S	S	U	U	U	U	U	U	S	S	S	S	S
Cryptogramma stelleri	Steller's rockbrake		S				X		X				S	S	S	S	U	U	U	S	U	U	U	S	U	S	S	S	U	U	U	U	A	U	S	S	S	S	U
Cypripedium fasciculatum	clustered ladyslipper	SP	T	SM		X	X						S	S	S	S	S	U	K	U	K	K	K	U	U	U	K	U	U	K	K	S	K	K	U	U	U	U	U
Cypripedium montanum	mountain ladyslipper			SM		X	X	X		X			S	S	S	S	K	U	K	S	K	U	K	K	K	K	K	K	U	K	U	S	K	U	K	K	K	K	K
Delphinium viridescens	Wenatchee larkspur	SP	E			X				X			U	U	U	U	U	U	U	U	K	U	K	U	U	U	U	U	U	U	U	A	K	K	U	U	U	U	U
Disporum hookeri	Hooker's fairybells				X	X	X				X		U	U	K	A	K	U	K	K	K	K	K	K	K	K	K	K	K	U	U	K	K	U	K	K	K	K	K
Dryopteris austriaca	wood fern						X		X	X			U	U	U	U	K	K	U	S	U	U	U	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Epipactis gigantea	giant hellebore		S							X			S	S	S	S	S	U	U	U	U	U	U	S	U	S	S	U	U	U	U	U	A	U	U	U	K	S	U
Erigeron salishii	Salish fleabane									X		X	U	U	U	U	S	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Eritrichium nanum var. elogatum	pale alpine forget-me-not		S								X		U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	A	U	U	U	U	U	U
Erythronium montanum	avalanche lily						X		X		X		U	U	K	S	K	K	U	U	U	K	K	K	U	U	K	K	U	K	U	A	A	U	U	U	K	U	U
Galium kamschaticum	boreal bedstraw		S	SM					X	X			U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gautheria ovatifolia	slender wintergreen							X	X				U	U	K	U	U	K	U	K	U	U	U	K	U	U	K	U	U	U	U	A	A	U	U	U	U	U	K
Geum rossii var. depressum	Ross' avens		S								X	X	U	U	U	U	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	A	A	U	U	U	U	U	U
Githopsis specularioides	common blue-cup		S										S	S	S	U	U	U	U	U	U	U	U	U	U	K	K	U	U	U	U	U	A	U	S	S	S	U	U
Goodyera oblongifolia	rattlesnake plantain				X	X	X	X	X				U	U	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	U	K	K	U	K	K	K	K	K
Gymmnocarpium dryopteris	oak fern							X	X				U	U	U	U	U	K	U	K	U	U	S	U	U	U	U	U	U	U	U	A	A	U	U	U	U	U	U
Hackelia hispida var. disjuncta	sagebrush stickseed		S		X								U	U	U	U	S	U	K	U	U	U	S	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Hackelia venusta	showy stickseed	SP	E		X							X	U	U	U	U	U	U	S	U	U	U	S	U	U	U	U	U	U	U	K	A	A	U	U	U	U	U	U
Hemitomes congestum	gnome plant								X				U	U	U	U	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hypopitys monotropa	pinesap								X				U	U	U	U	K	U	U	K	U	S	S	S	K	K	K	K	K	U	U	A	A	U	K	K	K	K	K
Iliamna longisepala	longsepal globemallow		S		X	X							U	U	K	U	K	U	S	U	S	U	S	U	U	U	U	U	S	U	K	K	K	K	U	U	U	U	U
Listera caurina	western twayblade					X	X						U	U	U	U	U	U	K	K	K	U	U	S	S	U	S	S	U	U	U	U	A	U	S	U	U	S	S

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Listera convallarioides	broad-lipped twayblade								X	X			U	U	U	U	U	K	U	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Listera cordata	twayblade								X	X			U	U	U	U	K	K	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Loiseleuria procumbens	alpine azalea		S										U.	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Luzula hitchcockii	smooth woodrush						X	X	X	X			U	U	K	K	K	K	U	K	U	U	S	K	K	K	K	K	U	U	U	U	A	U	A	A	K	A	A
Lysichiton americanum	skunk cabbage									X			U	U	U	U	K	K	U	U	U	U	U	U	U	U	U	U	K	U	U	U	U	U	U	U	U	U	U
Menziesia ferruginea	fool's huckleberry								X	X	X		U	U	U	U	K	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mitella breweri	Brewer's mitrewort						X		X	X			U	U	U	U	K	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Mitella trifida	miterwort						X		X	X			U	U	K	S	U	U	K	K	U	U	K	K	K	K	K	K	U	U	U	K	A	U	K	K	K	K	K
Monotropa uniflora	ghost pipe							X	X				U	U	S	S	K	S	U	S	U	U	U	S	S	S	S	S	U	U	U	A	A	U	S	S	S	S	S
Montia diffusa	branching monita		S							X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	A	U	U	U	U	U	U
Nicotiana attenuata	coyote tobacco		S										U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Orobanche pinorum	pine broomrape		S		X	X							S	U	S	S	S	U	K	K	S	K	K	K	U	S	S	K	U	K	S	S	K	K	K	K	S	U	S
Pedicularis rainierensis	Mt. Rainier lousewort		S						X		X		U	U	U	U	U	U	U	U	U	U	U	S	U	U	S	U	U	U	U	A	A	U	U	U	U	U	U
Pellaea brachyptera	Sierra cliff-brake		S		X								S	S	S	S	U	U	U	S	U	U	S	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Pellaea breweri	Brewer's cliff-brake		S						X		X		U	S	U	U	S	U	U	U	U	K	U	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Petrophytum cinerascens	Chelan rockmat	SP	T		X								U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	A	U	U	U	U	U	U
Planthera saccata	slender bog orchid							X	X	X			U	U	U	U	U	K	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Platanthera sparsiflora	canyon bog-orchid		S					X	X	X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Platanthera unalascensis	Alaska rein-orchid				X	X	X						U	U	U	U	U	U	K	S	K	U	K	K	K	K	K	K	U	U	U	S	K	U	K	K	K	K	K
Pterospora andromedea	woodland pinedrops				X	X	X						U	U	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	U	U	K	K	U	K	K	K	K	K
Pyrola asarifolia	alpine pyrola					X	X				X		U	U	K	S	K	K	K	K	K	S	K	K	K	K	K	K	K	U	U	K	A	U	K	K	K	K	K
Pyrola picta	white vein pyrola				X	X	X				X		U	U	K	S	K	K	S	K	K	K	K	K	K	K	K	K	U	U	U	S	K	U	K	K	K	K	K
Pyrola secunda	one-sided pyrola				X	X	X				X		U	U	K	K	K	K	S	K	K	K	K	K	K	K	K	K	K	U	U	K	S	U	K	K	K	K	K
Rubus lasiococcus	dwarf bramble				X	X	X						U	U	K	U	K	K	U	K	U	U	U	K	K	K	K	K	K	U	U	U	A	U	K	K	K	K	K
Rubus pedatus	five-leaved bramble							X	X				U	U	S	U	K	K	U	S	U	U	U	S	S	U	S	U	U	U	U	U	A	U	U	U	U	U	U
Salix vestita var. erecta	rock willow		E							X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U

*SP=Species of Concern, C=Candidate, S=Sensitive, T=Threatened, E=Endangered, M3=Monitor, SM=Survey Manage

Threatened, endangered, sensitive, candidate, survey/manage, and other plants of concern associated with late-successional forest on WNF

LATIN NAME	COMMON NAME	FED	ST*	FS*	FOREST TYPE								LSR																MLSA										
													K=Known S=Suspected A=Absent U=Unknown																										
					dry	mesic	moist gf / mesic hemlock	valley bottom mixed cnifer	wet forest group	riparian	subalpine fir	whitebark pine/subalp. larch	Lucerne	Sawtooth	Shady Pass	Slide Peak	Chiwawa	Little Wenatchee	Deadhorse	Icicle	Boundary Butte	Teanaway	Swauk	Manastash	Bumping	Rattlesnake	Tieton	Upper Nile	Twin Lakes	Natapoc	Tumwater	Eagle Creek	Camas Creek	Sand Creek	Milk Creek DM-9	Haystack DM-10	Russell Ridge DM-11	Lost Lake DM-12	Crow DM-14
Saxifraga debilis	pygmy saxifrage		S							X			U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Sidalcea oregana var. calva	Oregon checker-mallow	SP	T							X			U	U	U	U	U	U	U	U	K	U	S	U	U	U	U	U	U	U	U	A	K	K	U	U	U	U	U
Silene seelyi	Seely's silene	SP	T			X	X						U	U	U	U	U	S	S	S	U	K	S	U	U	U	U	U	U	U	K	A	A	A	U	U	U	U	U
Smilacina racemosa	false Solomon's seal					X	X		X				U	U	K	K	K	K	K	K	K	K	K	K	K	K	K	K	U	K	U	K	K	U	K	K	K	K	K
Smilacina stellata	starry false Solomon's seal					X	X		X				U	U	K	A	K	K	K	K	K	K	K	K	K	K	K	K	K	K	U	K	K	U	K	K	K	K	K
Spirannthes porrifolia	western ladies-tresses		S							X			S	S	S	U	U	U	U	S	U	U	U	S	S	K	K	S	U	U	U	U	A	U	S	S	U	K	K
Streptopus amplexifolius	clasp-leaf twisted stalk					X	X	X	X		X		U	U	K	K	K	K	S	S	K	K	K	K	K	S	K	K	K	U	U	U	K	U	S	S	S	K	K
Taxus brevifolia	Pacific yew							X	X				U	U	U	A	K	K	U	K	U	U	S	K	U	U	U	U	U	U	U	A	A	U	K	U	U	U	K
Thuja plicata	western red cedar							X	X	X			U	U	K	A	K	K	K	K	K	K	K	K	K	U	K	U	K	K	U	K	A	U	K	K	K	K	K
Tiarella unifoliata	coolwart foam plower							X	X	X			U	U	U	A	K	K	U	K	U	U	S	K	K	K	K	K	K	K	U	U	A	U	K	K	K	K	K
Trifolium thompsonii	Thompson's clover	SP	T		X								U	U	U	U	U	U	U	U	U	A	A	A	U	U	U	U	U	U	U	U	A	U	U	U	U	U	U
Trillium ovatum	wake-robin					X	X			X			U	U	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	U	K	K	U	K	K	K	K	K
Vaccinium alaskense	Alaska huckleberry					X			X				U	U	U	A	K	K	U	S	U	U	U	K	K	U	K	U	U	U	U	A	A	U	U	U	U	U	K
Vaccinium membranaceum	thin-leaved huckleberry						X		X		X		U	U	U	U	K	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Vaccinium ovatifolium	oval-leaf huckleberry						X						U	U	U	A	U	U	U	S	U	U	U	U	U	U	U	U	U	U	U	A	A	U	U	U	U	U	U
Vaccinium parvifolium	red huckleberry								X				U	U	A	A	K	K	U	S	U	U	U	U	U	U	U	U	U	U	U	A	A	U	U	U	U	U	U
Viola glabella	pioneer violet					X	X				X		U	U	K	U	K	K	K	K	K	K	K	K	K	K	K	K	K	U	U	S	K	U	K	K	K	K	K
Viola orbiculata	round-leaved violet						X		X				U	U	U	U	U	K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

*SP=Species of Concern, C=Candidate, S=Sensitive, T=Threatened, E=Endangered, M3=Monitor, SM=Survey Manage

Appendix 7

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in each LSR/MLSA

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in the Chiwawa LSR.
(K = Known, S = Suspected)

Group	Latin name	Common name	Fed*	St*	Fs*	Present
FUNGI	Albatrellus ellisii				SM	K
FUNGI	Albatrellus flettii				SM	K
FUNGI	Alpova alexsmithii				SM	S
FUNGI	Arcangeliella crassa				SM	S
FUNGI	Boletus haematinus				SM	S
FUNGI	Boletus pulcherrimus				SM	S
FUNGI	Bondarzewia montana (=B.mesenterica)				SM	S
FUNGI	Cantharellus cibarius				SM	K
FUNGI	Cantharellus formosus				SM	S
FUNGI	Cantharellus subalbidus				SM	K
FUNGI	Cantharellus tubaeformis				SM	S
FUNGI	Catathelasma ventricosa				SM	S
FUNGI	Choiromyces alveolatus				SM	S
FUNGI	Clavariadelphus borealis				SM	S
FUNGI	Clavariadelphus ligula				SM	S
FUNGI	Clavariadelphus pistillaris				SM	K
FUNGI	Clavariadelphus truncatus				SM	K
FUNGI	Clavulina cristata				SM	S
FUNGI	Clavulina ornatipes				SM	S
FUNGI	Collybia bakerensis				SM	S
FUNGI	Cortinarius magnivelatus				SM	S
FUNGI	Gastroboletus ruber				SM	S
FUNGI	Gastroboletus subalpinus				SM	S
FUNGI	Gastroboletus turbinatus				SM	S
FUNGI	Gomphus bonarii				SM	K
FUNGI	Gomphus clavatus				SM	K
FUNGI	Gomphus floccosus				SM	K
FUNGI	Gomphus kauffmanii				SM	K
FUNGI	Gyromitra californica (Helvella)				SM	S
FUNGI	Gyromitra esculenta (Helvella)				SM	K
FUNGI	Gyromitra infula (Helvella)				SM	K
FUNGI	Gyromitra melaleucoides (Helvella)				SM	S
FUNGI	Gyromitra montana (=G.gigas)				SM	K
FUNGI	Hebeloma olympiana				SM	S

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in the Chiwawa LSR.
(K = Known, S = Suspected)

FUNGI	Helvella crassitunicata				SM	S
FUNGI	Helvella elastica				SM	S
FUNGI	Hydnum repandum (Dentinum)				SM	K
FUNGI	Hydnum umbilicatum (Dentinum)				SM	S
FUNGI	Macowanites lymanensis				SM	S
FUNGI	Mycena lilacifolia				SM	S
FUNGI	Mycena monticola				SM	S
FUNGI	Otidea leporina				SM	S
FUNGI	Otidea onotica				SM	S
FUNGI	Otidea smithii				SM	S
FUNGI	Oxyporus nobilissimus				SM	S
FUNGI	Phlogiotis helvelloides				SM	K
FUNGI	Phytoconis ericetorum (Omphalina)				SM	S
FUNGI	Pithya vulgaris				SM	S
FUNGI	Plectania latahensis (Sarcosoma)				SM	S
FUNGI	Polyozellus multiplex				SM	S
FUNGI	Rhizopogon abietis				SM	S
FUNGI	Rhizopogon atroviolaceus				SM	S
FUNGI	Rhizopogon truncatus				SM	S
FUNGI	Sarcodon imbricatum (Hydnum)				SM	K
FUNGI	Sarcosoma mexicana				SM	S
FUNGI	Sarcosphaera eximia (=S.crassa)				SM	K
FUNGI	Sparassis crispa				SM	S
FUNGI	Spathularia flavida				SM	K
FUNGI	Thaxterogaster pingue				SM	S
VASCULAR	Allotropa virgata	sugarstick			SM	K
VASCULAR	Botrychium minganense	Victorin's grape-fern			SM	K
VASCULAR	Botrychium montanum	mountain moonwort		S	SM	K
VASCULAR	Botrychium paradoxum	two-spiked moonwort		S		K
VASCULAR	Botrychium simplex	little grape-fern		S		S
VASCULAR	Campanula lasiocarpa	Alaska harebell		S		S
VASCULAR	Carex buxbaumii	Buxbaum's sedge		S		K
VASCULAR	Carex proposita	smoky mountain sedge		S		S
VASCULAR	Cephalanthera austineae	phantom orchid		M3		K
VASCULAR	Cicuta bulbifera	bulb-bearing water-hemlock		S		K
VASCULAR	Cypripedium fasciculatum	clustered ladyslipper	SP	T	SM	S

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in the Chiwawa LSR.
(K = Known, S = Suspected)

VASCULAR	Cypripedium montanum	mountain ladyslipper		SM	K
VASCULAR	Epipactis gigantea	giant hellebore	S		S
VASCULAR	Hackelia hispida var. disjuncta	sagebrush stickseed	S		S
VASCULAR	Iliamna longisepala	longsepal globemallow	S		K
VASCULAR	Orobanche pinorum	pine broomrape	S		S
VASCULAR	Pellaea breweri	Brewer's cliff-brake	S		S

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in the Upper Nile LSR and Haystack MLSA

(K = Known, S = Suspected)

Group	Latin name	Common name	Fed*	St*	Fs*	Present in Upper Nile	Present in Haystack MLSA
VASCULAR	Agoseris elata	tall agoseris		S		K	S
VASCULAR	Anemone nuttalliana	pasqueflower		S		S	U
VASCULAR	Antennaria parvifolia	Nutall's pussytoes		S		U	S
VASCULAR	Astragalus arrectus	Palouse milk-vetch		S		U	S
VASCULAR	Carex interrupta	green-fruited sedge		M3		U	S
VASCULAR	Carex proposita	smoky mountain sedge		S		S	U
VASCULAR	Carex saxatilis var. major	russet sedge		S		S	U
VASCULAR	Carex scopulorum var. prionophylla	saw-leaved sedge		M3		S	U
VASCULAR	Cicuta bulbifera	bulb-bearing water-hemlock		S		U	S
VASCULAR	Cryptogramma stelleri	Steller's rockbrake		S		S	S
VASCULAR	Cypripedium montanum	mountain ladyslipper			SM	K	K
VASCULAR	Githopsis specularioides	common blue-cup		S		U	S
VASCULAR	Orobanche pinorum	pine broomrape		S		K	K
VASCULAR	Spirannthes porrifolia	western ladies-tresses		S		S	S

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in the Milk Creek MLSA
(K = Known, S = Suspected)

Group	Latin name	Common name	Fed*	St*	Fs*	Present
VASCULAR	Agoseris elata	tall agoseris		S		S
VASCULAR	Carex comosa	bristly sedge		S		S
VASCULAR	Carex interrupta	green-fruited sedge		M3		S
VASCULAR	Cryptogramma stelleri	Steller's rockbrake		S		S
VASCULAR	Cypripedium montanum	mountain ladyslipper			SM	K
VASCULAR	Githopsis specularioides	common blue-cup		S		S
VASCULAR	Orobanche pinorum	pine broomrape		S		K
VASCULAR	Spirannthes porrifolia	western ladies-tresses		S		S

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in the Shady Pass LSR
(K = Known, S = Suspected)

Group	Latin name	Common name	Fed*	St*	Fs*	Present
VASCULAR	Agoseris elata	tall agoseris		S		S
VASCULAR	Allotropa virgata	sugarstick			SM	S
VASCULAR	Anemone nuttalliana	pasqueflower		S		S
VASCULAR	Astragalus arrectus	Palouse milk-vetch		S		S
VASCULAR	Botrychium minganense	Victorin's grape-fern			SM	S
VASCULAR	Botrychium montanum	mountain moonwort		S	SM	S
VASCULAR	Botrychium simplex	little grape-fern		S		S
VASCULAR	Carex buxbaumii	Buxbaum's sedge		S		K
VASCULAR	Chaenactis thompsonii	Thompson's chaenactis		S		S
VASCULAR	Cryptogramma stelleri	Steller's rockbrake		S		S
VASCULAR	Cypripedium fasciculatum	clustered ladyslipper	SP	T	SM	S
VASCULAR	Cypripedium montanum	mountain ladyslipper			SM	S
VASCULAR	Epipactis gigantea	giant hellebore		S		S
VASCULAR	Githopsis specularioides	common blue-cup		S		S
VASCULAR	Iliamna longisepala	longsepal globemallow		S		K
VASCULAR	Orobanche pinorum	pine broomrape		S		S
VASCULAR	Pellaea brachyptera	Sierra cliff-brake		S		S
VASCULAR	Spirannthes porrifolia	western ladies-tresses		S		S

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in the Swauk LSR.
(K = Known, S = Suspected)

Group	Latin name	Common name	Fed*	St*	Fs*	Present
FUNGI	Albatrellus ellisii				SM	S
FUNGI	Albatrellus flettii				SM	S
FUNGI	Arcangeliella crassa				SM	S
FUNGI	Boletus pulcherrimus				SM	S
FUNGI	Bondarzewia montana (=B.mesenterica)				SM	S
FUNGI	Cantharellus cibarius				SM	S
FUNGI	Cantharellus subalbidus				SM	S
FUNGI	Clavariadelphus ligula				SM	S
FUNGI	Clavariadelphus pistillaris				SM	S
FUNGI	Clavariadelphus truncatus				SM	S
FUNGI	Clavulina cinerea				SM	S
FUNGI	Clavulina cristata				SM	S
FUNGI	Gastroboletus turbinatus				SM	S
FUNGI	Gomphus clavatus				SM	S
FUNGI	Gomphus floccosus				SM	S
FUNGI	Gomphus kauffmanii				SM	S
FUNGI	Gyromitra esculenta (Helvella)				SM	S
FUNGI	Gyromitra infula (Helvella)				SM	S
FUNGI	Gyromitra melaleucoides (Helvella)				SM	S
FUNGI	Gyromitra montana (=G.gigas)				SM	S
FUNGI	Helvella elastica				SM	S
FUNGI	Hydnum repandum (Dentinum)				SM	S
FUNGI	Hydnum umbilicatum (Dentinum)				SM	S
FUNGI	Mycena lilacifolia				SM	S
FUNGI	Mycena monticola				SM	S
FUNGI	Otidea leporina				SM	S
FUNGI	Otidea smithii				SM	S
FUNGI	Phlogiotis helvelloides				SM	S
FUNGI	Phytoconis ericetorum (Omphalina)				SM	S
FUNGI	Plectania latahensis (Sarcosoma)				SM	S
FUNGI	Polyozellus multiplex				SM	S

Survey and Manage or State Sensitive Plant Species Known or Suspected to Occur in the Swauk LSR.
(K = Known, S = Suspected)

FUNGI	Ramaria abietina				SM	S
FUNGI	Rhizopogon abietis				SM	S
FUNGI	Rhizopogon atroviolaceus				SM	S
FUNGI	Rhizopogon truncatus				SM	S
FUNGI	Sarcodon imbricatum (Hydnum)				SM	S
FUNGI	Sarcosphaera eximia (=S.crassa)				SM	S
FUNGI	Sparassis crispa				SM	S
FUNGI	Spathularia flavida				SM	S
FUNGI	Thaxterogaster pingue				SM	S
VASCULAR	Agoseris elata	tall agoseris		S		K
VASCULAR	Anemone nuttalliana	pasqueflower		S		K
VASCULAR	Astragalus arrectus	Palouse milk-vetch		S		S
VASCULAR	Chaenactis thompsonii	Thompson's chaenactis		S		K
VASCULAR	Cypripedium fasciculatum	clustered ladyslipper	SP	T	SM	K
VASCULAR	Cypripedium montanum	mountain ladyslipper			SM	K
VASCULAR	Delphinium viridescens	Wenatchee larkspur	SP	E		K
VASCULAR	Hackelia hispida var. disjuncta	sagebrush stickseed		S		S
VASCULAR	Hackelia venusta	showy stickseed	SP	E		S
VASCULAR	Iliamna longisepala	longsepal globemallow		S		S
VASCULAR	Orobanche pinorum	pine broomrape		S		K
VASCULAR	Pellaea brachyptera	Sierra cliff-brake		S		S
VASCULAR	Sidalcea oregana var. calva	Oregon checker-mallow	SP	T		S
VASCULAR	Silene seelyi	Seely's silene	SP	T		S

Appendix 8

Fish and Mollusk Species List

Fish and Aquatic Mollusk Species Known or Suspected on the Wenatchee National Forest

Suckers	*Catostomus sp.*
Sculpin sp.	*Cottus sp.*
Pacific Lamprey	*Entosphenus tridentatus*
Sunfish sp.	*Lepomis sp.*
Burbot	*Lota lota*
Small mouth bass	*Micropterus dolomieui*
Westslope Cutthroat trout	*Onchorynchus lewisi*
Cutthroat trout	*Onchoryncus clarki*
Rainbow trout	*Onchoryncus mykiss*
Steelhead trout	*Onchoryncus mykiss*
Redband/native rainbow trout	*Onchoryncus mykiss*
Bull trout	*Onchoryncus confluentus*
Chinook salmon	*Onchoryncus tshawytscha*
Kokanee salmon	*Onchoryncus nerka*
Coho salmon	*Onchoryncus kisutch*
Crappie sp.	*Pomoxis sp.*
Mountain Whitefish	*Prosorim williamsoni*
Northern Squaw fish	*Ptychocheilus oregonensis*
Redside shiners	*Richardsonius balteatus*
Dace sp.	*Rhinichthys sp.*
Eastern Brook trout	*Salvelinus fontinalis*
Lake trout	*Salvelinus namaycush*

Survey of the texts and lists available provided the following possibilities as aquatic mollusks that might be found in Washington. There have been a limited number of surveys for mollusks in the past.

Potential Aquatic Mollusks In Washington

	Amnicola sp.
California Floater Mussel	*Anodonta californienusis* Federal C2
Willamett Floater Mussel	*Anodonta w*
Western Floater Mussel	*Anodonta kennerlyi*
Oregon Floater Mussel	*Anodonta oregonensis*
	Aplexa elongata moroph tryoni
	Bythinella hemphilli
	Aplexa elongata moroph tryoni
	Bythinella hemphilli
Asian Clam	*Corbicula fluminea* (introduced)
Asian Clam	*Corbicula manilensis* (introduced)

	Ferrissia rivulans
	Fisherola nuttalli nuttalli
	Fisherola nuttalli kootaniensis
	Fisherola nuttalli lancides
Columbia Pebble Snail	*Fluminicola columbiana*
	Fluminicola fusca
	Fluminicola hindsi
	Fluminicola nattalliana (historic)
	Fluminicola virens
	***Fontelicella* sp.**
	Fossaria (Bakerilymnaea) bulimoides bulimoides
	Fossaria (Bakerilymnaea) bulimoides cockerelli
	Fossaria (Bakerilymnaea) bulimoides perplexa
	Fossaria obrussa modicella
	Fossaria obrussa obrussa
Western Ridge Mussel	*Gonidea angulata*
	Gyraulus (Torguis) parvus
	Helisoma anceps
	Helisoma (Crinifex) newberri
	Helisoma (Crinifex) newberri newberri
	Helisoma ancepsanceps
	Juga plicifer
	Juga Silicala
	Juga (Oreobasis) bulbosa
	Lanx sp.
	Lymnaea sp.
Washington Dusky Snail	*Lyogyrus n.* sp. 2; NWFP S&M Species
Western Pearl Shell	*Margaritifera falcata*
	Menetus opercularis Physa skinneri
	Physa sp.
	Physella columbiana
	Physella gyring
	Physella hordacea
	Physella lordi
	Physella propinqua propinqua
	Physella propinqua nutalli
	Physella propinqua nutalli morph triticea
	Physella propinqua nutalli morph venusta
	Physella virginea
Fingernail or Pea Clam	*Pisidium* sp.
	Planorbella binnyi
	Planorbella campestris
	Planorbella occidentale
	Planorbella (Pierosoma) subcrenaltum
	Planorbella (Pierosoma) occidentali
	Planorbella (Pierosoma) binneyi

	Planorbella subcreanatum
	Pristinicola hemphilli
	Pristinicola sp.
	Promenetus exacuous
	Promenetus umbilicatellus
Fingernail or Pea Clam	*Sphaerium sp.*
	Stagnicola elodes
	Stagnicola apicina
	Stagnicola hinkleyi montanensis
	Valvata sp.

Mussels are planktivores and serve as food for fishes and other vertebrate predators. During the past 30 years, numbers of both individuals and species diversity of native mussels have declined throughout the United States and Canada. The Nature Conservancy recognized 55% of North America's mussels as extinct or imperiled compared to 7% of the continent's bird and mammal species (Master 1990). This decline was not recognized until recently and "is primarily the result of habitat destruction and degradation associated with adverse anthropogenic activities.

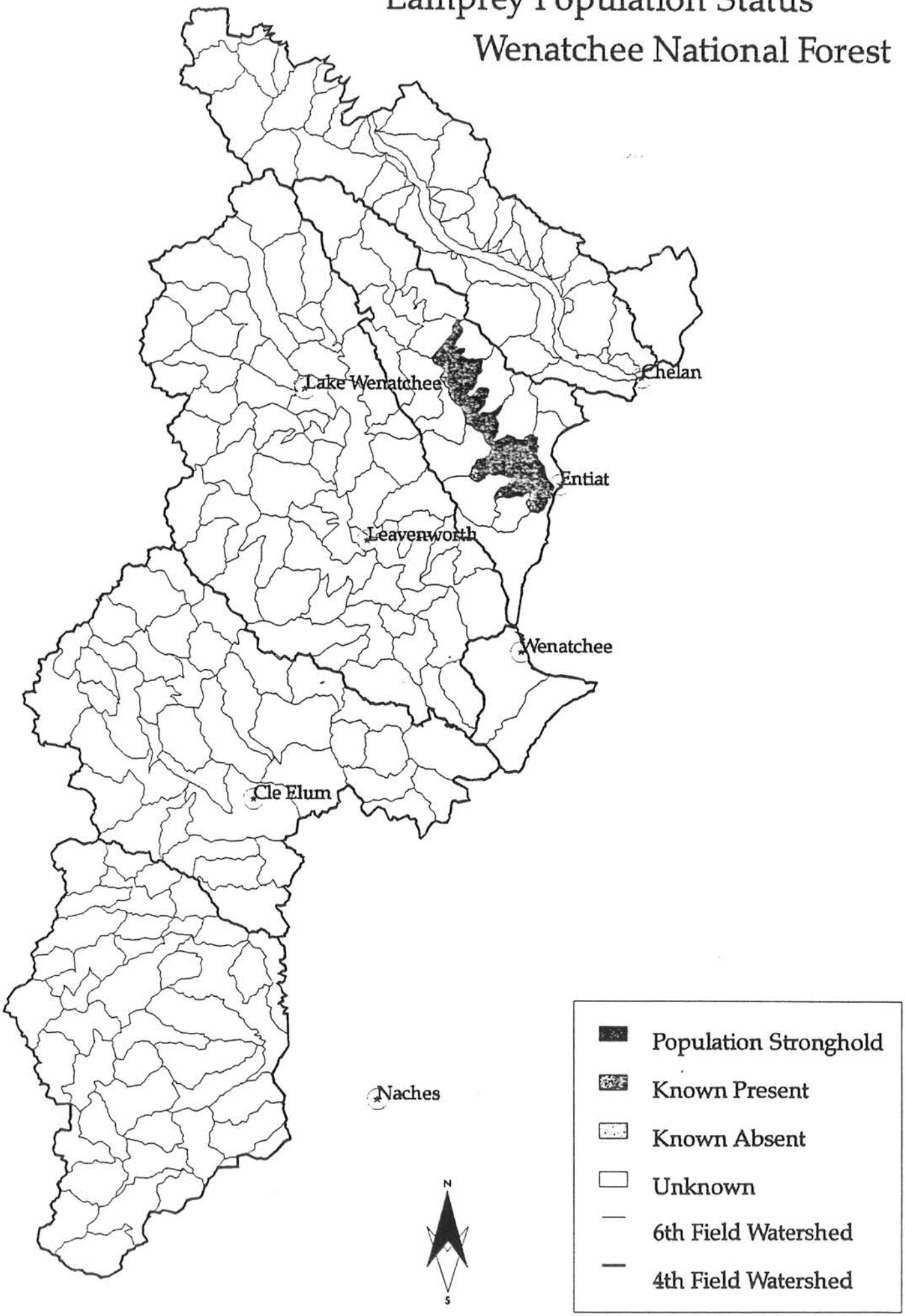
Mussels are sessil organisms and are considered good indicators of the health of aquatic ecosystems. They depend on good water quality and physical habitat conditions and an environment that will support populations of host fish. Destruction of mussel habitat has ranged from the obvious -- dams, dredging, and channelization -- to the more subtle -- siltation and contaminants. Dams change the physical, chemical and biological environment of streams, both upstream and downstream of the structure. The most detrimental effect of dams is likely the disruption of the reproductive cycle by eliminating host species, usually fish.

Erosion, caused in part by deforestation, poor agricultural practices and destruction of riparian zones has led to both increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants, such as heavy metals, pesticides and acid mine drainage, have long been recognized as threats to mussels.

Appendix 9

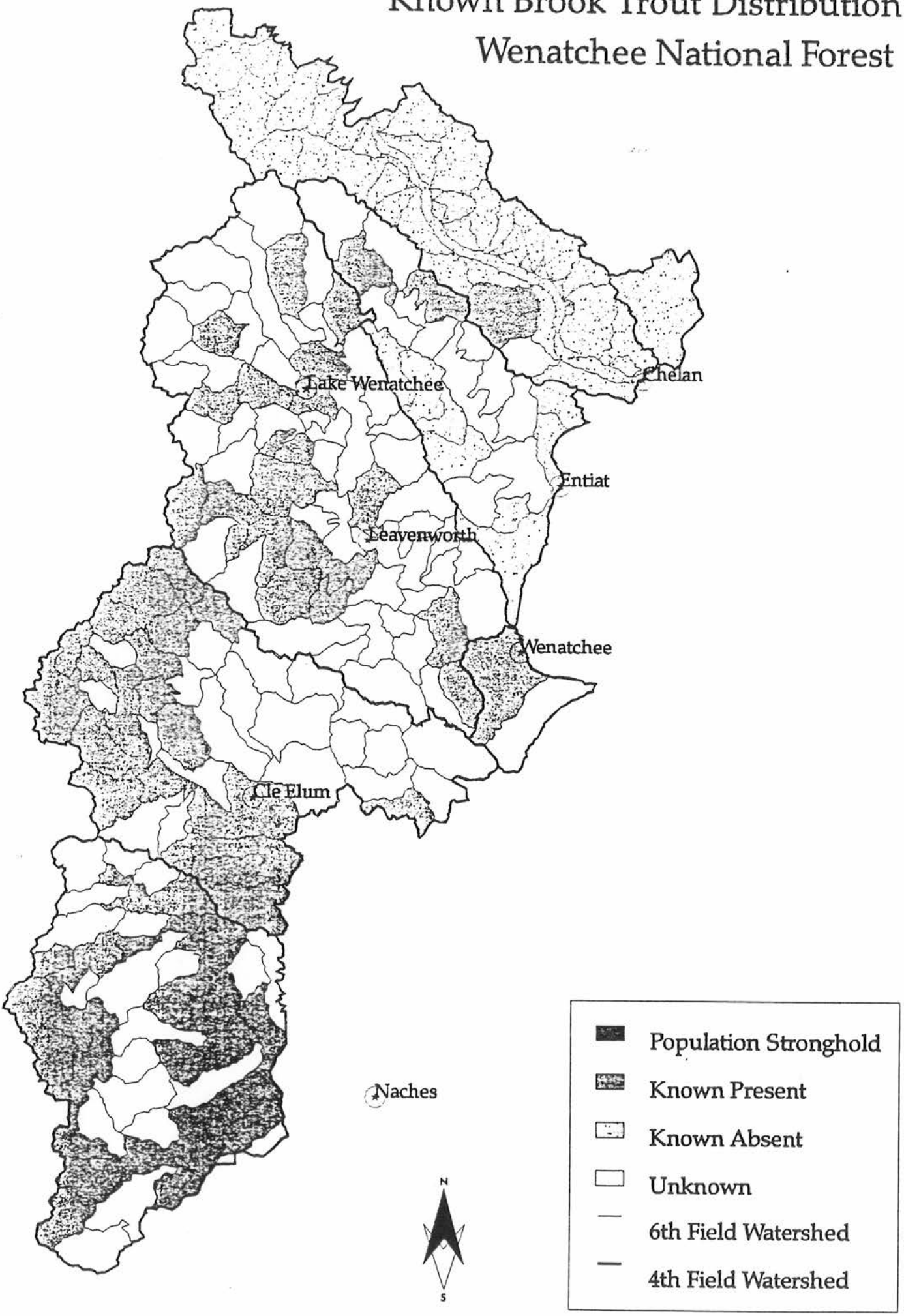
Fish Population Status Maps
Wenatchee National Forest

Lamprey Population Status
Wenatchee National Forest

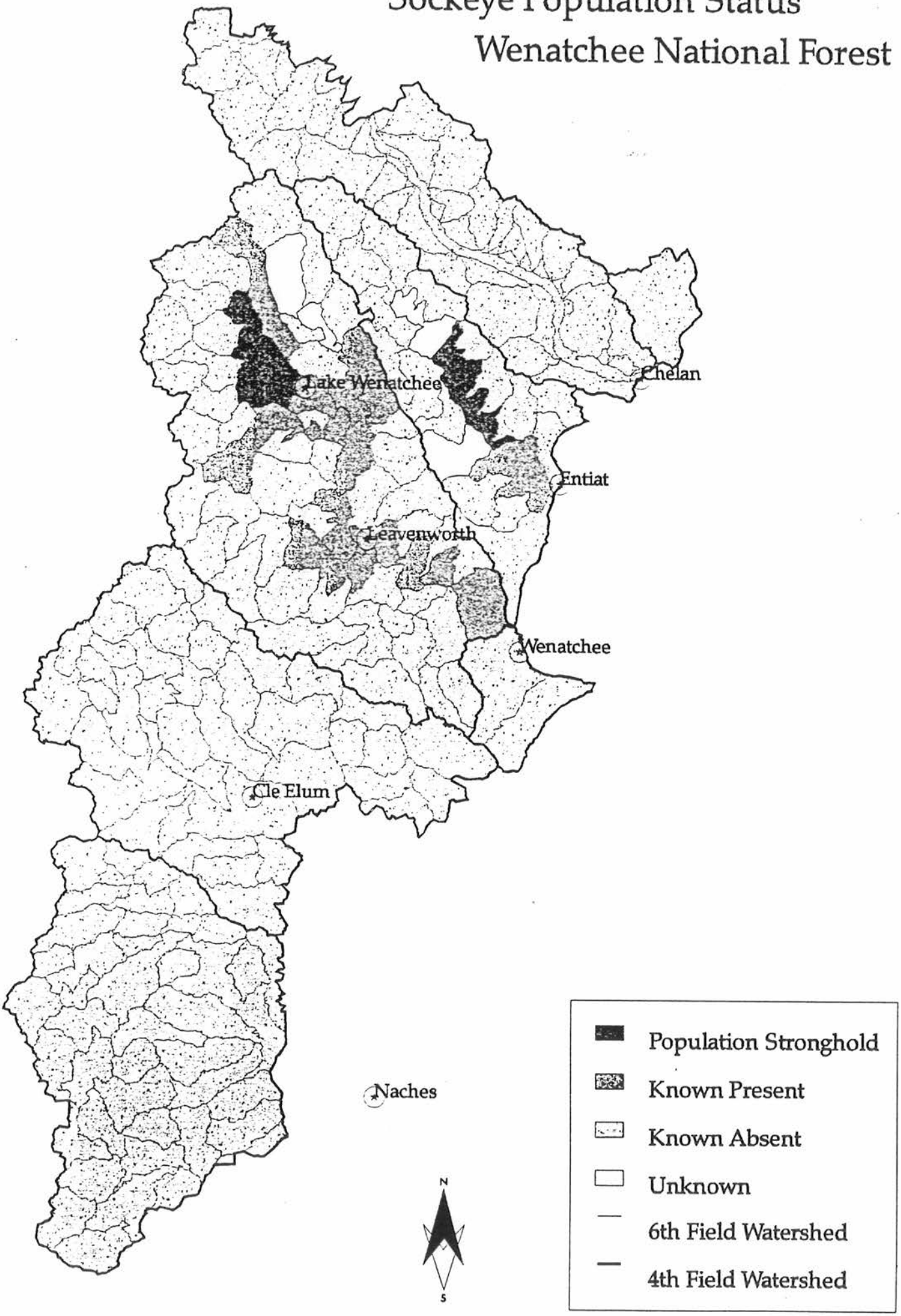


flampreyof.map March 20, 1996

Known Brook Trout Distribution
Wenatchee National Forest

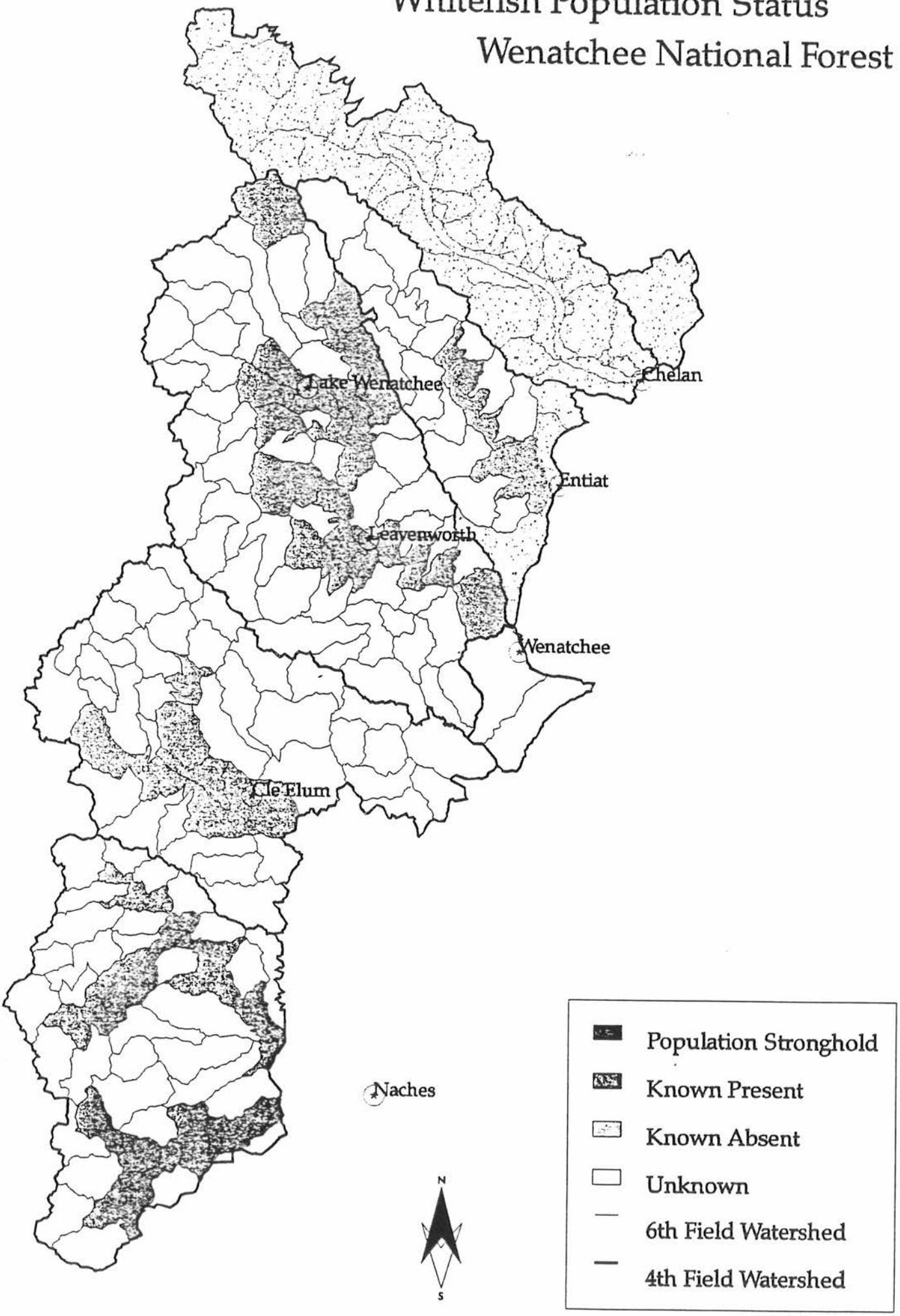


Sockeye Population Status
Wenatchee National Forest



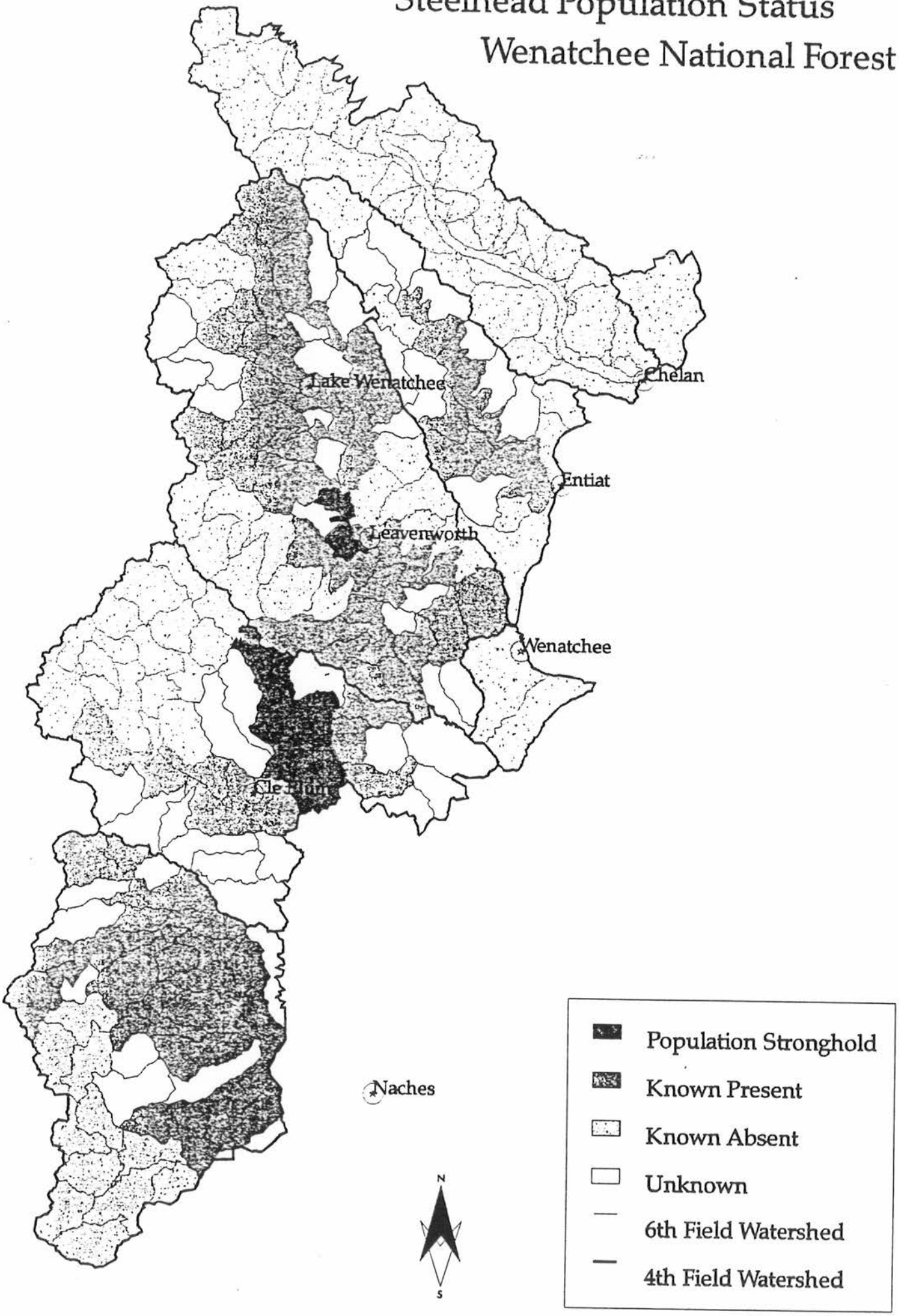
fsockof.map March 20,1996

Whitefish Population Status
Wenatchee National Forest



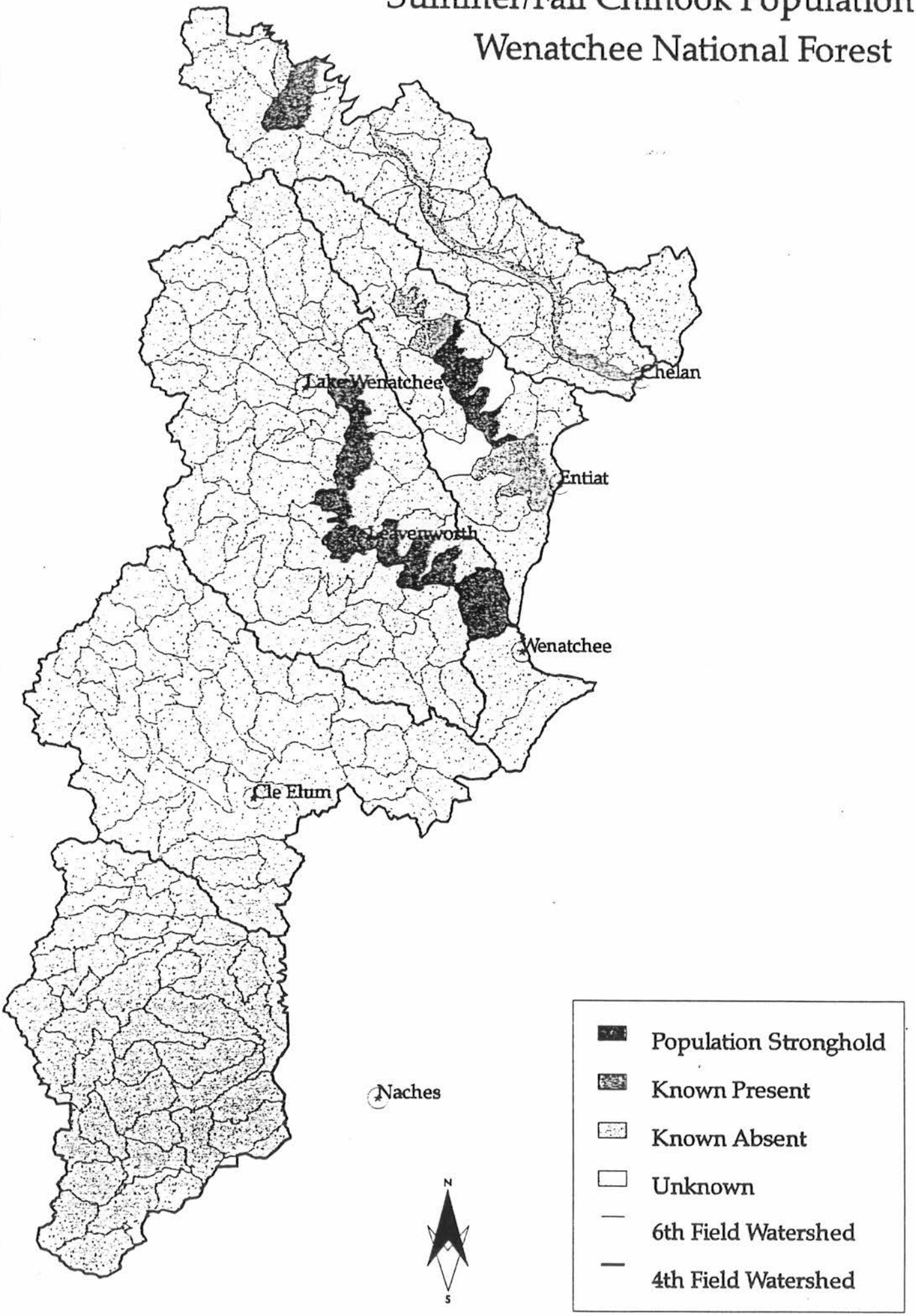
fwhiteof.map March 20,1996

Steelhead Population Status
Wenatchee National Forest



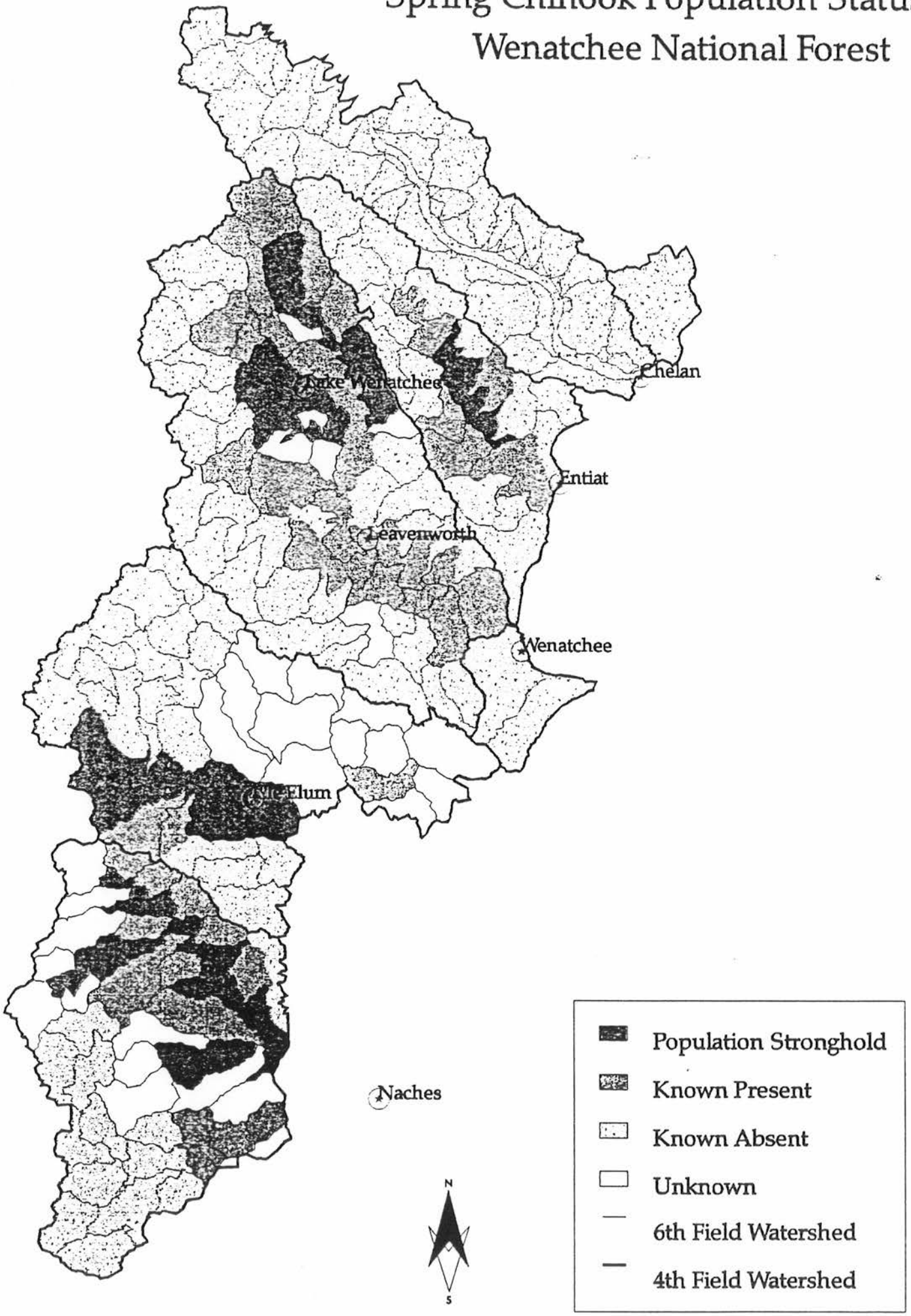
fstreelof.map March 20,1996

Summer/Fall Chinook Population Stat
Wenatchee National Forest



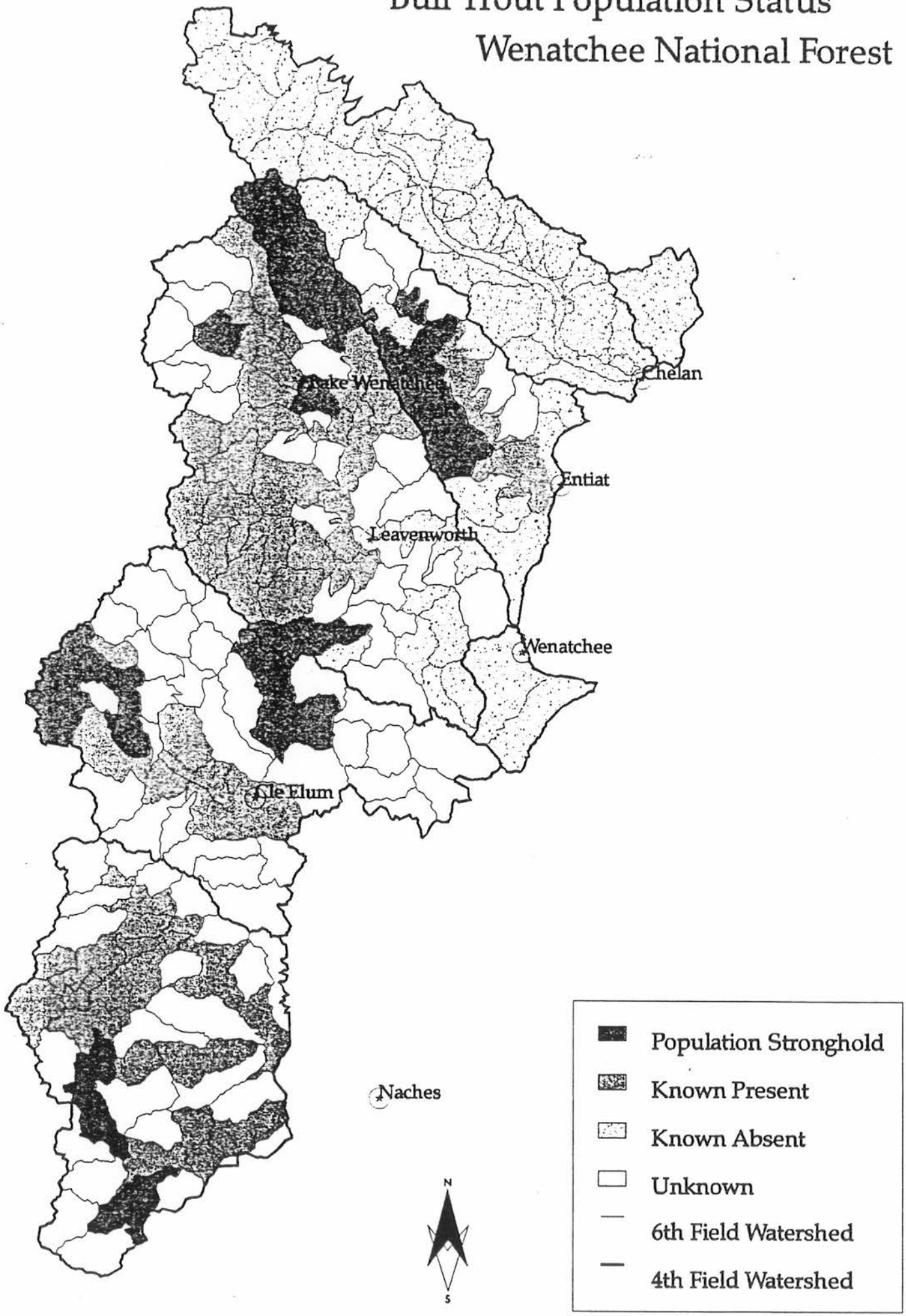
fsumchinof.map March 20,1996

Spring Chinook Population Status
Wenatchee National Forest



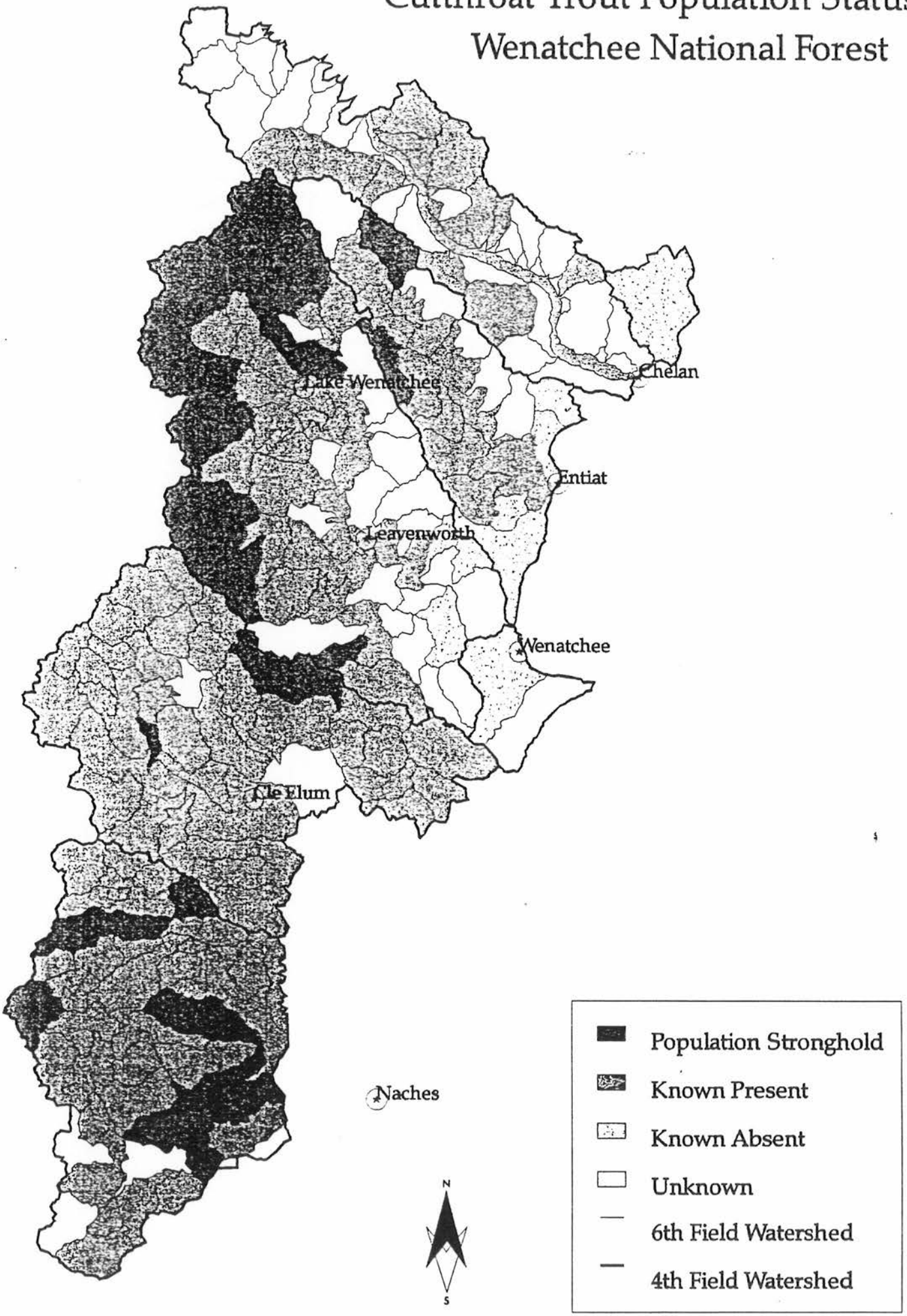
fspchinof.map March 20, 1996

Bull Trout Population Status
Wenatchee National Forest



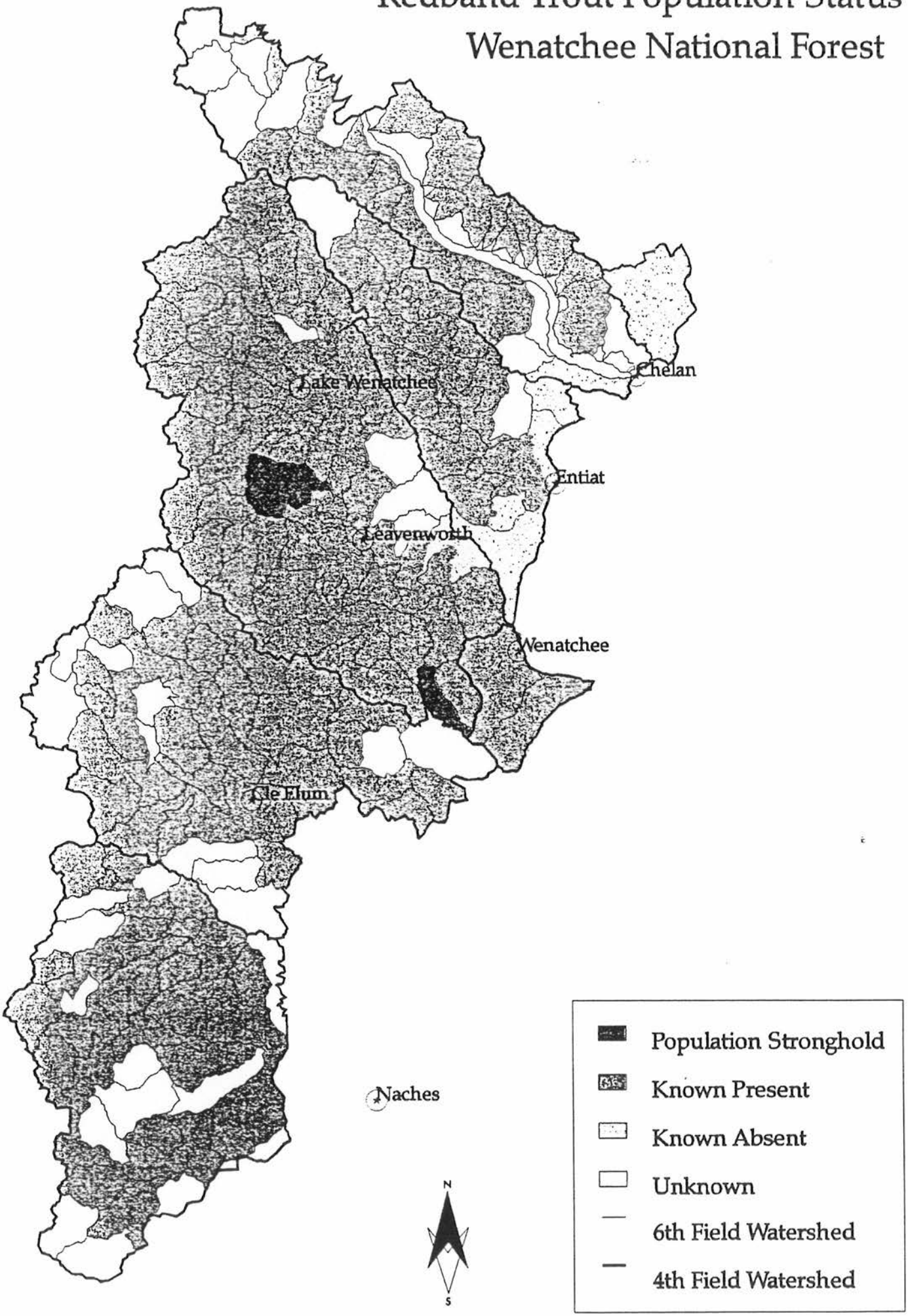
fbullof.map March 20, 1996

Cutthroat Trout Population Status
Wenatchee National Forest



fcutof.map March 20,1996

Redband Trout Population Status
Wenatchee National Forest



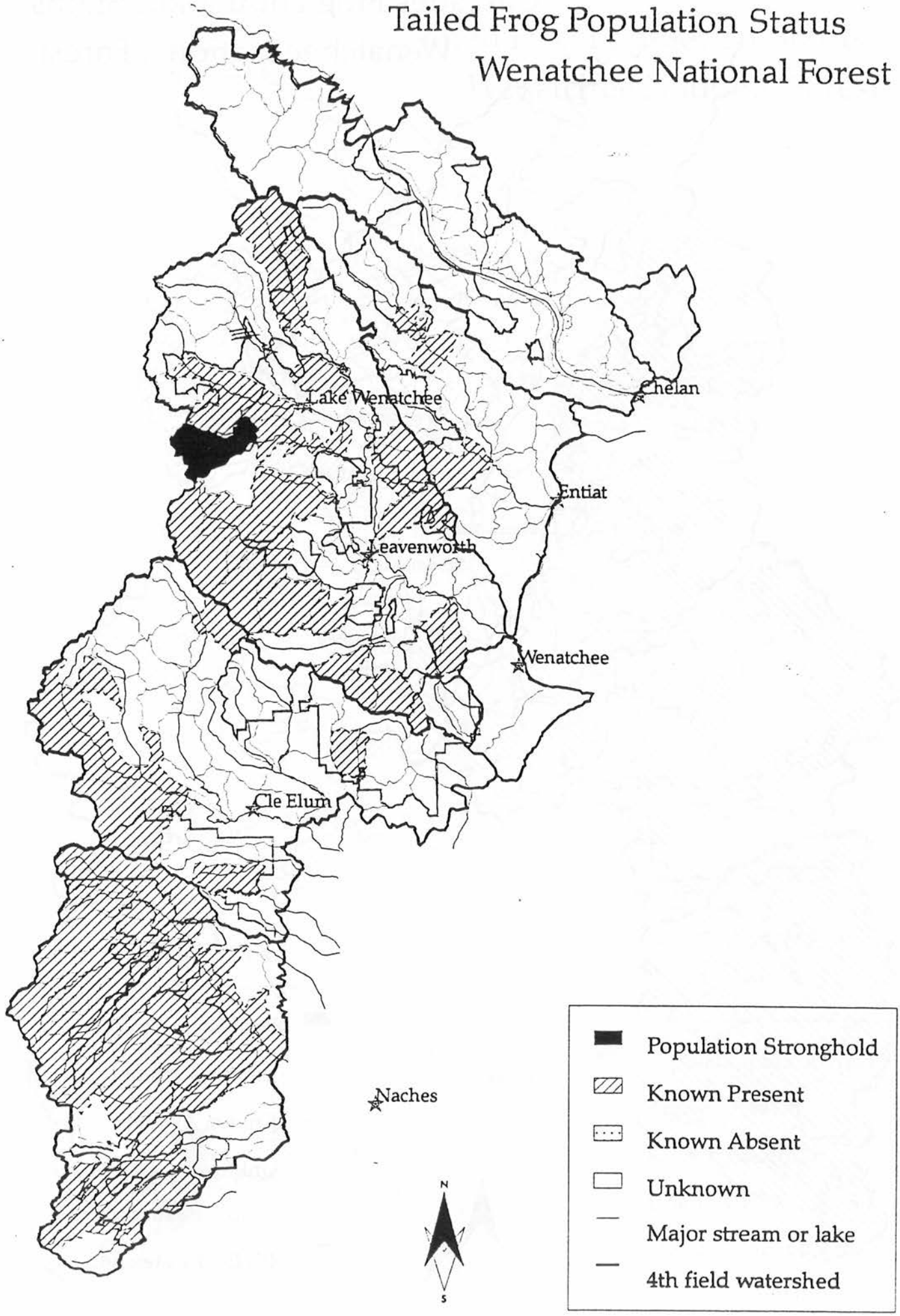
fredbundof.map March 20, 1996

Appendix 10

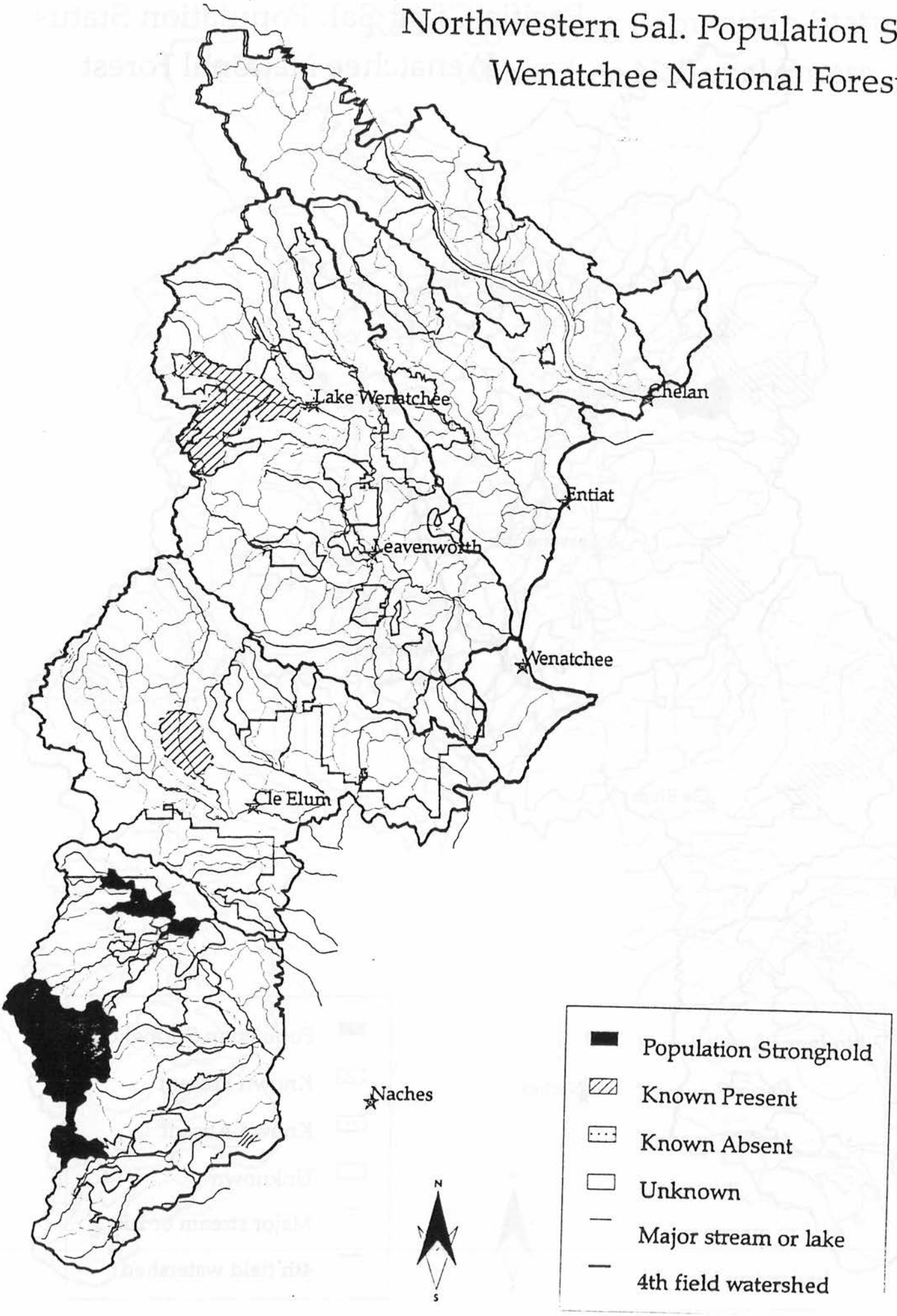
Amphibian Maps

Wenatchee National Forest

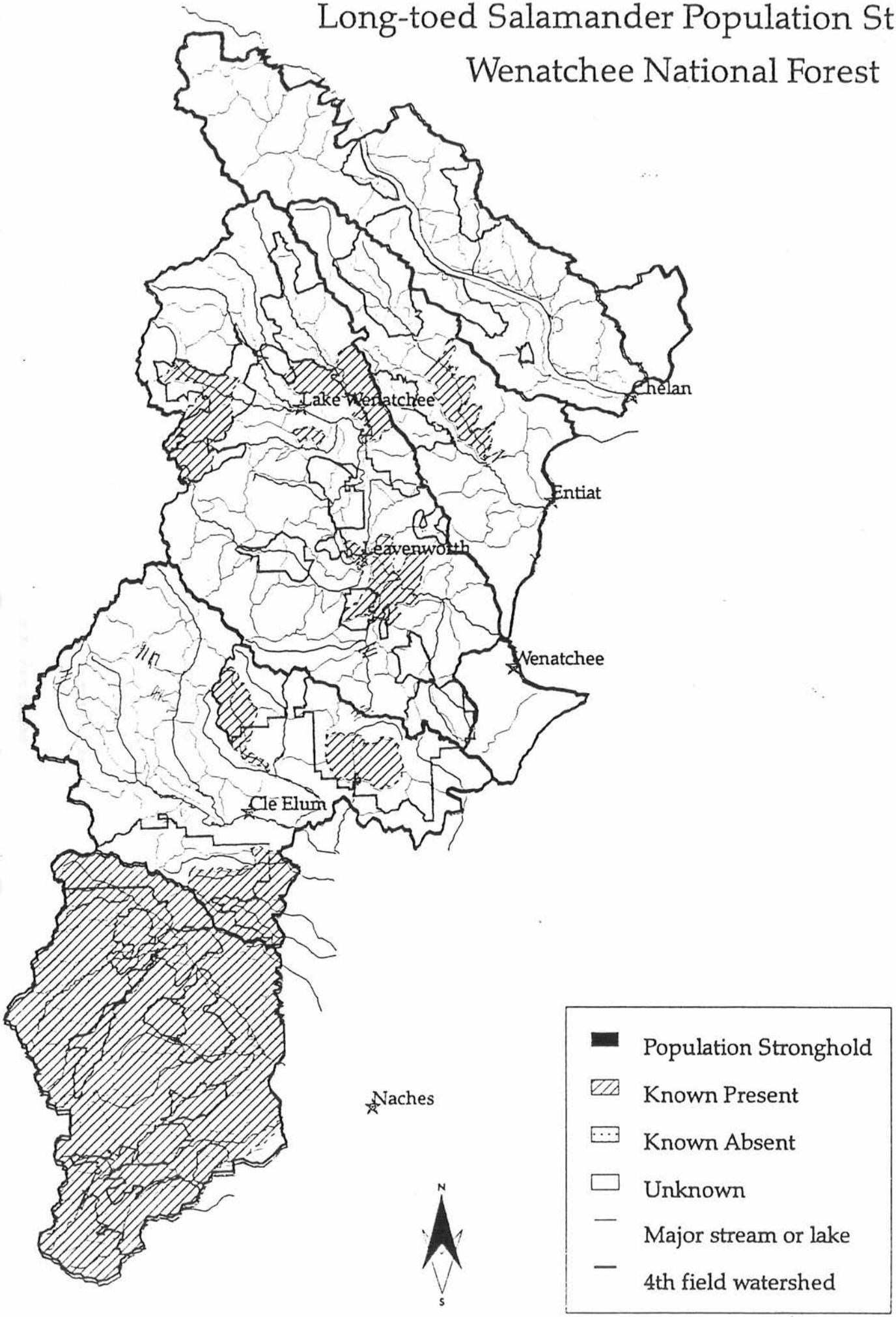
Tailed Frog Population Status
Wenatchee National Forest



Northwestern Sal. Population Status
Wenatchee National Forest



Long-toed Salamander Population Status
Wenatchee National Forest



Appendix 11

Key for Implementation of Standards and Guidelines for the Aquatic Conservation Strategy for Riparian Reserves

Note: This key is developed from the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl, pages C-30 &31. It is intended to display a logic path for project planning only in relationship to Riparian Reserves. It is not intended to present logic for all subjects needing consideration prior to project implementation.

1. Is the site being considered within 300 feet (or distance assigned in Watershed Analysis) of a "Fish Bearing Stream?"

   A. **No** Go to 2.
   B. **Yes** Is management activity planned to improve riparian condition meeting AQS standards and guidelines?
      1) Yes Project planning may proceed analyze other considerations.
      2) No No project.

2. Is the site being considered within 150 feet (or distance assigned in Watershed Analysis) of a "Permanently Flowing Non-fish Bearing Stream?"

   A. **No** Go to 3.
   B. **Yes** Is management activity planned to improve riparian condition meeting AQS standards and guidelines?
      1) Yes Project planning may proceed analyze other considerations.
      2) No No project.

3. Is the site being considered within 150 feet (or distance assigned in Watershed Analysis) of a "Constructed Pond, Reservoir or Wetland Greater Than 1 Acre?"

   A. **No** - Go to 4.
   B. **Yes** Is management activity planned to improve riparian condition meeting AQS standards and guidelines?
      1) Yes Project planning may proceed analyze other considerations.
      2) No No project.

4. Is the site being considered within 300 feet (or distance assigned in Watershed Analysis) of a Lake or Natural Pond?

   A. **No** - Go to 5.
   B. **Yes** Is management activity planned to improve riparian condition meeting AQS standards and guidelines?
      1) Yes Project planning may proceed analyze other considerations.
      2) No No project.

5. Does the site being considered have a "Seasonally Flowing or Intermittent Stream, Wetland Less Than 1 Acre, an Unstable or Potentially Unstable Area? (Intermittent streams are any non-

permanent flowing drainage feature having definable channel and evidence of annual scour or deposition.)

A. **No** Project planning may proceed analyze other considerations.
B. **Yes** Go to 6.

6. Is the site being considered within the extent of unstable and potentially unstable areas (including earthflows.)

A. **No** Go to 7.
B. **Yes** Is management activity planned to improve riparian condition meeting AQS standards and guidelines?
1) Yes Project planning may proceed analyze other considerations.
2) No No project.

7. Is the site being considered within the stream channel which extends to the top of the inner gorge.

A. **No** Go to 8.
B. **Yes** Is management activity planned to improve riparian condition meeting AQS standards and guidelines?
1) Yes Project planning may proceed analyze other considerations.
2) No No project.

8. Is the site being considered within the stream channel or wetland and the area from the edge of the stream channel or wetland to the outer edges of the riparian vegetation.

A. **No** - Go to 9.
B. **Yes** Is management activity planned to improve riparian condition meeting AQS standards and guidelines?
1) Yes Project planning may proceed analyze other considerations.
2) No No project.

9. Is the site being considered within the extension from the edges of the stream channel to the distance equal to the height of one site-potential tree or 100 feet slope distance, whichever is greatest.

A. **No** - Project planning may proceed analyze other considerations.
B. **Yes** - Is management activity planned to improve riparian condition meeting AQS standards and guidelines?
1) Yes Project planning may proceed analyze other considerations.
2) No No project.

Appendix 12

Wenatchee National Forest Spotted Owl Information in LSR's and MLSA's

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

LSR/MLSA	Owl	Status[3]	Ownership[4]	Dry or Wet Owl[5]	Threshold[6]	Critical Habitat Unit (CHU)	Forest Interior?[8]	Dispersal Habitat[9] Dry	Mesic	Wet	Total
BOUNDARY BUTTE	SO717	PY	FS	Dry	Below Threshold	WA-11		1,239	25	19	**1,283**
BOUNDARY BUTTE	SO723	PY	FS	Dry	Below Threshold	WA-11[7]	NEAR	857	1	15	**873**
BUMPING	SO803	PY	FS	Wet	Optimum	WA-15		177	0	96	**273**
BUMPING	SO820	P	FS	Wet	Optimum	WA-15	INSIDE	76	0	177	**253**
BUMPING	SO823	P	FS	Wet	Optimum	WA-15		0	0	1,527	**1,527**
BUMPING[1]	SO825	P	FS	Wet	Optimum	WA-15[7]	NEAR	0	0	1,207	**1,207**
BUMPING[1]	SO851	P	FS	Wet	Optimum	WA-15[7]	INSIDE	57	0	430	**487**
BUMPING	SO860	P	FS	Wet	Optimum	WA-15		0	0	1,135	**1,135**
BUMPING[1]	SO871	P	FS	Wet	At Threshold	WA-15[7]	INSIDE	0	0	1,183	**1,183**
CHIWAWA	SO506	PY	FS	Dry	Below Threshold	WA-6		2,411	0	39	**2,450**
CHIWAWA	SO509	PY	FS	Dry	Below Threshold	WA-6		2,292	0	110	**2,402**
CHIWAWA	SO510	PY	FS	Wet	Below Threshold	WA-6		956	0	134	**1,091**
CHIWAWA	SO604	P	FS	Wet	Optimum	WA-6	NEAR	0	0	1,051	**1,051**
CHIWAWA	SO605	PY	FS	Wet	Below Threshold	WA-6		0	0	1,471	**1,471**
CHIWAWA	SO621	PY	FS	Wet	Optimum	WA-6		0	0	1,635	**1,635**
CHIWAWA	SO627	PY	FS	Dry	Below Threshold	WA-6		1,452	38	273	**1,763**
CHIWAWA	SO630	PY	FS	Dry	Optimum	WA-6	NEAR	45	0	447	**492**
CHIWAWA	SO633	PY	FS	Dry	At Threshold	WA-6	INSIDE	187	0	821	**1,009**
CHIWAWA	SO634	RS	FS	Dry	Below Threshold	WA-6	NEAR	379	0	1,485	**1,864**
CHIWAWA	SO638	P	FS	Wet	Below Threshold	WA-6	NEAR	893	0	275	**1,167**
CHIWAWA	SO645	P	FS	Wet	Below Threshold	WA-6		703	0	681	**1,385**
CHIWAWA	SO649	PY	FS	Wet	Below Threshold	WA-6		809	0	504	**1,312**
CHIWAWA	SO708	PY	FS	Dry	Below Threshold	WA-6		2,525	708	42	**3,275**
CHIWAWA	SO714	PY	FS	Dry	Below Threshold	WA-6[7]		2,480	569	3	**3,053**
CHIWAWA	SO731	PY	FS	Dry	Below Threshold	WA-6[7]		2,017	631	0	**2,649**
CHIWAWA	SO749	PY	PVT	Dry	Below Threshold	WA-6[7]		1,438	156	0	**1,594**
DEADHORSE	SO703	PY	FS	Wet	Below Threshold	WA-9		965	45	187	**1,196**
DEADHORSE	SO715	PY	FS	Dry	Below Threshold	WA-9		1,175	113	12	**1,299**
DEADHORSE	SO720	RS	FS	Dry	Below Threshold	WA-9	NEAR	2,060	26	0	**2,085**

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

		SUITABLE SPOTTED OWL HABITAT[10]														
		1.8 mile Circle Around Activity Center				*0.7 mile Circle Around Activity Center*				*.33 mile Circle Around Activity Center*[11]				**Sustainability**		**Restoration?**
LSR/MLSA	**Owl**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	*1.8 mi.*	*0.7 mi.*	
BOUNDARY BUTTE	SO717	944	173	4	**1,121**	227	0	0	**227**	73	0	0	**73**			
BOUNDARY BUTTE	SO723	1,624	125	410	**2,159**	319	0	44	**363**	97	0	0	**97**			
BUMPING	SO803	276	0	4,619	**4,895**	53	0	771	**824**	17	0	162	**179**			
BUMPING	SO820	63	0	4,290	**4,353**	16	0	786	**801**	5	0	210	**215**			
BUMPING	SO823	0	0	4,704	**4,704**	0	0	788	**788**	0	0	135	**135**			
BUMPING[1]	SO825	0	0	4,939	**4,939**	0	0	700	**700**	0	0	187	**187**			
BUMPING[1]	SO851	321	0	5,035	**5,356**	64	0	744	**808**	17	0	181	**198**			
BUMPING	SO860	0	0	4,887	**4,887**	0	0	725	**725**	0	0	160	**160**			
BUMPING[1]	SO871	0	0	3,502	**3,502**	0	0	728	**728**	0	0	185	**185**			
CHIWAWA	SO506	476	0	75	**552**	55	0	0	**55**	13	0	0	**13**			
CHIWAWA	SO509	339	0	301	**640**	59	0	1	**60**	33	0	0	**33**			
CHIWAWA	SO510	426	0	805	**1,232**	5	0	58	**63**	0	0	0	**0**			
CHIWAWA	SO604	80	0	4,757	**4,836**	0	0	894	**894**	0	0	191	**191**			
CHIWAWA	SO605	417	0	3,894	**4,311**	42	0	451	**492**	0	0	82	**82**			
CHIWAWA	SO621	0	0	4,456	**4,456**	0	0	573	**573**	0	0	68	**68**			
CHIWAWA	SO627	428	348	899	**1,675**	132	167	114	**412**	48	17	44	**109**			
CHIWAWA	SO630	1,632	0	2,888	**4,519**	477	0	155	**632**	102	0	63	**166**			
CHIWAWA	SO633	1,209	0	2,239	**3,448**	257	0	249	**506**	56	0	51	**107**			
CHIWAWA	SO634	1,227	0	1,257	**2,484**	493	0	0	**493**	147	0	0	**147**			
CHIWAWA	SO638	376	0	2,748	**3,124**	96	0	224	**320**	62	0	32	**94**			
CHIWAWA	SO645	276	252	1,186	**1,715**	4	123	130	**257**	0	47	0	**47**			
CHIWAWA	SO649	786	0	2,183	**2,969**	64	0	200	**263**	22	0	51	**73**			
CHIWAWA	SO708	725	441	268	**1,434**	9	187	0	**196**	0	52	0	**52**			
CHIWAWA	SO714	1,010	148	168	**1,326**	172	0	0	**172**	52	0	0	**52**			
CHIWAWA	SO731	1,219	394	37	**1,650**	125	115	0	**240**	36	0	0	**36**			
CHIWAWA	SO749	1,682	12	0	**1,695**	289	0	0	**289**	69	0	0	**69**			
DEADHORSE	SO703	366	573	1,785	**2,724**	70	0	358	**428**	17	0	93	**111**			
DEADHORSE	SO715	1,068	820	739	**2,627**	231	165	60	**455**	52	46	0	**98**			
DEADHORSE	SO720	1,146	397	0	**1,542**	182	29	0	**211**	53	0	0	**53**			

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

LSR/MLSA	Owl	Status[3]	Ownership[4]	Dry or Wet Owl[5]	Threshold[6]	Critical Habitat Unit (CHU)	Forest Interior?[8]	Dispersal Habitat[9] Dry	Mesic	Wet	Total
DEADHORSE[1]	SO721	PY	FS	Dry	Below Threshold		NEAR	1,824	222	0	**2,046**
DEADHORSE	SO725	PY	FS	Dry	Below Threshold	WA-9	NEAR	2,069	124	0	**2,192**
DEADHORSE	SO726	PY	FS	Dry	Below Threshold	WA-9		1,573	71	1	**1,644**
DEADHORSE	SO727	P	FS	Dry	Below Threshold	WA-9		1,423	325	0	**1,749**
DEADHORSE	SO744	P	FS	Dry	Below Threshold	WA-9	NEAR	1,701	237	0	**1,939**
DEADHORSE	SO762	RS	PVT	Dry	Below Threshold	WA-9	NEAR	1,205	66	118	**1,389**
ICICLE	SO734	PY	FS	Wet	Optimum	WA-10	INSIDE	108	0	149	**257**
ICICLE	SO747	PY	FS	Wet	At Threshold	WA-10	NEAR	266	0	358	**625**
LITTLE WENATCHEE	SO602	P	FS	Wet	Below Threshold	WA-7		0	0	1,526	**1,526**
LITTLE WENATCHEE	SO603	PY	FS	Wet	At Threshold	WA-7	NEAR	0	0	1,438	**1,438**
LITTLE WENATCHEE	SO614	P	FS	Wet	At Threshold	WA-7	NEAR	0	0	1,016	**1,016**
LITTLE WENATCHEE	SO624	PY	FS	Wet	At Threshold	WA-8	NEAR	18	0	645	**664**
LITTLE WENATCHEE	SO631	PY	FS	Wet	Optimum	WA-7	INSIDE	0	0	1,179	**1,179**
LITTLE WENATCHEE	SO632	PY	FS	Wet	At Threshold	WA-8	NEAR	18	0	1,505	**1,523**
LITTLE WENATCHEE	SO648	P	FS	Wet	Optimum	WA-7		0	0	1,496	**1,496**
LITTLE WENATCHEE	SO653	PY	FS	Wet	Optimum	WA-7		0	0	1,138	**1,138**
LITTLE WENATCHEE	SO654	P	FS	Wet	At Threshold	WA-8		18	0	1,043	**1,061**
LUCERNE[1]	SO201	RS	FS	Dry	At Threshold		INSIDE	7	0	76	**83**
MANASTASH	SO305	PY	PVT	Wet	At Threshold	WA-14		173	0	2,435	**2,607**
MANASTASH	SO311	PY	FS	Wet	Below Threshold	WA-14		1,521	0	746	**2,266**
MANASTASH	SO321	PY	FS	Wet	At Threshold	WA-14		0	0	1,763	**1,763**
MANASTASH	SO326	PY	FS	Wet	Below Threshold	WA-14		1,312	0	1,091	**2,402**
MANASTASH	SO327	PY	PVT	Wet	Optimum	WA-14[7]		0	0	248	**248**
MANASTASH	SO332	P	FS	Wet	Optimum	WA-14	INSIDE	0	0	319	**319**
MANASTASH	SO338	PY	FS	Wet	At Threshold	WA-14	NEAR	0	0	255	**255**
MANASTASH	SO343	PY	FS	Wet	Optimum	WA-14	INSIDE	0	0	332	**332**
MANASTASH	SO349	PY	PVT	Wet	Below Threshold	WA-14		135	0	2,552	**2,687**
MANASTASH	SO351	PY	PVT	Wet	At Threshold	WA-14		569	0	1,170	**1,739**

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

		SUITABLE SPOTTED OWL HABITAT[10]														
		1.8 mile Circle Around Activity Center				*0.7 mile Circle Around Activity Center*				*.33 mile Circle Around Activity Center*[11]				**Sustainability**		**Restoration?**
LSR/MLSA	**Owl**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	*1.8 mi.*	*0.7 mi.*	
DEADHORSE[1]	SO721	1,024	0	0	**1,024**	288	0	0	**288**	82	0	0	**82**			
DEADHORSE	SO725	1,388	506	0	**1,894**	296	8	0	**303**	77	0	0	**77**			
DEADHORSE	SO726	1,279	1,258	1	**2,538**	44	475	0	**519**	0	155	0	**155**			
DEADHORSE	SO727	1,399	1,080	0	**2,480**	136	352	0	**488**	29	58	0	**87**			
DEADHORSE	SO744	1,363	438	0	**1,801**	290	2	0	**292**	91	0	0	**91**			
DEADHORSE	SO762	973	649	1,141	**2,763**	142	114	206	**463**	10	18	98	**126**			
ICICLE	SO734	7	0	5,215	**5,223**	0	0	833	**833**	0	0	186	**186**			
ICICLE	SO747	75	0	3,834	**3,910**	0	0	676	**676**	0	0	145	**145**			
LITTLE WENATCHEE	SO602	0	0	3,288	**3,288**	0	0	347	**347**	0	0	59	**59**			
LITTLE WENATCHEE	SO603	0	0	3,598	**3,598**	0	0	692	**692**	0	0	185	**185**			
LITTLE WENATCHEE	SO614	0	0	3,873	**3,873**	0	0	714	**714**	0	0	153	**153**			
LITTLE WENATCHEE	SO624	0	0	3,540	**3,540**	0	0	779	**779**	0	0	199	**199**			
LITTLE WENATCHEE	SO631	0	0	4,037	**4,037**	0	0	755	**755**	0	0	185	**185**			
LITTLE WENATCHEE	SO632	0	0	3,342	**3,342**	0	0	647	**647**	0	0	139	**139**			
LITTLE WENATCHEE	SO648	0	0	4,253	**4,253**	0	0	603	**603**	0	0	135	**135**			
LITTLE WENATCHEE	SO653	0	0	4,353	**4,353**	0	0	594	**594**	0	0	108	**108**			
LITTLE WENATCHEE	SO654	0	0	3,538	**3,538**	0	0	753	**753**	0	0	189	**189**			
LUCERNE[1]	SO201	1,677	0	2,090	**3,768**	419	0	188	**608**	158	0	6	**163**			
MANASTASH	SO305	87	0	3,535	**3,622**	0	0	534	**534**	0	0	109	**109**			
MANASTASH	SO311	908	0	2,060	**2,967**	216	0	238	**454**	47	0	22	**70**			
MANASTASH	SO321	0	0	3,807	**3,807**	0	0	657	**657**	0	0	107	**107**			
MANASTASH	SO326	830	0	2,005	**2,835**	75	0	390	**466**	21	0	117	**138**			
MANASTASH	SO327	0	0	5,317	**5,317**	0	0	827	**827**	0	0	211	**211**			
MANASTASH	SO332	0	0	4,732	**4,732**	0	0	774	**774**	0	0	202	**202**			
MANASTASH	SO338	0	0	3,712	**3,712**	0	0	619	**619**	0	0	164	**164**			
MANASTASH	SO343	0	0	4,493	**4,493**	0	0	751	**751**	0	0	215	**215**			
MANASTASH	SO349	125	0	3,494	**3,619**	0	0	406	**406**	0	0	86	**86**			
MANASTASH	SO351	462	0	2,643	**3,105**	183	0	383	**567**	63	0	109	**172**			

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

LSR/MLSA	Owl	Status[3]	Ownership[4]	Dry or Wet Owl[5]	Threshold[6]	Critical Habitat Unit (CHU)	Forest Interior?[8]	Dispersal Habitat[9] Dry	Mesic	Wet	Total
MANASTASH	SO353	PY	FS	Dry	Below Threshold	WA-14		1,123	0	621	**1,745**
MANASTASH	SO357	PY	PVT	Wet	Optimum	WA-14		0	0	1,353	**1,353**
MANASTASH	SO358	PY	FS	Wet	Optimum	WA-14	NEAR	0	0	655	**655**
MANASTASH	SO362	PY	FS	Wet	Below Threshold	WA-14	NEAR	0	0	327	**327**
MANASTASH	SO364	PY	PVT	Wet	At Threshold	WA-14[7]		0	143	505	**648**
MANASTASH	SO365	PY	FS	Wet	Below Threshold	WA-14	NEAR	197	0	1,530	**1,726**
MANASTASH	SO368	P	FS	Wet	At Threshold	WA-14		941	0	1,638	**2,578**
MANASTASH	SO375	RS	PVT	Wet	Optimum	WA-14	INSIDE	0	0	211	**211**
MANASTASH	SO378	PY	FS	Wet	At Threshold	WA-14		781	0	1,326	**2,108**
MANASTASH	SO379	PY	FS	Wet	Below Threshold	WA-14	NEAR	914	0	1,267	**2,181**
MANASTASH	SO392	P	FS	Wet	Optimum	WA-14	INSIDE	0	0	223	**223**
MANASTASH[1]	SO804	P	FS	Wet	Optimum	WA-14	INSIDE	0	0	0	**0**
MANASTASH	SO808	PY	FS	Wet	Optimum	WA-14	NEAR	0	0	13	**13**
MANASTASH	SO810	P	FS	Wet	Optimum	WA-14	INSIDE	39	0	0	**39**
MANASTASH[1]	SO811	RS	FS	Wet	Optimum	WA-14	INSIDE	0	0	0	**0**
MANASTASH	SO818	P	PVT	Wet	Optimum	WA-14[7]	INSIDE	0	0	0	**0**
MANASTASH	SO826	P	PVT	Wet	At Threshold	WA-34	NEAR	0	0	0	**0**
MANASTASH	SO829	P	FS	Wet	Optimum	WA-14	INSIDE	0	0	0	**0**
MANASTASH	SO830	P	FS	Wet	Optimum	WA-14	INSIDE	0	0	0	**0**
MANASTASH	SO839	PY	FS	Wet	Optimum	WA-14	NEAR	0	0	0	**0**
MANASTASH	SO845	P	PVT	Wet	Optimum	WA-14	INSIDE	0	0	227	**227**
MANASTASH	SO885	PY	FS	Wet	Optimum	WA-14	INSIDE	0	0	101	**101**
MANASTASH	SO894	PY	PVT	Wet	Optimum	WA-14	NEAR	0	0	109	**109**
RATTLESNAKE	SO801	P	FS	Wet	At Threshold	WA-16	INSIDE	227	0	835	**1,062**
RATTLESNAKE	SO815	P	FS	Wet	Below Threshold	WA-16		1,604	0	90	**1,694**
RATTLESNAKE	SO859	P	FS	Wet	At Threshold	WA-16		935	0	566	**1,501**
SHADY PASS	SO205	PY	FS	Wet	At Threshold	WA-4	INSIDE	128	0	68	**196**
SHADY PASS	SO502	PY	FS	Wet	Optimum	WA-5		0	0	275	**275**
SHADY PASS	SO503	P	FS	Wet	Optimum	WA-5	INSIDE	98	0	146	**244**
SHADY PASS	SO504	PY	FS	Dry	Optimum	WA-5	INSIDE	197	0	105	**302**

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

		SUITABLE SPOTTED OWL HABITAT[10]														
		1.8 mile Circle Around Activity Center				*0.7 mile Circle Around Activity Center*				*.33 mile Circle Around Activity Center*[11]				**Sustainability**		**Restoration?**
LSR/MLSA	**Owl**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	*1.8 mi.*	*0.7 mi.*	
MANASTASH	SO353	578	16	1,174	**1,768**	155	0	99	**254**	40	0	6	**46**			
MANASTASH	SO357	0	0	4,290	**4,290**	0	0	768	**768**	0	0	146	**146**			
MANASTASH	SO358	0	0	4,065	**4,065**	0	0	717	**717**	0	0	173	**173**			
MANASTASH	SO362	0	0	4,038	**4,038**	0	0	495	**495**	0	0	95	**95**			
MANASTASH	SO364	0	243	3,545	**3,789**	0	2	504	**506**	0	0	87	**87**			
MANASTASH	SO365	231	0	3,764	**3,994**	57	0	371	**428**	1	0	106	**107**			
MANASTASH	SO368	638	0	2,484	**3,122**	136	0	467	**604**	43	0	101	**144**			
MANASTASH	SO375	0	0	4,610	**4,610**	0	0	704	**704**	0	0	214	**214**			
MANASTASH	SO378	457	0	3,141	**3,598**	82	0	453	**535**	54	0	71	**125**			
MANASTASH	SO379	572	0	2,722	**3,294**	74	0	335	**409**	0	0	113	**113**			
MANASTASH	SO392	0	0	4,764	**4,764**	0	0	881	**881**	0	0	202	**202**			
MANASTASH[1]	SO804	0	0	5,396	**5,396**	0	0	864	**864**	0	0	218	**218**			
MANASTASH	SO808	0	0	5,151	**5,151**	0	0	777	**777**	0	0	165	**165**			
MANASTASH	SO810	8	0	4,705	**4,713**	0	0	731	**731**	0	0	182	**182**			
MANASTASH[1]	SO811	0	0	5,536	**5,536**	0	0	916	**916**	0	0	215	**215**			
MANASTASH	SO818	0	0	5,465	**5,465**	0	0	899	**899**	0	0	216	**216**			
MANASTASH	SO826	0	0	3,569	**3,569**	0	0	606	**606**	0	0	159	**159**			
MANASTASH	SO829	0	0	5,398	**5,398**	0	0	863	**863**	0	0	202	**202**			
MANASTASH	SO830	0	0	5,008	**5,008**	0	0	804	**804**	0	0	197	**197**			
MANASTASH	SO839	0	0	5,312	**5,312**	0	0	818	**818**	0	0	169	**169**			
MANASTASH	SO845	0	0	5,590	**5,590**	0	0	980	**980**	0	0	216	**216**			
MANASTASH	SO885	0	0	5,459	**5,459**	0	0	918	**918**	0	0	217	**217**			
MANASTASH	SO894	0	0	5,300	**5,300**	0	0	807	**807**	0	0	195	**195**			
RATTLESNAKE	SO801	72	0	3,799	**3,871**	69	0	670	**739**	34	0	135	**169**			
RATTLESNAKE	SO815	261	0	1,849	**2,110**	56	0	457	**513**	27	0	88	**115**			
RATTLESNAKE	SO859	101	0	3,328	**3,429**	0	0	556	**556**	0	0	105	**105**			
SHADY PASS	SO205	927	0	2,319	**3,245**	33	0	607	**640**	1	0	154	**155**			
SHADY PASS	SO502	8	0	5,436	**5,444**	0	0	724	**724**	0	0	178	**178**			
SHADY PASS	SO503	257	0	5,102	**5,359**	78	0	619	**697**	17	0	155	**171**			
SHADY PASS	SO504	1,021	0	3,465	**4,486**	285	0	245	**529**	127	0	11	**138**			

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

LSR/MLSA	Owl	Status[3]	Ownership[4]	Dry or Wet Owl[5]	Threshold[6]	Critical Habitat Unit (CHU)	Forest Interior?[8]	Dispersal Habitat[9] Dry	Mesic	Wet	Total
SWAUK	SO301	PY	FS	Dry	Below Threshold	WA-12		1,380	0	171	**1,550**
SWAUK	SO304	PY	FS	Wet	Below Threshold	WA-12		1,605	0	662	**2,267**
SWAUK	SO309	PY	FS	Dry	Below Threshold	WA-12		1,689	0	226	**1,915**
SWAUK	SO310	PY	FS	Dry	Below Threshold	WA-12		1,054	0	765	**1,818**
SWAUK	SO312	PY	FS	Dry	Below Threshold	WA-12		3,489	0	50	**3,539**
SWAUK	SO317	PY	FS	Dry	Below Threshold	WA-12	INSIDE	1,846	0	43	**1,889**
SWAUK	SO318	PY	FS	Dry	Below Threshold	WA-12		2,699	0	113	**2,812**
SWAUK	SO323	PY	FS	Wet	Below Threshold	WA-12		1,016	0	628	**1,644**
SWAUK	SO324	P	FS	Dry	Below Threshold	WA-12		2,127	0	36	**2,163**
SWAUK	SO335	PY	FS	Dry	At Threshold	WA-12	INSIDE	1,297	0	738	**2,036**
SWAUK	SO336	PY	FS	Dry	Below Threshold	WA-12	INSIDE	2,847	0	76	**2,923**
SWAUK	SO337	PY	FS	Dry	Below Threshold	WA-12		2,267	0	50	**2,317**
SWAUK	SO345	PY	FS	Wet	Below Threshold	WA-12		858	0	130	**988**
SWAUK	SO350	PY	FS	Dry	Below Threshold	WA-12	NEAR	3,029	0	112	**3,141**
SWAUK	SO352	P	FS	Wet	At Threshold	WA-12		840	0	515	**1,355**
SWAUK	SO370	P	FS	Dry	Below Threshold	WA-12	INSIDE	917	0	37	**954**
SWAUK	SO387	PY	FS	Wet	Below Threshold		NEAR	677	0	338	**1,015**
SWAUK	SO701	PY	FS	Dry	Below Threshold	WA-12	NEAR	1,335	172	86	**1,593**
SWAUK	SO712	PY	FS	Wet	Below Threshold	WA-12		593	97	951	**1,642**
SWAUK	SO713	PY	FS	Dry	Below Threshold	WA-12	NEAR	1,463	158	322	**1,944**
SWAUK	SO756	PY	FS	Dry	Below Threshold	WA-12		670	191	706	**1,567**
SWAUK	SO757	RS	FS	Dry	Below Threshold	WA-12	NEAR	552	108	1,028	**1,688**
SWAUK	SO761	PY	FS	Dry	Below Threshold	WA-12[7]		1,796	163	2	**1,960**
SWAUK	SO764	RS	FS	Dry	Below Threshold	WA-12[7]		1,440	82	246	**1,768**
TEANAWAY	SO306	PY	FS	Wet	Below Threshold	WA-13		376	0	280	**655**
TEANAWAY	SO319	PY	FS	Wet	At Threshold	WA-12	NEAR	573	0	349	**922**
TEANAWAY	SO344	PY	FS	Dry	Below Threshold	WA-13	NEAR	610	0	209	**819**
TEANAWAY	SO356	PY	FS	Dry	At Threshold	WA-13	NEAR	590	0	536	**1,126**
TEANAWAY	SO381	PY	FS	Wet	Below Threshold	WA-13		614	0	466	**1,080**
TIETON[1]	SO800	P	FS	Wet	At Threshold	WA-18[7]		35	0	1,125	**1,160**

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

		SUITABLE SPOTTED OWL HABITAT[10]														
		1.8 mile Circle Around Activity Center				*0.7 mile Circle Around Activity Center*				*.33 mile Circle Around Activity Center*[11]				**Sustainability**		**Restoration?**
LSR/MLSA	**Owl**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	*1.8 mi.*	*0.7 mi.*	
SWAUK	SO301	1,029	0	1,263	**2,292**	282	0	111	**394**	81	0	1	**82**			
SWAUK	SO304	435	0	2,431	**2,866**	58	0	415	**473**	14	0	77	**91**			
SWAUK	SO309	1,260	0	451	**1,711**	282	0	137	**419**	61	0	59	**120**			
SWAUK	SO310	1,097	0	1,662	**2,759**	249	0	243	**492**	71	0	47	**118**			
SWAUK	SO312	1,369	0	128	**1,496**	255	0	0	**255**	79	0	0	**79**			
SWAUK	SO317	2,138	0	104	**2,241**	427	0	0	**427**	98	0	0	**98**			
SWAUK	SO318	1,239	0	655	**1,894**	151	0	37	**188**	38	0	13	**51**			
SWAUK	SO323	813	0	2,105	**2,918**	126	0	271	**398**	48	0	13	**61**			
SWAUK	SO324	1,916	0	161	**2,077**	323	0	0	**323**	66	0	0	**66**			
SWAUK	SO335	1,015	0	1,748	**2,762**	332	0	204	**536**	103	0	8	**111**			
SWAUK	SO336	1,068	0	651	**1,720**	234	0	0	**234**	72	0	0	**72**			
SWAUK	SO337	1,868	0	226	**2,094**	284	0	2	**286**	47	0	0	**47**			
SWAUK	SO345	633	0	625	**1,258**	53	0	76	**129**	22	0	23	**45**			
SWAUK	SO350	1,355	0	292	**1,647**	221	0	0	**221**	59	0	0	**59**			
SWAUK	SO352	839	0	2,560	**3,399**	187	0	419	**607**	45	0	91	**135**			
SWAUK	SO370	2,141	0	348	**2,489**	449	0	1	**450**	102	0	0	**102**			
SWAUK	SO387	559	0	1,306	**1,865**	137	0	231	**369**	62	0	19	**81**			
SWAUK	SO701	1,653	565	130	**2,348**	291	73	0	**364**	83	29	0	**112**			
SWAUK	SO712	985	186	1,659	**2,830**	209	0	210	**419**	44	0	4	**48**			
SWAUK	SO713	1,491	556	357	**2,403**	328	119	0	**447**	72	23	0	**95**			
SWAUK	SO756	1,336	332	1,034	**2,702**	278	67	89	**434**	69	18	14	**101**			
SWAUK	SO757	1,048	184	1,633	**2,865**	259	7	126	**392**	83	0	24	**107**			
SWAUK	SO761	1,817	468	10	**2,295**	205	115	0	**320**	22	54	0	**75**			
SWAUK	SO764	1,284	371	445	**2,100**	229	107	3	**339**	43	59	0	**102**			
TEANAWAY	SO306	699	0	1,765	**2,465**	53	0	442	**495**	22	0	97	**119**			
TEANAWAY	SO319	805	0	2,059	**2,864**	178	0	350	**528**	33	0	104	**137**			
TEANAWAY	SO344	779	0	1,053	**1,832**	211	0	103	**314**	64	0	9	**73**			
TEANAWAY	SO356	898	0	2,573	**3,472**	299	0	251	**550**	85	0	35	**120**			
TEANAWAY	SO381	568	0	1,854	**2,422**	138	0	486	**624**	20	0	151	**170**			
TIETON[1]	SO800	0	0	3,392	**3,392**	0	0	655	**655**	0	0	189	**189**			

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

LSR/MLSA	Owl	Status[3]	Ownership[4]	Dry or Wet Owl[5]	Threshold[6]	Critical Habitat Unit (CHU)	Forest Interior?[8]	Dispersal Habitat[9] Dry	Mesic	Wet	Total
TIETON	SO802	P	FS	Wet	Optimum	WA-17	NEAR	241	0	129	**369**
TIETON	SO809	PY	FS	Wet	Optimum	WA-17	INSIDE	56	0	104	**159**
TIETON	SO812	P	FS	Wet	At Threshold	WA-17	NEAR	100	0	75	**175**
TIETON	SO819	P	FS	Wet	At Threshold	WA-18		0	0	1,630	**1,630**
TIETON	SO828	P	FS	Wet	At Threshold	WA-18	NEAR	221	0	351	**572**
TIETON	SO835	P	FS	Wet	At Threshold	WA-17[7]	INSIDE	159	0	852	**1,011**
TIETON	SO837	P	FS	Wet	Optimum	WA-17	INSIDE	51	0	28	**79**
TIETON	SO841	P	FS	Dry	At Threshold	WA-17	NEAR	446	0	136	**582**
TIETON	SO855	PY	FS	Wet	Optimum	WA-17[7]		88	0	8	**96**
TIETON	SO870	P	FS	Wet	Optimum	WA-17	NEAR	49	0	327	**376**
TIETON	SO882	PY	FS	Wet	At Threshold	WA-18	NEAR	65	0	317	**382**
TIETON[1]	SO888	PY	FS	Wet	At Threshold	WA-18[7]		0	0	1,381	**1,381**
UPPER NILE[2]	SO814	P	FS	Wet	At Threshold			649	0	61	**709**
UPPER NILE	SO862	RS	FS	Wet	Optimum			311	0	33	**344**
UPPER NILE	SO863	P	FS	Wet	At Threshold		INSIDE	587	0	28	**616**
CROW	SO805	PY	FS	Wet	Optimum		NEAR	0	0	27	**27**
CROW	SO824	P	FS	Wet	Optimum		NEAR	0	0	79	**79**
CROW	SO854	P	FS	Wet	At Threshold		INSIDE	246	0	231	**477**
CROW	SO874	P	FS	Wet	At Threshold			47	0	205	**252**
CROW	SO886	P	FS	Wet	Optimum		NEAR	0	0	54	**54**
EAGLE	SO748	PY	FS	Wet	Below Threshold		NEAR	2,095	13	7	**2,115**
HAYSTACK	SO806	P	FS	Dry	Below Threshold		NEAR	475	0	0	**475**
HAYSTACK[2]	SO814	P	FS	Wet	At Threshold			649	0	61	**709**
HAYSTACK	SO846	P	FS	Dry	Below Threshold			738	0	38	**776**
HAYSTACK	SO866	P	FS	Wet	At Threshold		NEAR	669	0	31	**699**
HAYSTACK	SO868	P	FS	Dry	Below Threshold		NEAR	1,531	0	0	**1,531**
HAYSTACK	SO879	RS	FS	Dry	Below Threshold		NEAR	1,077	0	0	**1,077**
HAYSTACK	SO883	P	FS	Dry	Below Threshold		INSIDE	795	0	30	**825**

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

		SUITABLE SPOTTED OWL HABITAT[10]														
		1.8 mile Circle Around Activity Center				*0.7 mile Circle Around Activity Center*				*.33 mile Circle Around Activity Center*[11]				**Sustainability**		**Restoration?**
LSR/MLSA	**Owl**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	*1.8 mi.*	*0.7 mi.*	
TIETON	SO802	679	0	3,427	**4,105**	158	0	537	**695**	43	0	121	**164**			
TIETON	SO809	423	0	4,490	**4,913**	34	0	826	**859**	3	0	216	**220**			
TIETON	SO812	1,232	0	2,408	**3,640**	182	0	449	**631**	33	0	129	**162**			
TIETON	SO819	0	0	3,419	**3,419**	0	0	529	**529**	0	0	116	**116**			
TIETON	SO828	694	0	2,505	**3,200**	108	0	491	**599**	10	0	156	**167**			
TIETON	SO835	71	0	2,879	**2,950**	0	0	540	**540**	0	0	173	**173**			
TIETON	SO837	28	0	4,817	**4,845**	0	0	819	**819**	0	0	187	**187**			
TIETON	SO841	1,452	0	1,769	**3,220**	507	0	35	**542**	153	0	0	**153**			
TIETON	SO855	41	0	4,911	**4,952**	5	0	803	**808**	5	0	131	**136**			
TIETON	SO870	341	0	3,879	**4,220**	0	0	699	**699**	0	0	160	**160**			
TIETON	SO882	15	0	2,888	**2,903**	0	0	539	**539**	0	0	133	**133**			
TIETON[1]	SO888	0	0	3,731	**3,731**	0	0	740	**740**	0	0	174	**174**			
UPPER NILE[2]	SO814	462	0	2,675	**3,137**	21	0	536	**557**	3	0	155	**158**			
UPPER NILE	SO862	65	0	4,206	**4,270**	24	0	630	**655**	10	0	109	**119**			
UPPER NILE	SO863	179	0	3,765	**3,944**	23	0	623	**645**	0	0	178	**178**			
CROW	SO805	0	0	4,873	**4,873**	0	0	841	**841**	0	0	182	**182**			
CROW	SO824	92	0	4,331	**4,423**	0	0	783	**783**	0	0	185	**185**			
CROW	SO854	220	0	3,755	**3,975**	23	0	729	**752**	6	0	206	**213**			
CROW	SO874	274	0	3,692	**3,966**	139	0	415	**554**	33	0	121	**154**			
CROW	SO886	0	0	5,190	**5,190**	0	0	713	**713**	0	0	162	**162**			
EAGLE	SO748	932	366	1,181	**2,479**	125	59	285	**469**	24	18	115	**157**			
HAYSTACK	SO806	1,435	0	1,611	**3,046**	336	0	25	**361**	107	0	1	**109**			
HAYSTACK[2]	SO814	462	0	2,675	**3,137**	21	0	536	**557**	3	0	155	**158**			
HAYSTACK	SO846	1,292	0	1,607	**2,898**	199	0	147	**347**	61	0	27	**89**			
HAYSTACK	SO866	1,360	0	1,778	**3,138**	145	0	439	**584**	40	0	112	**152**			
HAYSTACK	SO868	1,072	0	622	**1,694**	170	0	0	**170**	66	0	0	**66**			
HAYSTACK	SO879	1,516	0	1,190	**2,707**	246	0	238	**485**	77	0	40	**117**			
HAYSTACK	SO883	1,613	0	1,244	**2,857**	286	0	139	**425**	69	0	3	**72**			

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

LSR/MLSA	Owl	Status[3]	Ownership[4]	Dry or Wet Owl[5]	Threshold[6]	Critical Habitat Unit (CHU)	Forest Interior?[8]	Dispersal Habitat[9] Dry	Mesic	Wet	Total
HAYSTACK	SO890	P	FS	Dry	Below Threshold		NEAR	890	0	0	**890**
LOST LAKE	SO807	P	FS	Wet	At Threshold	WA-18[7]		126	0	421	**547**
MILK CREEK	SO838	PY	FS	Wet	At Threshold			303	0	85	**387**
MILK CREEK	SO840	PY	FS	Wet	Below Threshold			197	0	0	**197**
MILK CREEK	SO865	P	FS	Wet	At Threshold		NEAR	585	0	44	**629**
RUSSELL RIDGE	SO831	PY	FS	Wet	Below Threshold		NEAR	618	0	94	**712**
RUSSELL RIDGE	SO864	P	FS	Dry	Below Threshold			352	0	0	**352**
SAND CREEK	SO729	PY	FS	Dry	Below Threshold	WA-12	NEAR	1,431	43	0	**1,474**
SAND CREEK	SO753	RS	FS	Dry	Below Threshold			1,965	67	0	**2,032**
SAND CREEK	SO758	P	PVT	Dry	Below Threshold			1,428	3	0	**1,432**
TUMWATER	SO722	PY	FS	Dry	Below Threshold	WA-9		1,018	0	129	**1,146**
TWIN LAKES	SO611	PY	FS	Wet	Below Threshold			0	0	1,277	**1,277**

[1] Near the LSR or MLSA but not inside the LSR or MLSA.

[2] This owl is inside Haystack MLSA but is close to Upper Nile LSR.

[3] RS = Residential Single; P = Pair; PY = Pair with Young.

[4] FS = Forest Service; PVT = Private Ownership (ownership at activity center).

[5] If the majority of suitable spotted owl habitat in .7 mile circle is dry or mesic, then it is a dry owl. If the majority is wet, then it is a wet owl.

[6] Below Threshold: < 2,663 total suitable spotted owl habitat acres in 1.8 mile circle or < 500 total suitable spotted owl habitat acres in 0.7 mile circle.
At Threshold: 2,663-3,994 total suitable spotted owl habitat acres in 1.8 mile circle.
Optimum: > 3,994 total suitable spotted owl habitat acres in 1.8 mile circle.

[7] The activity center is within 1/2 mile of the CHU.

[8] Inside = activity center is at least 600' inside (forest interior) late successional habitat.
Near = activity center is inside late successional habiatat near forest interior.

[9] Habitat within 1.8 mile circle around activity center. Dry dispersal habitat includes vegetation codes 11, 13, and 52; mesic includes code 21; and wet includes codes 31, 35, 61, and 41.

Wenatchee National Forest SPOTTED OWL INFORMATION in LSRs and MLSAs

		SUITABLE SPOTTED OWL HABITAT[10]														
		1.8 mile Circle Around Activity Center				*0.7 mile Circle Around Activity Center*				*.33 mile Circle Around Activity Center*[11]				**Sustainability**		**Restoration?**
LSR/MLSA	**Owl**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	Dry	Mesic	Wet	**Total**	*1.8 mi.*	*0.7 mi.*	
HAYSTACK	SO890	1,535	0	948	**2,483**	251	0	96	**347**	54	0	53	**107**			
LOST LAKE	SO807	1,152	0	1,734	**2,886**	120	0	427	**547**	52	0	95	**147**			
MILK CREEK	SO838	46	0	3,741	**3,787**	0	0	621	**621**	0	0	162	**162**			
MILK CREEK	SO840	212	0	3,503	**3,716**	85	0	393	**478**	15	0	123	**137**			
MILK CREEK	SO865	194	0	2,806	**3,000**	9	0	595	**604**	3	0	147	**150**			
RUSSELL RIDGE	SO831	1,083	0	1,655	**2,737**	196	0	203	**399**	60	0	46	**106**			
RUSSELL RIDGE	SO864	1,097	0	1,256	**2,353**	252	0	96	**347**	72	0	50	**123**			
SAND CREEK	SO729	1,799	864	0	**2,663**	448	143	0	**592**	106	19	0	**125**			
SAND CREEK	SO753	1,331	340	168	**1,839**	162	21	0	**183**	39	0	0	**39**			
SAND CREEK	SO758	1,715	559	0	**2,274**	271	135	0	**405**	54	58	0	**112**			
TUMWATER	SO722	333	17	576	**926**	61	0	0	**61**	27	0	0	**27**			
TWIN LAKES	SO611	0	0	3,260	**3,260**	0	0	466	**466**	0	0	109	**109**			

[10] Dry suitable spotted owl habitat includes vegetation code 12 where size/structure is multistory greater than 9" DBH; mesic includes code 22; and wet includes codes 32, 36, 62, 64, and 42.

[11] A larger circle will be needed if there is less than 100 acres of suitable habitat.

Appendix 13

Forest-Wide Spotted Owl Information

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA *Number* *Name*	Acres in LSR/ MLSA	Critical Habitat Units Unit	Acres in LSR or MLSA	% LSR/ MLSA in CHU	# Activity Centers Inside[1]	Near[2]	Total	Threshold Status[3] *Dry Owls*[4] Below	At	Optimu	Total	*Wet Owls*[4] Below	At	Optimu	Total
RW126 BUMPING	14,989	WA-15	14,347	96%	4	3	**7**				**0**		1	6	**7**
RW135 CHIWAWA	107,044	WA-6	80,809	75%	17	0	**17**	8	1	1	**10**	5		2	**7**
RW133 DEADHORSE	18,319	WA-9	13,720	75%	8	1	**9**	8			**8**		1		**1**
RW132 ICICLE	14,289	WA-10	5,222	37%	2	0	**2**				**0**		1	1	**2**
RW134 LITTLE WENATCHEE	52,524	WA-7 WA-8	28,815 5,396	55%	9	0	**9**				**0**	1	5	3	**9**
RW138 LUCERNE	8,643			0%	0	1	**1**		1		**1**				**0**
RW125 MANASTASH	104,661	WA-14 WA-34	77,410 4,890	74%	31	2	**33**	1			**1**	5	9	18	**32**
RW128 RATTLESNAKE	10,484	WA-16	6,390	61%	3	0	**3**				**0**	1	2		**3**
RW139 SAWTOOTH	15,246			0%	0	0	**0**				**0**				**0**
RW136 SHADY PASS	76,502	WA-4 WA-5	7,247 17,158	9%	4	0	**4**			1	**1**		1	2	**3**

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA	Acres	Suitable Spotted Owl Habitat (N/R/F)[5]								Potential Suitable Spotted Owl Habitat (N/R/F)[6]							
Number	in LSR/	*Dry*		*Mesic*		*Wet*		Total		*Dry*		*Mesic*		*Wet*		Total	
Name	MLSA	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
RW126 BUMPING	14,989	71	0%	0	0%	9,168	61%	**9,238**	**62%**	165	1%	0	0%	12,961	86%	**13,126**	**88%**
RW135 CHIWAWA	107,044	7,598	7%	1,033	1%	40,858	38%	**49,489**	**46%**	14,290	13%	2,072	2%	65,205	61%	**81,567**	**76%**
RW133 DEADHORSE	18,319	3,210	18%	1,934	11%	1,549	8%	**6,692**	**37%**	6,377	35%	2,276	12%	2,391	13%	**11,044**	**60%**
RW132 ICICLE	14,289	495	3%	0	0%	7,366	52%	**7,861**	**55%**	1,268	9%	0	0%	9,412	66%	**10,680**	**75%**
RW134 LITTLE WENATCHEE	52,524	0	0%	0	0%	29,534	56%	**29,534**	**56%**	0	0%	0	0%	45,470	87%	**45,470**	**87%**
RW138 LUCERNE	8,643	2,724	32%	0	0%	730	8%	**3,454**	**40%**	4,509	52%	0	0%	976	11%	**5,485**	**63%**
RW125 MANASTASH	104,661	1,933	2%	37	0%	66,176	63%	**68,147**	**65%**	3,638	3%	46	0%	88,893	85%	**92,577**	**88%**
RW128 RATTLESNAKE	10,484	237	2%	0	0%	5,396	51%	**5,632**	**54%**	557	5%	0	0%	6,525	62%	**7,082**	**68%**
RW139 SAWTOOTH	15,246	221	1%	0	0%	1,742	11%	**1,963**	**13%**	681	4%	0	0%	2,926	19%	**3,607**	**24%**
RW136 SHADY PASS	76,502	6,327	8%	0	0%	35,897	47%	**42,224**	**55%**	12,744	17%	0	0%	38,898	51%	**51,642**	**68%**

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA *Number* *Name*	Acres in LSR/ MLSA	Spotted Owl Dispersal Habitat[7]		Dispersal To ...
		Acres	% of LSR/MLSA	
RW126 BUMPING	14,989	3,422	23%	
RW135 CHIWAWA	107,044	32,642	30%	
RW133 DEADHORSE	18,319	8,424	46%	
RW132 ICICLE	14,289	2,333	16%	
RW134 LITTLE WENATCHEE	52,524	10,259	20%	
RW138 LUCERNE	8,643	1,991	23%	
RW125 MANASTASH	104,661	14,607	14%	
RW128 RATTLESNAKE	10,484	2,652	25%	
RW139 SAWTOOTH	15,246	1,801	12%	
RW136 SHADY PASS	76,502	9,037	12%	

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA *Number* *Name*	Acres in LSR/ MLSA	Critical Habitat Units Unit	Acres in LSR or MLSA	% LSR/ MLSA in CHU	# Activity Centers Inside[1]	Near[2]	Total	Threshold Status[3] *Dry Owls*[4] Below	At	Optimu	Total	*Wet Owls*[4] Below	At	Optimu	Total
RW137 SLIDE PEAK	1,658			0%	0	0	**0**				**0**				**0**
RW129 SWAUK	107,962	WA-12	86,098	80%	24	0	**24**	17	1		**18**	5	1		**6**
RW130 TEANAWAY	34,043	WA-12 WA-13	2,573 9,361	8%	5	0	**5**	1	1		**2**	2	1		**3**
RW153 TIETON	39,998	WA-17 WA-18	12,391 8,107	31%	11	2	**13**		1		**1**		7	5	**12**
RW127 UPPER NILE	9,191			0%	2	1	**3**				**0**		2	1	**3**
DM-6 CAMAS	1,545				0	0	0				**0**				**0**
DM-14 CROW	12,479				5	0	5				**0**		2	3	**5**
DM-5 EAGLE	5,267				1	0	1				**0**	1			**1**
DM-10 HAYSTACK	24,644				8	0	8	6			**6**		2		**2**
DM-12 LOST LAKE	6,946	WA-17	4,735		1	0	1				**0**		1		**1**

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA	Acres in LSR/ MLSA	Suitable Spotted Owl Habitat (N/R/F)[5]								Potential Suitable Spotted Owl Habitat (N/R/F)[6]							
Number		*Dry*		*Mesic*		*Wet*		Total		*Dry*		*Mesic*		*Wet*		Total	
Name		Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
RW137 SLIDE PEAK	1,658	67	4%	188	11%	3	0%	**258**	**16%**	145	9%	196	12%	0	0%	**341**	**21%**
RW129 SWAUK	107,962	17,016	16%	1,138	1%	27,521	25%	**45,675**	**42%**	32,845	30%	1,495	1%	39,452	37%	**73,792**	**68%**
RW130 TEANAWAY	34,043	1,877	6%	0	0%	14,475	43%	**16,352**	**48%**	3,740	11%	0	0%	19,191	56%	**22,931**	**67%**
RW153 TIETON	39,998	1,792	4%	0	0%	23,795	59%	**25,587**	**64%**	3,131	8%	0	0%	29,616	74%	**32,747**	**82%**
RW127 UPPER NILE	9,191	84	1%	0	0%	6,053	66%	**6,136**	**67%**	259	3%	0	0%	7,095	77%	**7,354**	**80%**
DM-6 CAMAS	1,545	536	35%	5	0%	0	0%	**541**	**35%**	926	60%	6	0%	0	0%	**932**	**60%**
DM-14 CROW	12,479	197	2%	0	0%	9,752	78%	**9,950**	**80%**	412	3%	0	0%	10,786	86%	**11,198**	**90%**
DM-5 EAGLE	5,267	958	18%	386	7%	1,018	19%	**2,363**	**45%**	1,786	34%	407	8%	1,057	20%	**3,250**	**62%**
DM-10 HAYSTACK	24,644	4,650	19%	0	0%	5,348	22%	**9,998**	**41%**	10,871	44%	0	0%	6,794	28%	**17,665**	**72%**
DM-12 LOST LAKE	6,946	1,866	27%	0	0%	1,723	25%	**3,588**	**52%**	3,156	45%	0	0%	1,956	28%	**5,112**	**74%**

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA *Number* *Name*	Acres in LSR/ MLSA	Spotted Owl Dispersal Habitat[7] Acres	% of LSR/MLSA	Dispersal To ...
RW137 SLIDE PEAK	1,658	862	52%	
RW129 SWAUK	107,962	47,290	44%	
RW130 TEANAWAY	34,043	6,512	19%	
RW153 TIETON	39,998	3,402	9%	
RW127 UPPER NILE	9,191	523	6%	
DM-6 CAMAS	1,545	538	35%	
DM-14 CROW	12,479	381	3%	
DM-5 EAGLE	5,267	2,122	40%	
DM-10 HAYSTACK	24,644	9,799	40%	
DM-12 LOST LAKE	6,946	1,420	20%	

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA *Number* *Name*	Acres in LSR/ MLSA	Critical Habitat Units Unit	Acres in LSR or MLSA	% LSR/ MLSA in CHU	# Activity Centers Inside[1]	Near[2]	Total	Threshold Status[3] *Dry Owls*[4] Below	At	Optimu	Total	*Wet Owls*[4] Below	At	Optimu	Total
DM-9 MILK CREEK	15,711	WA-15	35		3	0	3				**0**	1	2		**3**
DM-2 NATAPOC	1,072	WA-9	135		0	0	0				**0**				**0**
DM-11 RUSSELL RIDGE	12,335				2	0	2	1			**1**	1			**1**
DM-7 SAND CREEK	9,225	WA-12	4,596		3	0	3	3			**3**				**0**
DM-3 TUMWATER	4,079	WA-9	2,692		1	0	1	1			**1**				**0**
DM-1 TWIN LAKES	5,573				1	0	1				**0**	1			**1**

[1] These are activity centers that are inside the LSR or MLSA.

[2] These are activity centers that are near enough to the LSR or MLSA to use habitat inside the LSR or MLSA. They are included in the analysis. Upper Nile LSR has one owl counted as near that is inside Haystack MLSA.

[3] Below Threshold: < 2,663 total suitable spotted owl habitat acres in 1.8 mile circle or < 500 total suitable habitat in 0.7 mile circle.
At Threshold: 2,663-3,994 total suitable spotted owl habitat acres in 1.8 mile circle.
Optimum: > 3,994 total suitable spotted owl habitat acres in 1.8 mile circle.

[4] If the majority of suitable spotted owl habitat in .7 mile circle is dry or mesic, then it is a dry owl. If the majority is wet, then it is a wet owl.

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA	Acres	Suitable Spotted Owl Habitat (N/R/F)[5]								Potential Suitable Spotted Owl Habitat (N/R/F)[6]							
Number	in LSR/	*Dry*		*Mesic*		*Wet*		**Total**		*Dry*		*Mesic*		*Wet*		**Total**	
Name	MLSA	Acres	%	Acres	%	Acres	%	**Acres**	**%**	Acres	%	Acres	%	Acres	%	**Acres**	**%**
DM-9 MILK CREEK	15,711	334	2%	0	0%	8,800	56%	**9,133**	**58%**	1,098	7%	0	0%	11,285	72%	**12,383**	**79%**
DM-2 NATAPOC	1,072	294	27%	117	11%	51	5%	**462**	**43%**	500	47%	232	22%	96	9%	**828**	**77%**
DM-11 RUSSELL RIDGE	12,335	2,005	16%	0	0%	4,036	33%	**6,042**	**49%**	4,048	33%	0	0%	5,275	43%	**9,323**	**76%**
DM-7 SAND CREEK	9,225	2,395	26%	1,273	14%	60	1%	**3,728**	**40%**	4,630	50%	1,357	15%	77	1%	**6,064**	**66%**
DM-3 TUMWATER	4,079	313	8%	25	1%	324	8%	**662**	**16%**	696	17%	26	1%	466	11%	**1,188**	**29%**
DM-1 TWIN LAKES	5,573	0	0%	0	0%	2,770	50%	**2,770**	**50%**	0	0%	0	0%	4,794	86%	**4,794**	**86%**

[5] Dry suitable spotted owl habitat includes vegetation code 12 where size/structure is multistory greater than 9" DBH; mesic includes code 22; and wet includes codes 32, 36, 62, 64, and 42.

[6] Dry potential suitable spotted owl habitat includes vegetation code 12; mesic includes codes 21 and 22; and wet includes codes 30, 31, 32, 33, 34, 35, 36, 37, 60, 61, 62, 64, 65, 41, and 42.

Wenatchee National Forest

Spotted Owl Information by Late Successional Reserve or Managed Late Successional Area

LSR or MLSA *Number* *Name*	Acres in LSR/ MLSA	Spotted Owl Dispersal Habitat[7]		Dispersal To ...
		Acres	% of LSR/MLSA	
DM-9 MILK CREEK	15,711	1,777	11%	
DM-2 NATAPOC	1,072	568	53%	
DM-11 RUSSELL RIDGE	12,335	2,758	22%	
DM-7 SAND CREEK	9,225	4,414	48%	
DM-3 TUMWATER	4,079	1,029	25%	
DM-1 TWIN LAKES	5,573	1,294	23%	

[7] Dispersal habitat includes vegetation codes 11, 13, and 52, 21, 31, 35, 61, and 41.

Appendix 14

LSR/MLSA Functioning Threshold (Northern Spotted Owl Activity Centers)

Wenatchee National Forest

Threshold Status of Spotted Owl Activity Centers in LSRs and MLSAs

LSR or MLSA	Dry Owls[3] Below Threshold[4]	Dry Owls[3] At Threshold[5]	Dry Owls[3] Optimum[6]	Wet Owls[3] Below Threshold[4]	Wet Owls[3] At Threshold[5]	Wet Owls[3] Optimum[6]
BOUNDARY BUTTE	SO717					
BOUNDARY BUTTE	SO723					
BUMPING						SO803
BUMPING						SO820
BUMPING						SO823
BUMPING[1]						SO825
BUMPING[1]						SO851
BUMPING						SO860
BUMPING[1]					SO871	
CHIWAWA	SO506					
CHIWAWA	SO509					
CHIWAWA				SO510		
CHIWAWA						SO604
CHIWAWA				SO605		
CHIWAWA						SO621
CHIWAWA	SO627					
CHIWAWA			SO630			
CHIWAWA		SO633				
CHIWAWA	SO634					
CHIWAWA				SO638		
CHIWAWA				SO645		
CHIWAWA				SO649		
CHIWAWA	SO708					
CHIWAWA	SO714					
CHIWAWA	SO731					
CHIWAWA	SO749					
DEADHORSE					SO703	
DEADHORSE	SO715					
DEADHORSE	SO720					
DEADHORSE[1]	SO721					
DEADHORSE	SO725					
DEADHORSE	SO726					
DEADHORSE	SO727					
DEADHORSE	SO744					
DEADHORSE	SO762					
ICICLE						SO734
ICICLE					SO747	
LITTLE WENATCHEE				SO602		
LITTLE WENATCHEE					SO603	
LITTLE WENATCHEE					SO614	
LITTLE WENATCHEE					SO624	

Wenatchee National Forest

Threshold Status of Spotted Owl Activity Centers in LSRs and MLSAs

LSR or MLSA	Dry Owls[3] Below Threshold[4]	Dry Owls[3] At Threshold[5]	Dry Owls[3] Optimum[6]	Wet Owls[3] Below Threshold[4]	Wet Owls[3] At Threshold[5]	Wet Owls[3] Optimum[6]
LITTLE WENATCHEE						SO631
LITTLE WENATCHEE					SO632	
LITTLE WENATCHEE						SO648
LITTLE WENATCHEE						SO653
LITTLE WENATCHEE					SO654	
LUCERNE[1]		SO201				
MANASTASH					SO305	
MANASTASH				SO311		
MANASTASH					SO321	
MANASTASH				SO326		
MANASTASH						SO327
MANASTASH						SO332
MANASTASH					SO338	
MANASTASH						SO343
MANASTASH				SO349		
MANASTASH					SO351	
MANASTASH	SO353					
MANASTASH						SO357
MANASTASH						SO358
MANASTASH				SO362		
MANASTASH					SO364	
MANASTASH				SO365		
MANASTASH					SO368	
MANASTASH						SO375
MANASTASH					SO378	
MANASTASH					SO379	
MANASTASH						SO392
MANASTASH[1]						SO804
MANASTASH						SO808
MANASTASH						SO810
MANASTASH[1]						SO811
MANASTASH						SO818
MANASTASH					SO826	
MANASTASH						SO829
MANASTASH						SO830
MANASTASH						SO839
MANASTASH						SO845
MANASTASH						SO885
MANASTASH						SO894
RATTLESNAKE					SO801	
RATTLESNAKE				SO815		
RATTLESNAKE					SO859	
SHADY PASS					SO205	

Wenatchee National Forest

Threshold Status of Spotted Owl Activity Centers in LSRs and MLSAs

LSR or MLSA	Dry Owls[3] Below Threshold[4]	Dry Owls[3] At Threshold[5]	Dry Owls[3] Optimum[6]	Wet Owls[3] Below Threshold[4]	Wet Owls[3] At Threshold[5]	Wet Owls[3] Optimum[6]
SHADY PASS						SO502
SHADY PASS						SO503
SHADY PASS			SO504			
SWAUK	SO301					
SWAUK				SO304		
SWAUK	SO309					
SWAUK	SO310					
SWAUK	SO312					
SWAUK	SO317					
SWAUK	SO318					
SWAUK				SO323		
SWAUK	SO324					
SWAUK		SO335				
SWAUK	SO336					
SWAUK	SO337					
SWAUK				SO345		
SWAUK	SO350					
SWAUK					SO352	
SWAUK	SO370					
SWAUK				SO387		
SWAUK	SO701					
SWAUK				SO712		
SWAUK	SO713					
SWAUK	SO756					
SWAUK	SO757					
SWAUK	SO761					
SWAUK	SO764					
TEANAWAY				SO306		
TEANAWAY					SO319	
TEANAWAY	SO344					
TEANAWAY		SO356				
TEANAWAY				SO381		
TIETON[1]					SO800	
TIETON						SO802
TIETON						SO809
TIETON					SO812	
TIETON					SO819	
TIETON					SO828	
TIETON					SO835	
TIETON						SO837
TIETON		SO841				
TIETON						SO855
TIETON						SO870
TIETON					SO882	

Wenatchee National Forest

Threshold Status of Spotted Owl Activity Centers in LSRs and MLSAs

LSR or MLSA	Dry Owls[3] Below Threshold[4]	Dry Owls[3] At Threshold[5]	Dry Owls[3] Optimum[6]	Wet Owls[3] Below Threshold[4]	Wet Owls[3] At Threshold[5]	Wet Owls[3] Optimum[6]
TIETON[1]					SO888	
UPPER NILE[2]					SO814	
UPPER NILE						SO862
UPPER NILE					SO863	
CROW						SO805
CROW						SO824
CROW					SO854	
CROW					SO874	
CROW						SO886
EAGLE				SO748		
HAYSTACK	SO806					
HAYSTACK[2]					SO814	
HAYSTACK	SO846					
HAYSTACK					SO866	
HAYSTACK	SO868					
HAYSTACK	SO879					
HAYSTACK	SO883					
HAYSTACK	SO890					
LOST LAKE					SO807	
MILK CREEK					SO838	
MILK CREEK				SO840		
MILK CREEK					SO865	
RUSSELL RIDGE				SO831		
RUSSELL RIDGE	SO864					
SAND CREEK	SO729					
SAND CREEK	SO753					
SAND CREEK	SO758					
TUMWATER	SO722					
TWIN LAKES				SO611		

[1] Near the LSR or MLSA but not inside the LSR or MLSA.

[2] This owl is inside Haystack MLSA but is close to Upper Nile LSR.

[3] If the majority of suitable spotted owl habitat in .7 mile circle is dry or mesic, then it is a dry owl. If the majority is wet, then it is a wet owl.

[4] Below Threshold: < 2,663 total suitable spotted owl habitat acres in 1.8 mile circle or < 500 total suitable habitat acres in 0.7 mile circle.

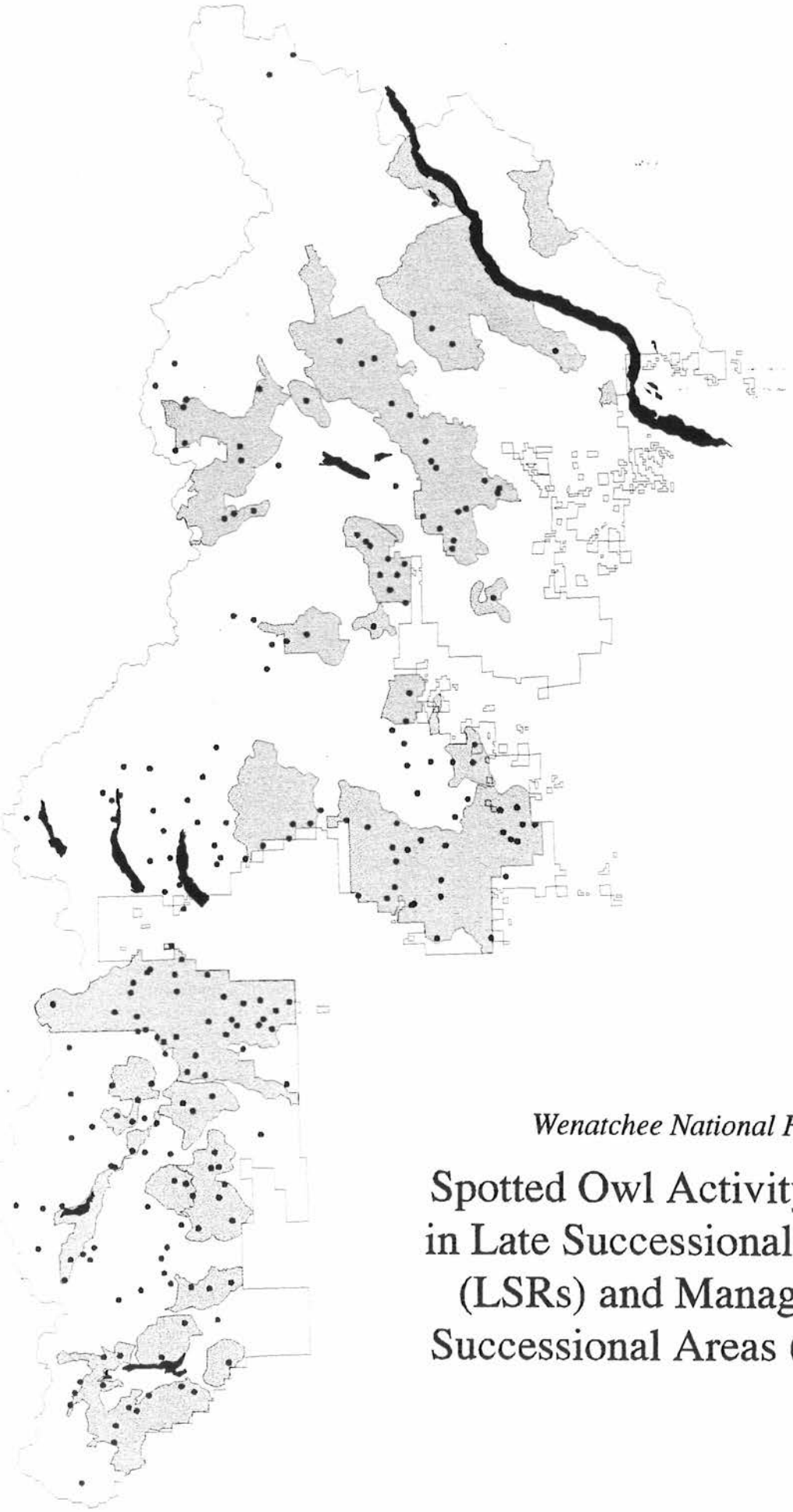
[5] At Threshold: 2,663-3,994 total suitable spotted owl habitat acres in 1.8 mile circle.

[6] Optimum: > 3,994 total suitable spotted owl habitat acres in 1.8 mile circle.

Appendix 15

Spotted Owl Activity Centers Map

(LSR's & MLSA's)



Wenatchee National Forest

Spotted Owl Activity Centers in Late Successional Reserves (LSRs) and Managed Late Successional Areas (MLSAs)

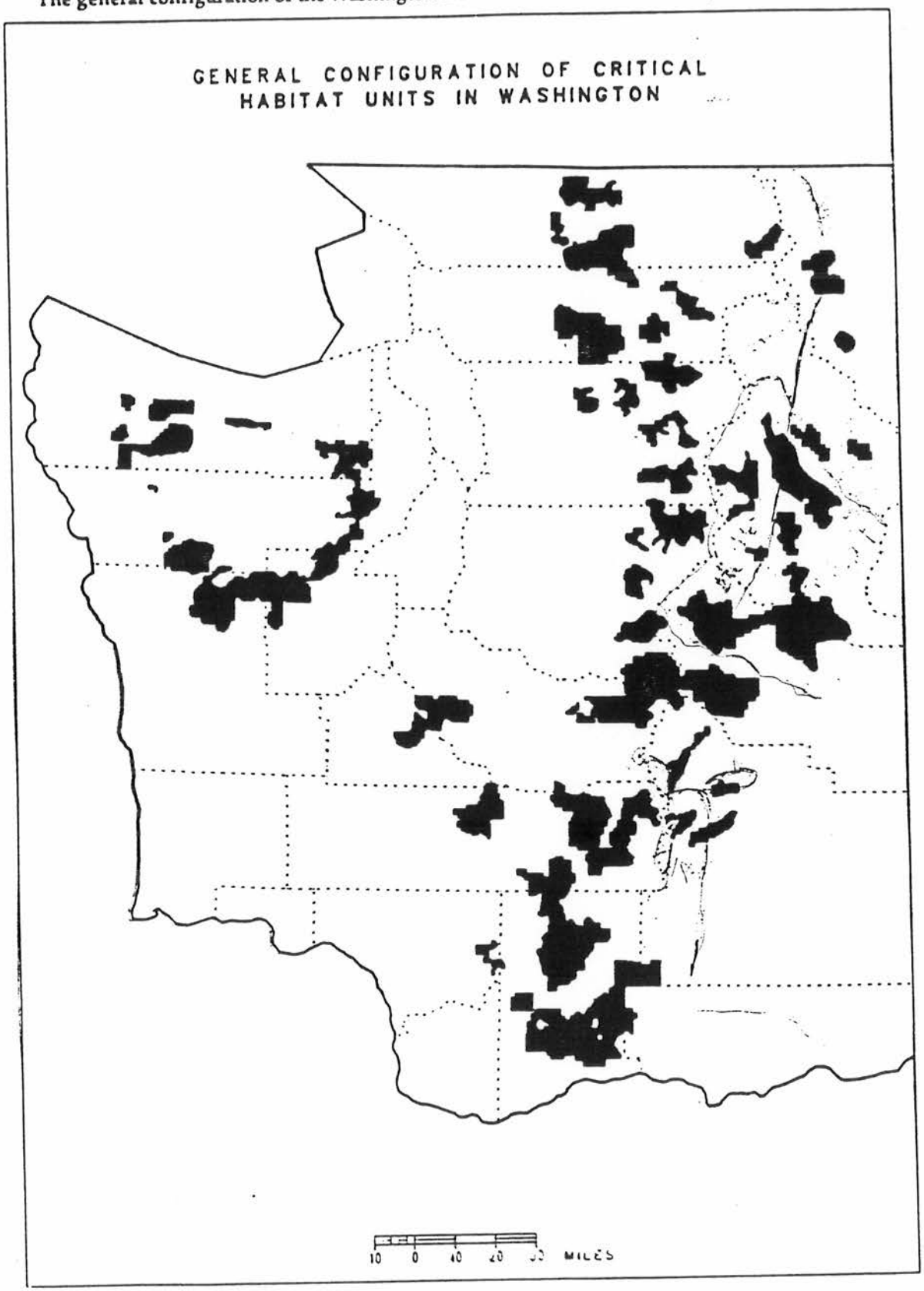
Appendix 16

Map of Critical Habitat Units

Washington State

(Northern Spotted Owl)

The general configuration of the Washington areas are illustrated on the map which follows:



Appendix 17

Distribution Centers of Species Rarity and Endemism (Interior Columbia Basin Project)