APPENDIX F

Appendix F
Fish Habitat

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LEVEL II STREAM SURVEY NARRATIVES

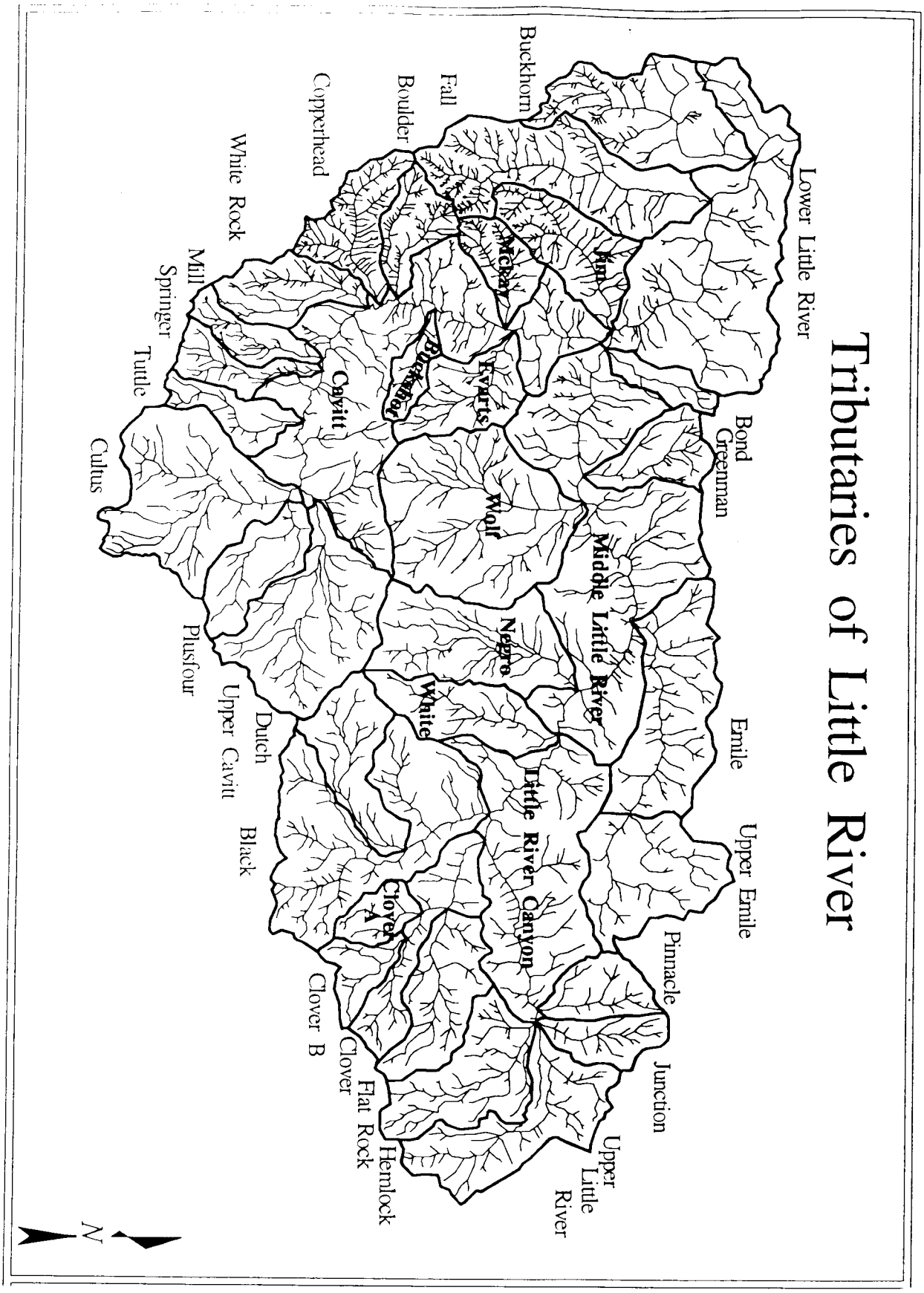
Introduction:

The following stream survey narratives are intended to provide additional information specific to fisheries resources within the Little River basin that was too detailed to report in the main body of the watershed analysis document. It is hoped that this more detailed and site specific information will be of use to individual project planners, state agencies, and private citizens when planning timber sales, restoration projects, and other activities that may potentially affect the watershed.

These narratives will vary widely in content (especially on private land or lands managed by the BLM) due to the authors lack of the site specific knowledge of certain streams. In these areas, aerial photographs, ODFW stream surveys, and professional judgements are the primary information sources used to describe habitat conditions.

The survey information is described by each of the 7 vicinity areas (see map F1) and then further broken down and described by individual subbasin areas within these vicinities, otherwise known as fish watershed analysis areas, or fish WAA's (see map F2). The fish WAA stratification was developed in order to provide specific information about resources on a fairly small scale that would be useful for project level planning activities. The Little River basin was broken down into 36 separate fish WAA's, most of which correspond to drainage boundaries of small fish-bearing tributaries within the basin. The majority of these fish WAA's will be discussed in this appendix.

Map F1: Seven Vicinity Areas of the Little River Watershed



Map F-2: Little River Fish WAA's.

Data Collection:

Initial Level II stream surveys began in Little River in 1990, but the majority of the surveys were conducted in 1994, partially as a result of the basin's designation as an Adaptive Management Area. The stream survey data contained within these reports comes from two different sources, the ODFW and the USFS. These two agencies utilize different survey methodologies, making interpretation and comparisons of this information difficult. Some of the codes used, as well as the important differences between data tables for each respective survey method, are listed below.

Fish Species:

Co = Coho Salmon
Ch = Spring Chinook Salmon
St = Steelhead Trout
mCt = Migratory Cutthroat Trout
rCt = Resident Cutthroat Trout
Rb = Resident Rainbow Trout
Bk = Brook Trout
? = Fish presence or absence not determined (either fluvial or sea-run)

Substrate types:

SI = Silts and fine organic materials
SA = Sand
GR = Gravel (pea to hardball size)
CO = Cobble (hardball to basketball size)
SB = Small boulders (basketball to 0.5 yd3)
LB = Large boulders
BR = Bedrock

Large Wood:

In ODFW surveys, the metric **volume** of in-channel wood is recorded, rather than the number of "large" pieces (see Forest Service definition of "large wood" below). Therefore, when reporting this information in this document, these values have been converted to English units for ease of comparison between survey types, and are reported as the number of cubic feet per 100 yards of stream, on average. In Forest Service stream surveys, only "large" pieces of wood that are 50 feet in length, and have diameters of 24 inches or larger at the small end, are counted. Therefore, when reporting this information in table format, only the number of pieces per mile meeting these criteria will be reported.

Table 1. Landslide frequency by cause by vicinity. Frequency is reported in occurrences per square mile. See Appendix A for more information on the landslide analysis.

Vicinity	"Natural" Landslide Frequency	Management Related Landslide Frequency	Combined Landslide Frequency
Lower Little River	0.6	4.5	5.2
Cavitt Creek	1.6	3.8	5.4
Emile Creek	1.0	3.4	4.3
Middle Little River	1.3	3.3	4.6
Wolf Plateau	1.1	5.2	6.2
Black/Clover	3.6	4.2	7.8
Upper Little River	1.6	3.5	5.1

From the above table it is evident that the Black/Clover vicinity had the highest "natural" landslide frequency of all vicinities within the basin. This vicinity also has the highest combined (management and natural) frequency of 7.8 slides per square mile. The Wolf Plateau vicinity had a relatively low incidence of natural landslides, but has the highest frequency of management related landslides and the 2nd highest frequency of combined landslides. Landslide frequencies of all of the vicinities have increased substantially over what they were naturally as a result of management activities. This fact has undoubtedly resulted in a negative contribution to the condition of aquatic habitat within the watershed.

Table 2. Percent of fish bearing miles by vicinity.

Vicinity	% of Total Basin Area	% of Total Anadromous Fish Bearing Miles	% of Total Resident Fish Bearing Miles	% of Total Fish Bearing Miles
Lower Little River	16	21	16	18
Cavitt Creek	29	29	28	28
Emile Creek	7	2	14	9

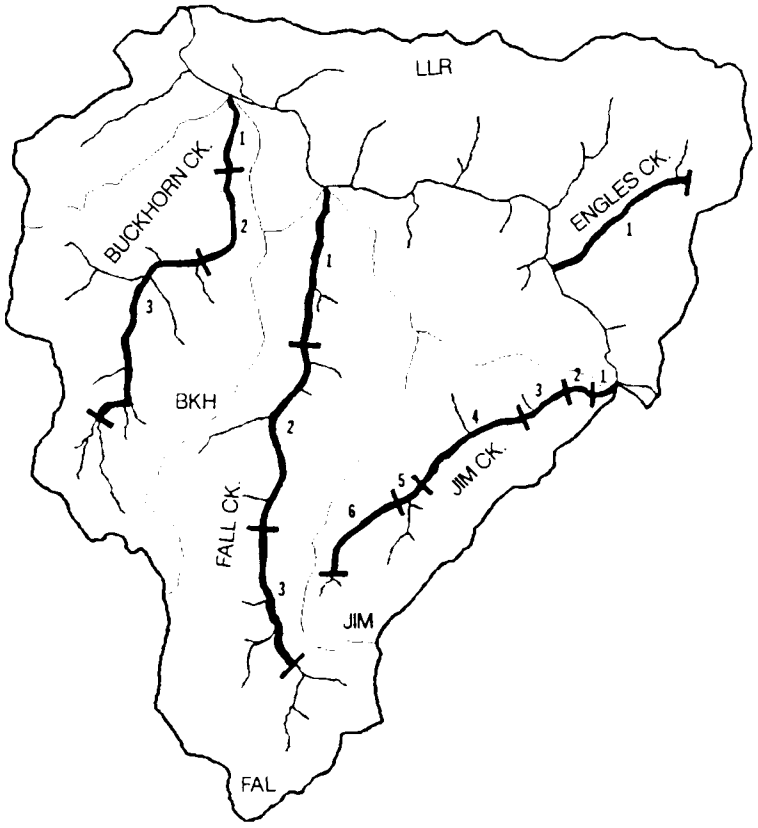
Vicinity	% of Total Basin Area	% of Total Anadromous Fish Bearing Miles	% of Total Resident Fish Bearing Miles	% of Total Fish Bearing Miles
Middle Little River	16	39	4	18
Wolf Plateau	11	6	3	4
Black/Clover	13	3	17	11
Upper Little River	8	0	18	11

From a fisheries standpoint, the Little River basin provides roughly 48 miles of anadromous fish habitat, and an additional 70 miles of resident salmonid habitat. In looking at the above table, and the stream survey narratives contained within this appendix, it becomes apparent that the bulk of anadromous fish habitat is provided by the larger, mainstem areas of the Lower Little River, Middle Little River, and Cavitt Creek vicinities. In contrast, the majority of the resident salmonid habitat is found within the smaller tributaries of the Upper Little River, Black/Clover, Cavitt Creek, Emile Creek, and Lower Little River vicinities.

LOWER LITTLE RIVER VICINITY

The lower Little River vicinity is comprised of 4 separate fish WAA's for a combined acreage of 21,834 acres (see map F-3). Within these 4 fish WAA's, there is very little land managed by the Federal government. It should be noted that Engles Creek, a small tributary to mainstem Little River in this vicinity, did not receive a separate fish WAA designation due to the fact that fish were not thought to have used this small system. However, recent surveys conducted in 1994 did identify fish here. While no drainage specific land management information is available for this subbasin, its habitat attributes (as obtained in the survey) are reported below.

In general, stream gradients in the fish bearing portions of streams in this vicinity are relatively low. This is a result of their location in the Coastal and Klamath geologic provinces, which have been exposed to erosional forces for a much longer period of time than the western cascades province. Streams in these areas have had more time to "work" on the landscape, resulting in channels with a more mature profile (ie. wider valley bottoms, lower gradients, and meander back and forth across their floodplains).



Map F-3: Lower Little River Fish WAA's and Survey Reaches.

Table 3: Land Management Information for the Lower Little River Vicinity.

Fish WAA	Drainage Acres	Road Density (Mi/Mi2)	% of Fish WAA Regen Harvested	% of Rip. Reserves Harvested	"Natural" Landslide Density (Slides/Mi2)	Mgmt. Related Landslide Density (Slides/Mi2)	Combined Landslide Density (Slides/Mi2)
Buckhorn Creek (BKH)	4,334	3.6	55 *	99	0.4	2.4	2.8
Fall Creek (FAL)	5,544	4.6	81	93	0.8	9.9	10.7
Jim Creek (JIM)	2,756	5.7	84	87	0.7	3.5	4.2
Lower Little River (LLR)	9,200	4.4	53 *	93	0.5	2.5	3.0

NOTE: * denotes an incomplete or suspect data set. It is likely that harvest levels are substantially higher in these areas.

Prior to 1946 (and significant upslope management activities) the overall landslide density for this vicinity was 0.6 slides per square mile. However, management activities have resulted in this area

having the second highest management-related landslide frequency in the entire Little River basin, at 4.5 slides per square mile. The total landslide frequency (natural and management related) for this vicinity is 5.2 slides per square mile, the 4th highest frequency of the 7 vicinity areas.

The survey information for each of the fish bearing tributaries found within this vicinity is listed below. No fish habitat surveys have been conducted on the mainstem of Little River in this area, but anecdotal information and professional judgement will be used to describe the quality of this habitat.

Buckhorn Creek

Buckhorn Creek (BKH) is a 4,334 acre tributary to lower Little River, and contains populations of resident cutthroat trout. There is reportedly a small falls near the mouth of this stream that prevents anadromous fish passage. The fish bearing portions of this stream pass through large blocks of flat valley-bottom land that is primarily used for agricultural purposes with some rural residential use as well. The upper slopes are steeper, with slope gradients averaging around 30 to 60 percent. These lands are predominantly commercial timber lands in their second or third harvest rotation.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Buckhorn Creek 1	1.1	rCt	34:34:30	26	GR:SA	1
2	1.0	rCt	21:55:24	117	BR:GR	1
3	2.1	rCt	17:54:29	36	SA:GR	2

The stream itself is similar to many other larger (3rd order and above) streams within Douglas County that are located on the flat valley bottom lands of the Klamath and Coastal geologic provinces. In general, these streams are highly incised into the flat valley bottom lands, which are comprised primarily of loose alluvial materials that were deposited there thousands of years ago during a wetter climatic period. Within Buckhorn Creek (as well as other similar channels), large amounts of stream bank erosion is occurring, and surveys indicate that there are high levels of sands and silts in the streambed substrate. In addition, anecdotal reports from residents of the area indicate that this stream is extremely turbid during the winter and spring months. This condition, along with the fact that this stream had one of the lowest volumes of in-channel large wood of any ODFW surveyed stream in the Little River basin, indicate that habitat is simple, degraded, and not conducive to producing or maintaining healthy fish populations.

An analysis of landslides indicated that there is a low density of mass wasting failures when compared to other, steeper terrain found in the western cascades and Klamath geologic provinces.

Fall Creek

Fall Creek (FAL), at 5,544 acres, is also a resident cutthroat trout stream. There is a large waterfall at its mouth that is a complete barrier to anadromous fish. The headwaters of this stream are located within granitic rock types that are highly susceptible to both surface erosion and mass wasting. These headwater areas experienced a large fire in 1987, that resulted in large amounts of salvage timber harvest. In total, the basin has been 81% clearcut harvested. As a result of the erosive ground, the large amount of management activities, and the recent fires, the majority of this channel is in a highly degraded condition.

Stream and Reach		Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Fall Creek	1	1.4	rCt	16:78:6	75	SA:GR	2
	2	1.9	rCt	12:83:5	396	SA:GR	4
	3	1.9	rCt	15:81:4	1280	BR:SA	4

Survey data shows that the stream is dominated by riffle habitat, with an abundance of sand in the streambed substrates. As with Buckhorn Creek and many of the other tributaries of the watershed, this may be an indication that the stream channel is receiving more fine sediment than it is capable of transporting. Many of the pools that are present within this stream are being formed as a result of beaver dams, especially in reach 3. This fact, combined with the recent fire occurrence in this area, may explain the larger volumes of wood recorded in reach 3. Reaches 1 and 2 have relatively low volumes of in-channel wood, likely a result of riparian timber harvest and stream cleanout activities. As with Buckhorn Creek, the presence of large amounts of fine sediment, relatively low volumes of wood, and a lack of pool habitat is an indication that this stream is in a degraded condition.

Jim Creek

Jim Creek (JIM) has a drainage area of 2,756 acres, and supports populations of steelhead trout, coho salmon, and resident cutthroat trout. The majority of Jim Creek is privately owned, but a substantial portion of the subbasin is managed by the Roseburg District BLM as well. Most of its drainage area (84%) has been clearcut harvested, and numerous portions of the mainstem channel have had their wood removed, as indicated by the relatively low wood volumes found in reaches 1,2, and 3.

Stream and Reach		Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Jim Creek	1	0.2	St, Co, mCt, rCt	21:70:9	260	BR:SA	6
	2	0.3	St, Co, mCt, rCt	33:63:4	803	SA:CO	1
	3	0.5	rCt	37:51:12	767	SA:BR	5
	4	1.5	rCt	38:59:3	2242	SA:GR	3
	5	0.5	rCt	47:50:3	3240	SA:GR	3
	6	1.4	rCt	49:49:2	1271	SA:GR	4

The fact that sand makes up a large portion of the streambed substrate in all reaches is an indication that this system contains more fine sediment than it is capable of transporting to downstream areas. While this may be expected in lower gradient streams with naturally high sediment loads, in Jim Creek, this situation is likely a cumulative effect of the intensive land management and recent (1987) fires that have occurred within its drainage area. Based on these conditions, much of the habitat in Jim Creek is considered to be degraded.

Engles Creek

Engles Creek is a small, roughly 1,060 acre drainage similar to Greenman and Bond Creeks of the Middle Little River vicinity. The habitat is dominated by high gradient riffle habitat types. According to the survey information, there is no barrier that would prevent anadromous fish from using the lower portions of this system. To date, no fish species determinations have been attempted in this stream, but it is likely that the headwaters are dominated by resident cutthroat trout, with the lower areas being inhabited by a mix of steelhead and resident cutthroat.

Although no drainage specific harvest information is available on this small system, interpretation of recent aerial photographs indicates that roughly 80 to 90% of the drainage area within this basin has been clearcut harvested. The overall drainage area currently appears stable, with a relatively contiguous stand of second growth conifers. However, the gravel/sand nature of the streambed substrates is an indication that the system may have excessive amounts of fine sediment, and is recovering from the past harvest and road related impacts.

Stream and Reach		Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Engles Creek	1	1.2	rCt	6:88:6	1868	GR:SA	13

The channel itself is steep, with very little pool habitat, and is not likely to be a large producer of resident or anadromous salmonids.

Lower Little River (Mainstem)

There have been no habitat surveys conducted in the lower mainstem portions of Little River. However, professional judgement can be used to describe the conditions in these areas. In this 7 mile stretch of the lower mainstem, physical habitat conditions, for the most part, are highly degraded. There is very little large wood, most substrates are highly embedded by fine sediment, water temperatures exceeding 83 degrees F were measured in 1994, high pH values were also recorded during this period, and extremely low flows persist throughout much of the summer.

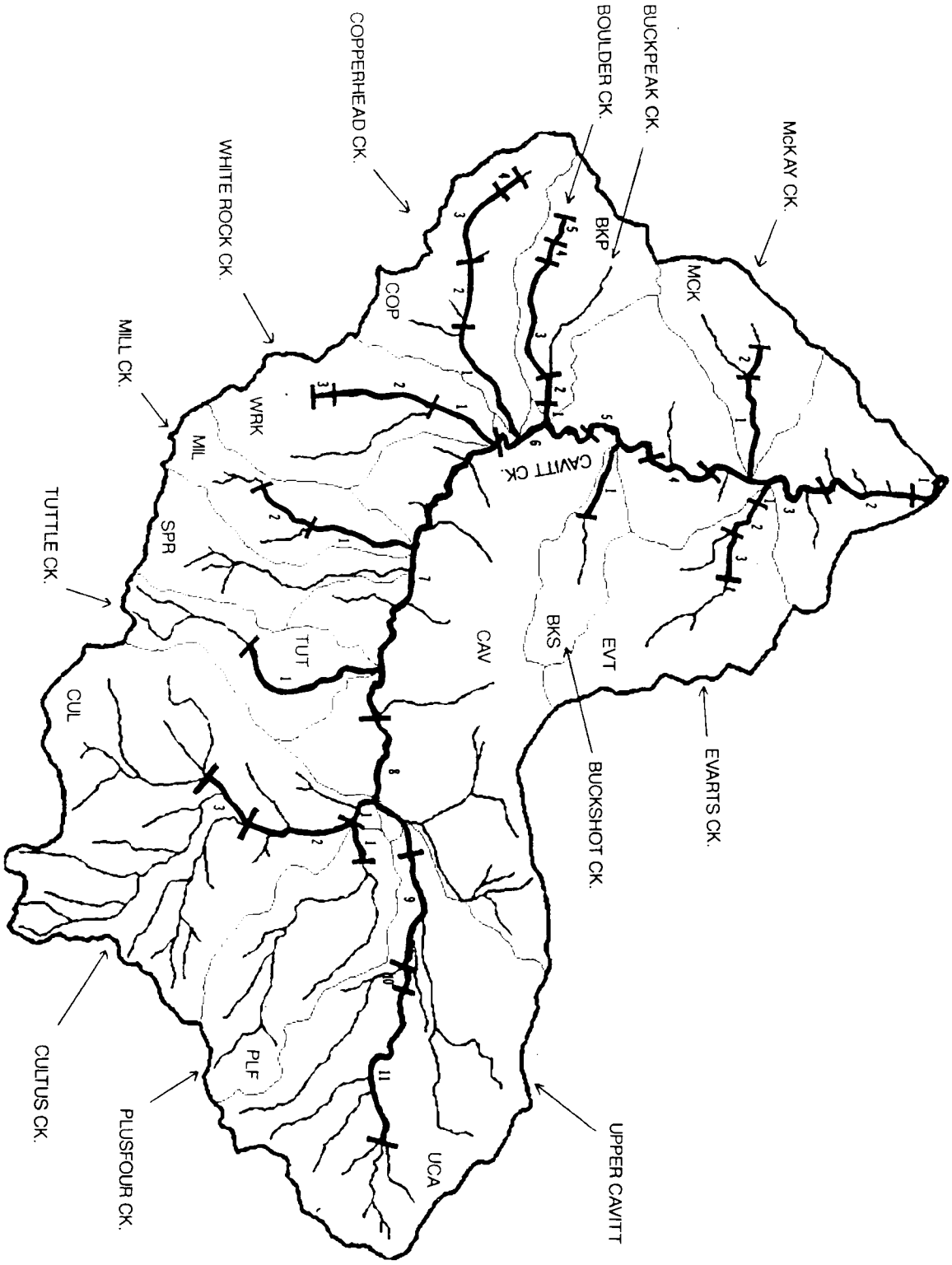
There are several areas of complex habitat that are found in short stretches of narrow canyon, where large boulders and bedrock outcroppings are resulting in the formation of diverse habitat. These areas are primarily located from the mouth of Cavitt Creek downstream approximately 3 miles. The remaining habitat downstream from these areas is dominated by shallow, wide, oversimplified glide or slow moving riffle areas, with virtually no diversity.

This lower stretch of mainstem Little River is used by spring chinook, coho salmon, and steelhead trout for spawning and rearing purposes. It is likely that the abundance of fine sediments, and the poor water quality conditions in these areas is having a negative affect on egg to fry, as well as fry to smolt survival.

CAVITT CREEK VICINITY

At 37,689 acres, Cavitt Creek is the largest tributary to Little River, representing roughly 29% of the land area found within the entire Little River drainage. Within the watershed boundaries of Cavitt Creek, there are 11 distinct fish bearing tributaries other than the mainstem of Cavitt Creek itself. In total, this subbasin contains approximately 14 miles of anadromous salmonid habitat, and an additional 20 miles of resident salmonid bearing habitat. These figures represent 29% of the total anadromous fish bearing miles, and 28% of the total resident fish bearing miles, respectively, within the Little River basin.

From a fisheries standpoint, Cavitt Creek contains a relatively diverse assemblage of salmonid species including coho salmon, steelhead, resident, fluvial, and sea-run cutthroat trout, and possibly spring chinook salmon. In particular, Cavitt Creek is considered to be the major producer of coho salmon and cutthroat trout within the basin. It is also likely that a large portion of the basins Pacific lamprey population is found here due to the abundance of fine sand and silt substrates, but additional information is necessary to support this hypothesis. Based on limited information and preliminary field investigations, it appears as though the salmon species only utilize the lower 3 or 4 miles of the mainstem, as well as the mouths of a few small tributaries. Steelhead, however, are the most ubiquitous of the anadromous species found in the basin, and have been observed using habitat as far upstream as Cultus Creek (see map F-4).



Map F-4: Cavitt Creek fish WAA's and Survey Reaches.

Cavitt Creek has a wide variety of management and land use boundaries, ranging from residential and agricultural near the mouth, to commercial timber lands near it midsections, to public lands in its headwater reaches. It was one of the first tributary streams to receive intensive Euro-American settlement in the early 1900's, resulting in a current residential population of several hundred people. Since settlement began in the subbasin, roughly 22,700 acres, or 60 percent of its drainage area, has been clearcut harvested using a variety of methods including tractor harvest, skyline yarding, etc. Approximately 300 miles of road have been constructed in the drainage as well.

In its natural condition, it is likely that Cavitt Creek had a relatively high sediment load due to the presence of a large earthflow located near its upper reaches. This earthflow, also known as Idiot Slide, is a natural phenomenon that delivers large amounts of sediment on a yearly basis. In addition, erosive "granitic" rock types are found along a portion of the western boundary of Cavitt Creek, in the vicinity of the headwaters of Boulder, White Rock, and Copperhead Creeks. This erosive ground is also likely to have contributed to the naturally high sediment load.

Currently, it is believed that the sediment load found within the basin is much higher than that observed naturally. Timber harvest and road construction greatly increased the number of landslides and debris flows occurring in this drainage. As shown in table x, landslide rates have increased dramatically over those seen prior to significant land management began in the basin. In fact, prior to 1946, the "natural" landslide frequency of the area was roughly 1.6 slides per square mile. With the onset of substantial management activities, this density jumped up to its current figure of 5.4 slides per square mile of ground...a significant increase.

Table 4: Land Management Information for the Cavitt Creek Vicinity.

Fish WAA	Drainage Acres	Road Density (Mi/Mi2)	% of Fish WAA Regen Harvested	% of Rip. Reserves Harvested	"Natural" Landslide Density (Slides/ Mi2)	Mgmt. Related Landslide Density (Slides/ Mi2)	Combined Landslide Density (Slides/Mi2)
McKay Creek (MCK)	1,435	4.7	75	71	1.3	8.9	10.3
Evarts Creek (EVT)	2,262	5.3	79	86	1.4	1.1	2.5
Cavitt Creek (CAV)	10,672	4.9	66	75	0.8	4.7	5.5
Buckpeak Creek (BKP)	1,559	6.2	99	100	1.2	17.7	18.9

Fish WAA	Drainage Acres	Road Density (Mi/Mi2)	% of Fish WAA Regen Harvested	% of Rip. Reserves Harvested	"Natural" Landslide Density (Slides/ Mi2)	Mgmt. Related Landslide Density (Slides/ Mi2)	Combined Landslide Density (Slides/Mi2)
Buckshot Creek (BKS)	840	4.0	90	88	0.0	2.3	2.3
Copperhead Creek (COP)	2,215	4.8	82	85	0.0	4.0	4.0
White Rock Creek (WRK)	2,007	5.4	96	98	0.3	6.7	7.0
Springer Creek (SPR)	1,220	6.3	71	81	0.5	4.2	4.7
Mill Creek (MIL)	1,205	6.6	91	94	3.2	4.2	7.4
Tuttle Creek (TUT)	1,329	5.0	44	45	3.4	0.5	3.8
Plusfour Creek (PLF)	2,126	5.7	38	32	2.4	3.6	6.0
Cultus Creek (CUL)	5,622	4.4	28	21	3.1	0.1	3.3
Upper Cavitt Creek (UCA)	5,199	5.4	51	36	2.2	1.2	3.4

Mainstem Cavitt Creek (CAV and UCA fish WAA's):

Cavitt Creek is an important drainage because of its size, and because it is distinctly different than most of the other tributaries within the basin. It is characterized by an abundance of gravel, a relatively low gradient, and by the presence of large amounts of fine sediment, compared to the mainstem of Little River. The Cavitt Creek subbasin has extensive areas of dormant, large-scale landslide complexes and massive earthflow deposits, both active (idiot slide) and inactive. The ancient, deep-seated landslide complexes have historically interacted with the stream channel changing the profile of the drainage. Landslide obstructions have caused the formation of wide, alluvial valley bottoms, with sinuous stream channels that meander back and forth across these low gradient reaches. The majority of these localized flat valley areas are small, averaging about 0.25 to 0.5 mile in length. However, a significant landslide deposit at the mouth of Buckshot Creek restricted flow in Cavitt Creek which resulted in a large sediment accumulation. This 2 mile long segment of flat valley bottom represents the largest such section along Cavitt Creek (reaches 6 and 7).

In their natural condition, these low gradient, meandering channels in the mainstem of Cavitt Creek, tend to be some of the most productive in terms of aquatic insects and fish populations. This is because water velocities are slower, habitat complexity (ie. large wood, pools, undercut banks, etc.) is usually higher, and more of the nutrients that enter the aquatic system are retained on-site as a result (ie. leaves collect on woody debris, high water velocities don't wash everything downstream, etc.).

Much of this potentially productive habitat, however, is in a degraded state because the channel has lost one of the key components of its former productivity - large wood. Large wood was removed from the stream channel and the future source of large wood (as well as stream shade) was removed from riparian areas as a result of intensive timber harvest. As a result, the stream is continuing to meander back and forth across its valley, but the large wood component that formerly added stream bank stability and in-channel habitat diversity, is no longer there to fall in. Consequently, banks continue to erode as the stream channel moves laterally with no resistance (ie. no trees holding the banks together). This results in a widened stream channel that contains more sediment, is exposed to more sunlight, and has no large structural elements to aid in the formation of complex habitat.

The table below summarizes some of the key habitat elements for the mainstem of Cavitt Creek. The upper most reaches in Cavitt Creek generally have more large wood. These are areas where the source of large wood has not been removed. This stream was surveyed in 1993 using ODFW methods.

Several large sources of fine sediment are present today in the upper Cavitt Creek drainage. One of these sources, a large active earthflow known as Idiot Slide, continues to contribute sediment on an annual basis. This earthflow was not caused by management activities, however activities that increase peakflows may lead to an increase in the stream's ability to erode the toe of the earthflow resulting in an increased yield of sediment from this naturally occurring feature. The other major source of sediment is located along the western edge of Cavitt Creek, where highly erosive granitic bedrock is present. Granitics are well known for their highly erosive nature. Soils derived from granitic parent material are highly susceptible to weathering because of the granular texture and widespread fracturing and jointing of this terrain. This terrain is subject to both large amounts of surface erosion, as well as debris avalanches and debris flows on steep slopes. Much of this granitic terrain has been intensively managed for timber with high road densities. These land management activities have greatly accelerated natural erosion process in these areas, scoured streams on steep slopes and deposited the sediment in low gradient channel segments.

The presence of large sediment sources, combined with physical habitat that has been simplified, results in stream channels that contain extremely large amounts of fine sediment. These "embedded" streambeds do not promote diverse or abundant aquatic insect communities. Numerous studies have shown that high levels of fine sediment can have serious detrimental effects on aquatic communities (various authors in Meehan, 1991).

In the lower to middle mainstem of Cavitt Creek, there are short segments of relatively diverse habitat found within the incised stream channel. Although the large wood has been removed from virtually the entire stream, these areas still possess moderate diversity as a result of large boulders of bedrock outcroppings. These complex areas are not present to the extent seen in the mainstem of Little River (in the MLR and LRC fish WAA's), but they still provide localized patches of diverse rearing habitat. They are primarily found in reaches 2, 4 and 5 of mainstem Cavitt Creek. As with the lower mainstem of Little River, however, water temperatures and pH values in 1994 sometimes exceeded 80 degrees F and 8.7 respectively.

Based on the habitat and water quality conditions described above, the lower to middle mainstem reaches of Cavitt Creek are not believed to support large populations of juvenile salmonids during the summer months. Within the basin overall, it is likely that the majority of the summer rearing takes place in the upper watershed areas, upstream of lethal water temperatures.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds	Dom/sub dom Substrate	Gradient %
Mainstem Cavitt 1	0.6	Co, St, mCt	68:27:5	4	BR:CO	1
2	1.0	Co, St, mCt	48:33:19	7	CO:BR	1
3	1.3	Co, St, mCt	46:35:19	7	CO:BR	1
4	0.9	Co, St, mCt	57:36:7	106	CO:BR	2
5	1.5	Co, St, mCt	53:37:10	159	CO:GR	2
6	0.8	Co, St, mCt, rCt	75:19:6	187	GR:CO	1
7	3.7	Co, St, mCt, rCt	36:52:12	42	CO:GR	2
8	1.3	St, mCt, rCt	39:57:4	484	CO:SB	9
9	2.1	rCt	27:71:2	1378	CO:GR	5
10	0.1	rCt	50:50:0	131	CO:GR	3
11	1.5	rCt	24:75:1	745	CO:GR	10

McKay Creek:

McKay Creek is a small tributary that is relatively steep in nature. There is a high gradient cascade over a bedrock ledge at the mouth of this stream which is believed to be a barrier to anadromous fish. Resident trout, believed to be cutthroat, are found within the lower xx mile of habitat however. 100% of this drainage is privately owned, with the primary uses being commercial timber land, and rural residential. The volume of in-channel wood appears to be low to moderate relative to other streams of a similar size that have not been completely harvested (ie

Tuttle Creek, Upper Cavitt Creek). In addition, the fact that sand is the dominant substrate in both reaches of this steep stream is likely an indication of an impacted system. The presence of these fine sediments in a stream that has low to moderate levels of complexity (wood) indicates that more sediment is entering the channel than the stream is capable of transporting downstream.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds	Dom/sub dom substrate	Gradient %
McKay Creek 1	1.2	rCt	38:62:0	286	SA:CO	4
2	0.3	rCt	*	559	SA:BR	9

McKay Creek has a relatively high density of management related landslides. This fact is likely a result of the moderate to high levels of land management that have occurred, as well as the presence of highly erosive "granitic" rock types found in the headwaters of this system.

Evarts Creek:

Evarts Creek is a steep, rugged channel that has a drainage area that is relatively resistant to erosion overall. Even though this system has had roughly 79% of its drainage area harvested, it has one of the lowest overall landslide densities within the entire Cavitt Creek vicinity. Its headwaters flow off of the same resistant rock feature that resulted in the formation of the Wolf Plateau vicinity area (see discussion).

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds	Dom/sub dom Substrate	Gradient %
Evarts Creek 1	0.2	Co, rCt, St	32:68:0 *	71	BR:GR	7
2	0.5	rCt	50:50:0	647	LB:CO	13
3	0.5	??	33:66:1	647	GR:CO	8

* = Much of this reach was dry channel.

Anadromous fish, primarily coho and steelhead, are known to utilize the lower 0.2 mile of this stream, but a small waterfall supposedly prevents them from using habitat further upstream. In general, the habitat appears to be in fair shape, with a moderate amount of wood in the upper reaches, and a moderate amount of pool habitat throughout the system as well.

Boulder Creek:

Boulder Creek is somewhat similar to McKay Creek in that its headwater areas are located within the highly erosive granitic rock types. There is also a large tributary fork known as Buckpeak Creek that joins this system approximately 0.5 mile upstream from its confluence with Cavitt Creek. This stream likely contains fish, but has not been surveyed to date.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds	Dom/sub dom Substrate	Gradient %
Boulder Creek 1	0.2	St, rCt	32:68:0	335	SA:CO	2
2	0.3	St, rCt	31:64:5	1196	SA:SI	5
3	1.5	rCt	47:53:0	812	GR:CO	9
4	0.3	?	2:98:0	673	GR:SA	8
5	0.3	?	0:100:0	929	BR:SA	25

The Boulder Creek/Buckpeak Creek subbasin (otherwise known as the Buckpeak fish WAA) has been 100% harvested. This fact, combined with the erosive areas of granitics, has resulted in the Boulder Ck/Buckpeak Ck. subbasin having the highest frequency of management related landslides of any fish WAA within the entire Little River basin. As shown in the table above, this stream has large quantities of sands and silts in the streambed substrates, which are likely having a negative impact on fish populations.

Buckshot Creek:

At 840 acres, Buckshot Creek is one of the smallest fish bearing tributary streams found within the entire Little River basin. It is characterized as an extremely steep and rugged channel that is dominated by riffle and cascade habitat types. While the percentage of pools recorded during the survey is relatively low, it is likely that the steep cascade and riffle habitat units contain numerous smaller "pocket pools" that were not large enough to call separate pool units. Regardless of this, the habitat found in this system is extremely rugged, and not conducive to producing large numbers of fish. This subbasin had the lowest landslide density of all tributaries within Cavitt Creek despite the fact that 90% of its drainage area has been clearcut harvested.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds	Dom/sub dom Substrate	Gradient %
Buckshot Creek 1	0.7	rCt	8:92:0	471	CO:BR	14

Copperhead Creek:

This stream has had roughly 82% of its drainage area harvested. As with Boulder Creek and McKay Creek, the headwaters of this stream are located within the erosive granitic rock types. The overall landslide density is lower when compared to Boulder and McKay Creeks, but the habitat in this stream is in a similar, degraded condition. The majority of the reaches in this stream are highly embedded with silts and sands. Large wood is present in the channel in moderate amounts, but the majority of it appears to be remnant pieces left over from previous logging activities within the subbasin. It will take decades before the second growth conifers currently growing on the site will reach a large size and start to enter the channel naturally. Current habitat conditions within this system are not conducive to healthy populations of aquatic insects of fish.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Copperhead Ck 1	1.6	St, rCt	66:33:1	530	SI:SA	2
2	1.0	rCt	20:79:1	972	SA:GR	3
3	0.7	rCt	6:94:0	1310	SA:GR	11
4	0.4	?	*	2349	SA:SI	17

* = This stream was too small in these areas to effectively separate into different habitat types.

White Rock Creek:

White Rock Creek appears to be very similar to its neighboring subbasin, Mill Creek, which is discussed below. It is dominated by riffle habitat, especially in reaches 2 and 3, where gradients are higher. It contains an unusual combination of sand and bedrock in the streambed substrates of its upper reaches. The presence of large amounts of sand in a steep, bedrock channel, is highly indicative of a stream that is receiving more sediment than it is capable of transporting. There is a small portion of granitic ground in the upper portions of this subbasin, potentially explaining the large amount of fines seen in the channel. In addition, this subbasin also has a relatively high frequency of management related landslides.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
White Rock Ck 1	0.9	St, rCt	27:68:5	175	GR:CO	3
2	1.2	St, rCt	10:89:1	1721	BR:SA	10
3	0.4	?	*	737	SA:BR	17

* = Stream was a small, steep cascade that was too small to effectively separate habitat units.

Mill Creek:

Mill Creek has a long, narrow watershed area and a relatively steep channel gradient overall. Very few pools were present in the lower reach, and the stream is extremely small upstream, in reach 2. This channel is of limited use to fish due to a waterfall barrier found a short distance upstream from the mouth. Wood volumes are moderate to high, but are likely to be smaller remnant pieces that were left over from the previous logging activities that have occurred within the drainage. As with many other streams that have had the majority of their drainage areas harvested within the last 40 years, it will be several decades before the second growth trees attain a larger size and begin to fall into the stream channel naturally.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Mill Creek 1	1.3	St, rCt *	10:90:0	932	CO:GR	10
2	0.9	?	**	2897	GR:CO	11

* = There is a falls approximately 0.1 mile upstream from the mouth that appears to be a barrier to all fish. No fish were seen upstream of this point.
** = The stream was too small to effectively distinguish separate habitat types in this reach.

Tuttle Creek:

Tuttle Creek is a small stream with limited habitat available to fish use. It has a steep gradient and is dominated by riffle and cascade habitat units. It has experienced some significant timber harvest in the lower reaches of the stream, but there is a relatively contiguous block of mature forest upstream of this point. Harvest has occurred in the upper reaches as well, but it was mainly done along the upper third of the slopes within the drainage area of the basin. As a result, the riparian and channel functions within the mature block of forested area appear to be relatively healthy and intact.

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per mile	Dom/sub dom Substrate	Gradient %
Tuttle Creek 1	1.9	St, rCt	4:96:0	1715	GR:CO	13

Plusfour Creek:

Plusfour Creek is another relatively steep stream that only provides a small amount of habitat for fish use. Resident cutthroat trout utilize the lower 0.4 mile of this stream, with their upper distribution being blocked by a series of large waterfalls. Upstream of this point there is evidence that the stream has experienced a large debris flow in the past. The majority of the channel has been scoured down to bedrock, and most of the riparian vegetation located immediately adjacent to the stream channel is very young. There are also debris flow scars present on many of the larger conifers that were able to withstand the mass of water and debris that had moved down this channel. Below the torrent track (and falls) the channel takes on a much more diverse nature, with an extremely high level of large wood (96 pieces per mile) resulting in numerous small debris jams, and the formation of abundant, high quality pool habitat.

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per mile	Dom/sub dom Substrate	Gradient %
Plusfour Ck 1	0.4	rCt	46:47:7	96	CO:GR	9

Cultus Creek:

At 5,622 acres, Cultus Creek is the largest tributary stream to the Cavitt Creek system. As was seen in Tuttle Creek, there is also a relatively contiguous block of mature forest found in the mid "core" reaches of its drainage area. Within these areas, it appears that the riparian and stream channel functions are relatively healthy and functioning well. In its lower reaches, the stream provides a small amount of habitat for steelhead, with the remainder of the stream being dominated by resident cutthroat trout.

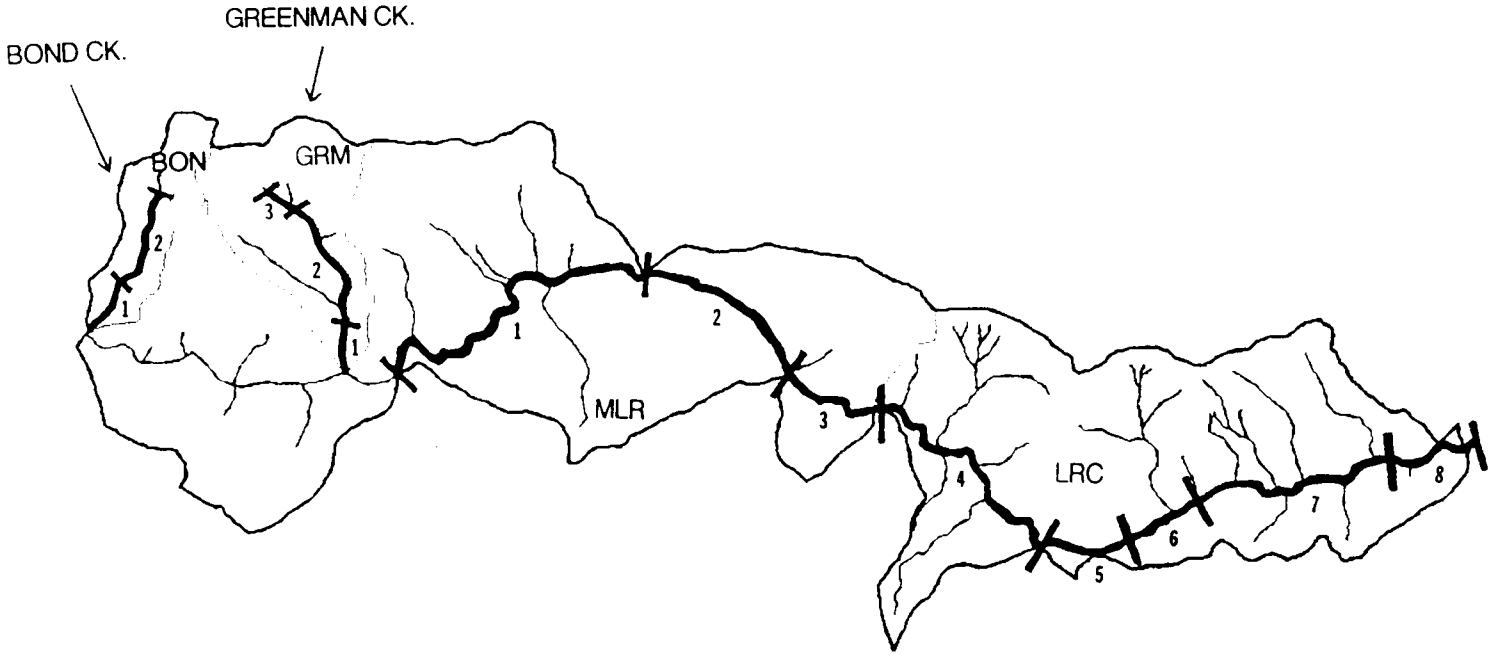
Near the headwaters of this subbasin, there is a small artificial impoundment known as Cultus Lake. This lake has been stocked with rainbow trout for several decades, but apparently contains a mix of rainbow and cutthroat trout.

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per mile	Dom/sub dom Substrate	Gradient %
Cultus Creek 1	1.7	St, rCt	43:56:0	28	CO:GR	5
2	0.4	rCt	24:76:0	27	SB:CO	10

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per mile	Dom/sub dom Substrate	Gradient %
3	0.8	rCt	100:0:0	3	SI:SA	3

MIDDLE LITTLE RIVER VICINITY

The Middle Little River vicinity is approximately 21,633 acres in size, and encompasses the long inner gorge areas of the middle mainstem of Little River. This is an unusual vicinity area in that it is predominantly made up of small, face draining tributaries to the mainstem, most of which are not fish bearing. There are two exceptions to this (discovered so far); Bond Creek and Greenman Creek. Both of these streams are small, and only contain short segments of fish bearing water. The vicinity was broken up into 4 fish WAA's for analysis purposes; 2 of which are segments of the mainstem, and the other 2 being the small tribs mentioned above (see map F-5).



Map F-5: Middle Little River Fish WAA's and Survey Reaches.

Due to the mainstem nature of the habitat found here, this vicinity (by default) supports a large percentage of the basins anadromous fish populations. It represents 16% of the basin area, but contains 39% of the anadromous fish bearing miles of stream, and only 4% of the resident fish bearing miles of stream.

Table 5: Land Management Information for the Middle Little River vicinity.

Fish WAA	Drainage Acres	Road Density (Mi/Mi2)	% of Fish WAA Regen Harvested	% of Rip. Reserves Harvested	"Natural" Landslide Density (Slides/ Mi2)	Mgmt. Related Landslide Density (Slides/ Mi2)	Combined Landslide Density (Slides/ Mi2)
Bond Creek (BON)	887	4.6	87	92	0.0	1.4	1.4
Greenman Creek (GRM)	1,775	5.0	82	85	1.4	6.5	7.9
Middle Little River (MLR)	11,312	4.7	59	60	1.0	2.4	3.4
Little River Canyon (LRC)	7,659	4.4	47	40	1.9	4.0	5.9

Bond Creek

With a drainage area of 887 acres, Bond Creek is one of the smaller fish bearing tributaries found within the entire Little River basin. While the mouth is accessible to anadromous fish, only resident cutthroat trout have been found in this system to date. These fish were found for a distance of approximately 1.5 miles upstream from the mouth. Bond Creek has had 87% of its drainage area harvested, but also has one of the lowest landslide densities found within the Little River watershed. This may be an indication that the majority of the drainage area of Bond Creek is relatively stable, and not prone to large amounts of mass wasting. Contrary to this finding however, is the fact that substrates in this steep stream are dominated by sand and gravel. This is an indication that the stream may be receiving more fine sediment inputs than it is capable of transporting to downstream areas. Recent aerial photos show that the landslides that have occurred have been located in the upper headwater reaches of this system, possibly explaining the presence of the sand substrate throughout both reaches. Wood volumes are relatively low in reach 1, but increase in reach 2, where there is also a slight increase in the amount of pool habitat.

Stream and Reach		Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds	Dom/sub dom Substrate	Gradient %
Bond Creek	1	0.8	rCt	11:81:2	270	SA:GR	7
	2	1.3	rCt	14:72:3	1014	SA:GR	10

Greenman Creek

As with Bond Creek, Greenman Creek has experienced high levels of timber harvest, with approximately 82% of its drainage area having been clearcut harvested. It has the highest landslide density within the Middle Little River vicinity. Although this subdrainage also has the highest road density within the vicinity, the majority of the landslides were related to harvest units, and occurred within the same time frame as the large flood events of 1953, 1956, and 1964 (all around 25-year recurrence interval flood events).

Stream and Reach		Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds	Dom/sub dom Substrate	Gradient %
Greenman Creek	1	0.7	rCt	*	97	SA:GR	4
	2	1.6	rCt	*	504	SA:BR	11
	3	0.4	?	*	218	SA:CO	8

* = All reaches had large quantities of dry channel, where habitat units were not delineated.

Sands were found to be the dominant material in the substrates. In conjunction with the presence of large amounts of sand, relatively low volumes of large wood and large amounts of dry channel in the summer, lead to overall poor habitat conditions. In fact, it is possible that the high frequency of landslides in this system has caused widespread accumulation of poorly sorted sediments in the channel bottom. This condition may be causing much of the flow to go "subgravel", resulting in large stretches of dry channel.

Mainstem Little River

The survey reaches below represent mainstem habitat from Wolf Creek upstream to the point where FS road 27 crosses Little River, a distance of approximately 14 miles. This survey passes through both the Middle Little River (MLR) and Little River Canyon (LRC) fish WAA's. These fish WAA's are somewhat similar in nature and will be discussed together.

The relatively narrow face draining strips of land that make up MLR and LRC have been 59% and 47% clearcut harvested, respectively. The lower land areas found in the MLR fish WAA are more gentle in nature and contain a large mix of ownership and management patterns. As a result, more harvest and road construction has occurred in this area. The opposite is true of the LRC canyon area, which is slightly steeper, is predominantly public land, and hasn't experienced quite as much harvest and road construction.

Stream and Reach		Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Mainstem Little Riv.	1	3.2	Co, Ch, St, mCt	58:37:5	0	CO:GR	1

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
2	1.8	Co, Ch, St, mCt	53:40:6	3	CO:GR	2
3	1.0	Co, Ch, St, mCt	48:44:6	6	CO:GR	2
4	2.4	St, Rb	67:29:3	19	CO:GR	2
5	0.9	St, Rb	65:30:3	21	CO:GR	3
6	0.9	St, Rb	35:59:3	67	CO:GR	3
7	2.4	St, Rb	49:49:2	21	CO:GR	3
8	1.4	Rb	36:59:1	17	CO:GR	3

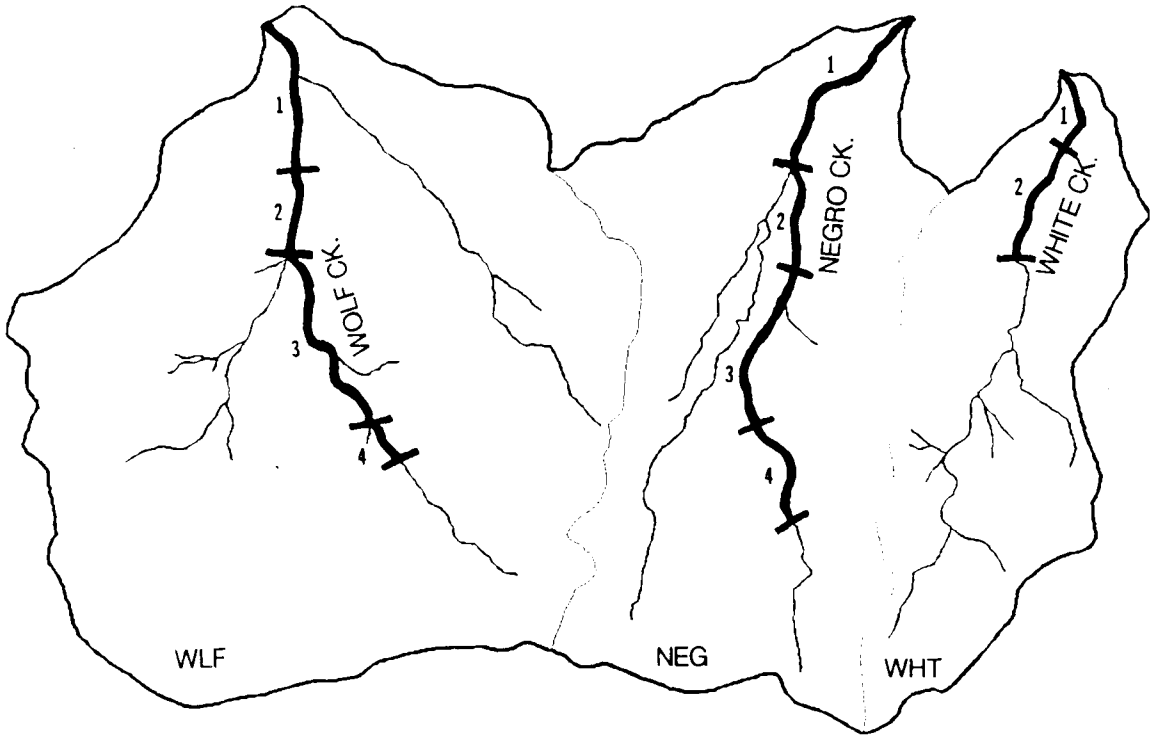
While the dominant and subdominant substrates are listed and cobble and gravel, there is also a large amount of bedrock found in these stream segments. The majority of these areas have had the large woody material removed at one time, and are just now starting to regain wood complexity as new pieces fall into the channel (and are left there). This is particularly true in reach 6, where a large fire in 1987 killed many riparian trees that are now starting to fall into the channel.

Overall, habitat in these reaches has been simplified somewhat due to the removal of large wood, but it remains relatively stable due to the bedrock controlled nature of the channel. There are areas of diverse habitat in the more confined "gorge-like" areas, represented by reaches 3, 4, and 5. It is likely that fish densities would be higher in these areas due to the more complex habitat found there, but this has not been verified.

As with much of the Little River basin, the effects of cumulative sediment impacts are visible in this stretch of the mainstem as well. Virtually all areas of gravel and cobble deposition also contain large amounts of fine sediments. This fine sediment is also seen in the steeper gorge areas, where the high water velocities would be expected to transport it to downstream areas. This is likely an indication of a large scale sediment problem within the Little River basin.

WOLF PLATEAU VICINITY

The Wolf Plateau Vicinity is located near the center of the Little River watershed. This vicinity represents 11% (14,514 acres) of the Little River basin and ranges in elevation from approximately 1,000' to 5,275' at Red Butte Mountain. This vicinity is made up of three fish WAA's; Wolf Creek, Negro Creek, and White Creek (see map F-6)



Map F-6: Wolf Plateau Fish WAA's and Survey Reaches.

The Wolf Plateau Vicinity contains 6% (2.8 miles) of the anadromous fish habitat within the Little River basin. Steelhead are the primary anadromous species which use this vicinity, although coho and spring chinook salmon have access to the lower portions of all three streams. It is likely that migratory cutthroat trout (either sea-run or fluvial) also use the anadromous fish bearing portions of these basins due to the fact that a 9 inch cutthroat "smolt" was captured in Wolf Creek during an electroshocking survey. Rainbow trout, cutthroat trout, and at least one species of sculpin can be found in the resident fish bearing water within this vicinity. Lamprey may also be present within these basins. There are a total of 1.9 miles of resident fish habitat within the vicinity. This represents 3% of the resident fish habitat within the Little River basin. Overall, the Wolf Plateau Vicinity contains 4% of the total fish habitat within the Little River watershed.

The Wolf Plateau Vicinity can be divided into three primary land ownerships. These are privately owned lands, public lands managed by the Forest Service, and public lands managed by the Bureau of Land Management. The majority of the basin (50% or 7,011 acres) is privately owned. These lands are primarily owned by industrial timber companies. The Forest Service manages 3,233 acres or 23% of the Wolf Plateau Vicinity. Twenty-seven percent or 3,861 acres within the vicinity are public lands managed by the Bureau of Land Management.

Management practices within the Wolf Plateau Vicinity include timber harvest, road building, and developed recreation. Approximately 78% (11,377 acres) of the land area with the Wolf Plateau Vicinity has been harvested to date. Initial entry into the basin occurred in the 1950's, with the

peak of activity occurring in the 1960's. All of the timber harvest which occurred within the basin was done under clearcut silvicultural prescriptions. The primary logging system used within the vicinity was tractor skidding. Riparian harvest and stream cleanout also occurred within some Class I - IV streams within the vicinity. There are a total 109.7 miles of road within this vicinity, for an overall road density of 4.8 miles of road per square mile of ground. The majority of these roads are aggregate surface roads.

The Wolf Plateau Vicinity had the second highest vicinity landslide density (6.2 landslides per square mile of ground) within the Little River basin. This was due in part to the fact that this vicinity had the highest management related landslide density within the watershed. The management related landslide density within the Wolf Plateau Vicinity was 5.2 landslides per square mile. In contrast the natural landslide density within the vicinity was only 1.1 landslides per square mile.

Table 6: Land Management Information for the Wolf Plateau Vicinity.

Fish WAA	Drainage Acres	Road Density (Mi/ Mi2)	% of Fish WAA Regen Harvested	% of Rip. Reserves Harvested	"Natural" Landslide Density (Slides/ Mi2)	Mgmt. Related Landslide Density (Slides/ Mi2)	Combined Landslide Density (Slides/ Mi2)
White Creek (WHT)	2,558	4.8	70%	71%	0.0	9.3	9.3
Negro Creek (NEG)	4,420	5.3	90%	86%	0.4	3.0	3.5
Wolf Creek (WLF)	7,531	4.6	75%	73%	1.8	5.0	6.8

White Creek

White Creek is a Class I stream which drains approximately 2,558 acres (4.0 sq. miles) and ranges in elevation from 1,440' to 5,275' at Red Butte. Fish known to use White Creek include steelhead trout, cutthroat trout, and at least one species of sculpin. The lower 0.2 miles of White Creek is known to support steelhead and may provide habitat from coho salmon, chinook salmon, and possibly migratory cutthroat trout (sea-run or fluvial). At approximately river mile 0.2 within the basin there is a fall which prevents the passage of migratory fish further into the basin. There is only 0.4 miles of resident fish habitat in the basin and it is occupied primarily by cutthroat trout.

Stream and Reach		Length (Miles)	Species Present	P:R:G ratio	Large Wood per mile	Dom/sub dom Substrate	Gradient %
White Creek	1	0.7	St, mCt, rCt	25:73:1	57	CO:GR	9
	2	0.5	no fish	31:69:0	0	CO:GR	8

White Creek runs through a moderately steep "V"-shaped valley with side slopes ranging 30% to 60%, and a valley floor which is less than 100' wide. Stream surveys conducted during 1994 showed that the lower 1.2 miles of White Creek are moderately entrenched with an average channel gradient of 9%. An extreme increase in gradient was observed at the end of reach 1 where six falls ranging height from 6' to 25' were encountered. The in-stream habitat the lower 1.2 miles of stream was dominated (72%) by cobble and gravel riffles. Pools comprised 26% of the available habitat in the surveyed reaches of stream. Stream bed substrate embeddedness was observed throughout the surveyed reaches. The amount of large wood within the stream channel varied greatly between survey reaches. In reach 1 there were 57 pieces of large wood per mile. Survey notes suggest that there were also many pieces of wood which did not meet the large wood criteria but were contributing to stream habitat diversity. There were log/debris jams

located throughout the reach associated with channel nick points. In reach 2 there were zero large pieces of wood within the bankfull width of the stream. Review of the 1966 aerial photographs showed that this reach of stream had been cleaned out, and all of the riparian (and upslope) trees had been harvested prior to 1966. Stream cleanout appeared to have been facilitated by tractor skidding in portions of the channel itself. The riparian canopy within the surveyed reaches of stream ranged from 0% to 30%, with the canopy closure being the lowest in reach 2. Douglas-fir and willow in the sapling/pole seral stage are the dominant species within the riparian areas in both reaches.

Land ownership within White Creek was divided between lands managed by the Forest Service and private land. The public land represents 77% of the basin or 1,963 acres. The remaining 595 acres or 23% of the basin is private land.

Road building and timber harvest are the two primary management practices that have occurred within the White Creek basin. There are currently 19.4 miles of road located within the watershed, for a road density of 4.8 miles of road per square mile of ground. The majority of these roads are aggregate surface roads. This does not include an undocumented amount of tractor roads and compacted skid trails within the basin. A total of 1,786 acres or 70% of the basin has been harvested to date, primarily under clearcut silvicultural prescriptions. Review of the 1966 aerial photographs show that many of units harvested within the basin were harvested using tractor logging systems. Therefore, there may be some soil compaction associated with these harvest units. These tractor harvest methods were also used for conducting riparian logging and stream cleanout activities. These activities occurred along Class II - IV streams within the basin.

White Creek had the highest landslide density of all of the streams within the Wolf Plateau Vicinity, with 9.3 landslides per square mile. All of these landslides were management related (ie. either associated with road building or timber harvest activities). There were no detectable natural landslides present on the historic aerial photographs of the White Creek watershed. This is a likely explanation for the large amounts of fine sediments seen embedding gravels throughout the surveyed reaches.

Negro Creek

Negro Creek is a Class I stream which drain approximately 4,420 acres (6.9 sq. miles) and ranges in elevation from 1,280' to 5275' at Red Butte. Migratory fish known to use Negro Creek include steelhead, chinook salmon, coho salmon, and possibly migratory cutthroat trout. Chinook and coho salmon are limited to the lower 100 yards of Negro Creek by a nine foot falls that blocks their passage. Migratory cutthroat (sea-run or fluvial) also have access to this portion of the Negro Creek basin. This falls may also be a partial barrier to steelhead, depending upon flows. When steelhead are able to get above these falls they have access to the lower 1.3 miles of Negro Creek before their passage is blocked by another falls. Cutthroat trout are the most abundant resident fish within the basin, although there are some resident rainbow trout found within the

basin. There are a total of 1.2 miles of resident fish habitat within the watershed.

Surveys conducted during the summer of 1994 showed that the lower 1.9 miles of Negro Creek runs through a moderate to steep "V"-shaped valley and is considered to be constrained by its valley walls. Stream gradients within the surveyed reaches ranged from 7% to 20%. The instream habitat in basin was dominated (89%) by high gradient cobble and boulder riffles. These riffles were classified as cascades which would suggest that they would contain some significant pocket pool habitat. Only 8% of the habitat surveyed in the lower 1.9 miles of Negro Creek was pool habitat. This may have an influence on the basin's ability to support fish populations, since most resident and anadromous salmonids prefer pool habitat during some portion of their freshwater residence. Riparian canopy closure within the surveyed reaches of stream was > 60%. Riparian tree species were not documented, but hardwoods in the sapling/pole seral stage were considered be the most abundant riparian tree component.

Stream and Reach		Length (miles)	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Negro Creek	1	1.3	St, rCt	10:89:1	1110	CO:SB	6
	2	0.7	St, rCt	5:94:1	2017	CO:SB	15
	3	1.2	rCt	4:96:0	1075	CO:SB	8
	4	0.9	No fish	13:84:3	2063	CO:GR	9

Land ownership in Negro Creek is dominated by private land. A total of 3,541 acres or 80% of the basin is considered to be private ground. The remaining 879 acres or 20% is public land managed by the Forest Service.

Road building and timber harvest are the two primary management practices that have occurred within the Negro Creek drainage. There are currently 36.4 miles of road located within the watershed for a road density of 5.3 miles of road per square mile of ground. Seventeen miles of this are Forest Service system road, the majority of which (14.7 miles) is aggregate surface road. The remaining 19 miles of road are located on private land and their composition is unknown. A total of 3,978 acres or 90% of the basin has been harvested within the basin. All harvest has been conducted under clearcut silvicultural prescriptions. Logging systems within the basin have included skyline yarding and tractor skidding. Therefore, it is likely that there is some soil compaction associated with units that were tractor harvested. Riparian harvest and some stream cleanout also occurred within and along Class II - IV streams within the basin. Even with some stream cleanout activities, this stream had moderate volumes of in-channel large wood. Further investigation of these wood volumes indicates that some large or "key" pieces are present, but the majority of the pieces are small and contained in small debris jams.

Negro Creek had the lowest overall landslide density within the Wolf Plateau Vicinity at 3.5 landslides per square mile. There have been few natural landslide occurrences within the basin. The natural landslide density was only 0.4 landslides per square mile of ground. Management activities have greatly increased the rate of landslides within the basin. The density of management related landslides is 3.0 landslides per square mile of ground.

Wolf Creek

Wolf Creek is a moderate sized Class I stream which drains approximately 7,531 acres (11.8 sq. miles) and ranges in elevation from 1,100" to 4,350". The headwaters of Wolf Creek are located within an ancient earthflow complex. Wolf Creek has two major tributaries, an unnamed west fork and Egglestron Creek.

Steelhead are the primary anadromous fish known to use the Wolf Creek basin, although coho have been documented spawning in the stream, and spring chinook salmon have access to the basin as well (but haven't be documented). Migratory cutthroat (sea-run or fluvial) likely use the basin as well. There are a total of 1.3 miles of stream within the basin which can be accessed by migratory fish. The upper most distribution of steelhead within the basin is limited by the presence of a 90' falls on the main stem of Wolf Creek. Cutthroat trout are the primary resident fish present within the basin, although resident rainbow trout and sculpins are likely present as well. There is a total of 0.3 mile of resident fish bearing water within the basin, most of which is contained within Egglestron Creek.

Surveys conducted during the summer of 1994 showed that the lower 4.2 miles of Wolf Creek flows through a moderate "V"-shaped valley and was constrained by its valley walls. The stream channel ranged in gradient from 4% to 13% and in-stream habitat was dominated (71%) by riffles. The dominant streambed substrates within the basin ranged from sand to bedrock, but the majority of the channel appears to have scoured down to its bedrock underlayment. This may have been caused by a debris torrent, increased peak flows, stream cleanout, or a combination thereof. Pools constituted only 21% of the in-stream habitat. Riparian canopy cover was > 60% throughout all reaches. Conifers in the sapling/pole and small tree seral stages were the most abundant trees in the adjacent riparian areas.

Public lands managed by the Bureau of Land Management occupy the majority (54%) of the Wolf Creek basin. A total of 3,861 acres of the basin are managed by the BLM. Privately owned land within the Wolf Creek basin totals 2,875 acres. The Forest Service only manages 391 acres of public land within the basin.

Road building and timber harvest are the two primary management practices that have occurred within the Wolf Creek basin. There are currently 53.9 miles of road within the Wolf Creek basin, for an overall road density of 5.3 miles of road per square mile of ground. The majority of this road is aggregate surface road. A total of 5,612 acres or 75% of the basin of the Wolf Creek

basin has been harvested to date. All of this harvest has occurred as clearcut harvest. Stream cleanout and riparian harvest have also occurred along Class I-IV streams within the basin. There is also a developed recreational trail along the lower main stem of Wolf Creek.

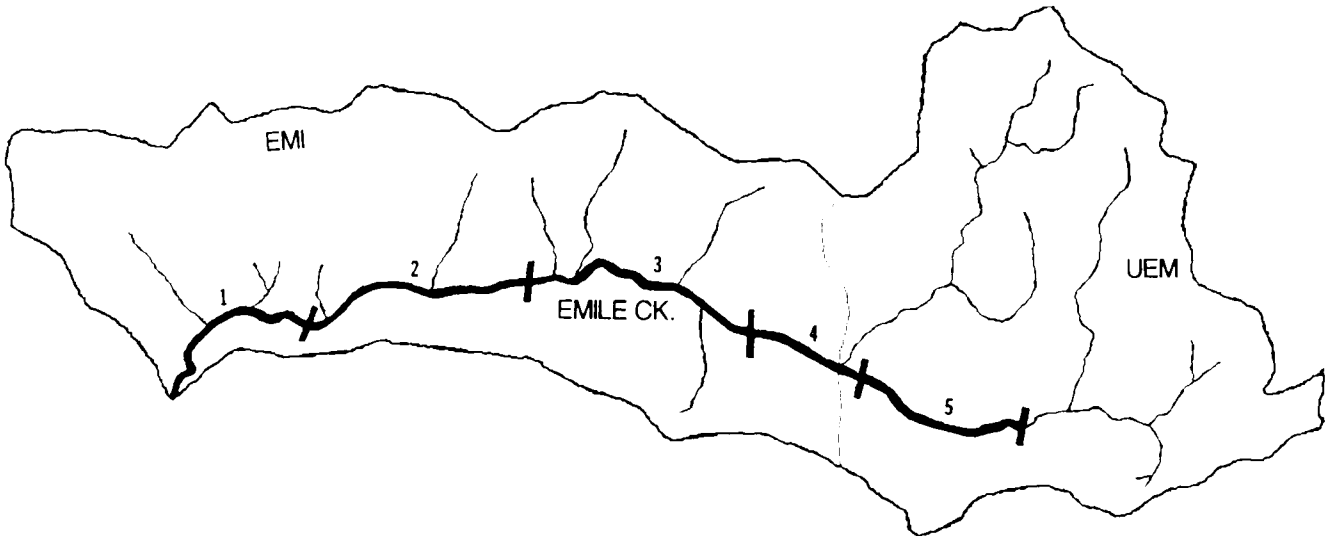
Stream and Reach		Length (miles)	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Wolf Creek	1	0.9	Co, St, mCt, rCt	28:57:15	507	SI:GR	8
	2	0.4	No fish	21:79:0	1611	BR:SI	7
	3	1.2	No fish	17:82:1	1630	CO:SB	11
	4	0.4	No fish	3:97:0	637	BR:SA	15

The overall landslide density within Wolf Creek was 6.8 landslides per square mile of ground. This can be further broken down into 1.8 natural landslides per square mile of ground and 5.0 management related landslides per square mile. This indicates that Wolf Creek had the highest natural landslide density of any fish WAA within the vicinity, and that management appears to have accelerated the landslide rate within the basin.

A maximum water temperature of 69.9°F was documented at the mouth of Wolf Creek in July of 1994 (a low water year with higher than average water temperatures).

EMILE CREEK VICINITY

With a drainage area of 8,716 acres, Emile Creek is one of the larger tributary streams to the Little River basin. This vicinity represents 7 percent of the basin area, and provides 2% of the anadromous fish bearing miles and 14% of the resident fish bearing miles. Anadromous fish use of the system is limited to the lower 1.5 miles of stream due to the presence of an impassable falls barrier at that point. Currently, only steelhead trout have been documented using this lower stretch of Emile, but there is nothing that would prevent migratory cutthroat, coho or spring chinook salmon from utilizing this area as well. Above this falls barrier the stream is dominated by rainbow trout with an occasional brook trout being found as well. These brook trout are coming from upstream ponds and water holes that have been stocked in the past, and now have naturally reproducing populations of this exotic salmonid. This basin was broken down into two separate "fish watershed analysis areas" (fish WAA's) based on distinct differences in topography, climate, and resulting channel types (see map F-7).



Map F-7: Emile Creek fish WAA's and Survey Reaches.

The upper Emile fish WAA (UEM) is somewhat similar to the Wolf Plateau vicinity in that it has gentle terrain that is being "held together" by a rock band that is resistant to erosion. Due to its higher elevation however, it has a climate that is moister and cooler than that of the Wolf Plateau. Due to the gentle nature of the terrain, combined with a relatively infrequent fire disturbance regime that resulted in stands with very large trees, this upper Emile area received a slightly higher amount of timber harvest and road construction when compared to the lower reaches of the subbasin. Currently, 52% of this area has been harvested with a corresponding road density of 5 miles per square mile. This upland plateau area is characterized by stream channels that are low in gradient and tend to meander back and forth through wet meadows with dense willow patches. Oftentimes, a defined stream channel with active scour is difficult to find in these areas.

The lower Emile fish WAA (EMI) is characterized by the steep, rugged nature of the terrain, and a mainstem stream channel that is also steep, highly incised into its canyon, and extremely diverse. The one exception to this is the lower 2 mile segment of the mainstem, where the gradient flattens out somewhat, and intensive upslope and riparian timber harvest and stream cleanout have resulted in habitat that is much more simplified than that found upstream, where riparian areas are intact.

Table 7: Land Management Information for the Emile Creek Vicinity.

Fish WAA	Drainage Acres	Road Density (Mi/ Mi2)	% of Fish WAA Regen Harvested	% of Rip. Reserves Harvested	"Natural" Landslide Density (Slides/ Mi2)	Mgmt. Related Landslide Density (Slides/ Mi2)	Combined Landslide Density (Slides/ Mi2)
Lower Emile Creek (EMI)	4,836	3.6	46	49	1.5	5.7	7.1
Upper Emile Creek (UEM)	3,880	5.0	52	43	0.3	0.5	0.8

Emile Creek:

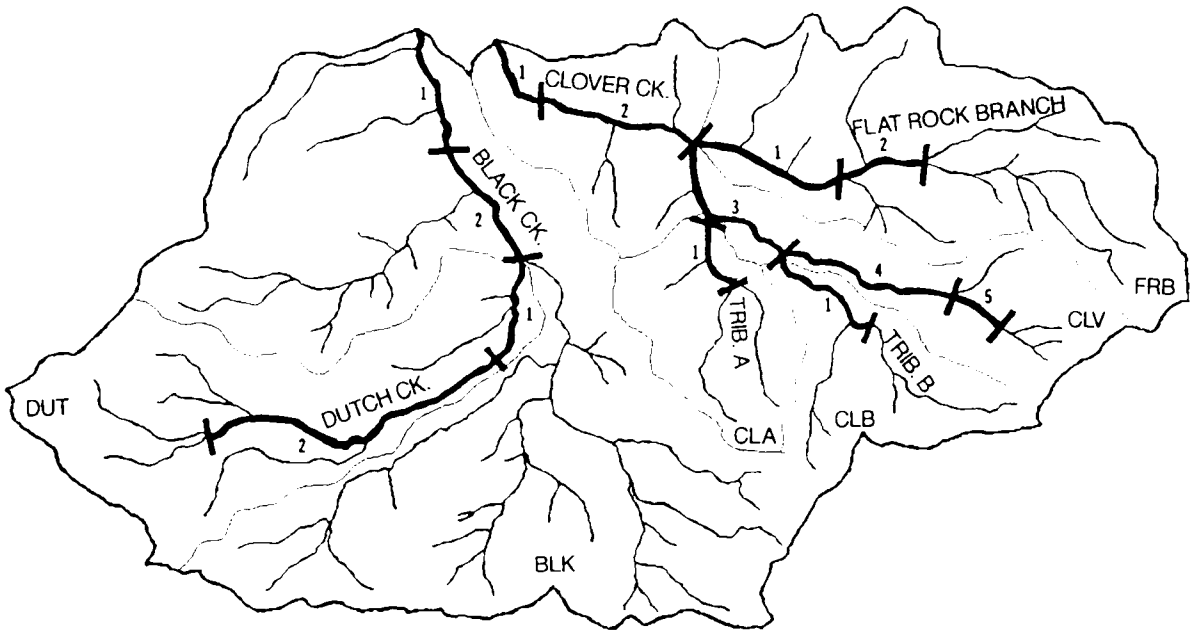
As expected, the steep canyon areas of lower Emile have experienced more landslide activity than the flatter, upper plateau areas of the subbasin. As with all of the other vicinities containing steeper ground, the number of landslides and debris flows significantly increased following timber harvest and road construction activities in the basin. In most cases, the bulk of these large erosional events occurred in conjunction with the largest storm events that have been recorded since flow measurements began in the basin, ie. the floods of 1953, 1956, and 1964. These storm events were of the magnitude of 25-year recurrence interval storm events.

Within the channel itself, there are numerous debris jams and individual pieces of wood, particularly in reaches 2 through 6, above the areas of intensive riparian management. In addition, these reaches also have an abundance of large and small boulders, further adding to the complex nature of the habitat. This habitat is some of the healthiest found within the Little River basin, and is extremely resistant and resilient to change.

Stream and Reach	Length (miles)	Species Present	P:R:G ratio	Large Wood per mile	Dom/Sub dom Substrate	Avg. Gradient
Mainstem Emile 1	1.2	St	54:44:2	9	CO:GR	3
2	1.6	Rb	31:67:1	37	CO:GR	5
3	1.6	Rb	44:53:0	59	CO:GR	9
4	0.7	Rb	32:67:0	29	CO:GR	7
5	1.1	Rb, Bk	35:63:0	63	BR:CO	18

BLACK/CLOVER VICINITY

The Black/Clover Vicinity is located near the headwaters of the Little River watershed on the south side of the basin. This vicinity represents 12.9% (17,056 acres) of the Little River basin and ranges in elevation from approximately 1,680' to 5,310' at Flat Rock Mountain. The vicinity is made up six fish WAA's, namely Black Creek, Dutch Creek, Clover Creek, Clover Creek tributary A, Clover Creek tributary B, and the Flat Rock Branch of Clover Creek, all of which support fish populations (see map F-8).



Map F-8: Black/Clover fish WAA's and Survey Reaches.

The Black/Clover Vicinity contains 1.5 miles of anadromous fish habitat and 11.7 miles of resident fish habitat. This represents 3% of the anadromous fish bearing miles and 17% of the resident fish bearing miles within the Little River basin, respectively. Overall, the fish bearing

miles found in the Black/Clover Vicinity represent 11% of the total fish bearing miles within the watershed. Steelhead are the only anadromous salmonid known to use Black Creek or Clover Creek. This is due to the presence of a falls on the main stem of Little River near Poore Creek, that historically prevented the passage of chinook and coho salmon. The upstream distributions of steelhead within both Black Creek and Clover Creek are limited by impassable falls. Above these falls, resident rainbow trout and sculpins are the primary fish species present within this portion of the basin, although it is possible that brook lamprey may also be present.

Management practices within the Black/Clover Vicinity include timber harvest, road building, and rock extraction (quarry). Approximately 36% (6,176 acres) of the land area within the Black/Clover Vicinity has been harvested to date. Initial entry into the basin occurred in the late 1950's, with peaks of activity occurring in the 1960's and 1980's. The majority of the timber harvesting which took place in this vicinity occurred under clearcut and shelterwood harvest prescriptions. Harvest practices prior to the late 1980's included riparian timber harvest and stream cleanout. There are a total of 113.8 miles of road within the this vicinity, for an overall road density of 4.3 miles of road per square mile of ground. The majority of these roads (75%) are aggregate surface roads.

The Black/Clover Vicinity has the highest natural and combined (natural & management related) landslide densities of any of the other vicinities within the Little River watershed. This suggests that the steep, highly dissected nature of the ground within this vicinity is prone to mass slope failure, and that landslides and debris flows have a large influence of stream channel conditions.

Table 8. Land Management Information for the Black/Clover Vicinity.

Fish WAA	Drainage Acres	Road Density (Mi/ Mi2)	% of Fish WAA Regen Harvested	% of Rip. Reserves Harvested	"Natural" Landslide Density (Slides/ Mi2)	Mgmt. Related Landslide Density (Slides/ Mi2)	Combined Landslide Density (Slides/ Mi2)
Black Creek (BLK)	7,042	4.4	45%	19%	3.9	5.9	.9.8
Dutch Creek (DUT)	2,619	5.8	40%	40%	0.7	2.0	2.7
Clover Creek (CLV)	2,510	4.0	30%	20%	5.1	5.1	10.2
Flat Rock Branch (FRB)	2,871	2.8	22%	11%	3.8	1.8	5.6
Clover Trib. A (CLA)	973	4.4	31%	19%	2.6	5.3	7.9
Clover Trib. B (CLB)	1042	4.2	28%	17%	4.9	1.8	6.7

Black Creek

Black Creek is a Class I stream with a drainage area of approximately 7,040 acres (11.0 sq. miles) within the headwaters of Little River. This does not include Black Creeks largest tributary Dutch Creek, which is discussed separately below. The watershed ranges in elevation from 1,680' to 5,050' at Black Butte.

Fish known to use the Black Creek basin include Steelhead trout, rainbow trout, and at least one species of sculpin. Steelhead use the lower mile of Black Creek for spawning and rearing. Their distribution within the basin is limited by the presence of a falls which blocks their access to the remainder of the watershed, including Dutch Creek. Rainbow trout and sculpin distributions extend another 1.4 miles above the falls to where their distribution ends at a high gradient cascade-dominated reach of stream. Currently, only 18% of the perennial streams within the entire Black Creek watershed support fish populations. It is believed that the upper portion of the Black Creek basin was cut off by a "geologically recent" lava flow that dammed Black Creek, upstream of Dutch Creek, before it was colonized by fish. It is speculated that this "dam" of lava created numerous waterfalls and a high gradient reach of stream that fish could not travel through. Above this high gradient reach of stream, channels are lower gradient and depositional in nature, tending to meander back and forth across the widened valley bottom.

Surveys conducted during 1994 showed that the lower 2.0 miles of Black Creek flowed through a moderate "V"-shaped valley with side slopes ranging from 30% to 60%, and had a valley floor width of < 100' wide. The channel itself is moderately entrenched, with an average gradient of 4%. The majority (58%) of the in-stream habitat in Black Creek is composed of bedrock dominated riffles. Thirty-six percent of the habitat in this lower mile is composed of bedrock and gravel dominated pools. Pool habitat in these portions of the stream is large and often associated with bedrock plunge features. Stream bed substrates within the lower 2 miles of stream are considered to be embedded with fine sediment, and numerous pools that were partially filled with fine sediment were also observed.

Even though the majority of the riparian areas adjacent to this section of stream are in excellent condition, with large stands of mature forest, stream cleanout has occurred within this lower portion of the basin. Aside from the low large wood densities recorded during the 1994 surveys, cut log ends can be seen within the stream channel, where single logs were bucked to length. It is unclear whether the logs were removed as part of timber salvage operations of simply cut and left to wash downstream as part of stream cleanout activities. Riparian canopy cover within the surveyed reaches of stream is considered to be > 60% throughout both surveyed reaches. The riparian tree species are dominated by hemlock and red alder in the sapling/pole seral stage.

Stream and Reach		Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Black Creek	1	0.9	St, Rb	27:61:11	10	BR:GR	4

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
2	1.1	Rb	43:54:3	18	BR:GR	4

Road building and timber harvest are the two primary management practices which have occurred within the Black Creek basin. There are currently 48 miles of Forest Service system road within the basin, for a road density of 4.4 miles of road per square mile of ground. The majority (73%) of these roads were aggregate surface roads. A total of 3,162 acres (45%) have been harvested within the Black Creek watershed. Most of this harvest has been in the form of clearcut silvicultural prescriptions.

Black Creek had the highest management related landslide density of all the subbasins within the Black/Clover Vicinity, at 5.9 landslides per square mile of ground. The natural landslide density was 3.9 landslides per square mile of ground. The combined landslide rate for the basin is 9.8 landslides per square mile. This is the second highest combined landslide rate within the vicinity.

Summer stream temperatures monitored during the summer of 1994 recorded a maximum water temperature of 67.9°F at the mouth of Black Creek in July.

Dutch Creek

Dutch Creek is a small (2,619 acre), steep Class II tributary of Black Creek which drains east. The watershed ranges in elevation from 2,400' to 5,275' at Red Butte. Rainbow trout are the only fish known to inhabit Dutch Creek and they are located in the lower 2.7 miles of stream below Eureka Pond. Dutch Creek likely did not support fish populations naturally, due to its high gradient and numerous impassable waterfalls. It is believed that the few fish found in Dutch Creek came from historic stocking efforts in this pond.

Stream and Reach	Length	Species Present	P:R:G ratio	Wood Volume ft3/100 yds.	Dom/sub dom Substrate	Gradient %
Dutch Creek 1	1.0	Rb	37:59:1	54	CO:SA	11
2	2.1	Rb	27:72:1	31	CO:GR	8

Dutch Creek runs through a moderate to steep "V"-shape valley with side slopes from 30% to > 60%, and a valley floor which is less than 100' feet in width. The valley itself lies within a large earthflow geologic complex. Surveys conducted during the summer of 1994 showed that the lower 3.1 miles of Dutch Creek are moderately entrenched with average channel gradients ranging from 8% - 11%. The in-stream habitat in this portion of the basin was dominated by cobble and

gravel riffles. Many of the habitat units within the surveyed reaches of stream were embedded with sands and other fine sediments. The subdominant Stream bed substrate in reach 1 was sand. This may indicate that there is a high delivery of sand sized sediment, as the average reach gradient was 11% and material this size would be expected to be easily transported. Reach 1 of Dutch Creek has a relatively high large wood density (54 pieces per mile). This would suggest that little to no stream cleanout or riparian harvest has occurred along this section of stream. In reach 2 the stream narrows and the channel becomes "brushed-in". The last 350' of the stream channel surveyed during 1994 was very shallow and "swamp-like", and ended at Eureka Pond. The riparian canopy within the surveyed reaches of stream ranged from 31% to > 60%. The riparian tree species were dominated by western hemlock and western red cedar in the sapling pole seral stage.

Road building and timber harvest are the two primary management practices that have occurred in the Dutch Creek basin. There are currently 23.7 miles of Forest Service system road located within the watershed for a road density of 5.8 miles of road per square mile of ground. The majority of these roads (76%) are aggregate surface roads. A total of 1,052 acres (40%) have been harvested within the basin, primarily under clearcut harvest silvicultural prescriptions. Review of the 1991 aerial photos shows that some of the units were harvested using tractor skidding methods. Therefore, there may be some compaction associated with these harvest units. Unlike many other streams within the Little River drainage it appears that there was little riparian salvage or stream cleanout along the main stem of Dutch Creek. However, riparian harvest, and most likely stream cleanout, has occurred along Class III and IV streams associated with harvest units in other portions of the basin.

Dutch Creek had the lowest natural landslide density of any of the subbasins within the Black/Clover Vicinity at 0.7 landslides per mile of ground. It also had the lowest overall landslide density with 2.6 landslides per square mile. It should be noted however, that there are many small slides and localized bank failures within the canyon of this highly incised stream system. The combination of a steep, highly incised and well shaded channel made detection of these small failures virtually impossible using aerial photographs. As a result, they were not factored in to landslide density determinations.

Clover Creek

Clover Creek is a Class I stream which drains approximately 2,510 acres (3.9 square miles). This does not include tributary "A", tributary "B", or the Flat Rock Branch, which are discussed separately in this document. With these tributaries included the total watershed area of the Clover Creek basin is 7,396 acres (11.5 square miles) The watershed ranges in elevation from 1,750' to 5,050' at Black Butte.

Fish known to use Clover Creek include steelhead trout and resident rainbow trout. Steelhead use the lower ½ mile of stream for spawning and rearing. Their distribution within the basin is limited by the presence of a falls which blocks their access to the remainder of the basin. The

rainbow trout distribution within the main stem extends another 4.2 miles above the falls.

Stream habitat surveys conducted in 1994 showed that the lower 4.5 miles of Clover Creek flowed through a low to moderate "V"-shaped valley with slide slopes ranging from 20% to 60%, and had a valley floor width of <100' wide. The channel itself was moderately entrenched and had channel gradients ranging from 4% - 8%. Instream habitat in Clover Creek was dominated (67%) by cobble and gravel riffles. Stream bed substrate throughout all surveyed reaches was considered to be embedded. Pool habitats in surveyed reaches 1 and 3 were documented as being large, as compared to pools in other surveyed reaches. Reaches 2 and 3 contained 2% and 4% side channel habitat respectively. Bank erosion was reported as moderate to high in surveyed reaches 3 and 4. Bank erosion in the lower reaches was noticeably less, primarily a result of the bedrock nature of the stream banks here. The riparian canopy cover within the surveyed reaches of stream was considered 31% to 60%. The majority of the riparian trees were Douglas-fir and red alder in the small tree seral stage.

Stream and Reach		Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Clover Creek	1	0.5	St, Rb	45:52:3	32	CO:GR	4
	2	1.2	Rb	43:54:1	17	CO:GR	4
	3	1.2	Rb	26:70:0	11	CO:GR	4
	4	1.0	Rb	22:76:1	24	CO:GR	8
	5	.5	Rb	12:87:0	35	CO:GR	15

Road building and timber harvest are the two primary management practices that have occurred within the Clover Creek basin. There are currently 15.7 miles of Forest Service system road in the Clover Creek watershed. The majority of this road (72%) is aggregate surface road, while the remaining road is native surface. The road density within the basin is 4.0 miles of road per square mile of ground. A total of 745 acres (30%) of the Clover Creek basin (excluding the aforementioned tributaries) have been harvested to date. Most of this harvest has occurred under clearcut harvest silvicultural prescriptions. Stream cleanout and riparian salvage has also occurred within the basin. This is reflected in the low large woody material densities and in the fact that surveyors commented on the lack of mature sized trees in the riparian along the lower two reaches of stream.

There have been recent increases in the large wood densities in the lower reach of Clover Creek due to a fire which occurred in 1987. This fire, which occurred near the mouth of Clover Creek, resulted in direct tree mortality and an increase in the occurrence of debris flows, both of which increased the delivery of large wood (and sediment) to the stream channel.

While Clover Creek had the highest overall landslide rate of all the streams within the

Black/Clover Vicinity, this basin also had the highest natural landslide density of any fish WAA in the entire Little River basin, at 5.1 landslides per square mile.

Summer water temperatures at the mouth of Clover Creek during July, 1994 reached a maximum of 69.9°F.

Tributary A

Tributary "A" is a small class II stream which drains 973 acres (1.5 square miles) and ranges in elevation from 2,100' and 5,050'. The lower 0.7 mile of this tributary is known to support resident rainbow trout.

Stream surveys conducted on the lower mile of Tributary "A" showed that it flowed through a moderate "V"-shaped valley, with side slopes ranging from 30% to 60%, and had a valley floor width of <100' wide. The channel itself was moderately entrenched and had an average gradient of 6%. The majority of the instream habitat was dominated by cobble and gravel riffles. When this tributary was surveyed in September of 1994, there was a considerable amount of dry channel. Pools located between sections of dry channel were seen to hold resident rainbow trout. Bank erosion was considered to be low to moderate in the surveyed reach of stream, but embeddedness was high. In-stream wood densities were low suggesting that some form of stream cleanout may have taken place. There is a valley bottom road along the surveyed portion of stream which would have facilitated such activities. The riparian canopy cover within the surveyed reaches of stream was considered to be > 60%. The riparian tree community along these reaches were dominated by Douglas-fir and vine maple in the sapling/pole seral stage.

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Clover Trib A	0.9	Rb	34:66:1	11	CO:GR	6

Road building and timber harvest are the primary land management activities that have taken place in the basin. There are currently 6.7 miles of Forest Service system road within Tributary "A", for an overall road density of 4.4 miles of road per square mile of ground. A total of 297 acres (30%) has been harvested within the watershed.

Tributary "A" had the second lowest natural landslide density (2.7 landslide per square mile) of the watersheds within the Black/Clover Vicinity. It also had the second highest management related landslide density (5.3 landslides per square mile) within the vicinity. The combined landslide density within the basin was 7.9 landslides per square mile of ground.

Tributary B

Tributary "B" is a small Class II stream which drains 1,042 acres (1.6 square miles) and ranges in

elevation from 2,450' to 4,900'. The lower 0.8 mile of Tributary "B" provides habitat for resident rainbow trout.

Stream surveys conducted on the lower mile of Tributary "B" showed that it flowed through a moderate "V"-shaped with side slopes ranging from 30% to 60%, and had a valley floor width of <100' wide. The channel was moderately entrenched with and average gradient of 8%. Instream habitat was dominated by cobble and gravel riffles. Stream bed substrate within this reach was considered to be embedded. Similar to Tributary "A" there was a considerable amount of dry channel present during the 1994 surveys. Wood densities in this stream were low (17 pieces of large wood per mile) but there was a large wood jam near the end of the reach. In general the stream was small in size and the shrub component of the riparian vegetation was high, making surveying this stretch of stream difficult. The riparian canopy cover within the surveyed reaches of stream was considered to be 31% - 60%. Trees species within the riparian areas were dominated by Douglas-fir and western hemlock in the mature tree seral stage.

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Clover Trib. B	1.0	Rb	37:61:2	17	CO:GR	8

Road building and timber harvest are the two primary management activities that have occurred within the basin. There are currently 6.9 miles of Forest Service system road in the watershed for a road density of 4.2 miles of road per square mile of ground. A total of 28% (290 acres) of the basin has been harvested to date.

Tributary "B" had an overall landslide density of 6.7 landslides per square mile. This tributary had the second highest density of natural landslides within the Little River basin, at 5.0 landslides per square mile. Of interest is that this same tributary had a relatively low density of management related landslides, with a density of 1.9 landslides per square mile.

Flat Rock Branch

The Flat Rock Branch of Clover Creek is a 2,510 acre watershed which drains west, and ranges in elevation from 2,150' to 5,310' at Flat Rock Mountain. Rainbow trout are the only species of fish known to inhabit the Flat Rock Branch and they are only found in the lower 1.8 miles of stream.

Surveys conducted during the summer of 1994 showed two very different channel types being present within the main stem of the Flat Rock Branch. The lower 1.2 miles of the Flat Rock Branch of Clover Creek runs through a moderate to steep "U"-shaped valley with side slopes being greater than 30% and a valley floor greater than 100' - 150' wide. This channel is moderately entrenched and had an average gradient of 4%. The lower 2/3 of this reach had many

complex side channels, almost to the point of being considered braided. "Swampy" areas were also common along this stream channel. The in-stream habitat in this reach was dominated by cobble riffles, although pools that were present were large and of high quality. Bank erosion was low to moderate in this reach, and the Stream bed substrate within the reach was considered to be embedded. The amount of large wood increased in the upper portion of the reach. The upper portion of the valley (from river mile 1.2 to river mile 2) was a moderate "V"-shape with side slope ranging from 30% to 60%, and a valley floor width of <100'. This portion of the channel was deeply entrenched and had an average gradient of 12%. The in-stream habitat in this reach was dominated by cobble riffles. Survey notes said that there were also large stretches of bedrock and small boulder cascades. Falls occupied one percent of the instream habitat in this reach. Stream bed substrate in this reach was considered to be embedded. Large wood densities increased greatly within this reach. The riparian canopy cover in the surveyed reaches of stream was considered to range from 31% to > 60%. Douglas-fir and western red cedar in the mature tree seral stage dominated the riparian tree community.

Stream and Reach		Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Flat Rock Branch	1	1.2	Rb	26:72:1	27	CO:CO	4
	2	0.7	Rb	16:82:0	49	CO:CO	12

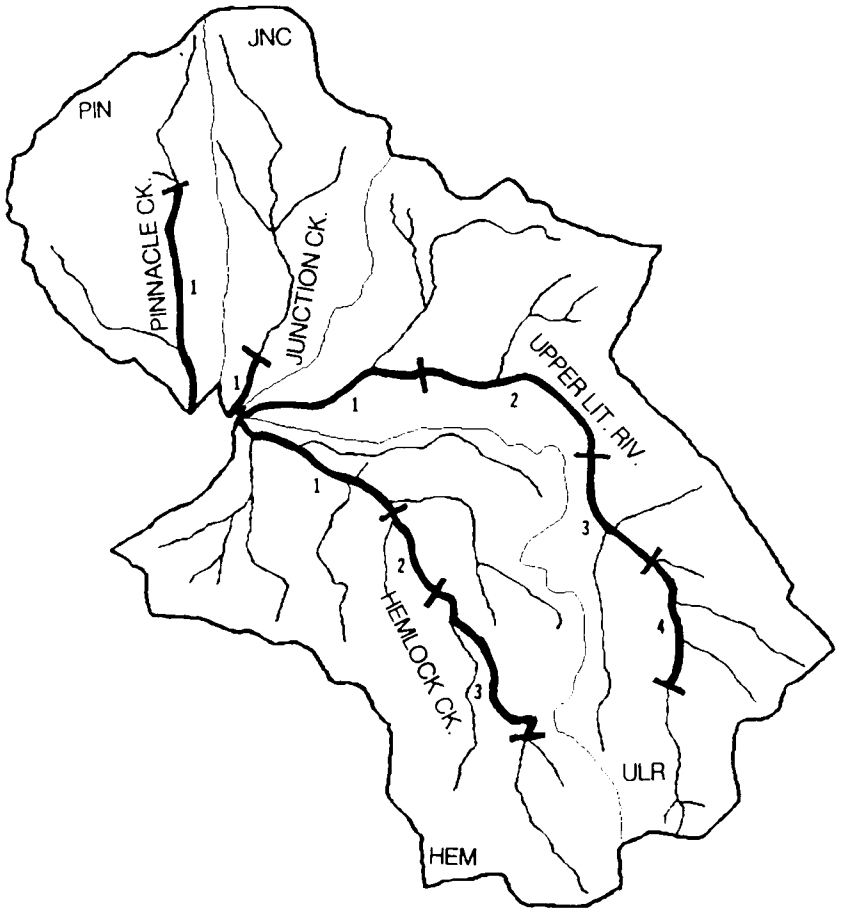
Road building and timber harvest are the two primary management practices that have occurred within the Flat Rock Branch. There are currently 12.6 miles of Forest Service system road within the basin for road density of 2.8 miles of road per square mile of ground. This is the lowest road density of all the subbasins within the Little River watershed. A total of 631 acres (22%) have been harvested within the Flat Rock Branch watershed.

The Flat Rock Branch has a landslide density of 5.6 landslides per square mile of ground. This can be further broken down into natural and management related landslides. The natural landslide density within the basin was 3.8 landslides per square mile. The Flat Rock Branch had the lowest density of management related landslides within the vicinity with a density of only 1.8 landslides per square mile of ground. This is likely directly related to the fact that relatively little land management has occurred within the basin.

Considering the fact that the Flat Rock Branch has experienced the least amount of harvest and road construction activities within the Little River basin, this stream is one of the few that can be considered to be near its "natural" or reference condition. As such a rare resource within the basin, an emphasis should be placed on the maintenance of this condition.

UPPER LITTLE RIVER VICINITY

The Upper Little River vicinity is located in the upper headwaters of the Little River watershed. This vicinity represents 7.9% (10,406 acres) of the Little River basin, and ranges in elevation from 2,400' to approximately 5,300'. The vicinity is made up of four Fish WAA"s, namely Hemlock Creek, Junction Creek, Pinnacle Creek, and Upper Little River (see map F-9).



Map F-9: Upper Little River Fish WAA's and Survey Reaches.

The Upper Little River Vicinity plays an important role in the maintenance of summer flows within the Little River watershed. The high elevation snowpack, deep soils and highly fractured geologic rock types within this vicinity allow for the retention and gradual release of stored water over time. During the summer months the water released from the Upper Little River Vicinity is

roughly five times the flow per square mile of land, than is observed in most portions of the Little River basin. The Hemlock Creek and Upper Little River Fish WAA's contribute the majority of this flow.

Table 9. Land Management Information for the Upper Little River vicinity.

Fish WAA	Drainage Acres	Road Density (Mi/ Mi2)	% of Fish WAA Regen Harvested	% of Rip. Reserves Harvested	"Natural" Landslide Density (Slides/ Mi2)	Mgmt. Related Landslide Density (Slides/ Mi2)	Combined Landslide Density (Slides/ Mi2)
Junction Creek (JNC)	1,331	4.2	32	34	1.4	2.4	3.8
Pinnacle Creek (PIN)	1,540	3.7	33	29	2.1	5.0	7.1
Upper Little River (ULR)	3,984	5.0	38	31	1.3	2.9	4.2
Hemlock Creek (HEM)	3,551	4.0	34	32	1.8	4.0	5.8

The Upper Little River Vicinity contains no anadromous fish habitat. Resident rainbow trout and at least one species of sculpin are the primary fish species present within this portion of the basin, although brook lamprey may also be present. There are a total of 13.0 miles of fish bearing water in this vicinity. This represents 18% of the resident fish habitat in the basin, and 11% of the total fish habitat within the Little River watershed.

Management practices within the Upper Little River Vicinity include timber harvest, road building, rock extraction (quarry), water impoundment (Hemlock Lake and Lake-in-the-woods), and developed recreation. Approximately 35% (3,660 acres) of the land area within the Upper Little River Vicinity has been harvested to date. Initial entry into the basin began in the late 1950's, with peaks of activity in the 1950's, 70's, and 1980's. Clearcutting was the primary silvicultural prescription used, although some shelterwood harvest prescriptions were used in the 1980's. Review of the 1966 and 1991 aerial photos showed that riparian harvest and stream cleanout associated with timber harvest were also among the timber harvest practices which occurred within the basin. Roads within the Upper Little River Vicinity include both aggregate surface and native surface roads. There are a total of 71.3 miles of road within this vicinity for an overall road density of 4.4 miles of road per square mile of ground. Developed recreation in the vicinity centers primarily around the two human made lakes which provide recreational fishing opportunities. Hemlock Lake is the largest of the two impoundments with a surface area of 28 acres and a total volume of 440 acre feet (540,000 m^3). Lake-in-the-woods is a much smaller impoundment occupying a surface area of only 4 acres and having a total volume of only 20 acre feet (25,000 m^3). Both lakes are stocked annually with non-native rainbow fingerlings, and

Hemlock lake has been stocked with kokanee salmon in the past. Both species are seen in recreational angler bag limits. Dead Cow Lake is also present in this vicinity. This lake is a small, shallow, natural lake located in the head waters of Hemlock Creek. It is unknown wether this lake supports any species of fish.

Junction Creek

Junction Creek is a small Class II stream which drain approximately 1,330 acres (2.1 sq. miles) within the headwaters of the Little River basin. The watershed ranges in elevation from 2,440' to it highest point of approximately 5,150' at Lookout Mountain. Rainbow trout occupy only the lower 0.5 mile of Junction Creek, due to the presence of a barrier which appears to have inhibited their progress into the basin.

The mainstem of Junction Creek is located within a moderate "V"-shaped valley with side slopes ranging from 30% to 60%. The valley floor is less than 100' wide. Surveys conducted during 1994 showed that the channel was moderately entrenched, and has an average gradient of 6%. The majority (66%) of in-stream habitat in Junction Creek is composed of cobble and gravel dominated riffles. The riparian canopy within the surveyed reaches of stream was considered to be > 60%. The riparian trees species in this reach were dominated by Douglas-fir and red alder in the small tree seral stage.

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Junction Creek 1	0.6	Rb	31:66:2	27	CO:GR	6%

A stream channel condition and stability survey conducted in 1992 showed that in-stream habitat in Junction Creek is currently in a degraded condition. This survey documented that portions of the Junction Creek mainstem are highly simplified as a result of riparian timber harvest and stream cleanout. The removal of channel stabilizing features (large woody material) has allowed the upper portions of the main stem channel to degrade. This has resulted in severe bank cutting and mass wasting within the upper 0.7 mile of the main stem channel. The effects of this can be seen downstream where the cobble and gravel substrate is embedded and pools are being filled with fine sediment. The lower portions of the channel, while still having been simplified by the removal of large wood, are more stable than the upper portions of the main stem. The streambanks in this portion of the basin have a higher rock content, causing them to be more stable. Substrate embeddedness and pool filling remain a problem in this lower portion of the basin. The fish habitat that is available within the basin is in "poor" to "fair" condition.

Road building and timber harvest are the two primary management practices that have occurred within the Junction Creek basin. There are currently 8.8 miles of Forest Service system road located within the basin, for a road density of 4.2 miles of road per square mile of ground. The

majority of this road (6.6 miles) is aggregate surface road. Approximately 0.75 miles of the road in the basin can be considered valley bottom road. A total of 426 acres have been harvested within the Junction Creek watershed under clearcut silvicultural prescriptions. This represents approximately 32% of the basin. Riparian salvage and stream cleanout also occurred along Class II, III, and IV streams in the past.

The Junction Creek basin had the lowest landslide density of all of the Fish WAA's with in the Upper Little River Vicinity. Its overall landslide density (natural and management related) was 3.8 landslides per square mile.

Unlike Upper Little River and Hemlock Creek, Junction Creek does not contribute significantly to summer base flows within the Little River basin. During September of 1994 Junction Creek was shown to only contribute 0.05 CFS per square mile of ground to the flow of Little River, where as Upper Little River and Hemlock Creek contributed 0.24 CFS/mi2 and 0.25 CFS/mi2 respectively. This would suggest that Junction Creek does not play as much of a role in contributing to summer flows within the main stem of Little River as compared to other parts of the Upper Little River Vicinity.

Pinnacle Creek

Pinnacle Creek is a small, steep Class II stream which drains approximately 1,540 acres (2.4 sq. miles) in the upper portion of the Little River basin. The watershed ranges in elevation from 2,400' to about 4,800' at its highest point. Rainbow trout and at least one species of sculpin are present within the lower mile of Pinnacle Creek. Fish distribution within the basin ends at river mile 1.0 at the base of a 10 foot falls.

Pinnacle Creek flows through a moderate "V"-shaped valley, which has a less than 100' wide valley floor. The main stem channel is moderately entrenched and the channel has an average gradient of 7%. The majority (69%) of the in-stream habitat in Pinnacle Creek is composed of cobble and gravel dominated riffles. Pinnacle Creek, like Junction Creek, has also experienced stream cleanout associated with road building and timber harvest. Review of the 1966 aerial photos show that stream cleanout occurred within approximately 0.75 miles of the lower 1.5 miles of Junction Creek. Stream surveys conducted in 1994 showed that the lower 1.3 miles of Pinnacle Creek only contained 15 pieces of large woody material per mile. This is well below wood densities seen in other stream channels within the Upper Little River Vicinity. The lack of large structural elements within the stream has lead to an overall simplification of stream habitat conditions and a loss of fish habitat. The riparian canopy cover within the surveyed reaches of stream was considered to be > 60%. Douglas-fir and vine maple in the small tree seral stage dominated the riparian tree canopy.

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Pinnacle Creek 1	1.3	Rb	26:69:4	15	CO:GR	7

Road building and timber harvest are the two primary management practices which have occurred within the Pinnacle Creek basin. There are currently 8.9 miles of Forest Service system road located within the basin for a road density of 3.7 miles of road per square mile of ground. The majority of this road (5.9 miles) is aggregate surface road. A total of 505 acres (32%) have been harvested within the Pinnacle Creek watershed under clearcut silvicultural prescriptions. The majority of the recent harvest within the basin has occurred within the steep headwater portions of the basin. This has resulted in the occurrence of landslides and subsequent debris flows associated with road building and timber harvest within the upper portion of the watershed. Pinnacle Creek had a landslide density of 7.1 landslides per square mile of ground. This was the highest landslide density documented within the Upper Little River Vicinity.

Pinnacle Creek was also similar to Junction Creek in that it did not play a major role in contributing to summer base flows within the mainstem of Little River. Stream flow measurements taken in September 1994 showed that flows at the mouth of Pinnacle Creek were < 0.1 CFS, or roughly 0.02 CFS/mi2. This would suggest that Pinnacle Creek does not significantly contribute to the maintenance of summer flows as do Hemlock Creek and Upper Little River.

Hemlock Creek

Hemlock Creek is a relatively small Class II stream located in the upper headwater areas of the main stem Little River drainage (see map x). It has a drainage area of approximately 3,551 acres, and ranges in elevation from 2,400 feet at its confluence with upper Little River, to 5,310 feet near its headwaters. The streams origins lie in the general vicinity of Dead Cow Lake, a small wet meadow/pond area approximately one mile upstream of Hemlock Lake. Hemlock Lake was constructed primarily for recreational purposes, and receives moderate use in the spring, summer, and fall months. Fish stocks present in the lake include resident rainbow trout and kokanee salmon. Both of these stocks were artificially introduced into the lake in order to enhance the recreational uses of the site. Rainbow trout continue to be planted on a yearly basis and appear to survive and grow with vigor, with some of the larger fish attaining sizes of around 20 inches. The stocking of kokanee salmon has been discontinued for a number of years due to the fact that these fish never attained a large enough size to be a valuable contributor to the recreational fishery in the lake. Anecdotal reports of occasional catches of kokanee salmon in the lake, however, indicate that some successful spawning is taking place.

Within Hemlock Creek itself, only resident rainbow trout have been documented. Based upon the rugged nature of the habitat downstream, which consists of numerous waterfalls in excess of 75 feet, as well as a dominance of high gradient cascade habitats, it is likely that these fish originated

from the stocked rainbow trout within Hemlock Lake, and gradually migrated downstream. The stream surveyors conducting the survey of this stream noted the overall scarcity of fish, and apparent low densities seen throughout the surveyed reaches. Fish were only found in those few, isolated areas that were of low gradient and could potentially support individuals for extended periods of time. The nature of the habitat overall is not conducive to the long term survival and success of salmonid species.

This information would tend to support the theory that the fish within the system originated from stocked trout placed into Hemlock Lake, and that this population is not indigenous to Hemlock Creek, Little River, or the Umpqua System.

The stream was broken out into 3 separate reaches during the survey effort (see map x) covering a total of 3.2 miles of stream channel.

Stream and Reach		Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Hemlock Creek	1	1.3	Rb	21:78:0	51	CO:GR	15
	2	0.6	Rb	20:79:0	41	CO:SB	25
	3	1.3	Rb	13:87:0	31	GR:CO	8

From the data obtained during the 1994 stream surveys, several general points can be discerned. Hemlock Creek is an extremely steep and rugged stream that passes through a narrow bedrock canyon. Although this stream was surveyed in order to assess its condition and value as fish habitat, it is likely that this stream did not support populations of resident rainbow trout prior to human management activities within the Little River basin. Regardless of this fact, the stream does currently support a small population of resident rainbow trout. This population does not appear to be thriving in terms of numbers, likely due to the fact that suitable yearlong rearing habitat is very scarce within the Hemlock system. Overall, this system is very resistant to change due to the bedrock nature of the channel and surrounding bedrock canyon walls. It is also likely that any changes to the sediment or hydrologic regimes of the subbasin will be transported to downstream areas with very little impact on the Hemlock system, due to the extremely efficient nature of the channel.

Upper Little River

Upper Little River drains 3,983 acres within the headwaters of the Little River watershed. This portion of the basin ranges from 2,400' to 5,100', and as with the other basins making up the Upper Little River Vicinity, lies within the transient snow zone. The mainstem of Upper Little River has 5 major tributary junctions along its length before entering the Middle Little River Vicinity. These tributaries include Hemlock Creek, Junction Creek, Pinnacle Creek, and two

unnamed tributaries. Resident rainbow trout and at least one species of sculpin are present within the fish bearing portion of Upper Little River.

Upper Little River flows through a low to moderate "V"-shaped channel with a valley floor which is less than 100' in width. Surveys conducted during the summer of 1994 displayed that the majority of the stream channel in this portion of the basin is moderately entrenched and has stream gradients ranging from 5% to 12%. The streambed throughout the surveyed reaches is dominated by cobble and gravel substrate, although reach 1 does have a significant bedrock component. The canopy cover within the surveyed reaches of stream was considered to range from 20% to 60%. Douglas-fir, western red cedar and vine maple in the small and large tree seral stages were among the most common species observed within the riparian areas along Upper Little River.

Stream channel conditions within Upper Little River change drastically with increases in elevation and changes in the amount of stream side management practices. In the lower portion of the basin where there is little stream side management, pools and large wood are more abundant. In surveyed reaches 1 and 2, pool habitat makes up 30% to almost 50% of the in-stream habitat in the basin. Large wood plays a large role in creating these habitats. In the heavily managed areas higher in the basin, pool habitat is not as common. In reach 4 where stream side management is the most intense pool habitat drops to less that 20%. This is expected to be the result of the removal of large wood from the stream channel. Once the structural control was removed from the channel it was able to degrade and become simplified.

Stream and Reach	Length	Species Present	P:R:G ratio	Large Wood per Mile	Dom/sub dom Substrate	Gradient %
Upper Little River 1	1.0	Rb	42:57:0	67	CO:GR	12
2	1.3	Rb	30:66:1	45	CO:GR	8
3	1.0	Rb	29:71:0	38	CO:GR	4
4	0.8	Rb	18:81:0	10	CO:GR	5

Road building and timber harvest are the two primary management practices that have occurred within the Upper Little River basin. There are currently 31 miles of Forest Service system road within the basin, for a road density of 5.0 miles of road per sq.mile of ground. Twenty-three miles of this road was aggregate surface road, while the remaining 8 miles were native surface. Timber harvest in Upper Little River began in the 1950's and to date 1,516 acres (38%) of the basin have been harvested. Clearcutting was the most common silvicultural prescription used although a few shelterwood harvest units are present in the basin as well. As with the other streams in the basin, riparian harvest and steam cleanout occurred along and within many Class II, III, and IV stream channels.

APPENDIX G

APPENDIX G

RARE PLANTS, NON-NATIVE PLANTS, AND NATIVE REVEGETATION

Table of Contents

LITTLE RIVER WATERSHED
TES PLANT SPECIES
PREFERRED HABITAT

Descriptions are compiled from numerous sources, including Oregon Natural Heritage Program records, Forest Service and BLM working documents as well as pertinent Floras.

Allium bolanderi Bolander's Onion
This plant prefers clay soils in brush and mixed woods below 3000 feet. It often occurs on serpentine soils gravelly flats and stony slopes.

Allium campanulatum Sierra Onion
This species is known from a variety of habitats. On the east side of the Cascades it commonly grows in the litter at the base of ponderosa pine trees. On the Barlow Ranger District of the Mount Hood National Forest it is found growing in shallow clay soil on ridge top openings in coniferous forest at 3400 to 5000 feet elevation. On the Tiller Ranger District it occurs in open timber/meadow mosaic at elevations of 5500 to 5700 feet where it has been found on east to east-northeast facing ridge tops and slopes up to 30%. On the North Umpqua ranger District it is most likely to occur on high elevation ridge lines.

Asarum wagneri Green-flowered Wild Ginger
Known locations for this species occur from 3000 to 8400 feet in moist loamy to rocky soil on slopes of 0 to 45% at any aspect. Frequently sites occur in closed-canopy mixed conifer stands dominated by Shasta red fir (Abies magnifica). Plants are also occasionally found in open areas. The most common combination of site characters is: true fir conifer forest, open to filtered light, moist loamy soil, slope of 15% or less, north to east aspect, at over 5000 feet elevation. Associate species often include gooseberries (Ribes spp.),chinkapin (Castenopsis chrysophylla), pipsissiwa (Chimophylla umbellata), It occasionally shows up above timberline and in rocky situations such as talus slopes.

Asplenium septentrionale Grass-fern
Asplenium septentrionale sites are concentrated in a narrow band extending from lower Copeland Creek over Limpy Rock to Singe Creek. It occurs on rock outcrops of pyroclastic origin where it grows in cracks along with moss and ferns. Aspect ranges from east to south-southwest. Slopes range from 10% to vertical. Moisture varies from moist to xeric and canopy can be open or closed. The elevation of the sites lies between 2400 and 5200 feet. Umpqua Kalmiopsis (Kalmiopsis "fragrans") is often present.

Astragualus umbraticus Woodland milkvetch
This species occurs in the West Side Cascades and Klamath Mountain physiographic provinces. Populations in Douglas and Lane Counties have been found from 1640 to 3600 feet on east, south and west aspects on slopes ranging from 0 to 90% . Nearly all sites have experienced some kind

of disturbance. Typical habitat is a midslope site at 2500 feet in open woods or forest on a southeast aspect with a pitch of less than 25% that has been disturbed by logging or fire. Old skid roads are often favored. Cutbanks, shoulders and even rocked surfaces of roads have been occupied by this plant.

Calamagrostis brewer Brewer's reedgrass
This is a moist site species found growing in open areas on stream banks, lake margins, moist subalpine to alpine meadows. Sites can be expected in an elevation range from 5000 to 12,200 feet.

Calochortus umpquaensis Umpqua mariposa lily
This species is restricted to open grassland and forests on serpentine soils in Southwestern Oregon ranging from the Little River drainage in southern Douglas County to northern Jackson and Josephine Counties. Habitat varies from forest to open grasslands, though it appears to prefer open grasslands dominated by native bunchgrasses and the ecotone between grassland and forest. Elevation ranges between 800 and 2900 feet. Populations have been found on all aspects, but favor north and east facing slopes in the southern portion of its range. Slopes range from 0% to 65%. The forest communities in which C. Umpquaensis is found are dominated by Pinus jeffreyi, Pseudotsuga menziesii, and Calocedrus decurrens. Meadow habitat is characterized by bunchgrasses such as Festuca idahoensis, Danthonia californica, and Stipa lemmonii, and introduced annuals such as Brome mollis, Cynosurus echinatus, and Aira caryophyllea.

Cimicifuga elata Tall bugbane
Cimicifuga elata prefers north aspects in shady, moist, low elevation forests, woods and thickets. An exception to this occurs on the Tiller Ranger District where the plants are also found in timber/meadow mosaic habitats above 4000 feet elevation. Known sites occur habitat from 200 to 5000 feet in elevation with most occurring at less than 1000 feet. Slopes range from 0 to 90%. Sites include old growth conifer forests, deciduous woods, clearcuts, ecotones between timber and clearcuts as well as thickets and road margins. This demonstrates a wide tolerance of cover variation from none to dense, however the most common situation is one of shade or deep shade. Dominant canopy species include Douglas-fir (Pseudostuga menziesii), bigleaf maple (Acer macrophyllum) and red alder (Alnus rubra) and, on the Tiller R.D., Shasta red fir (Abies magnifica var. shastensis). Associate species generally include trillium (Trillium ovatum), fairy bells (Disporum hookerii and D. smithii), and thimbleberry (Rubus parvifloris).

Collomia mazama Mazama collomia
This is a high elevation species with sites concentrated along the Cascade crest. Known sites occur from 4900 to 6200 feet elevation. Most are mid to upper slope moist meadows, meadow margins or open canopy timber such as that found in timber/meadow mosaic situations, however, sites are occasionally found in riparian situations.. Aspect generally ranges from south through west to north although many sites are flat and consequently occupy no aspect. Slopes are generally less than 20%. Plants are located in areas that receive light shade or filtered sun . Canopy cover seldom exceeds 30%. Plants are not found in dry openings or under dense canopy.

Soils are generally composed of loam or sandy loam. Associated species frequently include red fir (Abies magnifica) and mountain hemlock (Tsuga mertensiana).

Cypripedium fasciculatum Clustered Lady's slipper
Habitat for this species is variable. Elevation of known sites in southwest Oregon ranges from 150 to 6000 feet with the majority occurring between 1500 and 3000 feet. Aspect at the site is usually somewhere from west to north. Slopes are generally moderate with some at the flat and some at the very steep end of the scale. Midslope and riparian bench sites are common with the midslope sites being of a moderate to dry moisture regime and the riparian sites generally being moist. Most sites are either moist riparian locations dominated by Douglas-fir (Pseudostuga menziesii) with Pacific dogwood (Cornus nuttallii present OR they are moderately dry midslope mixed woods or conifer forest locations with madrone (Arbutus menziesii) or tanoak (Lithocarpus densiflorus) or canyon live-oak (Quercus chrysophylla) present.

Frasera umpquaensis Umpqua swertia
Frasera umpquaensis is found primarily at elevations of 4000 to 6000 feet in open fir (Abies spp.) forests and meadows on the west side of the Cascades and in open mixed conifer forests in the Klamath Mountains. In all known sites the plants are located in areas that are relatively protected from environmental extremes, especially high temperatures dry soils. The Cascade populations are in relatively cool, moist sites that experience significant winter snow accumulations. Plants may be found growing as understory herbs in open forest stands or as a principal component on herb dominated meadows. They are rarely found in closed canopy situations.

Frittillaria glauca Siskiyou frittillaria
This plant inhabits gravelly, shallow soil on rocky and craggy sites at moderate or high elevations. Slopes range from 20 to 70%. Vegetative cover is sparse or nearly absent. Serpentine is a frequent parent material. On the Umpqua National Forest it known from the Rogue Umpqua Divide.

Hazardia (Haplopappus) **whitneyi** var. **discoidea** Whitney's hazardia
This plant is a high elevation lover of rocky open places. In the Cascades it occurs at elevations from 4500 to 7000 feet in gravelly soil on craggy sites on ridges, saddles and upper slopes where the vegetative layer is sparse. Occasionally it will occur with Siskiyou fritillary (Fritillaria glauca). Commonly associated species include sulfur flower (Eriogonum umbellatum), sedums (Sedum spp.), and pinemat manzanita (Artcostaphyllos nevadensis). Nearby tree cover usually consists of Shasta red fire (Abies magnifica var. shastensis) and mountain hemlock (Tsuga mertensiana).

Horkelia congesta var. **congesta** dwarf-flowered horkelia
Known only from the Willamette and Umpqua valleys, this plant inhabits interior valley prairie and oak savannah habitat in western Oregon below 2000 feet. Historically the species ranged from Washington to Douglas County. Extant populations no longer occur in Washington, Marion and Polk Counties in the northern portion of its range. One population is known in the Little River

watershed. Aspect is typically southerly with slopes ranging between 0% and 60%. It is known to have survived periodic mowing on several sites. Associated species include red fescue (Festuca rubra), California oatgrass (Danthonia californica), yarrow (Achillea millefolium), Oregon iris (Iris tenax), Leichtlin's camas (Camassia leichtlinii), barestem buckwheat (Eriogonum nudum), and spring phacelia (Phacelia verna). Associated with Little River are Calochortus tolmiei, Calochortus umpquaensis, Viola hallii, Keoleria cristata, and Festuca idahoensis.

Illiamna latibracteata California globe-mallow
California globe-mallow prefers open sites in forested areas. Often it is found where timber has been clearcut and the unit prepared for reproduction by burning. Known sites range in elevation from 2500 to 5200 feet and in variously described habitats including clearcuts, moist meadows, and dry, rocky cut-banks. Aspect is usually southerly or westerly. Soil is generally sandy and well drained. Overstory tree canopy is absent.

Isoprum stipitatum Dwarf isopyrum
In the Willamette and Umpqua Valleys dwarf isopyrum is found in moist open grassy habitats including mowed fields and oak woodland in a riparian setting where brush has limited cover. On the south slopes of the Klamath/Rogue divide near Hilt it occurs in association with buckbrush (Ceanothus cuneatus) where it has been found only on south and north aspects. While the sites are often sunny, plants tend to be under the canopy of brush or trees. Buckbrush is always present, however, plants are not found in young or medium age buckbrush, only old decadent stands. Plants are also found in stands of juniper, oak, or pine in their early seral stages when the 'skeletons' of dead buckbrush plants are still present. Near Hilt dwarf isopyrum may be found at elevations from 2000 to 4000 feet. In the Willamette and Umpqua valleys elevations of known sites lie between 300 and 1500 feet.

Kalmiopsis "fragrans" Umpqua Kalmiopsis
This plant is found in all aspects on rock outcrops composed of pyroclastic parent material. It grows in cracks in rocks and shallow soil overlying rock substrate. It will tolerate shade from overstory tree canopy but most often will be found in open areas growing on its own with occasional scattered shrubs and moss and lichen species. It generally is not found growing on soil where the shrub layer is dense. Slope varies from flat to vertical. Pinemat manzanita (Arctostaphylos nevadensis) is a common associate. Known sites occur from 1600 to 4500 feet.

Lewisia columbiana var. **columbiana** Columbia lewisia
Columbia lewisia favors exposed rocky sites where it grows rooted in moss mats in cracks and depressions in bedrock rock. Summertime conditions can become xeric. Elevations of known sites range from 100 feet above sea level in the Columbia Gorge to 6000 feet elevation in the Cascades of southern Oregon. Aspects of sites tend to be toward the north and/or east. Slope varies from flat to vertical. Associated species include typical 'rock garden' plants such as sedums (Sedum spp.) saxifrages (Saxifraga spp. and rock cresses (Arabis spp.). Tree and shrub canopy is absent.

Mimulus douglasii Douglas' monkey-flower
Douglas' monkey-flower is an ephemeral annual which, depending on weather conditions, may or may not appear each year. It inhabits gravelly soils in rocky open slopes that are moist in the spring. Known sites are generally located at 4000 feet elevation or lower. Habitats are variously described as chaparral, foothill woodland, and rock meadows. Serpentine is a common substrate.

Minuarta cismontana sandwort
Range of this species includes Douglas and Lane Counties. It is expected to be found on the west slope of the Cascade Range as well as in the Klamath Mountains and in California. Habitat information was unavailable when this document went to press.

Ophioglossum pusilum (vulgatum) Adder's tongue, Grass-fern
Grass-fern grows in shady moist or boggy meadows and margins of ponds. where it can be found among sedges, in the open or near low shrubs. Known sites occur from 1500 to 5000 feet elevation. Sites are generally flat having little or no slope or aspect. Soil is constantly wet and high in organic material. Associated species include baldhip rose (Rosa gymnocarpa), bracken fern (Pteridum apuilinum), sedges (Carex spp.), horsetail (Equisetum hymenale), rush (Juncus effusus), Douglas spirea(Spirea douglasii), and Oregon ash (Fraxinus latifolia).

Pellaea andromedaefolia Coffee fern
Known sites occur from 600 feet to 1800 feet on dry, open rock outcrops composed of basalt, siltstone, sandstone, conglomerate or metavolcanic rock. Plants generally root in crevices in the rock or in shallow loamy soil over the surface. Slope position varies from lower slope to crest with most sites being on the upper slope or crest. Aspect varies from southeast to southwest. Slope ranges from 20% to verticle with most being around 60 to 70%. Habitats are generally described as rock outcrops or rock balds. Associated species include hedgehog dogtail grass (Cynosurus echinatus), silverleaf phacelia (Phacelia hastata), Hall's desert parsley (Lomatiujm hallii), poison oak (Rhus diversiloba), and madrone (Arbutus menziesii).

Perideridia erythrorhyza Red-root yampa
This species can be found in moist prairies, valleys, and pasture land. It often occurs in heavy poorly drained soils. Sites are known mostly from elevations under 1600 feet on the west side of the Cascades but occur as high as 5000 feet on the east side in the Klamath area. Sites are open, flat or west facing with slopes from 0 to 15%. Trees and shrubs are usually absent. Those most commonly occurring are Oregon white oak (Quercus garryana) and Oregon ash (Fraxinus latifolia). Red-root yampa is usually found growing in meadows dominated by grasses with rushes (Juncus sp.)and mints (Mentha sp.) present. Herbaceous vegetation is often composed of as much as 50% non-native species.

Polystichum californicum California sword fern
California sword fern grows on rock cliffs where it most often occurs either in moist proximity of falling water or in grottos or deep overhangs recessed in the cliff. The plants require deep shade and a moist environment. Plants root in crevices in the rock or in shallow gravelly loam deposited

in concavities. Known sites occur at all aspects at elevations ranging from 100 to 4000 feet with the mean elevation being at about 1700 feet. Moss and lichen cover at the sites is generally moderate, herb layer light and shrub layer limited or absent. Tree canopy may or may not shade the site. Shade is required for survival, however, and where it is not provided by recesses in the cliff tree canopy is generally closed or dense. Associated vascular plant species are generally "rock garden" types . They usually include spatula-leaf stonecrop (Sedum spathulifolium), smallflower allumroot (Heuchera micrantha), saxifrages (Saxifraga sp.) and various rock- loving ferns.

Romanzoffia "thompsonii" Thompson's mistmaiden

Thompson's mistmaiden requires shallow soil on well drained sites that are moist or wet in the winter and spring. Sites have been variously described as rock balds, rocky seeps , vernally wet gravel slopes, and dripping wet moss-mats on cliffs.. Shrubs and large herbaceous plants are generally absent. Tree cover may be absent or limited and supplied by trees adjacent to rather than on the site. The plants are rooted in shallow gravelly loam. They are usually found growing in mats of red bryum moss (Bryum miniatum) which clings to cracks and irregularities in the surface of solid rock. The slope of known sites varies from 10% to 100% with 60% being about the mean. Sites are located on all aspects but most commonly occur in the range from southeast to southwest. Elevations range from 1200 to 6000 feet. Associated species include selaginella (Selaginella sp.), rosy plectritis (Plectritis congesta),seep spring monkeyflower (Mimulus guttatus), chickweed monkeyflower (Mimulus alsinoides),California mistmaiden (Romanzoffia californica), and Nuttall's saxifrage (Saxifraga nuttallii).

Utricularia minor Lesser bladderwort

Lesser bladderwort is restricted to standing or slow moving water where it floats just under the surface. Known habitats have been described as wet hollows, ponds, fens, marshes, wet meadow hollows, peatland, and organic muck. Slope ranges from 0 to 20 degrees with nearly all sites being reported as flat. Elevations range from 20 to 4900 feet with most known sites lying above 3200 feet. Reported water depths are generally less than six feet. Associated species include sphagnum moss (Sphagnum spp.), moss (Drepanocladus sp.), pondweed (Ponamogeton spp.), slender cottongrass (Eriophorum gracile), threeleaf bogbean (Menyathes trifoliata), and sedges (Carex spp.).

Wolffia columbiana Columbia water-meal

Wolffia borealis punctate water-meal

Columbia water-meal occurs in lakes, ponds, and pools of standing water. Plants float just below the water surface with the upper thallus just touching the surface film. Elevations of known sites range from 20 to 2000 feet. Slope is generally flat but can be as much as 20 degrees. Associated species include mosquito fern (Azolla sp.), Brazilian water-meal (Wolffia braziliensis), water lentil (Lemna minor), and great duckweed (Spirodela polyrhiza).

THREATENED, ENDANGERED AND SENSITIVE SPECIES OCCURRENCE

IN THE

LITTLE RIVER WATERSHED

Status codes:

1). United States Fish and Wildlife Service (USFWS [Represented in table as FWS]), Oregon Department of Agriculture (ODA).

- LE= Listed Endangered by ODA or USFWS.
- LT= Listed Threatened by ODA or USFWS.
- PE= Proposed Endangered by ODA or USFWS.
- PT= Proposed Threatened by ODA or USFWS.
- C1= Taxa for which USFWS has sufficient information to support a proposal to list as threatened or endangered. (Category 1 candidate).
- C2= USFWS candidates for which additional information is needed to support listing as threatened or endangered.
- C2*= USFWS candidates which may be extinct.
- 3A= Extinct taxa.
- 3B= Taxonomic problems which cause the taxa not to meet the USFWS definition of a "species".
- 3C= Taxa which have proven to be more abundant or widespread than previously believed and/or which have no identifiable threats.

2). ONHP

- 1= Threatened, endangered or presumed extinct throughout range.
- 2= Threatened, endangered or possibly extirpated from Oregon but more common elsewhere.
- 3= May be threatened or endangered in Oregon or throughout range. More information is needed.
- 4= Very rare but currently secure or declining but too common to be listed as threatened or endangered.

3). Forest Service Region 6 (R6)

- OR= Sensitive in Oregon
- OR\WA= Sensitive in Oregon and Washington

Sensitive species require project clearance, NEPA documentation, and may require USFS consultation.

4). Bureau of Land Management (BLM)

- Candidate= Federal Candidate Species. Requires project clearance, NEPA documentation, and coordination with USFWS
- Sensitive= Bureau Sensitive. Requires project clearance, and NEPA documentation
- Assessment= Assessment Species. Requires project clearance and NEPA documentation. Protection and mitigation to be balanced with other resources
- Tracking= Tracking species. Consideration of species is optional

5). Record of Decison (ROD): species closely associated with late successional and old growth forests

- 1= Strategy 1: manage known sites
- 2= Strategy 2: survey prior to activities and manage known sites
- 3= Strategy 3: conduct extensive surveys and manage sites
- 4= Strategy 4: conduct general regional surveys

Likelihood of Occurrance : **Documented**

vascular

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Aster vialis	C2	C	1		Candidate	12
Calochortus umpquaensis	C1	LE	1	OR	Candidate	
Horkelia congesta ssp congesta	C2	C	1		Sensitive	
Romazoffia thompsonii			1	OR	Sensitive	

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Astragulus umbraticus			2	OR	Assessment	
Iliamna latibracteata			2	OR	Assessment	
Lewisia columbiana var columbiana			2	OR		
Polystichum californicum			2	OR/WA	Assessment	
Wolffia borealis			2	OR	Assessment	

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Minuarta cismontana			3		Assessment	

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Phacelia verna	3C		4		Tracking	

Likelihood of Occurrance : **Suspected**

fungi

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Oxyporus nobilissimus			1			123

lichen

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Nephroma occultum			1			1 3

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Sulcaria badia			2			

Likelihood of Occurrance : **Suspected**

lichen

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Lecidea dolodes			3			
Pilophorus nigricaulis			3			1 3
Pseudocyphellaria aurata			3			

liverwort

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Chiloscyphus gemmiparus			1			
Sphaerocarpos hians			1			

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Herbertus sakuraii			2			1 3
Porella vernicosa var fauriei			2			

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Gymnomitrion concinnatum			3			
Haplomitrium hookeri			3			
Herburtus aduncus			3			
Jamesoniella autumnalis var heterospora			3			
Lophozia laxa			3			
Marsupella condensata			3			
Marsupella emarginata var aquatica			3			
Metsgeria temperata			3			
Plagiochila semidecurrens var alaskana			3			
Scapania gymnostomophila			3			
Scapania obscura			3			
Schofieldia moticola			3			

moss

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Encalypta brevicolla var crumiana			1	OR		1 3
Tripterocladium leucocladulum			1			

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Andreaea schofieldiana			2			
Frunaria muhlenbergii			2			
Helodium blandowii			2			
Racomitrium pacificum			2			
Tayloria serrata			2			

Likelihood of Occurrance : Suspected

moss

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Bruchia bolanderi			3			
Encalypta brevipes			3			
Trematodon boasii			3			

vascular

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Arabis koehleri var koehleri	C2	C	1			
Cimcifuga elata		C	1	0R/WA	Sensitive	
Cypripedium fasciculatum		C	1	OR/WA	Candidate	12
Frasera umpquaensis	C2	C	1	OR	Candidate	
Kalmiopsis fragrans			1	OR	Tracking	
Limnanthes gracilis var gracilis	3C	C	1	OR	Sensitive	
Lupinus sulphureus ssp kincaidii	C2	C	1		Candidate	
Perideridia erythrorhiza	C2	C	1		Candidate	
Plagiobothyrus hirtus	C1	LE	1		Candidate	

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Agoseris elata			2	OR/WA		
Arctostaphylos hispida			2			
Asplenium septentrionale			2	OR	Assessment	
Botrychium minganense			2	OR		12
Calamagrostis brewerii			2	OR		
Carex hystricina			2	OR/WA		
Carex livida			2	OR		
Cheilanthes intertexta			2	OR		
Fritillaria glauca			2	OR		
Haplopappus whitney ssp discoideus			2	OR		
Huperzia occidntalis			2			
Hydrocotyle verticillata			2	OR		
Lewisia leana			2	OR		
Lycopdiella inundata			2			
Mimulus kelloggii			2	OR	Assessment	
Ophioglossum pusillum			2	OR/WA		
Pellaea andromedaefolia			2	OR	Assessment	
Perideridia howellii			2		Assessment	
Scribneria bolanderi			2	OR		
Utricularia minor			2	OR	Assessment	
Wolffia columbiana			2	OR	Assessment	

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Allium bolanderi var bolanderi			3		Assessment	
Allium bolanderi var mirabile			3		Assessment	
Carex comosa			3			
Carex retrorsa			3			
Epilobium luteum			3			
Isopyrum stipitatum			3			

Likelihood of Occurrance : Suspected

vascular

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Navarretia tagetina			3			
Rosa spithamea var spithamea			3			
Scirpus pendulus			3			
Scirpus subterminalis			3			
Sysrinchium hitchcockii			3		Tracking	

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Erigeron cascadensis			4			
Mimulus douglasii			4		Assessment	
Montia diffusa			4			
Poa laxiflora			4			
Polystichum lemmonii			4			
Sidalcea cusickii			4		Tracking	

ROD SURVEY AND MANAGE SPECIES OCCURRENCE

IN THE

LITTLE RIVER WATERSHED

Status codes:

1). United States Fish and Wildlife Service (USFWS [Represented in table as FWS]), Oregon Department of Agriculture (ODA).

- LE= Listed Endangered by ODA or USFWS.
- LT= Listed Threatened by ODA or USFWS.
- PE= Proposed Endangered by ODA or USFWS.
- PT= Proposed Threatened by ODA or USFWS.
- C1= Taxa for which USFWS has sufficient information to support a proposal to list as threatened or endangered. (Category 1 candidate).
- C2= USFWS candidates for which additional information is needed to support listing as threatened or endangered.
- C2*= USFWS candidates which may be extinct.
- 3A= Extinct taxa.
- 3B= Taxonomic problems which cause the taxa not to meet the USFWS definition of a "species".
- 3C= Taxa which have proven to be more abundant or widespread than previously believed and/or which have no identifiable threats.

2). ONHP

- 1= Threatened, endangered or presumed extinct throughout range.
- 2= Threatened, endangered or possibly extirpated from Oregon but more common elsewhere.
- 3= May be threatened or endangered in Oregon or throughout range. More information is needed.
- 4= Very rare but currently secure or declining but too common to be listed as threatened or endangered.

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Likelihood of Occurrance : Documented

lichen

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Lobaria hallii						1 3

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Leptogium saturninum						4
Lobaria oregana						4
Lobaria pulmonaria						4
Nephroma bellum						4
Nephroma helveticum						4
Nephroma laevigatum						4
Nephroma resupinatum						4
Pannaria saubinetii						4
Peltigera collina						4
Peltigera neckeri						4
Pseudocyphellaria anomala						4
Pseudocyphellaria anthraspis						4
Pseudocyphellaria crocata						4
Sticta fuliginosa						4
Sticta limbata						4

vascular

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Allotropa virgata						12
Aster vialis	C2	C	1		Candidate	12

Likelihood of Occurrance : Suspected

fungi

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Bondarzewia montana						123
Oxyporus nobilissimus			1			123

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Albatrellus avellaneus						1 3
Albatrellus caeruleoporus						1 3
Aleurodiscus farlowii						1 3
Alpova alexsmithii						1 3
Alpova olivaceotinctus						1 3
Alpova sp. nov. # Trappe 1966						1 3
Alpova sp. nov. # Trappe 9730						1 3
Arcangeliella crassa						1 3
Arcangeliella lactarioides						1 3
Balsamia nigra						1 3
Boletus haematinus						1 3
Boletus pulcherrimus						1 3

Likelihood of Occurrance : Suspected

fungi

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Cantharellus formosus						1 3
Choiromyces alveolatus						1 3
Choiromyces venosus						1 3
Chroogomphus loculatus						1 3
Clitocybe senilis						1 3
Clitocybe subditopoda						1 3
Collybia bakerensis						1 3
Cortinarius boulderensis						1 3
Cortinarius canabarba						1 3
Cortinarius magnivelatus						1 3
Cortinarius olympianus						1 3
Cortinarius rainierensis						1 3
Cortinarius variipes						1 3
Cortinarius verrucisporus						1 3
Destuntzia fusca						1 3
Destuntzia rubra						1 3
Dichostereum granulosum						1 3
Elaphomyces subviscidus						1 3
Endogone acrogena						1 3
Gastroboletus imbelellus						1 3
Gastroboletus ruber						1 3
Gastroboletus sp. nov. # Trappe 7515						1 3
Gastroboletus subalpinus						1 3
Gastrosuillus sp. nov. # Trappe 7516						1 3
Gastrosuillus sp. nov. # Trappe 9608						1 3
Gautieria magnicellaris						1 3
Gautieria otthii						1 3
Gelatindoiscus flavidus						1 3
Gymnomyces sp. nov. # Trappe 1690, 1706, 1710						1 3
Gymnomyces sp. nov. # Trappe 5052						1 3
Gymnomyces sp. nov. # Trappe 7545						1 3
Gymnopilus puntifolius						1 3
Hebeloma olympiana						1 3
Helvella compressa						1 3
Helvella crassitunicata						1 3
Helvella elastica						1 3
Helvella maculata						1 3
Hydnotrya sp. nov. # Trappe 787, 792						1 3
Hydnotrya subnix sp. nov. # Trappe 1861						1 3
Hygrophorus caeruleus						1 3
Hygrophorus vernalis						1 3
Leucogaster citrinus						1 3
Leucogaster microsporus						1 3
Macowanites mollis						1 3
Marasmius applanatipes						1 3
Martellia fragrans						1 3
Martellia idahoensis						1 3
Martellia monticola						1 3
Martellia sp. nov. # Trappe 1700						1 3
Martellia sp. nov. # Trappe 311						1 3
Martellia sp. nov. # Trappe 5903						1 3
Martellia sp. nov. # Trappe 649						1 3
Mycena hudsoniana						1 3
Mycena monticola						1 3
Mycena overholtsii						1 3
Mycena quinaultensis						1 3
Neolentinus adherens						1 3
Neournula pouchetii						1 3

Likelihood of Occurrance : Suspected

fungi

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Nivatogastrium nubigenum						1 3
Octavianina macrospora						1 3
Octavianina sp. nov. # Trappe 7502						1 3
Otidea smithii						1 3
Phaeocollybia californica						1 3
Phaeocollybia carmanahensis						1 3
Phaeocollybia dissiliens						1 3
Phaeocollybia gregaria						1 3
Phaeocollybia kauffmanii						1 3
Phaeocollybia oregonenis						1 3
Phaeocollybia piceae						1 3
Phaeocollybia scatesiae						1 3
Phaeocollybia sipei						1 3
Pholiota albivelata						1 3
Pithya vulgaris						1 3
Plectania latahensis						1 3
Plectania milleri						1 3
Polyozellus multiplex						1 3
Ramaria abietina						1 3
Ramaria amyloidea						1 3
Ramaria araiospora						1 3
Ramaria aurantiisiccescens						1 3
Ramaria botryis var. aurantiiramosa						1 3
Ramaria celerivirescens						1 3
Ramaria claviramulata						1 3
Ramaria concolor f. marri						1 3
Ramaria concolor f. tsugina						1 3
Ramaria coulterae						1 3
Ramaria cyaneigranosa						1 3
Ramaria fasciculata var. sparsiramosa						1 3
Ramaria gelatiniaurantia						1 3
Ramaria gracilis						1 3
Ramaria hilaris var. olympiana						1 3
Ramaria largentii						1 3
Ramaria lorithamnus						1 3
Ramaria maculatipes						1 3
Ramaria rainierensis						1 3
Ramaria rubella var. blanda						1 3
Ramaria rubribrunnescens						1 3
Ramaria rubrievanescens						1 3
Ramaria rubripermanens						1 3
Ramaria spinulosa						1 3
Ramaria stuntzii						1 3
Ramaria suecica						1 3
Ramaria thiersii						1 3
Ramaria verlotensis						1 3
Rhizopogon brunneiniger						1 3
Rhizopogon evadens var. subalpinus						1 3
Rhizopogon exiguus						1 3
Rhizopogon flavofibrillosus						1 3
Rhizopogon inquinatus						1 3
Rhizopogon sp. nov. # Trappe 1692						1 3
Rhizopogon sp. nov. # Trappe 1698						1 3
Rhizopogon sp. nov. # Trappe 9432						1 3
Rhodocybe nitida						1 3
Rhodocybe speciosa						1 3
Sedecula pulvinata						1 3
Tricholoma venenatum						1 3

Likelihood of Occurrance : Suspected

fungi

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Tricholomopsis fulvescens						1 3
Tylopilus pseudoscaber						1 3

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Cantharellus cibarius						34
Cantharellus subalbidus						34
Cantharellus tubaeformis						34
Clavariadelphus borealis						34
Clavariadelphus ligula						34
Clavariadelphus lovejoyae						34
Clavariadelphus pistilaris						34
Clavariadelphus sachalinensis						34
Clavariadelphus subfastigiatus						34
Clavariadelphus truncatus						34
Clavulina cinerea						34
Clavulina cristata						34
Clavulina ornatipes						34
Gyromitra californica						34
Gyromitra esculenta						34
Gyromitra infula						34
Gyromitra melaleucoides						34
Phlogoitis helevlloides						34
Phytoconis ericetorum						34

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Albatrellus ellisii						3
Albatrellus flettii						3
Asterophora lycoperdoides						3
Asterophora parasitica						3
Baeospora myriadophylla						3
Boletus piperatus						3
Catathelasma ventricosa						3
Chrysomphalina grossula						3
Clavicorona avellanea						3
Collybia racemosa						3
Cordycepys capitata						3
Cordycepys ophioglossoides						3
Cortinarius azureus						3
Cortinarius cyanites						3
Cortinarius spilomius						3
Cortinarius tabularis						3
Cortinarius valgus						3
Cudonia monticola						3
Cyphellostereum laeve						3
Dermocybe humboldtensis						3
Fayodia gracilipes (rainierensis)						3
Gallerina atkinsoniana						3
Gallerina cerina						3
Gallerina heterocystis						3
Gallerina sphagnicola						3
Gallerina vaittaeformis						3
Gastroboletus turbinatus						3
Gomphus bonarii						3
Gomphus clavatus						3

Likelihood of Occurrance : Suspected

fungi

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Gomphus floccosus						3
Gomphus kauffmanii						3
Gyromitra montana (syn. G. gigas)						3
Hydnum repandum						3
Hydnum umbilicatum						3
Hygrophorus karstenii						3
Hypomyces luteovirens						3
Hypotrachyna revoluta						3
Mycena lilacifolia						3
Mycena marginella						3
Mycena tenax						3
Mythicomyces corneipes						3
Otidea leporina						3
Otidea onotica						3
Phaeocollybia attenuata						3
Phaeocollybia fallax						3
Phaeocollybia olivacea						3
Phaeocollybia pseudofestiva						3
Phaeocollybia spadicea						3
Phellodon atratum						3
Plectania melastoma						3
Podostroma alutaceum						3
Rhizopogon abietis						3
Rhizopogon atroviolaceus						3
Rhizopogon truncatus						3
Rickenella setipes						3
Russula mustelina						3
Sarcodon fuscoindicum						3
Sarcodon imbricatus						3
Sarcosoma mexicana						3
Sarcosphaera eximia						3
Sparassis crispa						3
Spathularia flavida						3
Stagnicola perplexa						3
Thaxterogaster pingue						3

herb

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Botrychium montanum						12

lichen

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Hypogymnia duplicata						123
Lobaria linita						123
Pseudocyphellaria rainierensis						123

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Dendriscocaulon intricatulum						1 3
Dermatocarpon luridum						1 3

Likelihood of Occurrance : **Suspected**

lichen

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Hydrothyria venosa						1 3
Leptogium rivale						1 3
Pannaria rubiginosa						1 3
Plagiochila satoi						1 3
Plagiochila semidecurrens						1 3
Sticta arctica						1 3
Tholurna dissimilis						1 3
Nephroma occultum			1			1 3
Pilophorus nigricaulis			3			1 3

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Cladonia norvegica						3
Heterodermia sitchensis						3
Hypogymnia vittata						3
Nephroma isidiosum						3

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Calicium abietinum						4
Calicium adaequatum						4
Calicium adspersum						4
Calicium glaucellum						4
Calicium viride						4
Cetrelia cetrarioides						4
Chaenotheca brunneola						4
Chaenotheca chrysocephala						4
Chaenotheca ferruginea						4
Chaenotheca furfuracea						4
Chaenotheca subroscida						4
Chaenothecopis pusilla						4
Collema nigrescens						4
Cyphelium inquinans						4
Leptogium burnetiae var. hirsutum						4
Leptogium cyanescens						4
Leptogium teretiusculum						4
Lobaria scrobiculata						4
Microcalicium arenarium						4
Mycocalicium subtile						4
Nephroma parile						4
Pannaria leucostictoides						4
Pannaria mediterranea						4
Peltigera pacifica						4
Platismatia lacunosa						4
Ramalina thrausta						4
Stenocybe clavata						4
Stenocybe major						4
Sticta beauvoisii						4
Usnea longissima						4

liverwort

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Kurzia makinoana						12

Likelihood of Occurrance : Suspected

liverwort

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Marsupella emarginata var. aquatica						12
Tritomaria exsectiformis						12

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Diplophyllum albicans						1 3
Herbertus aduncus						1 3
Tritomaria quinquedentata						1 3
Herbertus sakuraii			2			1 3

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Douinia ovata						4

moss

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Ulota megalospora						12

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Bartramiopsis lescurii						1 3
Brotherella roelli						1 3
Bryoria tortuosa						1 3
Iwatsuklella leucotricha						1 3
Orthodontium gracile						1 3
Pleuroziopsis ruthenica						1 3
Racomitrium aquaticum						1 3
Tetraphis geniculata						1 3
Encalypta brevicolla var crumiana			1	OR		1 3

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Antitrichia curtipendula						4
Scouleria marginata						4

vascular

SCIENTIFIC NAME	FWS	ODA	ONHP	R6	BLM	ROD
Cypripedium montanum (west Cascades)					Tracking	12
Botrychium minganense			2	OR		12
Cypripedium fasciculatum		C	1	OR/WA	Candidate	12

NON-NATIVE PLANT SPECIES
NOXIOUS WEED LAWS, REGULATIONS AND POLICY

The following laws, regulations, and policies provide the foundation for management of noxious weeds on public lands.

Federal Land Policy and Management Act of 1976 (FLPMA). Directs the BLM to "take any action necessary to prevent unnecessary and or undue degradation of the public lands."

Public Rangelands Improvement Act of 1978 (PRIA). Requires that BLM will manage, maintain, and improve the condition of the public rangelands so that they become as productive as feasible.

Carlson-Foley Act of 1968. Directs agency heads to enter upon lands under their jurisdiction with noxious plants and destroy noxious plants growing there.

Federal Noxious Weed Act of 1974, as amended by Sec. 15, Management of Undesirable Plants on Federal Lands, 1990. Authorizes the Secretary "to cooperate with other federal and state agencies, and others in carrying out operations or measures to eradicate, suppress, control or prevent or retard the spread of any noxious weed. Each Federal agency shall 1) designate an office or person adequately trained to develop and coordinate an undesirable plants management program for control of undesirable plants on federal lands under the agency's jurisdiction, 2) establish and adequately fund an undesirable plants management program through the agency's budgetary process, 3) complete and implement cooperative agreements with State agencies regarding the management of undesirable plant species on federal lands, and 4) establish integrated management systems to control or contain undesirable plant species targeted under cooperative agreements."

Final Environmental Impact Statement for Noxious Weeds (1985) and Final Supplemental Environmental Impact Statement for Noxious Weeds (1987). Declares that the BLM has the statutory duty to control and eradicate noxious weeds on public lands and identifies the environmental impacts of such a program.

Department Manual 517. Prescribes policy for the use of pesticides on the lands and waters under its jurisdiction and for compliance with the Federal Insecticide, Fungicide, and Rodenticide Act, as amended.

Department Manual 609. Prescribes policy to control undesirable or noxious weeds on the lands, water, or facilities under its jurisdiction, to the extent economically practicable and as needed for resource protection and accomplishment of resource management objectives.

BLM Manual 9011. Provides policy for conducting chemical pest control programs under an integrated pest management approach.

BLM Manual 9014. Provides guidance and procedures for planning and implementing biological control in integrated pest management programs.

BLM Manual 9015. Provides policy relating to the management and coordination of noxious weed activities among BLM, organizations and individuals.

BLM Manual 9220. Provides guidance for implementing integrated pest management on lands administered by the Bureau. The objective is to ensure optimal pest management with respect to environmental concerns, biological effectiveness, and efficiency while achieving resource management objectives.

Forest Service Land and Resource Management Plan for Umpqua N.F. States that noxious weed control should be accomplished in cooperation with other agencies and organizations. Notes that preventative management is critical to effective control.

Forest Service Manual 2080. Establishes Direction. Clarifies responsibilities and authorities for management of noxious weeds on Forest Service lands. Objectives are to 1) use integrated weed management to meet vegetation management goals, 2) prevent introduction and establishment of new infestations, 3) contain and suppress existing infestations, 4) cooperate with other agencies, organizations and land owners, 5) increase general knowledge of employees, other agencies, organizations, users and adjacent owners. Delineates project level responsibilities, prevention, and control measures.

BLM Roseburg District Draft Integrated Weed Control Plan and Environmental Assessment. Analyzes the current situation on lands administered by the Roseburg District. Identifies target species. Proposes management activities for target infestations. Explains environmental consequences.

OREGON STATE NOXIOUS WEED LIST

LITTLE RIVER OCCURRENCES

The following list includes those vascular plant species listed by the State of Oregon as Noxious. The plants are divided into three catagories.

"A" designated weed-- a weed of known econimic importance which occurs in the state in small enough infestations to make eradication/containment possible; or is not known to occur, but its presence in neighboring states maie future occurrence in Oregon seem imminent.

"B" designated weed-- a weed of econimic importance which is regionally abundant, but which may have limited distribution in some counties. Wher implementation of afully-integrated statewide management plan is infeasible biological control shall be the main control approach.

"T" designated weed-- a priority noxious weed designated by the State Weed Board as a target weed species on which the Department will implement a statewide management plan.

Common Name	Scientific Name	Present	Probable	Status	Habitat	Origin	Hazards
African Rue	Peganum harmala			A			
Austrian Peawood	Sphaerophysa salsula			B			
Bearded Creeper	Crupina vulgaris			A,T			
Buffaloburr	Solanum rostratum			B			
Bull Thistle	Cirsium vulgare	Yes		B	Meadows, clear cuts, roadsides, waste areas	Eurasia	Forms dense stands overcrowding native plants
Camelthorn	Alhagi pseudalhagi			A			
Canada Thistle	Cirsium arvense	Yes		B	Riparian, roadsides, pastureland, waste areas	Southeastern Europe and Asia, introduced in 1700's	Aggressive invader, crowds out natives
Creeping Yellow Cress	Rorippa sylvestris			A			

Common Name	Scientific Name	Present	Probable	Status	Habitat	Origin	Hazards
Dalmation Toadflax	Linaria dalmatica			B	Rangelands and roadsides	Southeastern Europe	Difficult to control, crowds natives
Diffuse Knapweed	Centaurea diffusa	Yes		B			
Dyer's Wood	Isatis tinctoria			B			
Eurasian Watermilfoil	Myriophyllum spicatum			B	Ponds, lakes	Europe	Destroys wildlife habitat, clogs ponds
Field Bindweed	Convolvulus arvensis	Yes		B	Widespread except in shady, extremely wet areas	Europe	Hard to erradicate, invader
French Broom	Cytisus monspessulanus		Yes	B			
Giant Horsetail	Equisetum telmateia	Yes		B			
Giant Knotweed -	Polygonum sachalinense			-			
Gorse	Ulex europeaus	Yes		B,T	Sandy coastal areas	Europe	Invader hinders reforestation, fire hazard, spreads rapidly
Halogeton	Halogeton glomeratus			B			
Hydrilla	Hydrilla verticillata			A			
Iberian Starthistle	Centaurea iberica			A			
Italian Thistle	Carduus pycnocephalus		Yes	B	Hilly pastureland, roadsides, waste areas		
Japanese Knotweed	Polygonum cuspidatum		Yes	B			
Johnsongrass	Sorghum halepense			B		Mediterranean region	Under stress conditions it forms cyanic acid and is toxic to animals
Jointed Goatgrass	Aegilops cylindrica			B		Southern Europe, first found in 1937 in Kansas	Rough-awned spikelets injure livestock mouths
Kochia	Kochia scoparia			B			
Leafy Spurge	Euphorbia esula			B,T	Riparian, pasturelands	Eurasia, introduced to U.S. around 1927	Aggressive invader of native areas
Matgrass	Nardus stricta			A			
Meadow Knapweed	Centaurea pratensis	Yes		B	Pastureland, roadsides, waste areas	Europe	Not palatable to livestock, low forage value
Mediterranean Sage	Aethiopsis salvia			B			
Medusahead Rye	Taeniatherum caput-medusae		Yes	B	Rangeland	Europe	Not palatable to livestock, vigorous invader
Milk Thistle	Silybum marianum		Yes	B	Pasturelands, roadsides, waste areas	Mediterranean region of Europe	Dense clumps exclude animal movement and vigorous invader

Common Name	Scientific Name	Present	Probable	Status	Habitat	Origin	Hazards
Musk Thistle	Carduus nutans			B	Riparian, timberlands, pasturelands, roadsides	Eurasia	Displaces native forage species
Perennial Pepperweed	Lepidium latifolium			B	Wet areas along roadsides and ditches		
Poison Hemlock	Conium maculatum	Yes		B			
Puncturevine	Tribulus terrestris			B			
Purple Loosestrife	Lythrum salicaria	Yes		B	Marshes, wet areas, riparian	Europe	Invades waterfowl habitat and clogs ponds
Purple Starthistle	Centaurea calcitrapa			A			
Quackgrass	Agropyron repens			B	Lawns, meadows, waste areas in cool moist climates	Eurasian native first found in 1837 in U.S.	Outcompetes other vegetation, vigorous invader
Ragweed	Ambrosia artemisiifolia			B			
Rush Skeletonweed	Chondrilla juncea			B,T	Agricultural areas	Eurasia	Invades natives and crops
Russian Knapweed	Centaurea repens			B	Agricultural areas, ditches, waste areas	Eurasia	Unpalatble to livestock, hard to control in alflafa fields
Scotch Broom	Cytisus scoparius	Yes		B	Pasturelands, meadows, roadsides, forested areas	Europe	Crowds out natives, spreads rapidly
Silverleaf Nightshade	Solanum elaegnifolium			A			
Slender-flowered Thistle	Carduus tenuiflorus			B			
Smooth Cordgrass	Spartina alterniflora			A			
Smooth Distaff Thistle	Carthamus baeticus			A			
South American Waterweed	Elodea densa			B			
Spikeweed	Hemizonia pungens			B			
Spiny Cocklebur	Xanthium spinosum			B			
Spotted Knapweed	Centaurea maculosa			B	Rangelands, roadsides, waste areas	Eurasia	Not palatable to livestock, low forage value
Squarrose Knapweed	Centaurea virgata			A,T			
St. Johnswort	Hypericum perforatum	Yes		B	Pasture and rangelands	Europe	Toxic to livestock making them photosensitive
Tansy Ragwort	Senecio jacobea	Yes		B,T	Wide ranging habitats	Europe, introduced in early 1900's	Toxic to livestock (alkaloids)
Velvetleaf	Abutilon theophrasti			B			
Western Horsetail	Equisetum arvense	Yes		B	Moist areas, stream courses and ditchbanks	Europe and North Africa	Poisonous to livestock, invades pasturelands

Common Name	Scientific Name	Present	Probable	Status	Habitat	Origin	Hazards
Whitestem Distaff Thistle	Carthamus leucocaulos			A			
Wild Proso Millet	Panicum miliaceum			B			
Wooly Distaff Thistle	Carthamus lanatus			A,T			
Yellow Nutsedge	Cyperus esculentus			B			
Yellow Starthistle	Centaurea solstitialis		Yes	B,T	Rangelands, waste areas, roadsides	Mediterranean region of Europe	Causes nervous disorder in horses (chewing disease)
Yellow Toadflax	Linaria vulgaris		Yes	B	Roadsides, pasturelands	Eurasia	Difficult to control, crowds natives

NATIVE GRASS SEED
AVAILABLE FROM J.H. STONE NURSERY
SEPTEMBER 1994

COMMON NAME	SCIENTIFIC NAME	PROVINCE
Bluebunch Wheatgrass	*Agropyron spicatum*	S,C
Leafy Bentgrass	*Agrostis pallens*	S,C
California Brome	*Bromus carinatus*	S,C
Narrow-flowered Brome	*Bromus vulgaris*	S,C
Tufted Hairgrass	*Deschampsia caespitosa*	S,C
Slender Hairgrass	*Deschampsia elongata*	S,C
Blue Wild-Rye	*Elymus glaucus*	S,C
California Fescue	*Festuca californica*	S,C
Idaho Fescue	*Festuca idahoensis*	S,C
Western Fescue	*Festuca occidentalis*	S,C
Meadow Barley	*Horedeum brachyantherum*	S,C
Junegrass	*Koelaria cristata*	S,C
Pine Bluegrass	*Poa scabrella*	S,C
Squirreltail	*Sitanion hystrix*	S,C
California Needlegrass	*Stipa californica*	S,C
Tall Trisetum	*Trisetum canescens*	S,C

S = Siskiyou Mountains on Rouge River National Forest and adjacent BLM land.
C = Cascade Mountains on Rouge River National Forest and adjacent BLM land.

NITROGEN FIXING SPECIES
ON THE
UMPQUA NATIONAL FOREST

compiled by Lisa Wolf
North Umpqua R.D.
Fall 1993

Species List with Recommendations

Scientific Name	Common Name	Native?	Recommended	Frequency
Alnus rubra	red alder	Yes	Yes	common
Alnus viridis s sinuata (sinuata)	sitka alder	Yes	Yes	occasional
Astragalus umbraticus	sylvan milkvetch	Yes	No	rare
Ceanothus cuneatus	Buckbrush	Yes	Yes	common
Ceanothus integerrimus	Deerbrush	Yes	Yes	common
Ceanothus prostratus	squaw carpet	Yes	Yes	occasional
Ceanothus sanguineus	redstem ceanothus	Yes	Yes	occasional
Ceanothus velutinus v velutinus	snowbrush	Yes	No	common
Cytisus scoparius	Scotchbroom	NO	No	occasional
Lathyrus latifolius	sweet pea	NO	No	common
Lathyrus nevadensis s nevadensis	Sierran pea	Yes		occasional
Lathyrus polyphyllus	leafy pea	Yes	Yes	common
Lotus corniculatus	birdsfoot-trefoil	NO	No	abundant
Lotus crassifolius v subglaber	buckvetch	Yes	Yes	occasional
Lotus formosissimus	seaside lotus	Yes	Yes	common
Lotus micranthus	small flowered deervetch	Yes		common
Lotus nevadensis	Nevada deervetch	Yes		common?
Lotus oblongifolius v nevadensis	oblong leaved lotus	Yes		common
Lotus purshianus	Spanish clover	Yes		common
Lupinus albicaulis	sickle-keeled lupine	Yes		occasional
Lupinus albifrons	white-leaved lupine	Yes	Yes	occasional
Lupinus bicolor	two-color lupine	Yes	Yes	common
Lupinus latifolius v latifolius	broad-leafed lupine	Yes	Yes	
Lupinus lepidus v lobbii	dwarf lupine	Yes	Yes	common
Lupinus polyphyllus v polyphyllus	big-leaf lupine	Yes	Yes	common
Lupinus rivularis	riverbank lupine	Yes	Yes	common?
Medicago polymorpha (hispida)	bur clover	NO	No	common?
Medicago sativa	alfalfa	NO	No	uncertain
Metilotus alba	white sweetclover	NO	No	common
Metilotus officinalis	yellow sweetclover	NO	No	occasional
Psoralea physodes	California tea	Yes	Yes	common
Thermopsis montana v venosa	golden banner	Yes	Yes	common
Trifolium cyathiferum	cup clover	Yes	Yes	uncommon
Trifolium dubium	little hop clover	NO	No	common
Trifolium howellii	Howell's clover	Yes	Yes	common
Trifolium hybridum	Alsike clover	NO	No	uncommon
Trifolium longipes v hansenii	long-stalked clover	Yes	Yes	occasional
Trifolium microcephalum	small-headed clover	Yes		occasional
Trifolium oliganthum	few-flowered clover	Yes		uncommon
Trifolium pratense	red clover	NO	No	occasional
Trifolium repens	White clover	NO	No	common
Trifolium subterraneum	subterranean clover	NO	No	common
Trifolium tridentatum	tomcat clover	Yes		rare?
Trifolium variegatum	white-tip clover	Yes		occasional
Trifolium wormskjoldii	springbank clover	Yes	Yes	uncommon
Vicia americanc v truncata	American vetch	Yes	Yes	common
Vicia cracca	tinegrass	NO	No	uncommon
Vicia sativa	common vetch	NO	No	common
Vicia tetrasperma	slender vetch	NO	No	uncommon

SPECIES RECOMMENDED BY SO NATIVE PLANTS GROUP.
LIST HAS NOT BEEN REVIEWED

compiled from Forest-wide suggestions. Fall 1993

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	HABIT	SITE	COVER
ASTER	ACHILLEA MILLEFOLLIUM	YARROW	COMMON	HERB	MOD-DRY	OPEN
ASTER	ERIOPHYLLUM LANATUM	WOOLY DAISY	COMMON	HERB	DRY	OPEN
ASTER	GNAPHALLIUM MICROCEPHALUM	SLENDER CUDWEED	COMMON	SHRUB, SUB	DRY	OPEN
ASTER	HIERACIUM ALBIFLORUM	WHITE HAWKWEED	COMMON	HERB	MOD-DRY	OPEN
BERBERID	BERBERIS NERVOSA	DWARF OREGON GRAPE	COMMON	SHRUB, LOW	MOIST-DRY	SHADE/PART
CAPRIFOLI	LINNAEA BOREALIS	TWIN FLOWER	COMMON	VINE	MOIST	SHADE/PART
CAPRIFOLI	LONICERA HISPIDA	HAIRY HONEYSUCKLE	COMMON	VINE	DRY	SHADE/OPEN
CAPRIFOLI	SYMPHOROCARPOS MOLLIS	CREEPING SNOWBERRY	COMMON	SHRUB, LOW	DRY	SHADE/OPEN
CYPER	CAREX CONCINNOIDES	NORTHWESTERN SEDGE	COMMON	GRAMINOID	MOD-DRY	PART/OPEN
ERIC	ARCTOSTAPHLOS NEVADENSIS	PINEMAT MANZANITA	COMMON	SHRUB	DRY	PART/OPEN
ERIC	ARCTOSTAPHLOS PATULA	GREENLEAF MANZANITA	COMMON	SHRUB	MOIST	OPEN
ERIC	ARCTOSTAPHYLOS NEVADENSIS	PINEMAT MANZANITA	COMMON	SHRUB, LOW	DRY	PART/OPEN
FAB	LOTUS CRASSIFOLIUS	BIG DEERVETCH	COMMON	HERB	MOD-DRY	OPEN
FAB	LUPINUS POLYPHYLLUS	BIGLEAF LUPINE	OCCASIONAL	HERB	MODERATE	OPEN
FAB	PSORELIA PHYSOIDES	CALIFORNIA TEA	COMMON	HERB	MOD-DRY	PART/OPEN
FAB	THERMOPSIS MONTANA	GOLDEN PEA	OCCASIONAL	HERB	MODERATE	PART/OPEN
FABI	LUPINUS ALBIFRONS	WHITE-LEAVED LUPINE	OCCASIONAL	SHRUB, SUB	DRY	OPEN
HYDRANG	WHIPPLEA MODESTA	WHIPPLEVINE	COMMON	VINE	MODERATE	SHADE/PART
LILI	XEROPHYLLUM TENAX	BEARGRASS	COMMON	HERB	MODERATE	PART/OPEN
PAPAVER	DICENTRA FORMOSA	BLEEDING HEART	OCCASIONAL	HERB	MODERATE	SHADE/OPEN
PO	BROMUS CARINATUS	CALIFORNIA BROME	COMMON	GRAMINOID	MOIST	PART
PO	DANTHONIA CALIFORNICA	CALIFORNIA OATGRASS	UNCOMMON?	GRAMINOID	MOIST-DRY	PART
PO	DANTHONIA UNISPICATA	ONESPIKE DANTHONIA	RARE	GRAMINOID	DRY	OPEN
PO	ELYMUS GLAUCUS	BLUE WILDRYE	COMMON	GRAMINOID	MOIST-DRY	PART/OPEN
PO	FESTUCA MEGALURA	FOXTAIL FESCUE	UNCOMMON	GRAMINOID	MOIST-DRY	OPEN
PO	GLYCERIA ELATA	TALL MANNA GRASS	COMMON	GRAMINOID	WET	OPEN
PO	SITANION HYSTRIX	BOTTLEBRUSH SQUIRRELTAIL	OCCASIONAL	GRAMINOID	DRY	OPEN
PO	STIPA LETTERMANNII	LETTERMAN'S NEEDLEGRASS	UNCOMMON	GRAMINOID	DRY	OPEN
POLEMONI	PHLOX ADSURGENS	WOODLAND PHLOX	COMMON	SHRUB, SUB	MOIST-MOD	PART
POLYGON	ERIOGONUM COMPOSITUM	NORTHERN BUCKWHEAT	OCCASIONAL	HERB	DRY	OPEN
POLYGON	ERIOGONUM UMBELLATUM	SULFUR FLOWER	OCCASIONAL	SHRUB, SUB	DRY	OPEN
POLYPODI	POLYSTICHUM IMBRICANS	CLIFF SWORDFERN	COMMON	HERB	DRY	PART/OPEN
RHAMN	CEANOTHUS INTEGERIMUS	BLUEBLOSSOM	COMMON	SHRUB	MODERATE	OPEN

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	HABIT	SITE	COVER
RHAMN	CEANOTHUS PROSTRATUS	SQUAW CARPET	COMMON	SHRUB, LOW	DRY	OPEN
ROS	FRAGERIA VESCA BRACTEOSA	STRAWBERRY	COMMON	SHRUB	MOIST-DRY	PART/OPEN
ROS	PRUNUS EMARGINATA	BITTERCHERRY	COMMON	SHRUB/TREE	MODERATE	PART/OPEN
ROS	RUBUS LEUCODERMUS	BLACKCAP RASPBERRY	COMMON	SHRUB, SUB	MOD-DRY	OPEN
ROS	RUBUS PARVIFLORUS	THIMBLEBERRY	COMMON	SHRUB, SUB	MOIST-MOD	OPEN
ROS	RUBUS URSINUS	PACIFIC BLACKBERRY	COMMON	VINE	MOIST-MOD	PART
SCROPHULARI	PENSTEMON CARDWELLII	CARDWELL'S PENSTEMON	COMMON	SHRUB, SUB	MOD-DRY	OPEN
SCROPHULARI	PENSTEMON DEUSTUS	HOT ROCK PENSTEMON	OCCASIONAL	SHRUB, LOW	DRY	OPEN

NORTH UMPQUA R.D.
USEFUL NATIVE PLANT SPECIES
FOR
REVEGETATION AND RESTORATION

compiled by Lisa Wolf
Fall 1993

The following is a list of species recommended for use in revegetation projects on the North Umpqua Ranger District. This list is arranged to emphasize habit and habitat. Species included were chosen with a focus on hot dry habitats such as roadside cutbanks. It should be noted that almost any species can be used if its habitat needs are met. This list does not include all possiblilities. Each project should be evaluated separately with special attention paid to those plants already on the site.

GRAMINOID

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
CYPER	CAREX CONCINNOIDES	NORTHWESTERN SEDGE	COMMON	MOD-DRY	OPEN/PART	RHIZOMES GROW FROM CUTTINGS
CYPER	CAREX PENSYLVANICA	LONG-STOLON SEDGE	COMMON	DRY	OPEN	HIGHER ELEVATIONS
PO	AGROSTIS DIEGOENSIS	LEAFY BENTGRASS		MOIST-DRY	OPEN	ALL ELEVATIONS
PO	AGROSTIS EXARATA	SPIKE BENTGRASSS	UNCOMMON	MOIST		LOW-MID ELEVATIONS
PO	AGROSTIS HALLII	HALLS BENTGRASS		DRY	OPEN/PART	
PO	AGROSTIS HUMULIS	ALPINE BENTGRASS	RARE	WET-MOIST	OPEN	SUBALPINE-ALPINE
PO	AGROSTIS OREGONESIS	OREGON BENTGRASS	UNCOMMON	WET		MEDIUM ELEVATIONS
PO	AGROSTIS SCABRA	TICKLE GRASS	UNCOMMON	MOIST-DRY		SEA-SUBALPINE
PO	AGROSTIS TENUIS	COLONIAL BENTGRASS	COMMON			EURASIAN
PO	AGROSTIS THERBERIANA	THURBER BENTGRASS	UNCOMMON	MOIST		MOSTLY ALPINE-SUBALPINE
PO	AGROSTIS VARIABILIS	VARIANT BENTGRASS	RARE	MOIST	OPEN	ALPINE-SUBALPINE MOIST RIDGES
PO	ALOPECURUS AEQUALIS	SHORT-AWN FOXTAIL	UNCOMMON	WET	OPEN	
PO	BROMUS CARINATUS	CALIFORNIA BROME	COMMON	MOIST	PART	CYCLES OUT IN 3 YEARS
PO	BROMUS PACIFICUS	PACIFIC BROME	UNCOMMON	MOIST	OPEN/PART	
PO	BROMUS SITCHENSIS	BROME	RARE	MOIST	OPEN	OURS = v SITTCHENSIS
PO	BROMUS VULGARIS	COLUMBIA BROME	UNCOMMON	MOIST-DRY	OPEN/PART	TO 6000 FEET
PO	CALAMAGROSTIS CANADENSIS	BLUEJOINT REEDGRASS	UNCOMMON	WET		3 VARIETIES
PO	CLAMAGROSTIS PURPURESCENS	PURPLE REEDGRASS		DRY	OPEN/PART	CAESPITOSE RHIZOMATOUS
PO	DANTHONIA CALIFORNICA	CALIFORNIA OATGRASS	UNCOMMON	MOIST-DRY	PART	CAESPITOSE
PO	DANTHONIA INTERMEDIA	TIMBER OATGRASS	COMMON	MOIST-DRY	OPEN/PART	CAESPITOSE TO ALPINE
PO	DANTHONIA UNISPICATA	ONESPIKE DANTHONIA	RARE	DRY	OPEN	RIDGES PARKS MONTANE
PO	DESCHAMPSIA ATROPURPUREA	MOUNTAIN HAIRGRASS	UNCOMMON	MOIST	OPEN	MONTANE-ALPINE
PO	DESCHAMPSIA CAESPITOSA	TUFTED HAIRGRASS	UNCOMMON	MOIST	OPEN	CEASPITOSE TO ALPINE
PO	ELYMUS GLAUCUS	BLUE WILDRYE	COMMON	MOIST-DRY	OPEN/PART	TWO VARIETIES BELOW 7500 FEET
PO	ELYMUS HIRSUTUS	HAIRY WILDRYE		MOIST-DRY	OPEN/PART	VERY SIMILAR TO E.GLAUCUS

GRAMINOID

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
PO	FESTUCA CALIFORNICA	CALIFORNIA FESCUE	RARE	MOIST-DRY	OPEN	BELOW 6000 FEET
PO	FESTUCA IDAHOENSIS	IDAHO FESCUE	UNCOMMON	DRY	OPEN	"ONE OF FINEST RANGE GRASSES"
PO	FESTUCA MEGALURA	FOXTAIL FESCUE	UNCOMMON	MOIST-DRY	OPEN	LIKES DISTURBED SITES WEEDY
PO	FESTUCA OCCIDENTALIS	WESTERN FESCUE	UNCOMMON	MOIST	OPEN/PART	
PO	FESTUCA OVINA	SHEEP FESCUE		DRY	OPEN	VARIETIES , ONE INTRO AS LAWN
PO	FESTUCA RUBRA	RED FESCUE	UNCOMMON	MOIST-DRY	OPEN/PART	MANY CULTIVARS
PO	FESTUCA SUBULATA	BEARDED FESCUE	RARE	MOIST	OPEN/PART	CEASPITOSE
PO	GLYCERIA ELATA	TALL MANNA GRASS	COMMON	WET	OPEN	RHIZOMATOUS
PO	HIEROCHLOE OCCIDENTALIS	WESTERN SWEETGRASS	OCCASIONAL	MOIST-MOD	SHADE	BUNCHGRASS
PO	HIEROCHLOE ODORATA	HOLY GRASS		MOIST		RHIZOMATOUS
PO	HORDEUM JUBATUM	SQUIRRELTAIL		MOIST-DRY	OPEN	WEEDY LIKES DISTURBED AREAS
PO	PHLEUM ALPINUM	ALPINE TIMOTHY	RARE	MOIST	OPEN	SEMIRHIZOM MONTANE-SUBALPINE
PO	PLEUROPOGON REFRACTUS	NODDING SEMAPHORE GRASS	RARE	WET		RHIZOMATOUS
PO	POA CUSICKII	CUSICK'S BLUEGRASS		DRY	OPEN	SAGEBRUSH TO ALPINE
PO	POA LEPTOCOMA	BOG BLUEGRASS		WET		STOLONIFEROUS TO ALPINE
PO	POA NERVOSA				OPEN/PART	RHIZOMATOUS TO ALPINE
PO	SITANION HYSTRIX	BOTTLEBRUSH SQUIRRELTAIL	OCCASIONAL	DRY	OPEN	BELOW 13000 FEET
PO	STIPA COLUMBIANA	NEEDLEGRASS		DRY	OPEN	4000-10000 FEET
PO	STIPA LEMONII	LEMON'S NEEDLEGRASS	OCCASIONAL	DRY		TUFTED TO MIDMONTANE
PO	STIPA LETTERMANNII	LETTERMAN'S NEEDLEGRASS	UNCOMMON	DRY	OPEN	TUFTED TO SUBALPINE
PO	TRISTEUM CERNUUM	NODDING TRISTEUM	RARE	MOIST	OPEN/PART	TUFTED WOODS STREAMBANKS

HERB

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
ASTER	ACHILLEA MILLEFOLLIUM	YARROW	COMMON	MOD-DRY	OPEN	MEDICINAL
ASTER	ANAPHALIS MARGARITACEA	PEARLY EVERLASTING	COMMON	DRY	OPEN	HARDY PERENNIAL
ASTER	ERIOPHYLLUM LANATUM	WOOLY DAISY	COMMON	DRY	OPEN	CREEPER
ASTER	HIERACIUM ALBIFLORUM	WHITE HAWKWEED	COMMON	MOD-DRY	OPEN	LIKES DISTURBED AREAS BIENNIAL
ASTER	SENECIO EURYCEPHALUS??	ANNUAL BUTTERWEED	COMMON	DRY	OPEN	THICK IN FIRE TREATED CLEARCUTS
ERIC	PYROLA PICTA	WHITE VEINED PYROLA	COMMON	MODERATE	SHADE/PART	
FAB	LOTUS CRASSIFOLIUS	BIG DEERVETCH	COMMON	MOD-DRY	OPEN	FROM SEED ONLY PERRENNIAL

HERB

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
FAB	LUPINUS POLYPHYLLUS	BIGLEAF LUPINE	OCCASIONAL	MODERATE	OPEN	AESTHETICS TO THREE FEET TALL
FAB	PSORELIA PHYSOIDES	CALIFORNIA TEA	COMMON	MOD-DRY	OPEN/PART	PERENNIAL
FAB	THERMOPSIS MONTANA	GOLDEN PEA	OCCASIONAL	MODERATE	OPEN/PART	AESTHETICS PERENNIAL
IRID	IRIS CHYSOPHYLLA	SLENDER-TUBED IRES	COMMON	DRY	OPEN/PART	PROPOGATE FRM SEED CUTTINGS
LILI	CAMAS QUAMASH	CAMAS	COMMON	WET	OPEN	THREE VARIETIES
LILI	CAMASSIA SP	CAMAS	OCCASIONAL	WET	OPEN/PART	BULBS
LILI	LILIUM WASHINGTONIANUM	WASHINGTON LILY	OCCASIONAL	MODERATE	OPEN	BULBS
LILI	SMILACINA STELLATA	SMALL FLOWRD SOLOMON SEA	COMMON	MOIST	SHADE/PART	RHIZOMATOUS
LILI	SMILCINA RACEMOSA	WESTERN SOLOMON SEAL	COMMON	MOIST-DRY	SHADE/PART	RHIZOMATOUS
LILI	TILLIUM OVATUM	TRILLIUM	COMMON	MOIST	SHADE	SHORT RHIZOME
LILI	XEROPHYLLUM TENAX	BEARGRASS	COMMON	MODERATE	OPEN/PART	RHIZOMATOUS
PAPAVER	DICENTRA FORMOSA	BLEEDING HEART	OCCASIONAL	MODERATE	OPEN/SHADE	RHIZOMATOUS
POLYGON	ERIOGONUM COMPOSITUM	NORTHERN BUCKWHEAT	OCCASIONAL	DRY	OPEN	TOUGH HOT SITES
POLYPODI	POLYSTICHUM IMBRICANS	CLIFF SWORDFERN	COMMON	DRY	OPEN/PART	RHIZOMATOUS
POLYPODI	POLYSTICHUM MUNITUM	SWORDFERN	COMMON	MOIST	SHADE/PART	RHIZOMATOUS
POLYPODI	PTERIDIUM AQUILINUM	BRACKEN FERN	COMMON	MOIST-DRY	OPEN	RHIZOMATOUS COSMOPLITAN
RANUNCUL	ANENOME DELTOIDEA	WINDFLOWER	COMMON	MODERATE	SHADE/PART	RHIZOMATOUS
RANUNCUL	AQUILEGIA FORMOSA	COLUMBINE	COMMON	WET-MOIST	OPEN/SHADE	MAINTAINS SELF FROM SEED
ROS	FRAGARIA VIRGINIANA v PLATYPETAL	WILD STRAWBERRY	COMMON	DRY	OPEN	HIGHER ELEVATIONS STOLONS
RUBI	GALIUM APARINE	CLEAVERS	COMMON	MODERATE	SHADE/PART	
SCROPHULA	CASTILLEJA MINIATA v MINIATA	SCARLET PAINTBRUSH	COMMON	MOIST	OPEN	MIDDLE ELEVATIONS
SCROPHULA	MIMULUS GUTATTUS	MONKEY FLOWER	COMMON	WET	OPEN/PART	
SCROPHULA	PENSTEMON RYDBERGII	RYDBERG'S PENSTEMON	COMMON	MOIST-MOD	OPEN	*HIGH ELEVATIONS ONLY

SHRB/TREE

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
FAG	QUERCUS SP	OAK	OCCASIONAL	DRY	OPEN	

SHRUB

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
CAPRIFOLI	SYMPHOROCARPOS ALBUS	COMMON SNOWBERRY	COMMON	MOIST	SHADE/PART	LOW TO MID ELEVATIONS
CELASTR	PACHISTIMA MYRSINITES	OREGON BOXWOOD	COMMON	MODERATE	SHADE/PART	
ERIC	ARCTOSTAPHLOS NEVADENSIS	PINEMAT MANZANITA	COMMON	DRY	OPEN/PART	HIGHER ELEVATIONS
ERIC	ARCTOSTAPHLOS PATULA	GREENLEAF MANZANITA	COMMON	MOIST	OPEN	
ERIC	GAULTHERIA SHALON	SALAL	COMMON	MOIST	OPEN/SHADE	EASY PROPOGATED FRM CUTTING
ERIC	RHODODENDRON MACROPHYLLUM	RHODODENDRON	COMMON	MOIST	OPEN/SHADE	
ERIC	VACCINIUM PARVIFLORA	RED HUCKLEBERRY	COMMON	MOIST	SHADE/PART	
GROSSULARI	RIBES SP.	CURRANTS	COMMON	ALL	ALL	SEVEN SPECIES
RHAMN	CEANOTHUS INTEGERIMUS	BLUEBLOSSOM	COMMON	MODERATE	OPEN	VERY VALUABLE FORAGE
RHAMN	CEANOTHUS VELUTINUS	SNOWBRUSH	COMMON	MODERATE	OPEN	300 YR SEED SILVI. CONFLICTS
ROS	AMELANCHIER ALNIFOLIA	SERVICE BERRY	COMMON	MOIST-DRY	SHADE/OPEN	
ROS	CRATAEGUS DOUGLASSII	BLACK HAWTHORN	UNCOMMON	MOIST	OPEN/PART	FRUIT = FOOD
ROS	HOLODISCUS DISCOLOR	OCEAN SPRAY	COMMON	MOD-DRY	OPEN/PART	
ROS	OEMLERIA CERASIFORMIS	INDIAN PLUM	COMMON	MOIST	SHADE/PART	
ROS	PRAGERIA VESCA	STRAWBERRY	COMMON	MOIST-DRY	OPEN/PART	FOUND ON ALL ECOPLOT CUTBANKS
ROS	PRUNUS VIRGINIANA	CHOKECHERRY	UNCOMMON	MOIST-DRY	SHADE/PART	
ROS	ROSA GYMNOCARPA	WOOD ROSE	COMMON	MODERATE	SHADE/PART	RHIZOMATOUS

SHRUB, HI

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
ACER	ACER CIRCINATUM	VINE MAPEL	COMMON	MOIST	SHADE/PART	RIPARIAN SEEDS, NEW GROWTH
ACER	ACER GLABRUM	DOUGLAS' MAPLE	COMMON	DRY	OPEN/PART	
BETUL	CORYLUS CORNUTA	HAZEL NUT	COMMON	MOIST	SHADE/PART	
ROS	AMELANCHIER ALNIFOLIA	SERVICEBERRY	COMMON	MODERATE	OPEN/PART	PROVIDES BERRIES, FOLIAGE, TWIGS

SHRUB, LOW

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
BERBERID	BERBERIS NERVOSA	DWARF OREGON GRAPE	COMMON	MOIST-DRY	SHADE/PART	RHIZOMATOUS MEDICINAL

SHRUB, LOW

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
CAPRIFOLI	SYMPHOROCARPOS MOLLIS	CREEPING SNOWBERRY	COMMON	DRY	OPEN/SHADE	TOXIC TO HUMANS
ERIC	ARCTOSTAPHYLOS NEVADENSIS	PINEMAT MANZANITA	COMMON	DRY	OPEN/PART	VARIETY OF SOILS
ERIC	ARCTOSTAPHYLOS UVA-URSI	KINNIKINNICK	UNCOMMON	DRY	OPEN	TRAILING, ROOTS FROM NODES
ERIC	VACCINIUM SCOPARIUM	WHORTLEBERRY	OCCASIONAL	DRY	SHADE/OPEN	*HIGHER ELEVATIONS ONLY
RHAMN	CEANOTHUS PROSTRATUS	SQUAW CARPET	COMMON	DRY	OPEN	* HIGHER ELEVATIONS 4000+
SCROPHULA	PENSTEMON DEUSTUS	HOT ROCK PENSTEMON	OCCASIONAL	DRY	OPEN	TOUGH HOT SITES

SHRUB, SUB

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
ASTER	GNAPHALLIUM MICROCEPHALUM	SLENDER CUDWEED	COMMON	DRY	OPEN	PIONEERS TAPROOTED PERENNIAL
ASTER	HAPLOPAPPUS GREENII	GREEN'S GOLDENWEED	OCCASIONAL	MODERATE	OPEN	*HIGHER ELEVATIONS ONLY
CORN	CORNUS CNADENSIS	BUNCHBERRY DOGWOOD	OCCASIONAL	MOIST	SHADE	HIGHER ELEVATIONS
ERIC	CHIMAPHILA UMBELLATA	WESTERN PRINCE'S PINE	COMMON	MOIST	SHADE	
FABI	LUPINUS ALBIFRONS	WHITE-LEAVED LUPINE	OCCASIONAL	DRY	OPEN	
FABI	LUPINUS LEPIDUS vLOBBII	PRAIRIE LUPINE	OCCASIONAL	DRY	OPEN	HIGHER ELEVATIONS
POLEMONI	PHLOX ADSURGENS	WOODLAND PHLOX	COMMON	MOIST-MOD	PART	FORMS SMALL MATS RHIZOMES
POLEMONI	PHLOX DIFFUSA	SPREADING PHLOX	OCCASIONAL	MOD-DRY	OPEN	HIGHER ELEVATIONS
POLYGON	ERIOGONUM UMBELLATUM	SULFUR FLOWER	OCCASIONAL	DRY	OPEN	CARPET FORMING
ROS	ARUNCUS SYLVESTER	GOATSBEARD	OCCASIONAL	MOIST	OPEN/PART	
ROS	RUBUS LEUCODERMUS	BLACKCAP RASPBERRY	COMMON	MOD-DRY	OPEN	
ROS	RUBUS PARVIFLORUS	THIMBLEBERRY	COMMON	MOIST-MOD	OPEN	RHIZOMATOUS
SCROPHULA	PENSTAMON RUPICOLA	CLIFF PENSTAMON	OCCASIONAL	DRY	OPEN	GROW FROM CUTTINGS HIGH ELEV
SCROPHULA	PENSTEMON CARDWELLII	CARDWELL'S PENSTEMON	COMMON	MOD-DRY	OPEN	ROOTS FRM NODES CUTTINGS

SHRUB/TREE

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
ROS	PRUNUS EMARGINATA	BITTERCHERRY	COMMON	MODERATE	OPEN/PART	
SALIX	SALIX PIPERI	PIPER'S WILLOW		WET	OPEN/PART	GROW FROM CUTTINGS

SHRUB/TREE

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
SALIX	SALIX SP	WILLOW	COMMON	WET	OPEN/PART	GROW FROM CUTTINGS

TREE

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
ACER	ACER MACROPHYLLUM	BIG-LEAF MAPLE	COMMON	MOIST	OPEN/PART	FORAGE=SEEDS, NEW GROWTH
BETUL	ALNUS RUBRA	RED ALDER	COMMON	WET	OPEN/PART	SEEDS SHADE
BETUL	ALNUS RUBRA	RED ALDER	COMMON	WET-MOIST	SHADE/OPEN	
CAPRIFOLI	SAMBUCUS CERULEA	BLUE ELDERBERRY	COMMON	MOIST	OPEN	ELK BROUSE BERRIES
CAPRIFOLI	SAMBUCUS RACEMOSA	RED ELDERBERRY	COMMON	MOIST	OPEN	
CORN	CORNUS NUTTALLII	PACIFIC DOGWOOD	COMMON	MOIST	SHADE/PART	
CUPRESS	CALOCEDRUS DECURRENS	INCENSE CEDAR	COMMON	DRY	OPEN	
CUPRESS	THUJA PLICATA	RED CEDAR	COMMON	MOIST	SHADE	RIPARIAN
ERIC	ARBUTUS MENZIESII	PACIFIC MADRONE	COMMON	MODERATE	OPEN	
FAG	CASTANOPSIS CHRYSOPHYLLA	CHINKAPIN	COMMON	DRY	OPEN/PART	
OLE	FRAXINUS LATIFOLIA	OREGON ASH	OCCASIONAL	WET	OPEN/PART	TEMPORARY SUBMERSION
RHAMN	RHAMNUS PERSHIANA	CASCARA	COMMON	MODERATE	SHADE/PART	
TAX	TAXUS BREVIFOLIA	PACIFIC YEW	COMMON	MOIST	SHADE	

VINE

FAMILY	SCIENTIFIC NAME	COMMON NAME	FREQUENCY	SITE	COVER	COMMENTS
CAPRIFOLI	LINNAEA BOREALIS	TWIN FLOWER	COMMON	MOIST	SHADE/PART	HARD TO START SEED EXPENSIVE
CAPRIFOLI	LONICERA CILIOSA	ORANGE HONEYSUCKLE	COMMON	MOIST	SHADE/PART	
CAPRIFOLI	LONICERA HISPIDA	HAIRY HONEYSUCKLE	COMMON	DRY	SHADE/OPEN	
HYDRANG	WHIPPLEA MODESTA	WHIPPLEVINE	COMMON	MODERATE	SHADE/PART	RHIZOMES CARPET FORMING
ROS	RUBUS NIVALIS	SNOW BRAMBLE	OCCASIONAL	MOIST	SHADE	RHIZOMATOUS COLD SITES
ROS	RUBUS URSINUS	PACIFIC BLACKBERRY	COMMON	MOIST-MOD	PART	RHIZOMATOUS

AREAS NEEDING STABILIZATION AND REVEGETATION

Four areas on Forest Service administered land have been identified as needing stabilization and revegetation:

1. The bend in Little River Road, T27S R1E, Sec 17 in the NW 1/4.
2. Along the 2715 Road, T27S, R1E, Sec 15 in the SW 1/4.
3. Above the east boat ramp at Hemlock Lake.
4. Above the Hemlock Lake dam.

Exploratory botanical work has already been completed for these projects. Experimental efforts to produce appropriate stocking materials were successfully undertaken at J.H. Stone Nursery. It is recommended that planting be undertaken, monitored, and used to create a template for work at similar sites.

The Roseburg Bureau of Land Management has recommended that an area along Ace Williams Mountain, T26S, R3W, Sec 27, (approximately 15 acres), and along Jim Creek, T27S, R3W, Sec 3 (approximately 10 acres) be revegetated with native bunch grasses. This open meadow habitat is currently dominated by exotic grasses. This revegetation action would be consistent with the draft conservation strategy recommended for Calochortus umpquaensis.

LITTLE RIVER WATERSHED ANALYSIS
DATA SUMMARIES -VICINITY COMPARISONS

Table 1. Sites requiring special management

Vicinity	TES Sites	ROD* Sites	NOXIOUS Target Sites
Lower Little	6		1
Mid Little	3	2	
Upper Little	3		
Emile	4		
Wolf Plateau	3		
Cavitt Creek	2	1	
Black Clover	10	1	
Watershed	**31**	**4**	**1**

*ROD "Strategy 1" species

Table 2. Acres of watershed surveyed

Vicinity	FS TES	BLM TES	ROD*
Lower Little	0	?	
Mid Little River	148	?	2
Upper Little	324		
Emile	1		
Wolf Plateau	30	?	
Cavitt Creek	0	?	1
Black Clover	168		1
Watershed	**678**	**4139**	**4**

Table 3. Percent of Forest Service Lands adequately surveyed for current listed TES species

Vicinity	Acres Surveyed	Portion Surveyed (%)
Lower Little	---	---
Mid Little River	54	0.6
Upper Little	143	1.4
Emile	0	0
Wolf Plateau	1	0
Cavitt Creek	3	0
Black Clover	169	1
Watershed	370	**0.6**

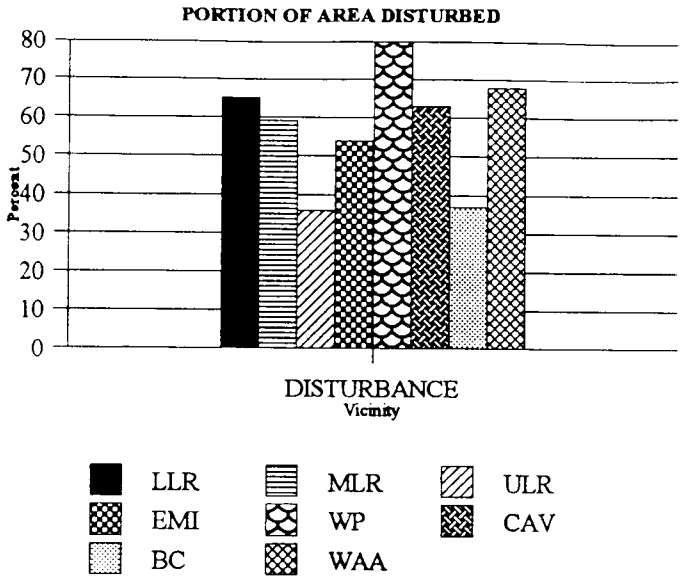

Figure 1. Portion of vicinity disturbed and subject to possible encroachment by non-native species.

Table 4. Portion of vicinity disturbed

Vicinity	Portion of Area (%)
Lower Little	65
Mid Little	59
Upper Little	36
Emile	54
Wolf Plateau	80
Cavitt Creek	63
Black Clover	37
Watershed	**68**

INTEGRATED WEED MANAGEMENT (IWM) GUIDELINES

Use the following guidelines to implement and determine the best method(s) for an integrated approach to weed management.

Cultural

Prevention

1. Develop available preventive measures, such as quarantine and closure, to reduce the spread of the infestation.
2. Determine whether policy and laws allow for the use of all preventive measures, including local quarantine and closure.
3. If past management activities have allowed the introduction and spread of noxious weeds, determine how to change management after selecting a treatment method.

Livestock Manipulation

1. Determine whether changes in livestock grazing will affect the target weeds.
   a. Reduced grazing may allow for increased competition from beneficial vegetation or just allow for more seeds to be disseminated.
   b. Increased grazing may reduce beneficial vegetation or may be used to reduce seed source.
2. Determine whether changes in movement or type of livestock is neccessary to reduce or contain the infestation due to movement of seeds on or in the animals.
3. Determine whether containing livestock in a weedfree area prior to introduction to the area would prevent new infestations.

Wildlife Manipulation

1. Determine whether wildlife or wildlife feeding programs can be managed to reduce weed infestations.
2. Determine feasibility of changes in wildlife movement that would reduce or contain the infestation due to movement of seeds on or in the animals.

Soil Disturbance Activities

1. Revegetate all bare soil following disturbance.
2. Select plants species that will reduce the spread of noxious weeds.
3. Defer soil disturbance if possible until weeds are controlled or under management.

Rock Sources

1. Develop rock source management plans
2. Keep utilization of rock source confined to existing contaminated roads.
3. Keep new or "clean" rock stockpiles separate from contaminated stockpiles.
4. Obtain rock from uncontaminated sources.