

**SECTION 7**

**LITTLE NACHES RIVER SUB-BASIN  
SHORELINE INVENTORY AND ANALYSIS  
DISK #3**

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## LITTLE NACHES RIVER SUB-BASIN CONTEXT SUMMARY

*Portions of the following text have been primarily taken, in whole or in part, from the following reports: (Haring 2001 and Muir 2003).*

### LITTLE NACHES SUB BASIN OVERVIEW

The Little Naches River extends from its confluence with the Bumping River at an elevation of 2,560 feet to the crest of the Cascade Range at elevations approaching 7,000 feet. With a drainage length of 22.4 miles, the stream gradient is characteristic of headwater streams in the region, exhibiting high-gradient upper reaches that terminate in a low-gradient (1-2%) glacial valley stream-bottom, in this case terminating in a V-shaped canyon. The total drainage area is 148.6 square miles.

The SMP jurisdiction for the Little Naches River is comprised of one reach extending 13.3 miles from the confluence of the Little Naches and Bumping Rivers upstream to the junction of the Middle Fork of the Little Naches River. The SMP jurisdiction is almost entirely public land and has undergone dramatic historical changes. This reach has been the site for major habitat restoration efforts by multiple agencies and private interests. The Little Naches River is a landscape of contrasting uses; part resource extraction landscape with respect to timber harvest and its associated structures, and part federally recognized wilderness.

### FLOW

There is an active debate related to the influence of timber harvest activities and flow characteristics in the Little Naches Basin (Muir 2003).

#### **Hyporheic Flow**

Water emerging as numerous springs along the margins and internal to the floodplain indicates hyporheic flow in the broader floodplains of the SMP. This water is derived from glacial valley slopes, from down-welling and upwelling processes internal to the floodplain, and from the connective tributaries. Importantly, relatively narrow floodplain configuration and hydrological runoff patterns suggest that ground water storage potential is not high in the Little Naches River Basin (Muir 2003).

### SALMON

The Little Naches River supports anadromous fish including spring chinook, summer steelhead, and coho. Resident populations of rainbow trout, brook trout, cutthroat trout, bull trout, and mountain whitefish are present, as well as sculpin, and other fish species (Washington Department of Fish and Wildlife [WDFW], 1998).

spring chinook and summer steelhead utilize the reach for both spawning and rearing. Research indicates significant rearing habitat, particularly for chinook salmon, exists within the reach (WDFW, 2004c).

### **Passage**

No structural barriers exist in the Little Naches River inhibiting fish migration. Formerly, Salmon Falls may have blocked fish migration at certain flows. Salmon Falls fish passage was achieved in 1988 and the potential habitat area for anadromous fish expanded. Dewatering in the North Fork of the Little Naches related to an increase in sediment loading from landslides and debris flows inhibits fish movement during low flows (Haring 2001).

## **SALMON HABITAT**

### **Riparian**

The riparian community is dominated by a complex mosaic of deciduous trees and shrubs and conifers (Yakima County, 2003b). In places where light penetrates the forest canopy, willow, alder, maple, and cottonwood are substantially present. Anthropogenic riparian habitat alteration is primarily the result of historic grazing, road construction, recreational camping and associated campsites and Off Highway Vehicle (OHV) use, timber harvests, and stream channel modifications resulting from flood responses by federal and state agencies.

### **Substrate**

Channel substrate and floodplain sediments are comprised of a complex mosaic of large cobbles grading to fine silts, reflective of the glacial processes that once dominated the valley setting.

Throughout the lower 3 miles of the reach, the basalt canyon-walls become increasingly confining upstream. The upper 10 miles of this reach are closely confined by these canyon walls, and is additionally confined by massive road structure. Low stream gradients allow sediment deposition to occur across the floodplain, particularly in the upper 10 miles of the SMP jurisdiction. Sediment residence time was estimated to be in the hundreds, if not thousands of years (Plum Creek 1996). Deposition of fine sediments has increased due to historic land-use changes and fine-sediment deposition is identified as a major inhibitor of salmon spawning (WDFW 1998). Smith (1993) documents and reviews sediment increases from 1935 to 1990 noting significant increases in fine sediments, associated with timber harvest and road construction. Efforts have been initiated to mitigate the rate of sediment delivery (United States Forest Service [USFS], 1994). Confinement of the floodplain along the lower portions of the SMP jurisdiction has resulted in entrenchment and the removal of both large cobble and fine sediments from the channel. These processes are directly associated with transportation structures and the removal of large woody debris following the 1976 flood (Smith 1993).

## **WATER QUALITY**

High temperatures have been recorded for several Little Naches tributaries over past years. In late summer, temperatures in the Little Naches River consistently average between 65°F and 70°F (Haring 2001).

### **303(D) LISTINGS**

Several portions of tributary streams and three segments of the Little Naches River are 303(d)-listed for impaired water quality because of high temperatures recorded in late summer (Washington State Dept. of Ecology, 1998). Two of these segments lie in the downstream end of the Little Naches SMP jurisdiction and the third is located at the extreme upstream end of the jurisdiction. All of the SMP jurisdiction listings are for temperatures recorded in late summer at low flow. There are no 303(d)-listed facilities in the SMP jurisdiction, although three facilities are listed west of the Little Naches River.

## LITTLE NACHES RIVER SUB-BASIN REACH DESCRIPTION

Although the Little Naches SMP is not in pristine condition, it does provide critical spawning and rearing habitat for anadromous and resident fish populations. Significant side-channel habitat exists in broader floodplain areas and drastic measures have been taken by management agencies to increase large woody debris, restructure channel patterns, and construct fish passage. Riparian functions are judged not to be in properly functioning conditions (USFS 1998). Localized impacts to riparian structure are associated with developed and undeveloped campsites, off highway vehicle use (OHV), timber extraction, and with the forest roads and trails. The primary use of the area is now recreational. Over 35% of the harvestable timber was removed by 1992 and little timber harvest on public lands has occurred since that date. The area is now part of the Aquatic Conservation Strategy identified in the Northwest Forest Plan (USFS 1994)

### **General Description**

The SMP jurisdiction for the Little Naches River is comprised of one reach extending 13.3 miles from the confluence of the Little Naches and Bumping Rivers upstream to the junction of the Middle Fork of the Little Naches River (Fig. LN5; Table LN1). The Little Naches River SMP jurisdiction is located in a glacial, valley-bottom setting over approximately the upper 9-miles of its course. The upper portion of the Little Naches SMP jurisdiction is characterized by broad floodplain areas set apart by intervening more-confined channel sections. Stream gradients in these broad areas are approximately 1.5% (Muir 2003).

Historic land use in the Little Naches altered the SMP habitat in important ways. Native American land use is well-documented, particularly below Salmon Falls and is represented by an intensive cluster of archaeological sites centered on the stream intersection with the Bumping River and the Naches River (Uebelacker 1980, 1986). The valley-bottom setting of the Little Naches River with its gentle slope (2%) from the mouth to headwaters served as a major travel corridor for Native Americans, early settlers, and, currently, as a recreational corridor (horse and OHV). The meadows within the SMP jurisdiction served as important forage areas for livestock and have long been a spatial focus of human camping activity in the basin. By the 1850s, the Naches Pass Trail was known to early settlers and the initial wagon tracks were formalized into roads. Sheep and cattle grazing and associated stock drives dominated land uses in the basin from the 1880s through 1950s (Smith 1993). Livestock grazing, coupled with fire suppression, greatly modified the SMP jurisdiction and the surrounding landscape (Uebelacker 1980). Early historic-period recreation in the basin was focused along the river corridor and in association with the High Cascades. The emergence of the federal landscape in the early 1900s has evolved into portions of the basin being formally recognized as wilderness (Norse Peak) and multiple-use lands. Timber harvest, concentrated along the SMP jurisdiction began in the early 1900s and involved portable

mills and use of the river as the delivery mechanisms. Logging was concentrated in the valley bottoms, but by the mid 1940s, substantial harvest had occurred on private land in the basins headwaters upstream of the SMP jurisdiction and in Kittitas County. Timber harvest on federal land began tentatively in the 1960s, peaked in the mid-1970s through the early 1980s and tapered off in the 1990s (Wissmar 1994). The Northwest Forest Plan and resulting Aquatic Conservation Strategy (USFS 1994) now governs federal lands and promulgated a greatly reduced timber harvest strategy.

Riparian vegetation is comprised of both deciduous shrubs and trees interspersed with a coniferous overstory. Significant meadow habitats occur within and adjacent to the geomorphic floodplain creating a riparian – meadow mosaic landscape. Riparian conditions have been degraded by historical and ongoing recreational uses (WDFW 1998). Elevated water temperatures, the loss of large woody debris, and sediment deposition and erosion degraded the riparian condition below Salmon Falls (WDFW 1998). Upstream of Salmon Falls the riparian condition is excellent (CBSP 1990, WDFW 1998).

## REACH 1

**ABIOTIC**– See **Little Naches Physical map and Little Naches Physical (soil characteristics) map** (*Little\_Naches\_physical.pmf and Little\_Naches\_Soil\_Characteristics.pmf*)

### **Geology/Landforms (Table LN2)**

The geological foundation of the Naches Basin is derived from a complex intersection of volcanic and sedimentary processes. Columbia River Basalts dominate the eastern margins of the basin while sedimentary, and Cascade volcanic rocks dominate the western margins. The Olympic Wallowa Linament (OWL) explains the position and orientation of the Naches River Canyon and the Little Naches River (Campbell 1992). Because the Naches and the Little Naches rivers mark the course of the OWL and lie at the intersection of folded Columbia River flood basalts, Cascade volcanic processes, and massive sedimentary interbeds, landslides are major landform components of the canyon/valley landscape.

Within the Little Naches SMP, alluvium comprises 71.2% of the SMP jurisdiction (Washington Department of Natural Resources [WDNR], 2000). Basalt flows make up 12.3% of the jurisdiction. This basalt foundation is expressed as a classic stepped canyon landscape and forms the upstream end of the much larger Naches River Canyon. Beginning immediately upstream and on the ridge line north of the Crow Creek drainage, massive glacial drift deposits, in part overlying the flood basalts, amplify the importance of glacial processes in forming the upper portions of the Little Naches River valley. A massive landslide occurs around the mouth of Sand Creek and in combination with smaller areas where mass wasting processes dominate comprise just over 20% of the SMP. Minor andesite flows cover 0.1% of the SMP. The valley setting of the upper Little Naches River is broad and relatively flat. The stream gradients are under 2%. Depositional processes dominate the SMP in this setting and consequently 71.2% of the jurisdiction is classified as alluvium (USDA Natural Resources Conservation Service [NRCS], 2003).

Geological hazard in the Little Naches River SMP jurisdiction include “intermediate risk” areas attributable to flash floods (2.5%), over-steepened slopes (10.8%) and landslides (0.7%). Of the SMP, 10.3% is classified as “high risk” associated with landslides and 7.5% over-steepened slopes.

### **Soils/Soil Properties (Table LN2)**

Approximately 71.2% of the SMP jurisdiction is underlain by alluvium (NRCS, 2003). There are a wide variety of soils within the SMP jurisdiction, but silt loams are predominant. Soil permeability is generally very rapid (41.8%). The hazard of erosion is classed as predominately slight (89.7%).

### **Stream Type/Channel Form (Table LN3)**

Meandering and braiding are channel characteristics where the floodplain widens and a single channel predominate when the floodplain is narrowed by side stream alluvial fans,

landslides, and narrowing valley walls. Numerous side channels are present in areas where the floodplain widens and in these areas the river expresses a braided channel pattern.

The Little Naches River, throughout the SMP jurisdiction, is low gradient less than 2% reflective of the glacially-carved valley bottom setting. Although the channel is expressed as very low gradient over the length of the SMP there are significant differences in channel form. The lower 3-miles of the SMP is classified as a pool-riffle type while the upper 9-miles is classified as a combination of pool-riffle and forced pool-riffle (Muir 2003). A great deal of research has been conducted on the channels and riparian interactions in the Little Naches River system as restoration efforts have targeted the degraded portions of the SMP from Sand Creek to the river's confluence with the Bumping River. Muir (2003) evaluated response reaches in the SMP and compared the Little Naches River reaches to "pristine" reaches on the American River. Importantly, Muir's work summarizes past assessments for the Little Naches River and evaluates extensive channel alteration and restoration efforts in the basin. Pool frequency remains below standards established by the Wenatchee National Forest Plan and large woody debris is lacking. The lack of large woody debris is attributable to channel clearing efforts following the 1976 flood (Haring 2001).

### **Stream Flow**

The hydrograph for the Little Naches is not regulated by reservoirs but it does show significant differences when compared to the hydrograph of the American River (Muir 2003). Peak flows occur in May (719 cfs), followed by a rapid falling limb through July. Base flows are reached early in September (47 cfs) with slight increases in October and November related to fall rains. Floods, related rain on snow events have caused sudden flood pulses in the Little Naches (5,000 to 10,000 cfs). Significant flood events occurred in 1976, 1990, and 1996. The 1996 flood was likely a on the magnitude of a 50 year recurrence interval of greater (Muir 2002).

Low flows in August and September are associated with high stream temperatures.

### **Hyporheic Flow**

Water emerging as numerous springs along the margins and internal to the floodplain indicates hyporheic flow in the broader floodplains of the SMP.

**BIOTIC - See Little Naches Biological map (*Little\_Naches\_Biological.pmf*)**

### **Natural Vegetation (Table 4)**

#### **Upland**

Historic vegetation lies primarily in the balsam fir – mountain hemlock association above Sand Creek. Below this stream junction significant portions of ponderosa pine occur in association with fir. This association grades to ponderosa pine dominated stands in the lower-canyon areas of the SMP (as designated by ICBEMP). Potential vegetation shows a similar pattern.

### **Riparian**

The riparian community consists of a diverse association of deciduous shrubs and trees within an over-story of conifers dominated by grand fir and Western hemlock primarily in mid-successional stages (Yakima County, 2003b). Meadows also form a small but significant component of the riparian mosaic. The riparian areas, which encompass approximately 35.5% of the SMP jurisdiction, are modified by human activity, particularly in the lower river.

Riparian areas along the Little Naches River from the mouth to Salmon Falls are considered degraded. Above that point they are considered excellent (WDFW, 1998). Field researchers have noted the degraded conditions and attributed them to timber harvests and associated infrastructure as well as to recreation and its attendant structures (trails, campgrounds). Road construction has significantly altered the riparian vegetation along the lower 5-miles of the SMP jurisdiction along the left bank (Kittitas County). Significant canopy loss has occurred along the Little Naches River as well as loss of the structural and functional contributions of large woody debris (USFS 2001, 1994).

### **Wetlands**

Wetlands occupy 10.4% of the SMP jurisdiction today (United States Fish and Wildlife Service [USFWS], 2003). Wetlands are clustered in areas where the floodplain widens and the channel migration zone expands and are scattered along the floodplain even in confined reaches. The wetlands range from palustrine forested-wetlands that are seasonally flooded, through seasonally-wet meadows, to riverine habitats. An additional 64.8 acres of wetland may be classified as associated wetlands within the final SMP jurisdiction, either intersecting the draft SMP jurisdiction boundary directly or being located in the 100-year floodplain.

### **Wildlife**

#### **Aquatic (Table LN5)**

This reach plays a key role in the life history of spring chinook, summer steelhead, rainbow trout, cutthroat trout, and brook trout (WDFW, 2004c). Significant spring chinook and summer steelhead spawning occurs in the SMP jurisdiction and concern over spawning and rearing habitat, adult holding habitat, nutrients, and temperature have been identified. Bull trout are also present within the SMP jurisdiction.

#### **Avian (Tables LN4 and LN6)**

Wildlife Heritage locations for the larger region encompassing the SMP includes multiple Northern goshawk observations (WDFW, 2003). GAP analysis data indicates that 96.9% of the reach may provide habitat for one species of current concern, the spotted owl. Similarly, the US Forest Service has classified 31.4% of the jurisdiction as being suitable habitat for the spotted owl. Priority habitat areas for harlequin duck are found within the SMP jurisdiction at places like Salmon Falls, encompassing 1.3% of the SMP jurisdiction.

### **Terrestrial (Table LN6)**

GAP analysis data indicates that all of the reach may provide habitat for one species of current concern, namely the Townsend's big-eared bat (WDFW, 2004a). Over 75% of the SMP jurisdiction is classified as Priority Habitat for the Rocky Mountain elk. These areas are designated because of the critical habitat elements they possess over other areas within the SMP. Elk calving grounds, primarily associated with the meadow and edge habitat located in the broader floodplain areas, have been identified within the SMP jurisdiction. Both elk and deer range throughout the jurisdiction. Terrestrial fauna comprises an extensive list and includes bear, bobcat, cougar, and potentially gray wolves (WDFW, 2003).

### **CULTURAL MODIFICATIONS – See Little Naches Cultural Modifications map (*Little\_Naches\_Cultural\_Modifications.pmf*)**

### **Land Use (Table LN7)**

The Little Naches River SMP jurisdiction contains areas in public ownership (WDNR, 2003). The Wenatchee National Forest administers 47.7% of the area ownership under various forest service land designations and the 4.0% of the unidentified public lands is likely designated wilderness (Norse Peak Wilderness Area). The primary use of the SMP is recreational.

Twenty seven formal “campsites” exist in the SMP jurisdiction and include developed and undeveloped campsites (USFS, 2003). These “campsites” are clustered around stream junctions like Crow Creek, road ways and bridge crossing, and wider valley segments and meadow systems in SMP jurisdiction. Impacts to riparian areas along the Little Naches River are primarily related to recreational activity associated with these “campsites” as well as the forest service road and trail system. Extensive OHV use in campgrounds and on the associated trail system significantly impacts the SMP and surrounding watershed. The Forest Service road (Rd 1900) directly impacts the river channel through confinement, removal of vegetation, and the addition of riprap and other bed materials. This road is the primary impervious surface in the SMP.

Recreation, (camping and associated OHV use) as well as extractive land uses (timber harvest) and the associated infrastructure are the primary impacts to the ecological integrity of the SMP. These activities are regulated and permitted by the U.S.F.S.

### **Transportation and Revetments**

No transportation infrastructure or revetments occur within the SMP jurisdiction.

**CULTURAL JURISDICTION – See Little Naches Cultural Jurisdictional map  
(*Little\_Naches\_Cultural\_Jurisdictional.pmf*)**

**Zoning**

Yakima County zoning establishes 73.1% of the area as “Forested Watershed”. The entire SMP jurisdiction is zoned Conservancy by the current SMP.

**Cultural Resources (Table LN9)**

There are thirteen Archeological Site Form records of cultural sites with the SMP jurisdiction on file with the Washington State Historic Preservation Office (Washington State Historic Preservation Office [WSHPO], 2004). Cultural resource sites include lithic scatters, rock shelters, rock depressions, places of cultural importance (e.g., Salmon Falls), and historic cabins and shelters. Recorded cultural sites are primarily clustered in the lower portion of the Little Naches River.

Prehistoric cultural resources relate, in part, to the former abundance of anadromous fish and the proximity of the river setting to upland resources.

**DOE Sites/facilities and 303(d) Listings (Table LN9)**

There are three 303(d)-listed segments within the SMP jurisdiction totaling 2.8 miles in length: at the northern end of the reach and two at the downstream end of the reach), excursions for temperature (Washington State Dept. of Ecology [WDOE], 1998). Temperatures in these portions of the jurisdiction are elevated at base flow during late summer and are related, in part, to past and ongoing land use activity in the basin (USFS, 1998).

**ECOLOGICAL FUNCTION SUMMARY**

**Reach 1 Characterization Summary**

<b>Hazard Potential</b>	<b>Habitat Conditions</b>	<b>Public Access</b>	<b>Key Modifications</b>
Steep Slopes: 18.3% High soil erosion: 1.7% High soil permeability: 41.8%	Riparian cover: 35.5% Wetlands: 10.4% Vacant/natural: 10.5% Priority habitats: 3 Species of concern: 2 Wildlife Heritage Locations: 2 Anadromous habitat: 13.3 mi Total fish species: 6	Public land: 51.7%	Principal land use: Vacant/natural Barriers: Passable falls

Ecological functions along Reach 1 are principally impaired by forestry practices and recreational use, which occurs on the 51.7% of public lands occupying the jurisdiction. There is one barrier (passable falls) within the jurisdiction. Upland vegetation has been removed and trampled through recreational uses and forestry practices, which can promote increased runoff and nonpoint source pollution. No DOE

sites/facilities are found in the SMP jurisdiction, though there are three 303(d)-listed stream segments totaling 2.8 miles. Riparian vegetation, which is a buffer for nonpoint pollution, covers approximately 35.5% of the reach, though tends to be degraded by timber harvesting and recreational uses. Road construction has also significantly altered the riparian vegetation along the lower 5-miles of the SMP jurisdiction. Much of the reach is presently undeveloped (10.5%), while 10.4% is covered by wetlands. The reach provides habitat for two species of concern, the Townsend's big-eared bat and the spotted owl, as well as three priority habitats, two wildlife heritage locations for the long eared myotis and the yuma myotis, and aquatic habitat for six fish species, including anadromous fish.

**ECOLOGICAL PROTECTION OPPORTUNITIES - See Little Naches Opportunity for Protection map (*Little\_Naches\_Opp\_Protection.pmf*)**

The following list refers to the similarly numbered locations on the digital ecological protection maps for the Little Naches River.

- 1) Rationale: Cultural significant sites found on private land. Suggested Action: Work with private landowners to protect cultural sites.
- 2) Rationale: Wetlands on private property. Suggested action: Work with landowner to protect wetlands.
- 3) Rationale: Cultural significant sites found on private land. Suggested Action: Work with private landowners to protect cultural sites.
- 4) Rationale: Cultural significant sites found on private land. Suggested Action: Work with private landowners to protect cultural sites.
- 5) Rationale: Harlequin Duck Priority Species habitat in riparian zone. Suggested Action: Protect habitat.
- 6) Rationale: Wetlands on private property. Suggested action: Work with landowner to protect wetlands.
- 7) Rationale: Mule deer and black-tailed deer priority species habitat in riparian zone. Suggested Action: Protect habitat.
- 8) Rationale: Cultural significant sites found on private land. Suggested Action: Work with private landowners to protect cultural sites.
- 9) Rationale: Spotted owl habitat in riparian zone. Suggested Action: Protect Spotted Owl habitat.
- 10) Rationale: Existing riparian buffer on forestry land protecting a recognized anadromous spawning habitat. Suggested Action: Work with U.S. Forest Service to protect riparian buffer.
- 11) Rationale: Wetlands on private property. Suggested action: Work with landowner to protect wetlands.
- 12) Rationale: Rocky Mountain Elk Priority Species habitat in riparian zone. Suggested Action: Protect Rocky Mountain habitat.

**ECOLOGICAL RESTORATION OPPORTUNITIES - See Little Naches Opportunity for Restoration map See Bumping Opportunity for Protection map (*Little\_Naches\_Opp\_Restoration.pmf*)**

The following list refers to the similarly numbered locations on the digital ecological restoration maps for the Little Naches River.

- 1) Rationale: Marginal riparian buffer on privately owned land protecting an anadromous spawning or rearing habitat. Suggested Action: Work with private landowners to establish a larger riparian buffer.
- 2) Rationale: Marginal riparian buffer on privately owned land protecting an anadromous spawning or rearing habitat. Suggested Action: Work with private landowners to establish a larger riparian buffer.

## APPENDIX

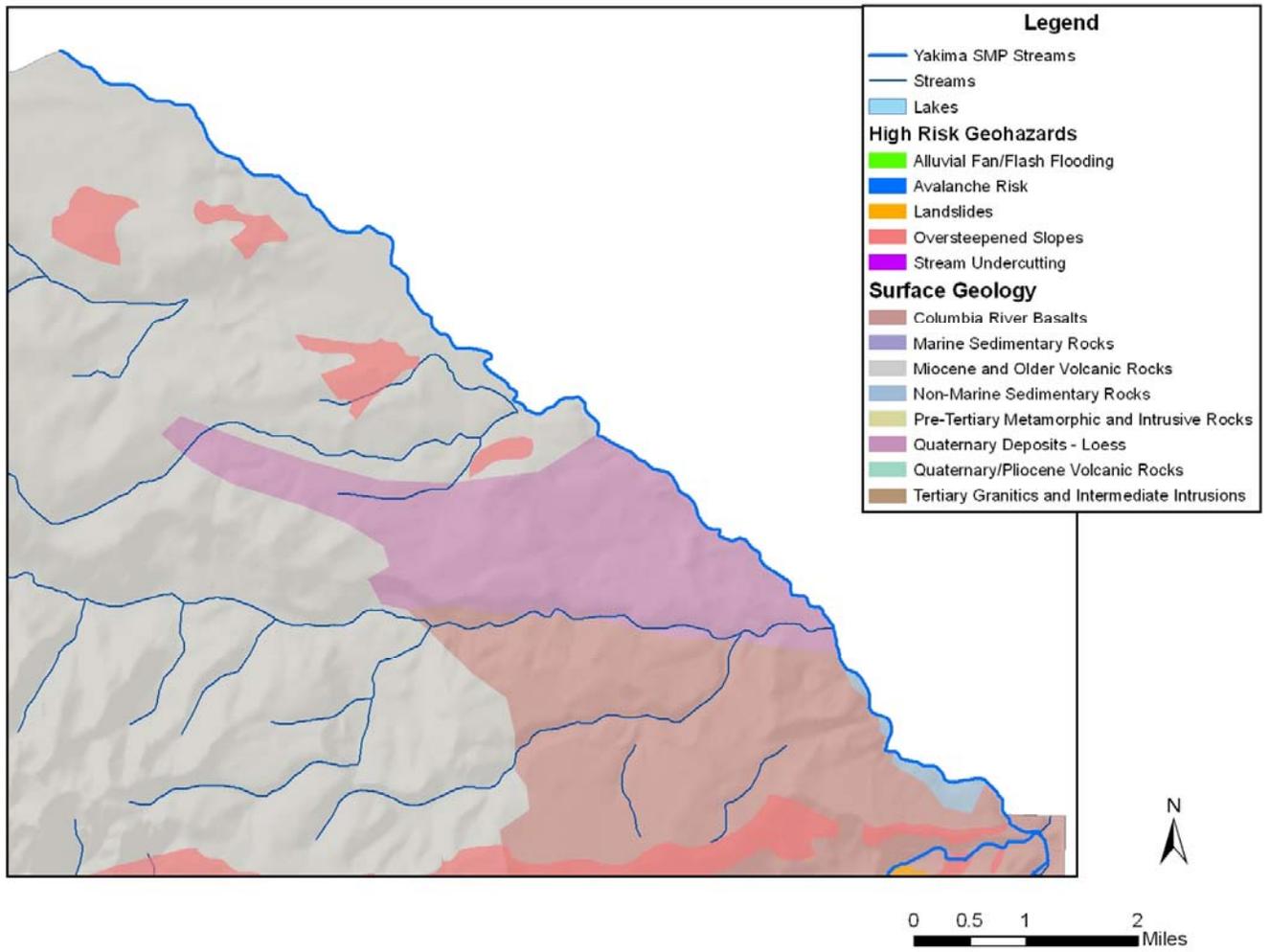


Figure LN1. Geology and Geohazards in the Little Naches River.

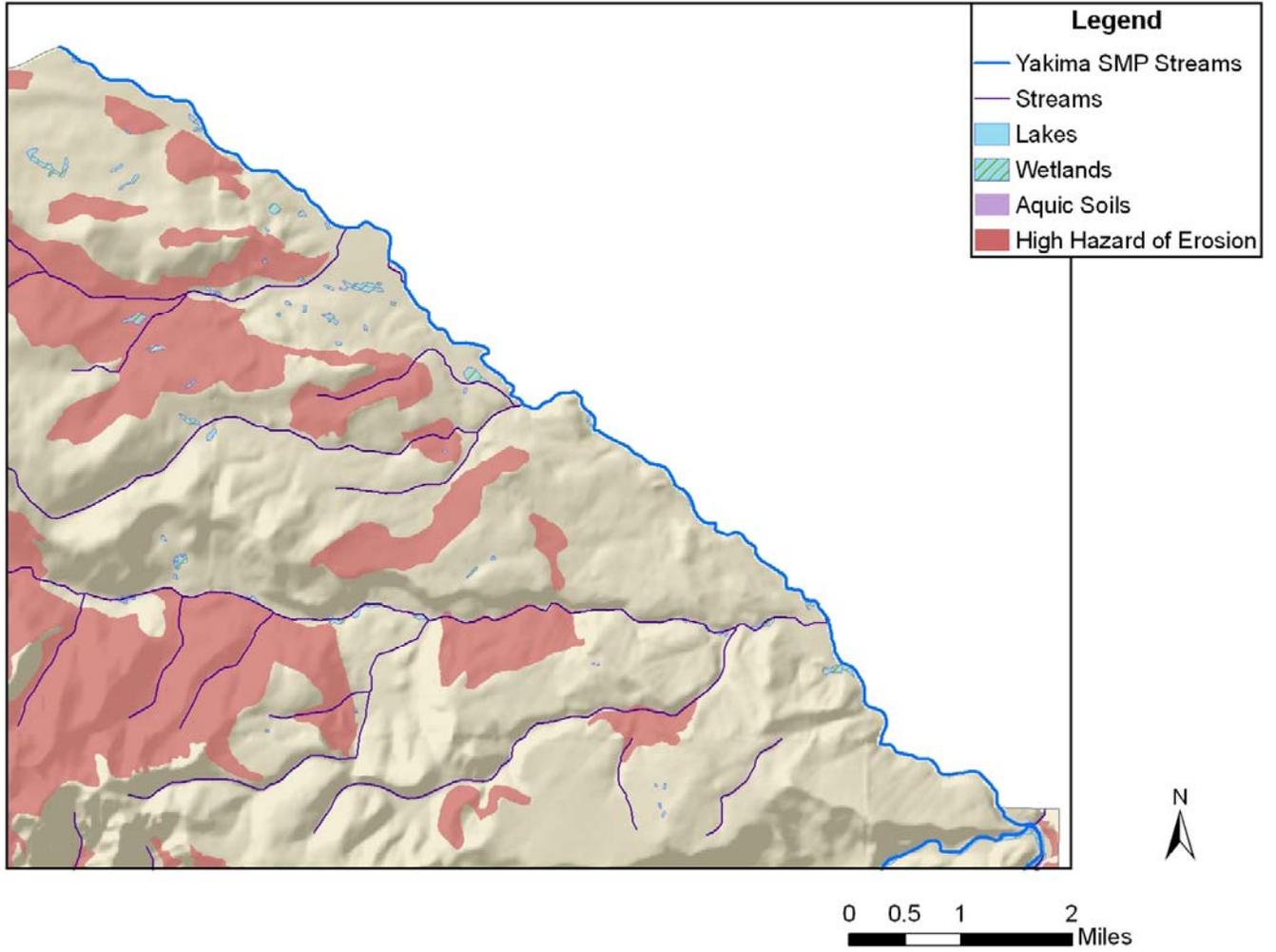


Figure LN2. Wetlands and Soil Characteristics in the Little Naches River.

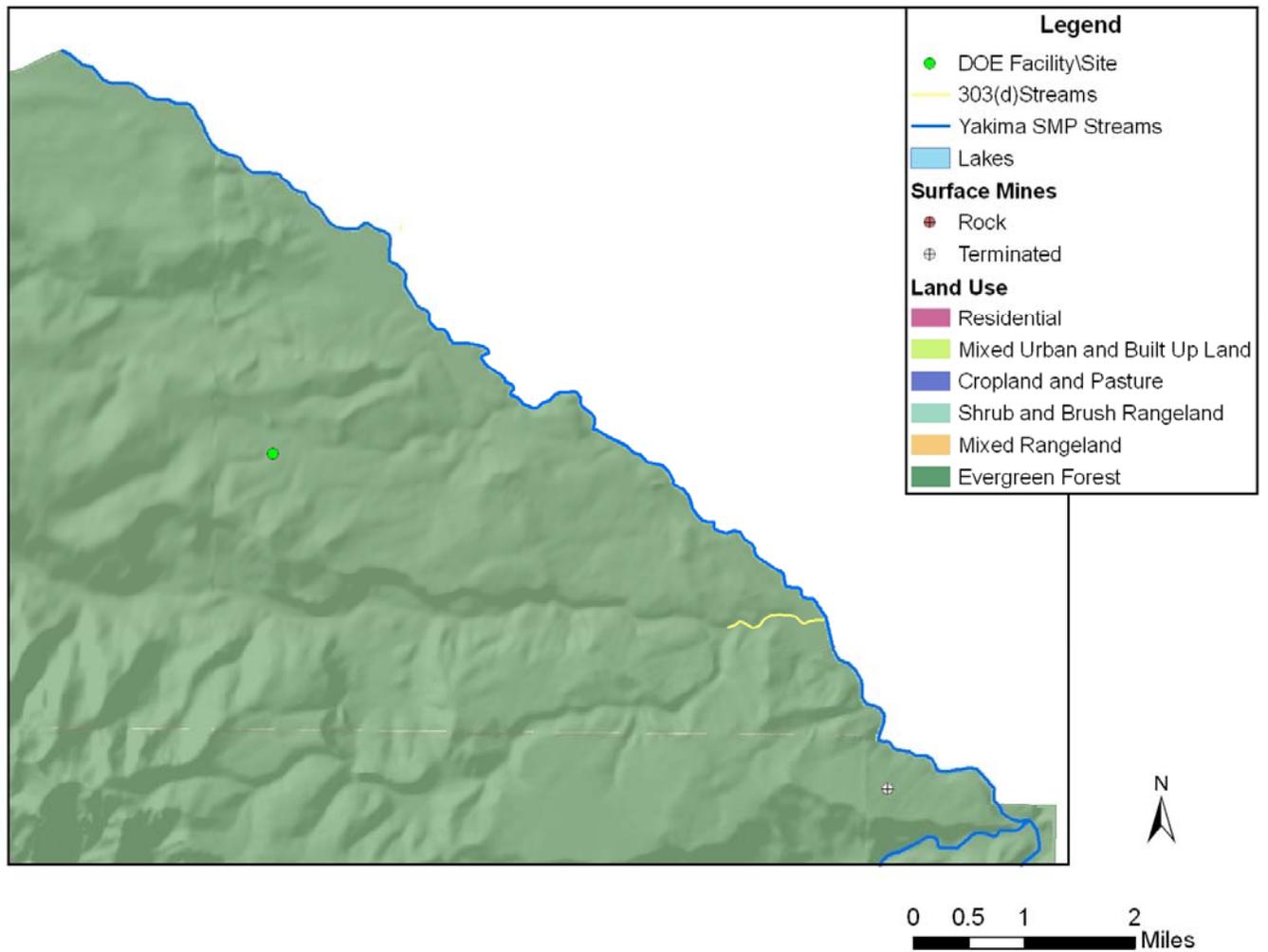


Figure LN3. Cultural Modifications in the Little Naches River.

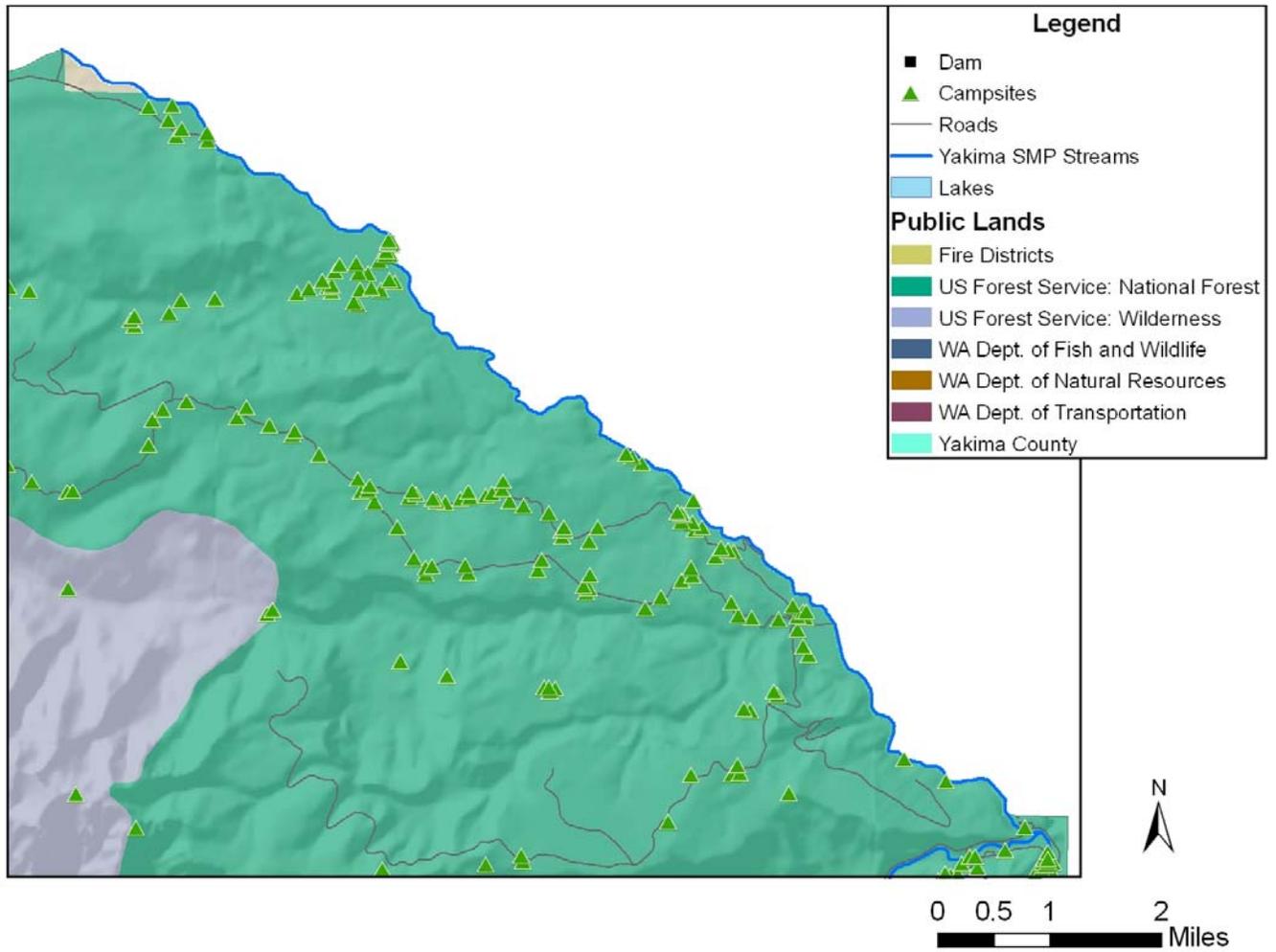


Figure LN4. Public Resources and Access in the Little Naches.

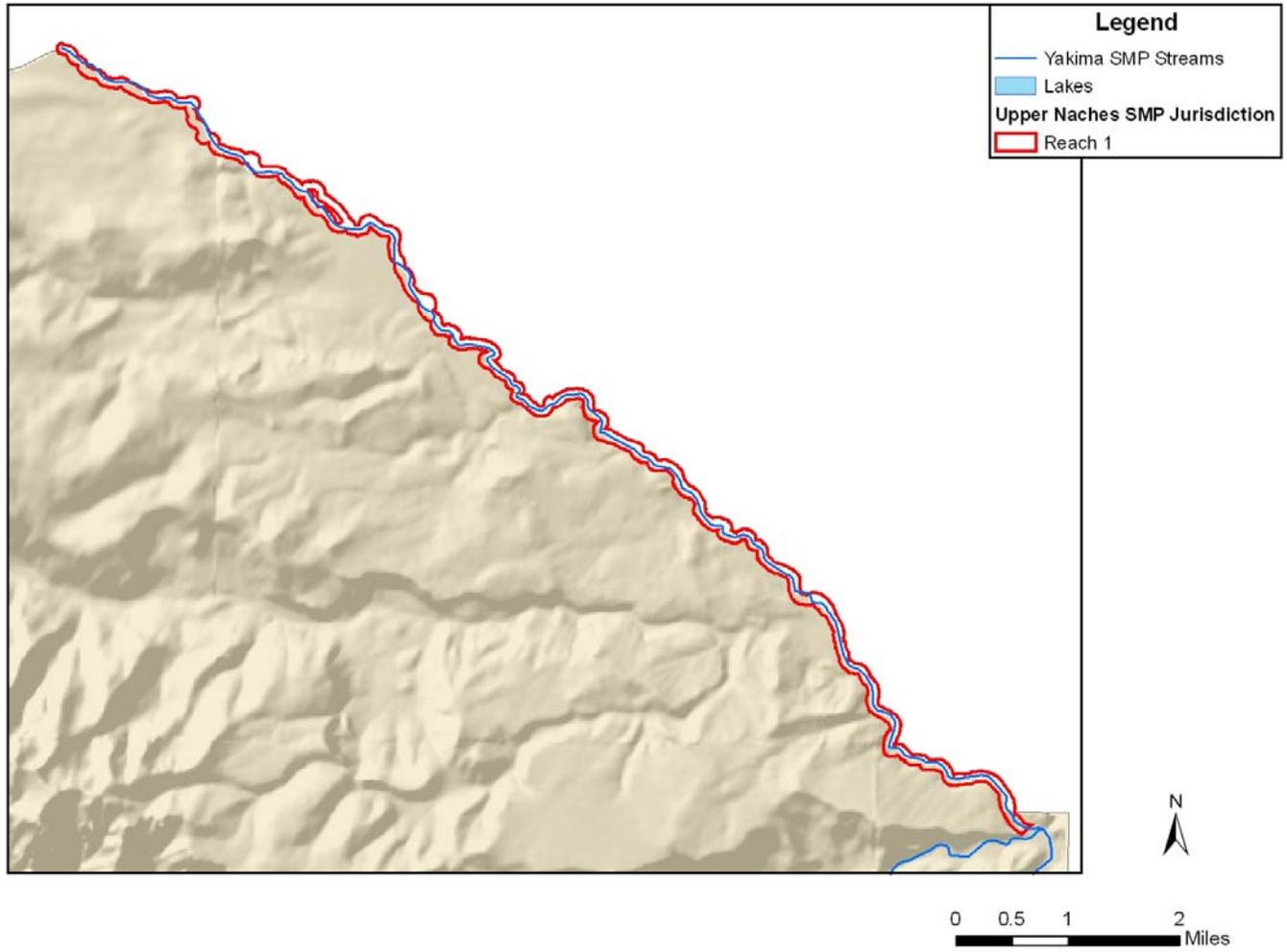


Figure LN5. SMP Jurisdiction Breaks for the Little Naches River.

Table LN1. SMP Reach Breaks for Inventory and Analysis, Little Naches River.

Reach	Length	Start	Reach Break Justification	End
1	13.3 Miles	NW¼, SE¼, S4, T17N, R14E	Geomorphic: Confluence with Bumping.	West line of S31, T19N, R13E

Table LN2. Geology, Geohazards, and Soil Characteristics for the Little Naches River.

REACH	Geology		Geohazard		Soil Characteristics				Aquic Soils
	Lithology	Area (%)	Geohazard	Area (%)	Permeability	Area (%)	Hazard of Erosion	Area (%)	Area (%)
1  Area: 842.3 Acres	Alluvium	71.2	Alluvial Fan/Flash Flooding (Intermediate Risk)	2.5	rapid	31.5	moderate	8.2	No Data
	Alpine Glacial Drift, Pre-Fraser	6.5	Landslides (Intermediate Risk)	0.7	moderate	17.0	severe	1.7	
	Andesite Flows	0.1	Landslides (High Risk)	10.3	moderately rapid	0.3	slight	89.7	
	Basalt Flows	12.3	Oversteepened Slopes (Intermediate Risk)	10.8	very rapid	41.8	no data	0.4	
	Mass-Wasting Deposits, Mostly Landslides	9.4	Oversteepened Slopes (High Risk)	7.5	very slow	8.9			
	Volcaniclastic Deposits or Rocks	0.4	Suspected Geologic Hazards (Low Risk)	2.3	no data	0.4			

Table LN3. Stream Characteristics for the Little Naches River.

REACH	Stream Lengths		Channel Migration	
	Total Streams (Miles)	SMP Stream (Miles)	Potential	Area (%)
<p><b>1</b></p> <p>Length: 13.3 Miles Area: 842.3 Acres</p>	13.3	13.3	No Data	No Data

Table LN4. Habitat Characteristics for the Little Naches River.

REACH	Wildlife Heritage Locations Common Name	Wildlife Heritage Locations Locations (#)	Wetlands Area (%)	Riparian Areas Area (%)	Priority Species & Habitats		Forest Type/Series		Successional Stage	
					Habitat	Area (%)	Plant Series	Area (%)	Forest Type Stage	Area (%)
1  Area: 842.3 Acres	Long Eared Myotis	1	10.4	35.5	Elk	76.3	Grand Fir	42.5	Pacific Silver Fir - Early	0.0
	Yuma Myotis	1			Harlequin Duck	1.3	Meadow Pacific Silver Fir	2.2	Pacific Silver Fir - Late	0.8
					Meadows	5.0		0.9	Grand Fir - Early	0.2
							Parkland Riparian Area	0.1	Grand Fir - Mid	17.6
							Rock	35.5	Grand Fir - Late	24.7
							Western Hemlock	5.4	Riparian - Mid	18.9
								13.5	Western Hemlock - Mid	13.5
									Western Hemlock-Late	0.0
									Nonforested	24.2

Table LN5. Fish Characteristics for the Little Naches River.

REACH	Anadromous Fish						Bulltrout		Resident Fish		Barriers	
	Presence		Spawning		Rearing		Presence	Length (Miles)	Species	Length (Miles)	Type	Species Blocked
	Species	Length (Miles)	Species	Length (Miles)	Species	Length (Miles)						
<b>1</b>  Length: 13.3 Miles	Spring Chinook	13.3	Spring Chinook	13.3	Spring Chinook	0.1	Currently Occupied	3.1	Eastern Brook Trout	0.1	Passable, Falls	N/A
	Summer Steelhead	13.3	Summer Steelhead	13.3			Presumed	9.5	Rainbow Trout	3.0		
									Westslope Cutthroat	0.1		

Table LN6. GAP Analysis of SMP Jurisdiction for the Little Naches River.

REACH	GAP Analysis*						Spotted Owl Habitat		
	Mammals		Birds		Vegetation		Suitability	Area (%)	
	Type	Area (%)	Type	Area (%)	Type	Area (%)			
<b>1</b>  Area: 842.3 Acres	Townsend's Big-Eared Bat		100.0	Spotted Owl	96.9	Grand Fir	99.8	Suitable	31.4
						Western Hemlock	0.2	Non Suitable	68.6

Table LN7. Land-use Characteristics for the Little Naches River.

REACH	Land Use*		Land Use Type on Rapid Runoff Soil*		Impervious Surface*	
	Type	Area (%)	Type	Area (%)	Range	Area (%)
<b>1</b> Area: 842.3 Acres	Forestry	62.5	Forestry	12.3	0	10.9
	Vacant/Natural	10.5			1-10	62.2
	Residential - Single Family	0.1			11-25	0.0
					26-50	0.0
					51-75	0.0
					76+	0.0

Table LN8. Cultural Jurisdiction Characteristics for the Little Naches River.

REACH	Zoning*		Public Land Ownership*		Environmental Designation (1981)	
	Type	Area (%)	Owner	Area (%)	Designation	Area (%)
<b>1</b> Area: 842.3 Acres	Forested Watershed	73.1	Not Identified	4.0	Conservancy	100.0
			US Forest Service: National Forest	47.7		

Table LN9. Little Naches Cultural Analysis of SMP Jurisdiction.

REACH	Campsites (#)	Known Cultural Sites (#)	DOE Sites/facilities and 303(d)-Stream Listings	
			Sites/ facilities (#)	Stream (Miles)
<b>1</b>  Length: 13.3 Miles	27	13	0	2.8