Deadman/Dompier Watershed Analysis

Roseburg District
South River Resource Area

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Key Issues

The following issues and concerns were identified during the analysis.

•Water quality.

•The impacts roads have on streams due to sediment.

•The impact harvest areas have on peak flows in streams, especially the amount of the Deadman Watershed (84%) in the transient snow zone, and the effect of introducing sediment into the streams.

•The amount of timber harvesting in the past 30 years on BLM administered lands and fragmentation of suitable owl habitat.

Findings

Vegetation

•Approximately 35 percent of the BLM administered lands in the Deadman Watershed and 29 percent in the Dompier Watershed have been harvested in the past 30 years.

•Riparian Reserves currently have approximately 49% in late seral conditions (greater than 80 years old) in the DD WAU with approximately 26% of the stands in Riparian Reserves in a late seral functioning condition.

•Fire exclusion resulting in overstocked stands and combining with prolonged drought has caused the decline and mortality of large, old sugar pine trees and threats of a bark beetle epidemic in recent blowdown have occurred in the Deadman Watershed.

Hydrology and Fisheries

•Main concern is sediment in streams. High road densities between 5.14 and 6.77 miles per square mile, high stream crossing densities, and cumulative effects of harvesting in the past 30 years especially within the transient snow zone have increased peak flows and increased sediment in the streams.

•Current water quality in the Deadman Watershed is within state water quality standards for pH and dissolved oxygen. The seven-day average daily maximum summer stream temperatures exceeded 64° F for only short periods. The Deadman Watershed provides cool, well-oxygenated water to the South Umpqua River during the warm summer months. The cool water Deadman Creek provides to the South Umpqua River may be due more to geology and landform of the Watershed with steep side slopes providing shade to streams rather than the vegetation in the Riparian Reserves.

•The ability of the BLM to improve anadromous fish habitat in the Deadman Watershed is limited to approximately 0.1 mile of accessible anadromous fish habitat on BLM administered lands.

•The principal means for the BLM to improve stream conditions for anadromous fish in the Deadman Watershed would be through improving cumulative water quality conditions by decommissioning roads or improving roads by replacing culverts upstream of the anadromous stream reaches. This would also benefit resident fish species.

•Approximately 84 percent of the Deadman Watershed is in the transient snow zone Approximately 91 percent of BLM administered lands in the Deadman Watershed is in the transient snow zone. This means approximately 700 acres of BLM administered lands in the Deadman Watershed are outside of the transient snow zone with approximately 200 acres greater than 80 years old and available for timber harvesting.

Northern Spotted Owl

•Approximately 54 percent (10,183 out of 18,830 acres) of the federally administered lands (Forest Service and BLM) in the DD WAU are considered suitable spotted owl habitat, with about 47 percent (5,134 out of 10,870 acres) of the BLM administered land in the DD WAU being considered suitable spotted owl habitat. Matrix lands were identified as being important for providing forest connectivity, various habitat types, a variety of forest successional stages, and ecological functions like dispersal of organisms as well as timber. Managing the timing and spacing of harvest activities in Matrix is important to minimize impacts to spotted owls and other species associated with late-successional habitat.

•Two quarter townships have less than 50 percent spotted owl dispersal habitat. They are the 29-02-NE and 30-02-NE quarter townships.

Elk

•Although there are opportunities to manage for elk, the decision must be made what level of elk management is desired. The ROD/RMP direction for elk management is to implement year long closure of approximately 15 road miles in the Deadman Mountain elk management area. Approximately one mile of the roads identified in the RMP/ROD fall within the boundary of the Deadman/Dompier WAU.

Recommendations and Restoration Opportunities

Vegetation

•Salvage harvest areas with blowdown from January 1996 storms to prevent bark beetle epidemic in WAU. Remove competing trees around large sugar pine to maintain healthy stands of sugar pine in the WAU.

Soils

•Management activities on granitic soils should follow or adhere to Best Management Practices. On-site investigation by a soil scientist is recommended for any ground disturbing activity on granitic soils.

•Best Management Practices (BMPs) should be applied during all ground and vegetation disturbing activities. Along with the BMPs, the Standards and Guidelines brought forth from the Record of Decision (USDA and USDI 1994) should be implemented in order to achieve proper soil management. Best Management Practices should be monitored for implementation and effectiveness in order to document if soil goals are being achieved.

Hydrology and Fisheries

•Consider deferring scheduled regeneration type harvests in the Middle and West Deadman subwatersheds for 10 years. The percentage of acres less than 30 years old would decrease by 5% and would be 6% lower than if the estimated number of acres (478 acres in the Deadman Watershed) were harvested. An alternative of harvesting half of the estimated number of acres (239 acres) would have a decrease of 3% from current conditions. (Table 19). Allow harvesting activities which improve or maintain forest health such as salvaging, commercial thinnings, and density management in the DD WAU.

•Conduct Rosgen Stream Classification surveys and Proper Functioning Condition Assessments.

•Conduct fish diversity/population, fish distribution, and habitat surveys in stream reaches that have not been surveyed previously.

•Identify road decommissioning and culvert replacement opportunities. Roads in Riparian Reserves should be a priority for road decommissioning.

•Place large wood, boulders, or root wads in channels identified as needing structures.

Northern Spotted Owl

•Determine location of harvest areas to minimize fragmentation based on criteria developed using spotted owl data and table.

•Projects that reduce dispersal habitat in quarter townships 29-02-NE and 30-02-NE should be avoided until these quarter townships have more than 50 percent dispersal habitat.

•Projects that modify or remove suitable owl habitat should be planned in areas outside of known territories first. If this is not possible then modification or removal of suitable habitat in the DD WAU should occur around MSNO 4046 first, MSNO 3264, 2088, or 2089 second, and MSNO 2203, 3102, or 3998 last.

•Spotted Owl Critical Habitat in the Deadman/Dompier WAU should be managed to minimize fragmentation.

Elk

•Road segments 29-2-8.0 (Segment A), 29-2-20.0 (Segment A), and 29-2-32.0 (Segment A) should be closed to public use from December 1 to August 15. Additional permanent road closure opportunities are present on roads 29-2-22.0 (Segments A and B), 29-2-19.2 (Segment A), 29-2-16.4 (Segment A), 29-2-15.2 (Segment A), 29-2-9.2 (Segment A).

Neotropical Birds

•Burning, brushing, PCT, commercial thinning, timber harvesting, and other activities that remove or modify neotropical bird habitat should not occur during the breeding season between April 1 and July 30 of any given year.

I. Characterization of the Watershed

The Deadman/Dompier (DD) Watershed Analysis Unit (WAU) is located in the South River Resource Area of the Roseburg District Bureau of Land Management (see Map 1). The WAU is located approximately 25 miles southeast of Roseburg, in the eastern part of the Resource Area. Tiller, Oregon is in the south part of the WAU. This WAU covers approximately 25,757 acres. The Roseburg District Bureau of Land Management (BLM) administers approximately 10,870 acres (42%) of the WAU. Privately owned lands include approximately 6,927 acres (27%) and Umpqua National Forest administered lands cover approximately 7,960 acres (31%) of the remaining 14,887 acres (58%) in the WAU.

This WAU is composed of two of the 43 watersheds identified within the South River Resource Area. The Deadman and Dompier Creek Watersheds will be combined for this analysis. The Deadman Watershed is approximately 18,614 acres in size. The Roseburg District BLM administers approximately 8,563 acres (46%) of the Deadman Watershed. The Forest Service administers approximately 7,358 acres (40%) of the Deadman Watershed and the rest, 2,693 acres (14%), is privately owned. Dompier Creek Watershed encompasses approximately 7,144 acres. Thirty-two percent (2,307 acres) of the Dompier Creek Watershed is managed by the Roseburg BLM. Approximately 60% (4,234 acres) of the Dompier Creek Watershed is privately owned. The Forest Service manages approximately 602 acres (8%) of the Dompier Creek Watershed, generally along the South Umpqua River.

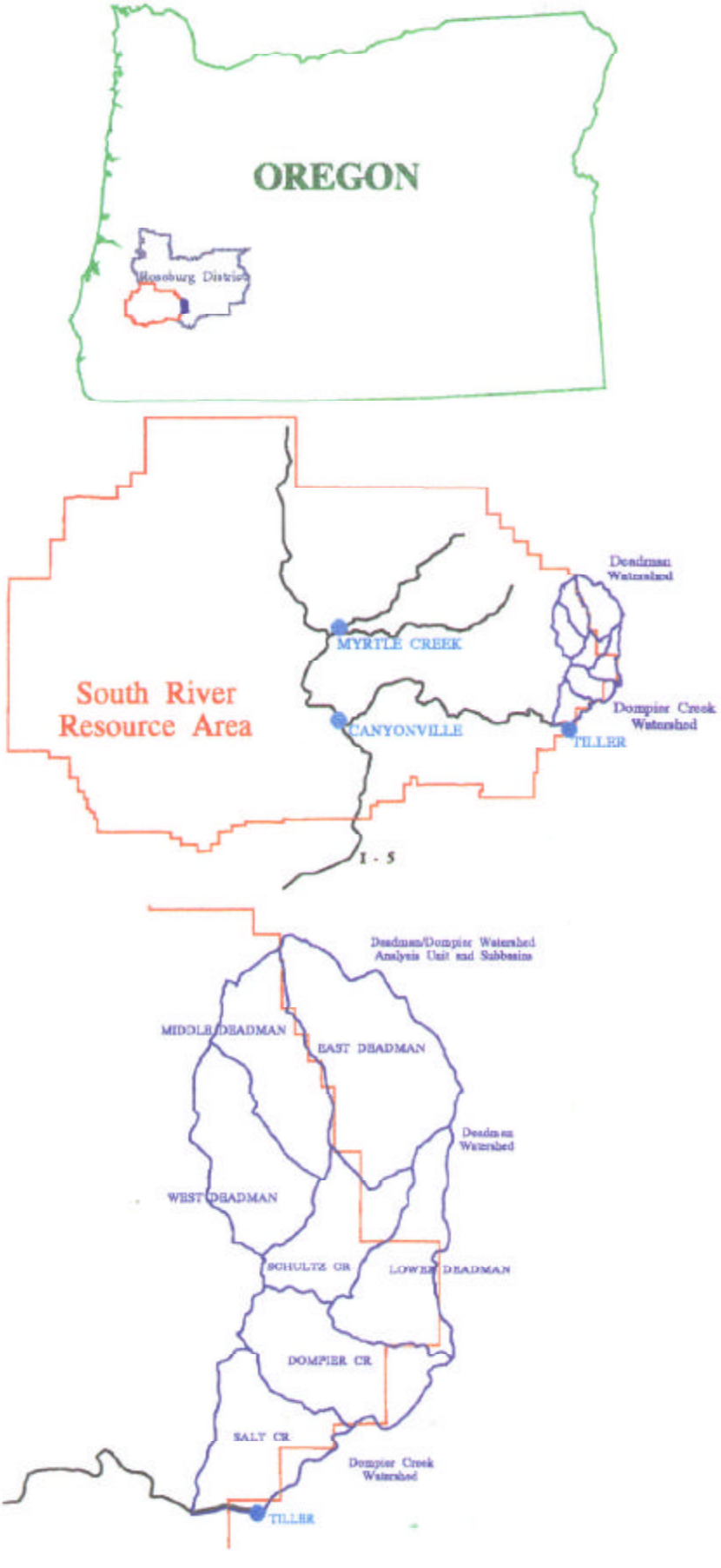
There are seven subwatersheds delineated within these watersheds. Deadman Watershed contains the following subwatersheds: East Deadman, Lower Deadman, Middle Deadman, West Deadman, and Schultz Creek. Dompier Creek and Salt Creek are the subwatersheds in the Dompier Creek Watershed.

Land use allocations on BLM administered lands in this WAU are composed of Matrix lands and Riparian Reserves. Matrix lands are further delineated into General Forest Management Areas (GFMA - 6,870 acres) and Connectivity (CONN - 4,002 acres).

The upper South Umpqua River Basin has been designated as a Tier 1 Key Watershed in the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, Attachment A to the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (hereafter referred to as SEIS ROD, S&G's). Tier 1 Watersheds were previously identified by the Scientific Panel on Late-Successional Forest Ecosystems (Johnson et al. 1991) and the Scientific Analysis Team Report (Thomas et al. 1993). The Deadman/Dompier (DD) WAU lies within this Tier 1 Key Watershed. Tier 1 Key Watershed designation overlays other land use allocations and places additional management requirements on activities within these areas.

Tier 1 Watersheds are designed to serve as refugia for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. The South Umpqua River Basin

Map 1. VICINITY MAP



has been identified as water quality limited by the Oregon Department of Environmental Quality (DEQ) in their 1994 Water Quality Assessment based on water quality standards for dissolved oxygen, fecal bacteria, and pH being exceeded. Key Watersheds with lower quality habitat were selected for their high potential for restoration and are designed to become future sources of high quality habitat with the implementation of a comprehensive restoration program (SEIS ROD, S&G B-18).

Management actions and directions on page 20 of the Roseburg District Resource Management Plan (RMP) state three requirements of management activities within Key Watersheds. They are 1) Key Watersheds are given the highest priority for watershed restoration. 2) Watershed analysis is required prior to management activities, including timber harvesting. Minor activities, such as those Categorically Excluded may proceed prior to watershed analysis being completed, if they are consistent with Aquatic Conservation Strategy objectives. 3) Reduce existing road mileage inside Key Watersheds. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in Key Watersheds.

II. Issues and Key Questions

The purpose of developing issues is to focus the analysis on the key elements of the ecosystem that are most relevant to the management questions, human values, or resource conditions within the WAU. Areas covered by this watershed analysis will receive more in-depth analysis during project development and the National Environmental Policy Act (NEPA) process. New information gathered during the Interdisciplinary (ID) team process will be appended back to the watershed analysis document as an update.

A. ISSUE 1 - Tier 1 Key Watershed

The upper South Umpqua River has been designated as a Tier 1 Key Watershed. Tier 1 Key Watersheds have been identified as priorities for watershed restoration.

Three components of watershed restoration include road treatments, silvicultural treatments to restore riparian vegetation, and restoring stream channel complexity. Road treatments (such as decommissioning or upgrading) would reduce erosion and sedimentation, and consequently improve water quality. Silviculture treatments such as planting unstable areas along streams, thinning densely-stocked stands, releasing young conifers overtopped by hardwoods, and reforesting shrub and hardwood dominated stands with conifers would improve bank stabilization, increase shade, and accelerate recruitment of large wood desired for future in-stream structure. The design and placement of in-stream habitat structure would increase channel complexity and provide a variety of habitats for fish and other aquatic organisms.

Key Questions

Vegetation Patterns

What are the vegetative conditions and seral stages in the riparian areas?

Soils / Erosion

What are the dominant erosion processes within the WAU and where have they occurred or are likely to occur?

Hydrology / Channel processes

What are the dominant hydrologic characteristics (e.g., total discharge, peak flows, and minimum flows) and other notable hydrologic features and processes in the WAU?

Water Quality

What are the limiting factors affecting water quality, and where are the priority opportunities to improve water quality and hydrologic conditions?

What beneficial uses dependent on aquatic resources occur in the WAU and which water quality parameters are critical to these uses?

Fisheries

Where are the locations of fish populations, historic and existing?

How have fish habitat and fish populations been affected by hydrologic processes and human activities?

What and where are the priority restoration opportunities to benefit fisheries?

ISSUE 2 - Harvest Potential

Matrix lands within Tier 1 Key Watersheds are responsible for contributing to the Probable Sale Quantity (PSQ) while meeting the additional management requirements placed on Key Watersheds (RMP pg. 20). Objectives in the matrix include producing a sustainable supply of timber and other forest commodities, providing connectivity (along with other land use allocations such as Riparian Reserves) between Late-Successional Reserves, providing habitat for a variety of organisms associated with both late-successional and younger forests, providing for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees, and providing early-successional habitat.

Key Questions

Vegetation Patterns

What are the historic and current vegetation conditions?

Where are the stands of harvestable age within the matrix?

How can the scale, timing, and spacing of harvest areas be adjusted to minimize fragmentation and maintain the function of large forest blocks?

What opportunities are there in the Deadman Mountain Elk Management Area to improve elk habitat through vegetation manipulation?

Special Status Species

What is the distribution of species of concern that are important in the WAU (e.g., threatened or endangered species, special status species, or species emphasized in other plans)? What is the distribution and character of their habitats?

How can scheduling of potential harvest areas be prioritized to minimize impacts to wildlife and hydrologic processes while still meeting the objectives for matrix lands established in the SEIS ROD and the Roseburg District RMP?

III. Reference and Current Conditions

A. Vegetation

1. Historical Perspective and Reference Vegetation Conditions

Journals kept by early explorers, settlers, and surveyors recorded the Umpqua Valley was in a state of mixed conifer forests of varying age classes when the pioneers migrated west. As settlements were established in the interior valleys, the need for lumber and land conversion to agricultural uses resulted in the harvesting of timber in the Umpqua Valley. Timber harvesting began in the lower elevations due to the logic of easy access and proximity to processing locations. When the Oregon and California (O & C) Railroad lands reverted to federal management in 1916, private lands in the Umpqua Valley continued to be harvested, and previously harvested areas were in various stages of second growth or had been converted to other uses. Federally administered lands at this time were comprised mainly of uncut, natural stands.

A map in the Roseburg District BLM Geographic Information System (GIS) gives general forest type descriptions on vegetation in 1936 for Douglas County in terms of diameter class and species

(see Map 2 and Table 1). Although the map scale is large and lacks detail the type map may be used to compare vegetation conditions in 1936 with current vegetative conditions.

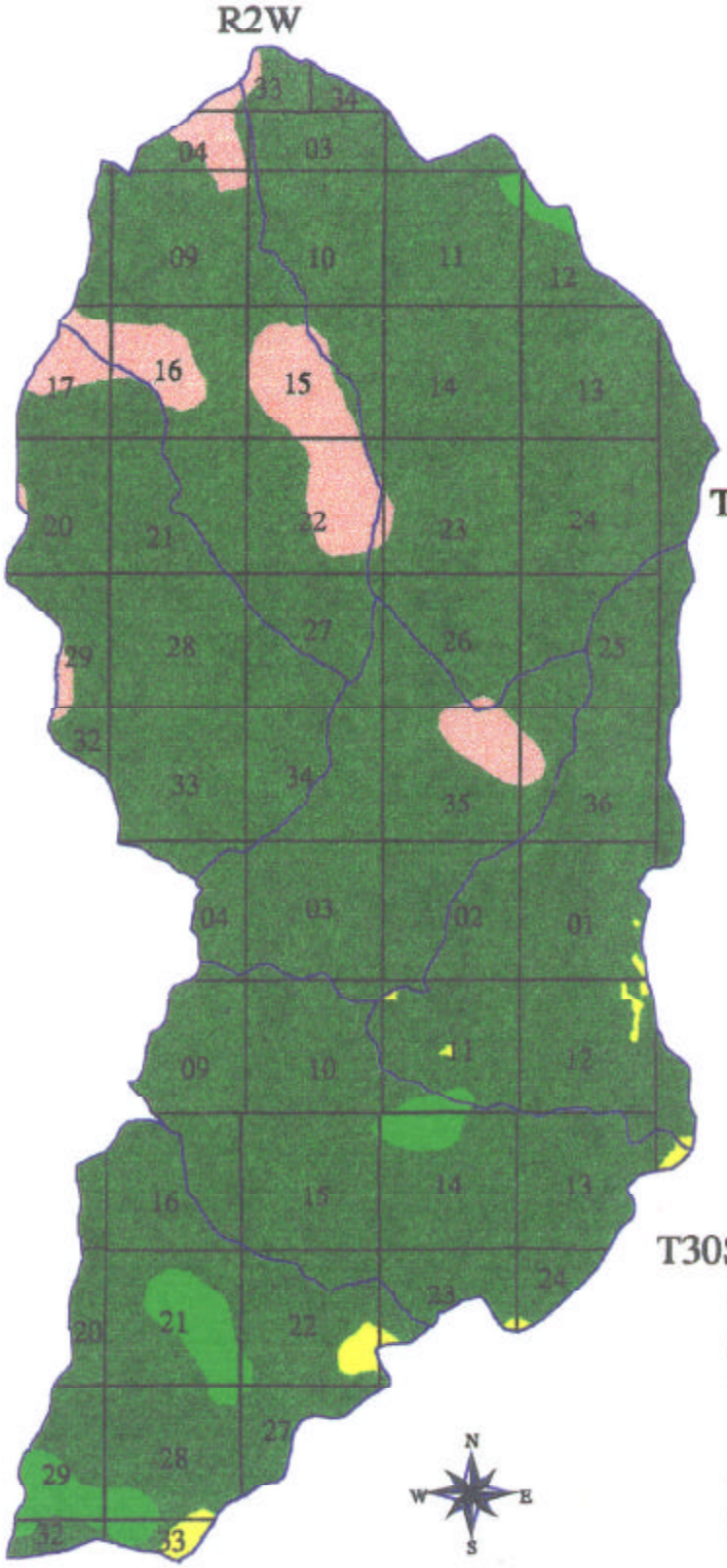
The 1936 diameter classes may be correlated to current age classes. The 0 to 6 inch diameter classes are correlated with stands between 0 and 30 years old. These classes are labeled Early Seral. Diameter classes 6 to 20 inches are correlated to stands between 30 and 80 years old. These classes are labeled Mid Seral. Diameter classes greater than 20 inches are correlated to stands greater than 80 years old. These classes are labeled Late Seral. Agricultural land was also identified in the 1936 vegetation type map. The agricultural land may be correlated with the nonforest lands used in the current vegetation type descriptions.

Table 1. Deadman/Dompier WAU 1936 Age Class Distribution

	Agricultural Land		Early Seral (< 6" DBH)		Mid Seral (6 - 20" DBH)		Late Seral (> 20" DBH)		
AREA	Acres	%	Acres	%	Acres	%	Acres	%	TOTAL
East Deadman	0	0	60	1	61	1	5,730	98	5,851
Lower Deadman	33	1	0	0	13	0	3,178	99	3,224
Middle Deadman	0	0	944	28	0	0	2,395	72	3,339
Schultz Creek	0	0	177	6	0	0	2,576	94	2,753
West Deadman	0	0	170	5	0	0	3,280	95	3,450
Deadman Watershed	33	0	1,351	7	74	0	17,159	92	18,617
Dompier Creek	31	1	0	0	130	3	3,672	96	3,833
Salt Creek	137	4	0	0	510	15	2,665	80	3,312
Dompier Creek Watershed	168	2	0	0	640	9	6,337	89	7,145
TOTAL	201	1	1,351	5	714	3	23,496	91	25,762

Fire was the primary disturbance process affecting the historic patterns of vegetation within the DD WAU. The land was probably a constantly changing mosaic of different age classes that resulted from stand replacement fires. Most of the areas with Early and Mid Seral stands on Map 2 (1936 Age Class Distribution Map) are probably the result of fire. These fires were caused by man (Native Americans used fire to clear lands, improve hunting areas, and produce desirable plant species) as well as lightning. Native American burning kept the lower elevations open and covered with lush native grasses. The result of fire suppression policies established early in the

Map 2. Deadman/Dompier WAU 1936 Vegetation Types



N
W
E
S

Subwatershed Boundaries

Section Lines

Vegetation Classes

Early Seral (< 6" DBH)

Mid Seral (6-20" DBH)

Late Seral (> 20" DBH)

Agricultural

0 0.5 1 1.5 2 2.5 Miles

1:83520

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Twentieth Century has been the replacement of the open forest with a more closed canopy forest with patches of dense undergrowth.

2. Current Vegetation Conditions

The Deadman/Dompier WAU is located in the Klamath and Cascade Mountain Physiographic Provinces described by Franklin and Dyrness (1984), with most of the WAU located in the Cascade Mountains Physiographic Province. The major plant community in the WAU is the Douglas-fir/Rhododendron-Ceanothus/Salal group. Douglas-fir is the predominant overstory species with western hemlock, western redcedar, ponderosa pine, sugar pine, and chinquapin as associated stand components. Western white pine may occur at the highest elevations. Brush species include Pacific rhododendron, poison oak, salal, and ceanothus. In the interior valleys grasses can be a major competitor, especially in the early seral stages.

Various vegetation age classes have been documented in the Deadman/Dompier WAU. For this analysis, vegetation on BLM administered lands is described by the age of the dominant conifer cover for each stand. The stands are aggregated into groupings of ten-year age classes (see Table 2, Map 3, and Figure 1). These groupings were selected because they represent an array of wildlife habitat types. Private lands are aggregated by the same age class groupings, using a dominant conifer or hardwood stand age. Acres of agricultural or nonforested lands are also identified. The arrangement of these age classes on the landscape within the WAU is a result of historic and recent natural (e.g., fire and blowdown), and human caused disturbance (e.g., introduced fire for clearing, tree harvesting, road construction, home building, and division of land by straight line boundaries).

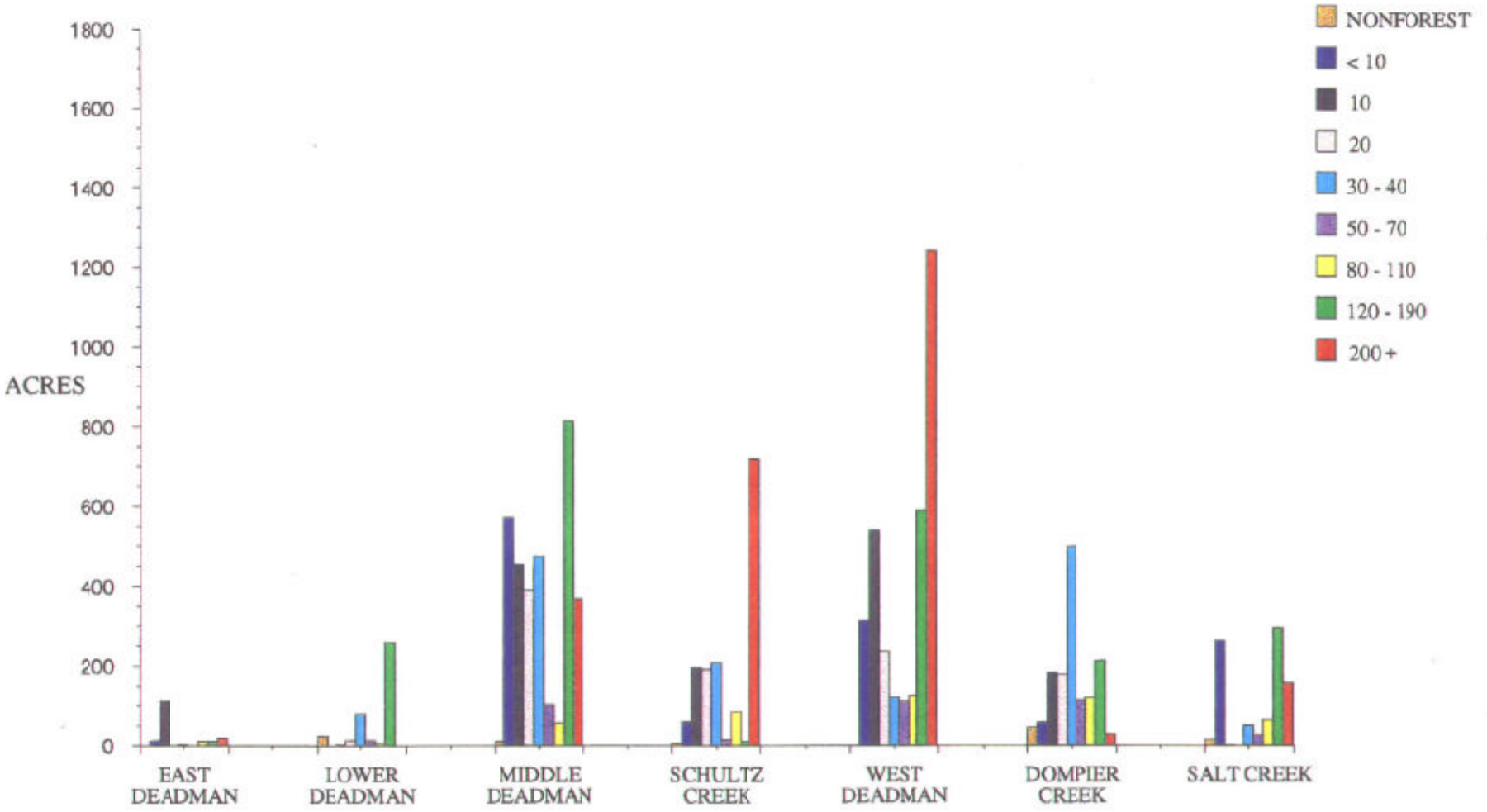
Comparing the 1936 vegetation data with the current data shows there has been a change from a majority of the area in Late Seral conditions to more Early and Mid Seral stands. The present vegetation pattern is primarily due to timber harvesting and associated forest management activities. Timber harvesting on BLM administered lands began in the 1940's and continued at a fairly steady rate through the 1980's.

Recent disturbances in the WAU include wind, insects, and diseases. A windstorm on December 12, 1995 and heavy wet snowfalls in late January 1996 resulted in numerous broken, uprooted, or downed trees in the WAU.

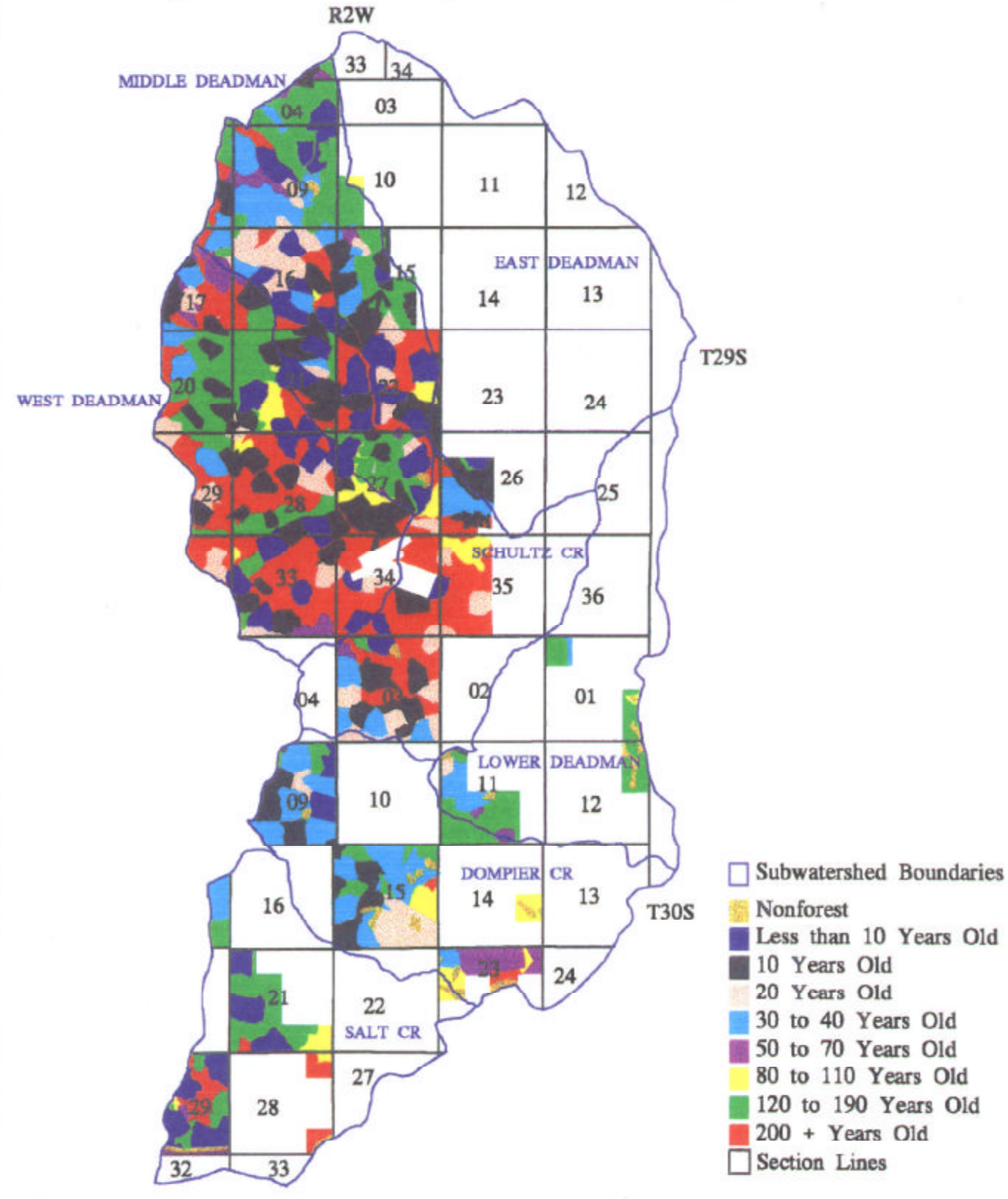
The damaged, windthrown, or felled trees provide ideal habitat for bark beetles. Epidemic levels of bark beetles could be expected to occur and move into standing green trees, attacking and killing the live trees. When the number of windthrown trees exceeds three trees per acre, bark beetle populations increase to levels that could lead to attack and mortality of green trees (Southwest Oregon Forest Insect and Disease Technical Center 1996).

Another recent disturbance in the WAU is the decline and mortality of large, old sugar pine trees. The sugar pine mortality is due to a combination of white pine blister rust, mountain pine beetles, overstocked stands, and drought (Goheen 1994).

Figure 1: BLM Age Class Distribution
Deadman/Dompier WAU



Map 3. Deadman/Dompier WAU - BLM Age Class Distribution



White pine blister rust is an introduced disease that stresses and damages large sugar pine, predisposing them to attack from bark beetles. Bark beetles also attack and kill trees in heavily stocked stands where competition for water is a weakening factor. Large, old trees are particularly vulnerable in overstocked stands and bark beetle activity is most evident during droughty periods when competition for water is most intense. Sugar pines growing in stands with basal areas greater than 140 square feet per acre are at high risk of being attacked by mountain pine beetles (Goheen 1994). Extensive areas of overstocked stands and nine years of drought have combined to favor mountain pine beetles throughout southwestern Oregon, including the Deadman/Dompier Watershed Analysis Unit.

a. BLM Administered Lands

The WAU contains approximately 10,870 acres (42%) of BLM administered lands. The northwest portion of the WAU (north of Township 30) is a block of BLM administered lands. The rest of the Bureau of Land Management managed lands are intermingled with private or Forest Service lands in the "checkerboard" pattern characteristic of Revested Oregon and California (O&C) Railroad lands.

Approximately 48% (5,180 acres) of BLM administered lands in the WAU are in stands 80 years old or older, with 2,525 acres (23%) of stands 200 years old or older (see Table 2). The majority of the older stands are in the block of BLM administered lands in the Middle and West Deadman subwatersheds.

Table 2. ACRES BY AGE CLASS ON BLM LANDS

AREA	ACRES of Nonforest lands	ACRES of age class <10	ACRES of age class = 10	ACRES of age class = 20	ACRES of age class = 30 TO 40	ACRES of age class = 50 TO 70	ACRES of age class = 80 TO 110	ACRES of age class = 120 TO 190	ACRES of age class = 200+	TOTAL
East Deadman	0	12	112	0	2	0	10	10	19	165
Lower Deadman	24	0	2	13	79	13	5	259	0	395
Middle Deadman	11	573	455	390	476	102	56	814	368	3,245
Schultz Creek	6	59	195	190	208	14	84	10	712	1,478
West Deadman	0	314	539	237	122	112	126	590	1,240	3,280
Deadman Watershed	**41**	**958**	**1,303**	**830**	**887**	**241**	**281**	**1,683**	**2,339**	**8,563**
Dompier Creek	45	57	183	178	499	113	121	212	29	1,437
Salt Creek	15	263	1	0	50	26	64	294	157	870
Dompier Creek Watershed	**60**	**320**	**184**	**178**	**549**	**139**	**185**	**506**	**186**	**2,307**
TOTAL	**101**	**1,278**	**1,487**	**1,008**	**1,436**	**380**	**466**	**2,189**	**2,525**	**10,870**

Riparian Vegetation

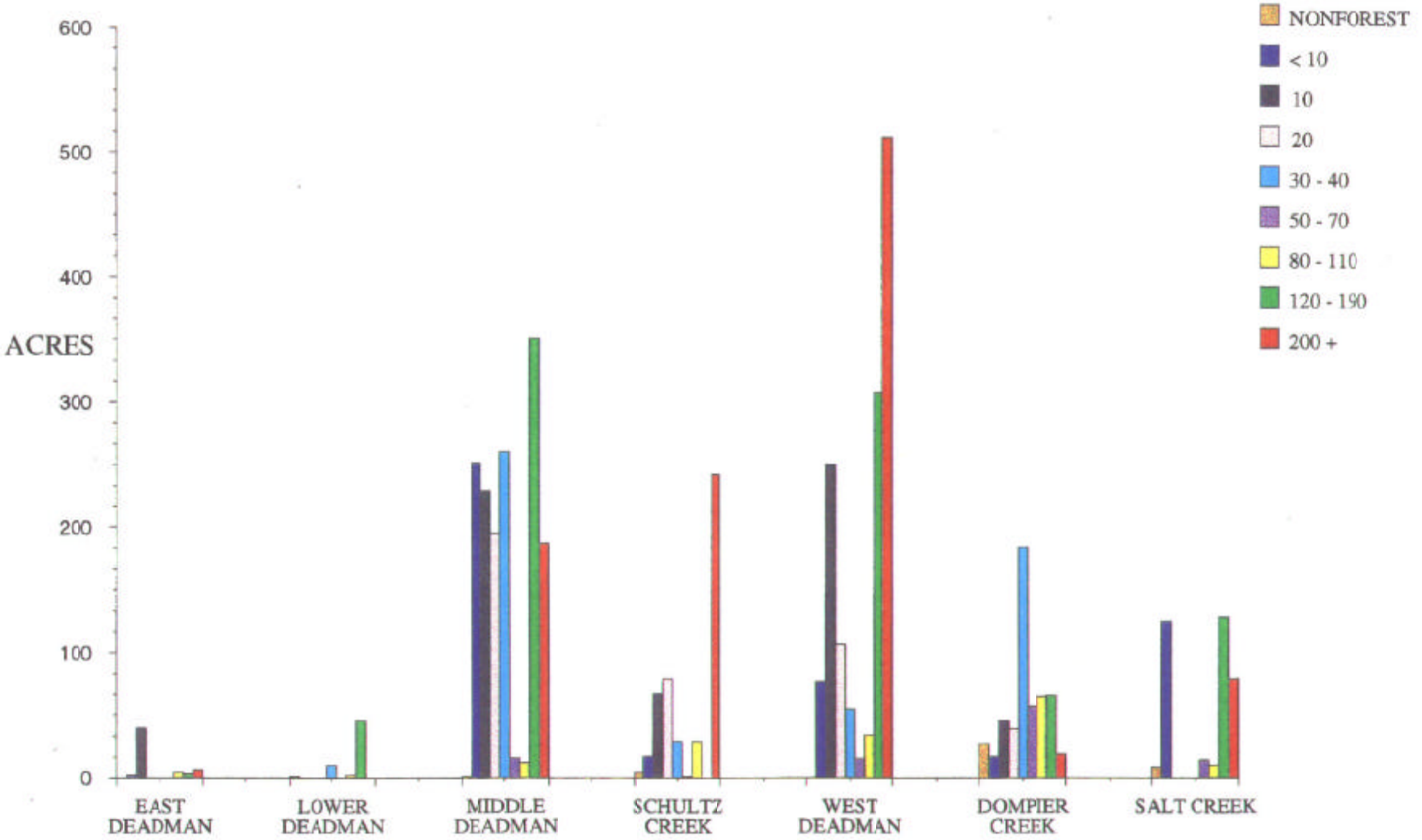
Riparian Reserves within the DD WAU account for 40 percent of the total BLM land base (4,322 acres out of 10,870 acres) (see Table 3, Figure 2, and Map 4). The purpose of Riparian Reserves is to "maintain and restore riparian structures and functions of intermittent streams, confer benefits to riparian-dependent and associated species other than fish, enhance conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide greater connectivity of the watershed" (ROD, B-13). For this analysis, the riparian reserve widths were developed using a site potential tree height of 180 feet. All intermittent streams were given a riparian reserve width of 180 feet on each side of the stream. Perennial streams were given a reserve width of 360 feet (2 times the site potential tree height) on each side of the stream.

Riparian Reserve widths may be adjusted following watershed analysis, a site specific analysis, and describing the rationale for the adjustment through the appropriate NEPA decision making process. Critical hillslope, riparian, channel processes and features, and the contribution of Riparian Reserves to benefit aquatic and terrestrial species would be the basis for the analysis. At a minimum, a fisheries biologist, soil scientist, hydrologist, botanist, and wildlife biologist should conduct the analysis for adjusting Riparian Reserve widths.

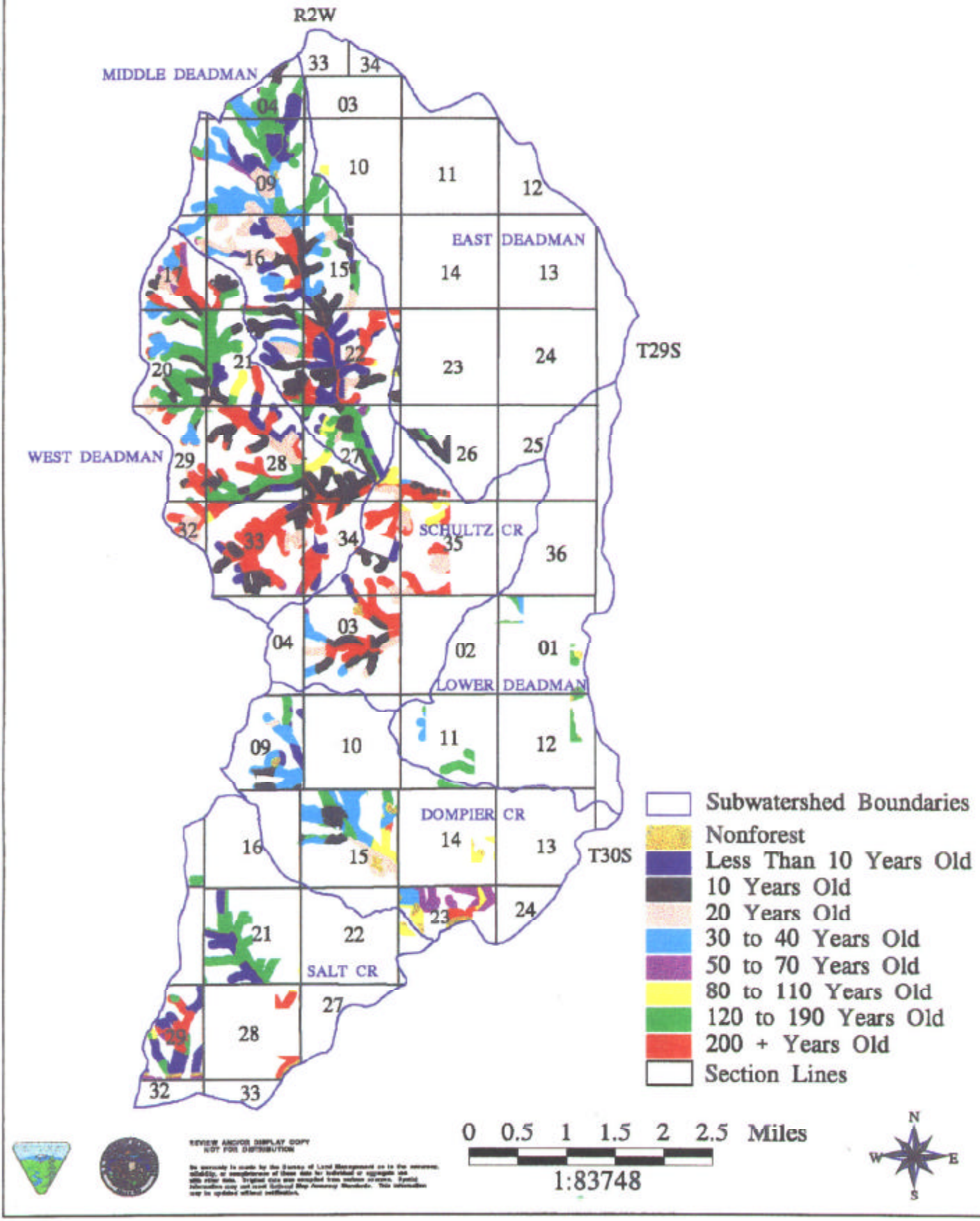
Table 3. ACRES BY AGE CLASS IN RIPARIAN RESERVES ON BLM LANDS

AREA	ACRES of Nonforest lands	ACRES of age class <10	ACRES of age class = 10	ACRES of age class = 20	ACRES of age class = 30 TO 40	ACRES of age class = 50 TO 70	ACRES of age class = 80 TO 110	ACRES of age class = 120 TO 190	ACRES of age class = 200+	TOTAL
East Deadman	0	2	40	0	0	0	4	3	6	55
Lower Deadman	1	0	0	0	10	0	2	46	0	59
Middle Deadman	1	251	229	195	260	16	12	351	187	1,502
Schultz Creek	4	17	67	79	29	1	29	0	242	468
West Deadman	0	77	250	107	55	15	34	307	511	1,356
Deadman Watershed	**6**	**347**	**586**	**381**	**354**	**32**	**81**	**707**	**946**	**3,440**
Dompier Creek	27	17	46	39	184	57	63	66	19	518
Salt Creek	8	125	0	0	0	14	10	128	79	364
Dompier Creek Watershed	**35**	**142**	**46**	**39**	**184**	**71**	**73**	**194**	**98**	**882**
TOTAL	**41**	**489**	**632**	**420**	**538**	**103**	**154**	**901**	**1,044**	**4,322**

Figure 2: BLM Riparian Reserve Age Class Distribution
Deadman/Dompier WAU



Map 4. Deadman/Dompier WAU - BLM Riparian Reserve Age Class Distribution



b. Private and Forest Service Lands

Private lands account for approximately 27% (6,927 acres) of the DD WAU. Private ownership is concentrated in the lower elevations of the WAU, with the majority (4,234 acres) in the Dompier Creek Watershed (see Table 4, Figure 3, and Map 5). Almost all of the private lands have been harvested within the past 40 years. Ninety percent of the private forested lands are in the 30 to 40 year age class.

Table 4. ACRES BY AGE CLASS ON PRIVATE LANDS

AREA	ACRES of ag or nonforest lands	ACRES of age class <10	ACRES of age class = 10	ACRES of age class = 20	ACRES of age class = 30 TO 40	ACRES of age class = 50 TO 70	ACRES of age class = 80 TO 110	ACRES of age class = 120 TO 190	ACRES of age class = 200+	TOTAL
East Deadman	5	0	0	0	6	0	3	1	0	15
Lower Deadman	249	0	0	47	1,526	0	0	0	0	1,822
Middle Deadman	0	0	0	0	0	0	0	0	0	0
Schultz Creek	9	0	0	0	629	3	33	1	13	688
West Deadman	0	0	0	0	150	18	0	0	0	168
Deadman Watershed	**263**	**0**	**0**	**47**	**2,311**	**21**	**36**	**3**	**13**	**2,693**
Dompier Creek	308	0	0	43	1,484	42	0	0	0	1,877
Salt Creek	424	0	209	0	1,515	106	0	103	0	2,357
Dompier Creek Watershed	**732**	**0**	**209**	**43**	**2,999**	**148**	**0**	**103**	**0**	**4,234**
TOTAL	**995**	**0**	**209**	**90**	**5,310**	**169**	**36**	**106**	**13**	**6,927**

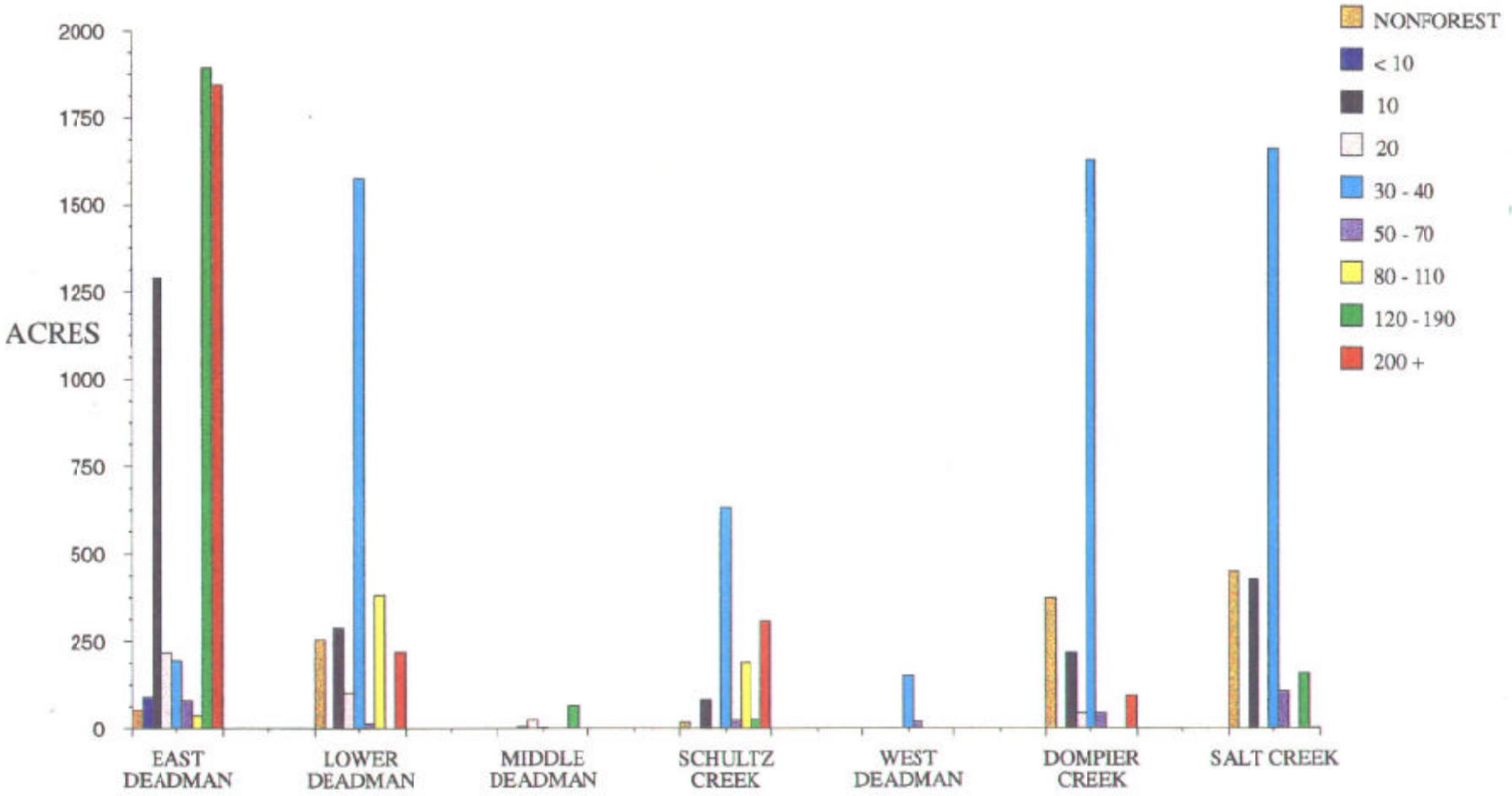
Forest Service administered lands are distributed in age classes similar to BLM administered lands. Most of the Forest Service managed lands are located in the higher elevations of the WAU, with the majority (71%) in the East Deadman subwatershed (see Table 5, Figure 3, and Map 5).

B. Geology, Soils, and Erosion Processes

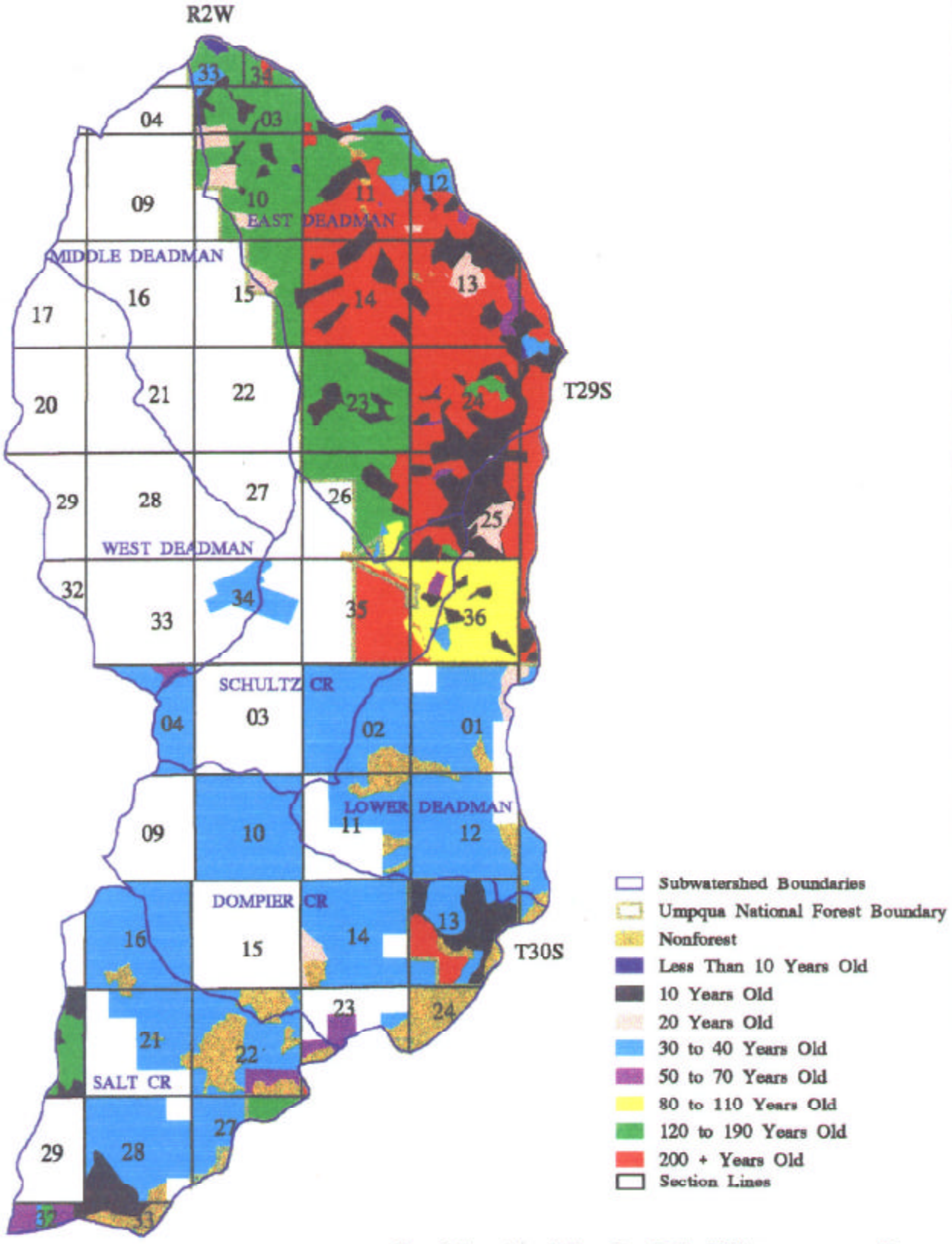
1. Geology

The Deadman/Dompier WAU is located along a geologic contact zone between the Klamath Mountains and the Cascade Range. The contact zone has produced complex mineralogy conducive to mining activities.

Figure 3: Private and Forest Service Age Class Distribution
Deadman/Dompier WAU



Map 5. Deadman/Dompier WAU - Private and Forest Service Age Class Distribution



A majority of this WAU is comprised of sedimentary and volcaniclastic deposits within the Cascade Range. Included in this group are 8,973 acres of Fisher and Eugene Formations and correlative rocks (Tfe), eight acres of undifferentiated tuffaceous sedimentary rocks, tuffs, and basalt (Tu), 2,787 acres of sedimentary and volcaniclastic rocks (Tus), and 7,075 acres of welded to unwelded ash-flow tuff (Tut). Also included in the Cascade Range are 59 acres of silicic vent complexes (Tsv) and 14,857 acres of basaltic/andesitic flows with some tuffs and breccias (Tub). The Klamath portion of this WAU is comprised of 1,514 acres of mudstone, shale, and siltstone (Js) and 2,320 acres of sandstone, conglomerate, and graywacke (KJds). Quartz diorite and other granitoids make up 1,514 acres of Intrusive Rocks (KJg).

Table 5. ACRES BY AGE CLASS ON FOREST SERVICE LANDS

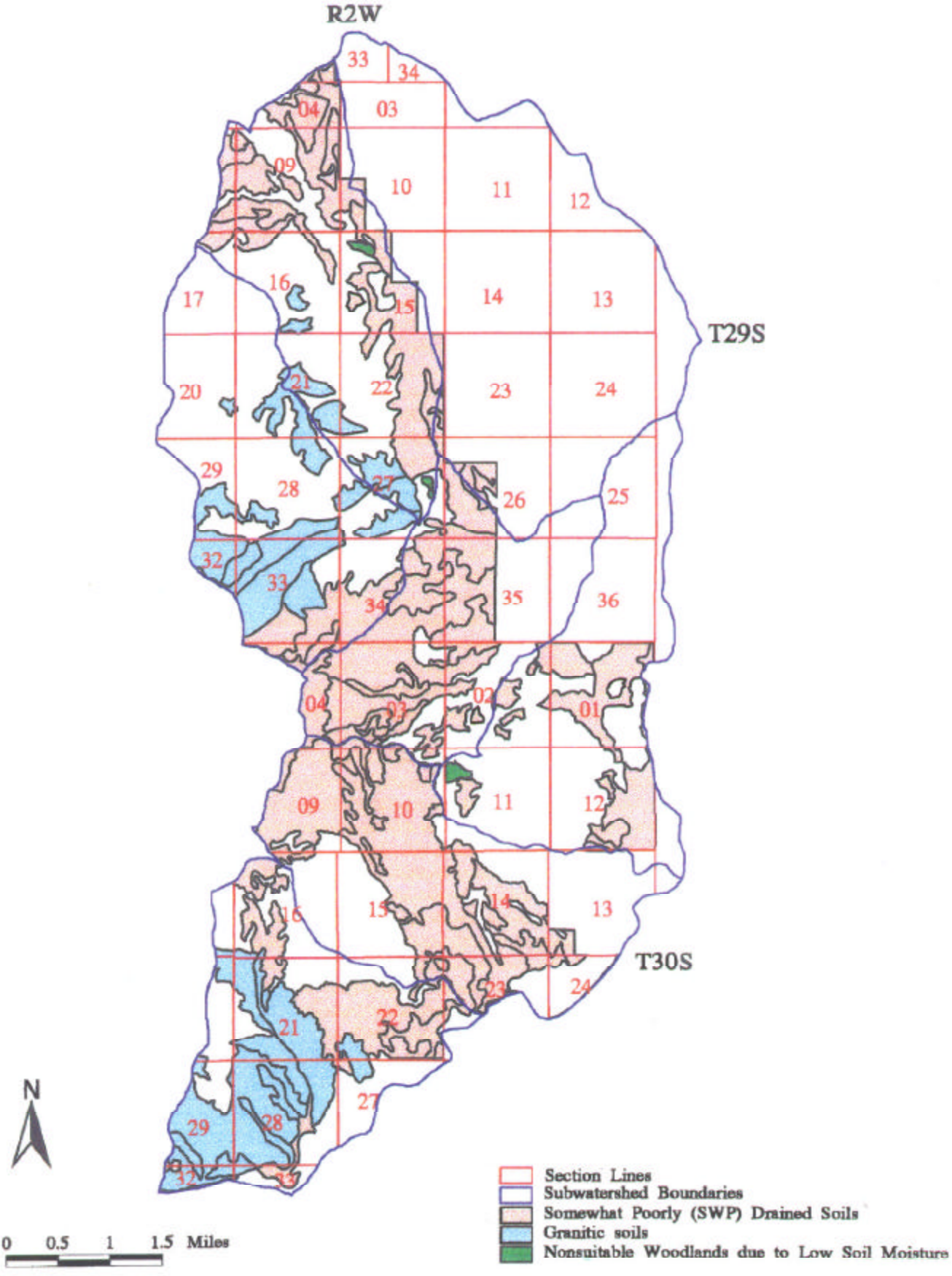
AREA	ACRES of ag or nonforest lands	ACRES of age class <10	ACRES of age class = 10	ACRES of age class = 20	ACRES of age class = 30 TO 40	ACRES of age class = 50 TO 70	ACRES of age class = 80 TO 110	ACRES of age class = 120 TO 190	ACRES of age class = 200+	TOTAL
East Deadman	48	89	1,289	217	188	80	34	1,892	1,834	5,671
Lower Deadman	3	0	287	55	48	14	381	0	219	1,007
Middle Deadman	0	0	6	23	2	0	0	63	0	94
Schultz Creek	8	0	81	1	2	20	156	24	294	586
West Deadman	0	0	0	0	0	0	0	0	0	0
Deadman Watershed	**59**	**89**	**1,663**	**296**	**240**	**114**	**571**	**1,979**	**2,347**	**7,358**
Dompier Creek	65	0	217	0	142	0	0	0	95	519
Salt Creek	24	0	0	0	2	0	0	54	3	83
Dompier Creek Watershed	**89**	**0**	**217**	**0**	**144**	**0**	**0**	**54**	**98**	**602**
TOTAL	**148**	**89**	**1,880**	**296**	**384**	**114**	**571**	**2,033**	**2,445**	**7,960**

2. Soils

The National Cooperative Soil Survey (NCSS) conducted by the Natural Resources Conservation Service (NRCS) and the Timber Production Capability Classification (TPCC) conducted by the Bureau of Land Management are the main sources of information for this section.

Soils in these watersheds have developed dominantly from volcanic parent material along the geologic contact zone between the Klamath Mountains and the Cascade Range. The main soils related properties significant to planning and analysis for this WAU are: granitic soils, nonsuitable woodlands due to low soil moisture, and landscape segments that commonly exhibit riparian/wetland characteristics (potentially wet) (see Map 6). There are 2,500 acres of granitic soils mapped in this WAU. The Deadman Watershed has 1,200 acres and Dompier Creek Watershed has 1,300 acres. Granitic soils are highly susceptible to surface erosion and shallow

Map 6. Problem Soils in the Deadman/Dompier WAU



slope failure, have a low organic carbon reserve, and are not very resilient. There are 44 acres of nonsuitable woodlands due to low soil moisture in the Deadman Watershed. These are areas where the soil's water holding capacity is too low to allow trees to grow. These soils have less than one inch of available water holding capacity in the top twelve inches of soil. Hydric soil areas too small for mapping (NCSS standards <5 acres) exist as minor components within mapping units that have been labeled 'potentially wet'. There are 7,200 acres of 'potentially wet' soils in this WAU. The Deadman Watershed has 4,300 acres and Dompier Creek Watershed has 2,900 acres of 'potentially wet' soils. It is anticipated that less than 20% of the 7,200 acres will classify as hydric soils. Most of these hydric inclusions will usually be less than one acre in size.

3. Landslides

A major process that can affect water quality, erosion, and sedimentation is the occurrence of landslides. Landslides can occur naturally or can be triggered by human activities such as road building or logging. The Deadman/Dompier WAU landslide occurrence/potential map (Map 7) indicates problem areas of slope instability.

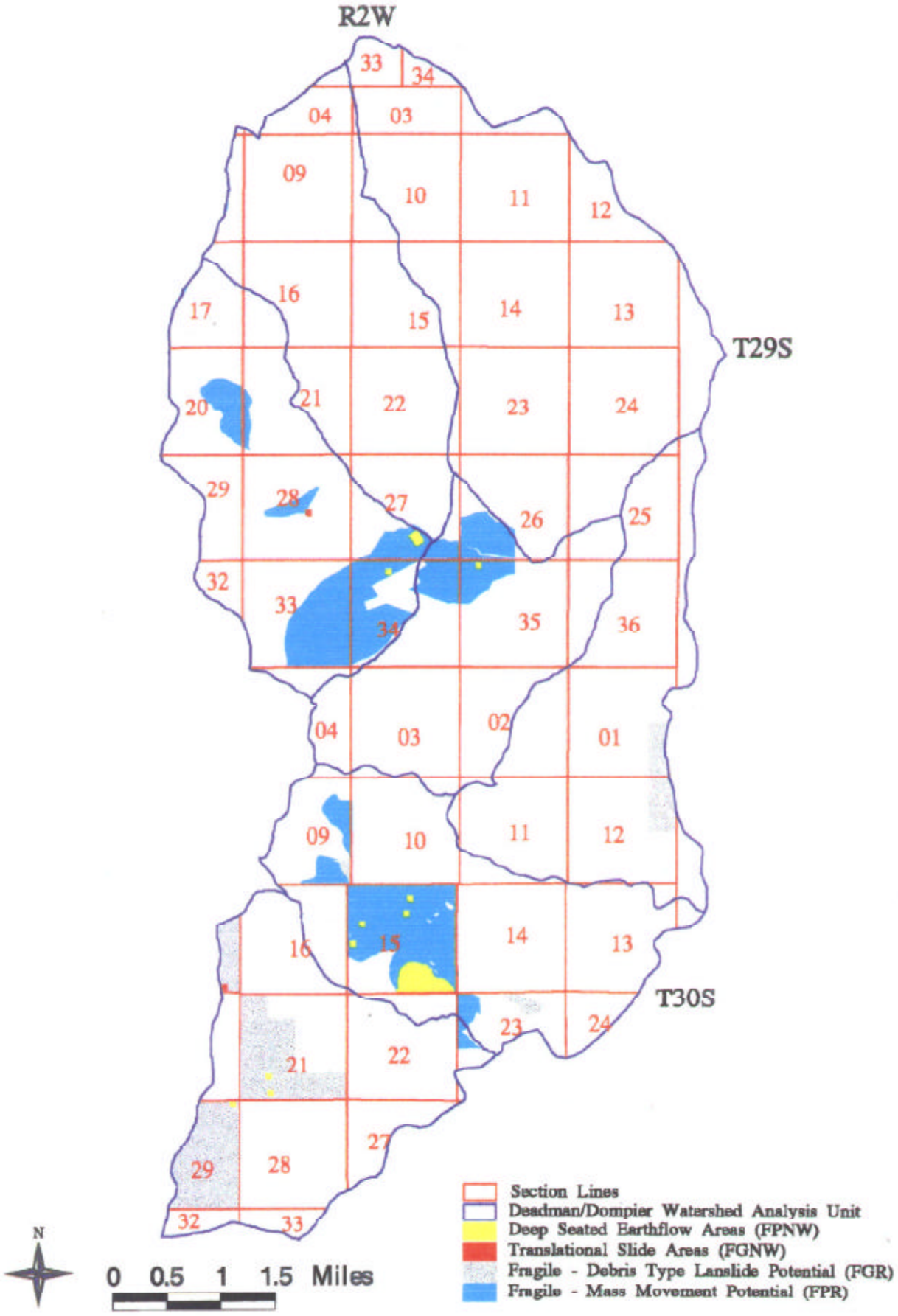
The **translational slide areas** (shown in red) are generally on steep slopes (60% to 100%) where debris type landslides exist. These areas have a high potential for debris type landslides and are not suitable for forest management activities.

The areas classified as **fragile: debris type landslide potential** (shown in gray) are characterized by slopes commonly ranging from 60% to 100% plus. Unacceptable soil and organic matter losses are expected to occur as a result of forest management activities unless mitigating measures (see Best Management Practices, Appendix D, Roseburg District Resource Management Plan, USDI 1995) are followed to protect the soil/site productivity. A considerable area associated with this classification is located in the Salt Creek subwatershed with smaller areas in the Dompier Creek and Lower Deadman subwatersheds.

The **deep seated earthflow areas** (shown in yellow) are characterized by undulating topography and slopes less than 60%. These deep-seated slump-earthflows are active and not suited for forest management activities. The major area with this classification is located in the Dompier Creek subwatershed (the Dompier Creek slide) with scattered areas in Salt Creek, West Deadman, and Schultz Creek subwatersheds.

The areas classified as **fragile: mass movement potential** (shown in blue) are characterized by undulating topography generally on less than 60% slopes where soil tension cracks and sag ponds may exist. Because of the slow rate of movement, forest management is feasible, when combined with Best Management Practices (BMP). Major areas of this classification are in the Dompier Creek, Schultz Creek, and West Deadman subwatersheds.

Map 7. Landslide Potential in the Deadman/Dompier Watershed Analysis Unit



C. Hydrology

Average annual rainfall between 1985 and 1995 measured at a permanent United States Geological Survey (USGS) station at Tiller, Oregon was approximately 40 inches. Approximately 85 percent of the precipitation falls during the Fall and Winter. The elevation at the station is approximately 1,100 feet. This station is along the South Umpqua River bordering the southern part of the DD WAU. Stream discharge measured at the same station closely followed precipitation (Swanston 1991) due primarily to the location and elevation where measurements were taken. Elevations found in the WAU range from 940 to 4,511 feet above sea level. The uplands of the DD WAU fall within the transient snow zone (2,000 to 5,000 feet elevation). Flows in the transient snow zones can be extreme, especially during warm rain-on-snow events (Swanston 1991). Jones and Grant (1996), Wemple (1994) and others have done studies relating clearcutting and road building to increased peak flows. Increased water delivery can trigger landslides on steep, marginally stable slopes, particularly on older road fills and stream crossings constructed before the mid-1970s.

Soils in the DD WAU, which are common in the South Umpqua River Basin, are susceptible to soil erosion and mass wasting, depending on the exact soil type, depth of soil, and slope (Richlen 1973). The geologic formations of the WAU develop into soils with low water storage capacities. Deep soils with high water storage capacities are able to generate baseflow to streams during periods with little or no precipitation. The combination of dry summers, minimal snow pack, low-yield headwater aquifers, and surface-water withdrawals for irrigating approximately 13,000 acres of agricultural lands can result in extremely low flows in the South Umpqua River during the summer (Rinella 1986).

1. Geomorphology

The drainage network of the Deadman/Dompier WAU may be characterized as highly dissected and palmately shaped with streams relatively close together. Watershed shape may indicate how efficiently streamflow and sediment are routed. Peak flows would probably occur sooner and peak higher in a palmately shaped watershed, such as the Deadman/Dompier WAU, than a more linear shaped watershed.

Current stream information shows there are 193 miles of streams in the 40 square mile WAU, with 137 miles of streams in the Deadman Watershed and 56 miles of streams in the Dompier Creek Watershed. Stream density for the Deadman Watershed is 4.72 miles per square mile and 4.99 miles per square mile for the Dompier Creek Watershed. The stream density for the WAU is 4.80 miles per square mile. There are 90 miles of streams on BLM administered lands in the WAU with a stream density of 5.31 miles per square mile. These numbers were derived from GIS HYD and ORD databases, which have varying accuracies with respect to first and second order streams.

2. Water Quality

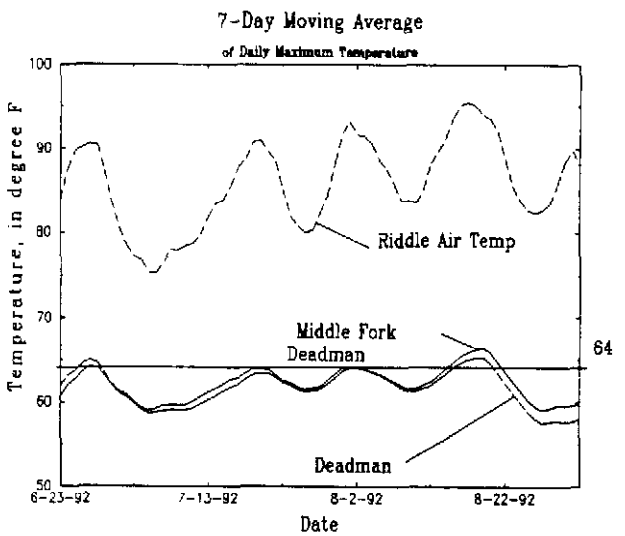
The South Umpqua River Basin was identified as being water quality limited in the 1992 and 1994 Water Quality Assessments (305b Report), required under Section 303 of the Clean Water Act, based on water quality standards for dissolved oxygen, fecal bacteria, and pH being exceeded. Aesthetics, aquatic life, and water contact recreation are beneficial uses listed as "not supporting". A "not supporting" use indicates 25 percent or more of the samples exceed water quality standards for an identified time period, and is the most severe classification for water quality. Dissolved oxygen and pH levels in Deadman Creek are within State water quality standards. The State Antidegradation Policy is to maintain and protect surface water quality from point and nonpoint sources of pollution to protect State identified beneficial uses of water (Oregon Department of Environmental Quality (DEQ) Administrative Rules, Chapter 340-26-026).

a. Stream Temperature

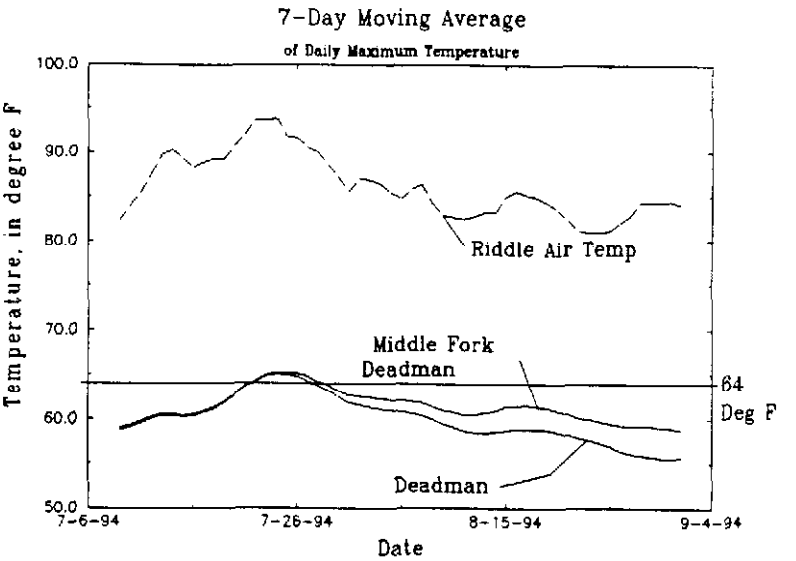
The Oregon Department of Environmental Quality (DEQ) is required under section 303(d) of the Clean Water Act to prepare a list of water quality limited streams in the State every two years. In 1996, DEQ identified the West Fork of Deadman Creek and the Middle Fork of Deadman Creek as not meeting state water quality standards for summer temperature. The Umpqua Basin temperature standard is 64 degrees Fahrenheit. The purpose of the standard is to protect the aquatic habitat and beneficial uses, and does not allow measurable temperature increases due to forest management activities. Beneficial uses affected are resident fish, aquatic life, and salmonid spawning and rearing.

The lowest streamflows and highest stream temperatures occur during the summer months. Deadman Creek flows into the South Umpqua River at a rate of approximately 2 to 4 cubic feet per second (cfs) during the summer and had maximum stream temperatures of 73 degrees Fahrenheit in 1991. Streamflows taken in the Middle Fork of Deadman and Deadman Creek just above the Middle Fork of Deadman Creek during the summer yield approximately 1 cfs at each site, depending on the climate for a given year. Temperature instruments were deployed at the mouth of the Middle Fork of Deadman Creek and on Deadman Creek just above the Middle Fork of Deadman Creek in 1992, 1994, 1995, and 1996. In 1992, 1994, and 1996 the seven-day moving average daily maximum temperatures, for both sites, rose above 64 degrees Fahrenheit for short periods of a week or less. In fact, the peaks and valleys in temperature at both sites occurred at the same time and both exhibit a sine-generated distribution (see Graphs 1,2,3, and 4). The high correlation between the two sites indicates similar physiography and stream morphology exist within the Middle and West Deadman subwatersheds. In August of 1996, maximum temperatures for both streams peaked at the same time but the maximum daily temperatures in the Middle Fork of Deadman Creek rose above 64 degrees Fahrenheit while Deadman Creek above the Middle Fork of Deadman Creek remained below 64 degrees Fahrenheit.

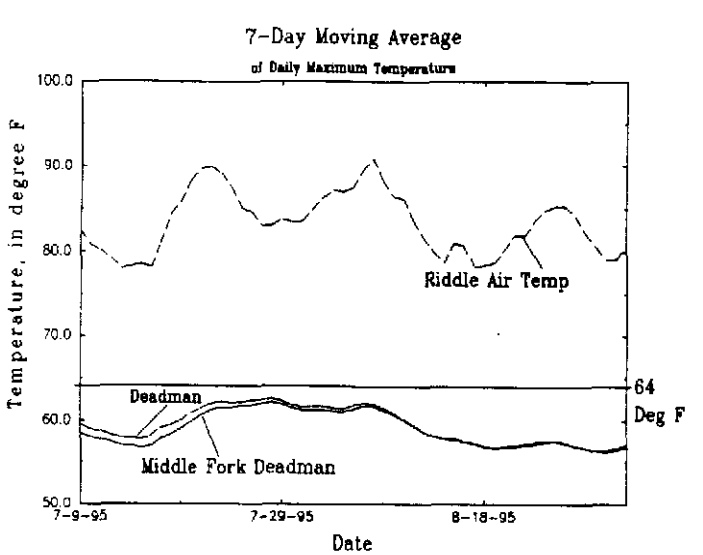
Graph 1. Average Daily Maximum Temperature in 1992



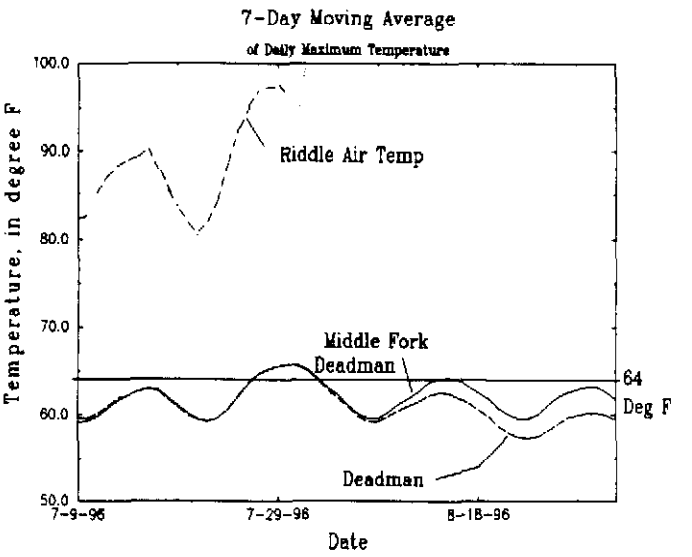
Graph 2. Average Daily Maximum Temperature in 1994



Graph 3. Average Daily Maximum Temperature in 1995



Graph 4. Average Daily Maximum Temperature in 1996



High summer stream temperatures in the WAU are attributable to a large extent to low flow conditions. There is less water to heat per unit area of stream in the summer months (June - September). Water is withdrawn from streams for livestock, irrigation, and domestic uses during the warm summer months. Low summer flows and increased stream temperatures may lead to increased phytoplankton plant growth, increased fecal bacteria growth, decreases in dissolved oxygen, and increases in pH.

Direct effects of stream temperatures on fish populations, growth, and the aquatic community in the DD WAU are not known. Determining the diurnal fluctuation and the number of consecutive days the water temperature exceeds 58 degrees Fahrenheit can indicate if fish and aquatic life are being stressed (Table 6). The preferred temperature range for cutthroat trout is approximately 50 to 55 degrees Fahrenheit and for salmonids it is 54 to 57 degrees Fahrenheit. The upper lethal temperatures for salmonids and cutthroat trout are 79 and 73 degrees Fahrenheit respectively.

Table 6. Consecutive Number of Days Stream Temperature was Greater Than 58° F and Diurnal Fluctuation for the Same Period.

Year	Middle Fork of Deadman Creek	Deadman Creek	Average Diurnal Fluctuation (°F)	Days
1992	10	8	3.4	8/9 - 8/20
1994	5	5	4.9	7/18 - 7/24
1995	1	2	2.4	7/22 - 7/23
1996	9	9	3.1	7/23 - 7/31

b. Sediment and Turbidity

Suspended sediment refers to that portion of the sediment load suspended in the water column (MacDonald et al. 1990). Particle size suspended depends on the amount of flow. Suspended sediment may be considered a pollutant when natural concentrations are exceeded, increasing turbidity to a point when the biotic balance is affected.

Turbidity refers to the amount of light scattered or absorbed by a fluid (APHA 1980). Turbidity is caused by the finer texture particles in suspension such as clay, silt, and finely divided organic and inorganic matter. Turbidity is a good indicator of clarity and how well fish can see food. The ability of salmonids to find and capture food is impaired at turbidities between 25 and 70 Nephelometric Turbidity Units (NTU) (Lloyd et al. 1987). Fish usually avoid areas with turbidities above 70 NTU (Meehan 1991). Fish growth is reduced and gill tissue is damaged after five to ten days of exposure to turbidities of 25 NTU. Turbidity may also impact drinking water, recreational uses, and aesthetic uses of water. Turbidities and suspended sediment numbers are highest due to peak discharges during the winter months. Peak flows cause streambank erosion, bedload transport, and the movement of particles into the water column. Sedimentation due to

landslides can increase turbidities well above 70 NTUs. Turbidity monitoring done on the Roseburg District showed turbidities exceeding 100 NTUs over a three month period after a landslide occurred. Similar responses would be expected in the DD WAU.

Increased peak flows from roads and timber harvesting may have caused increased width/depth ratios, a lack of large woody debris for storing sediment, and a lack of stream substrate in many stream reaches in the WAU. Sediment not being stored accelerates streambank erosion and limits riparian development.

3. Roads

Numerous publications have identified roads as having a major impact on the forest environment. The impacts include increased sedimentation in the streams, the potential for incising the stream channel to bedrock simplifying aquatic habitat complexity, and higher flows that rearrange stream substrates. Roads introduce sediment into the stream channel because of surface drainage, stream crossings, and poor design. Most of the roads built before the mid-1970s were designed without BMPs in place, as well as legislation directing companies and agencies to maintain and protect water quality from nonpoint sources of pollution. Over time, sediment buildup in the upper stream reaches provides a source of sediment for downstream reaches when the next storm runoff event occurs. Sediment may cover important salmonid spawning beds, lower the concentration of intergravel dissolved oxygen, and lessen pool depth, which may be critical to fish during the summer low flow period.

The construction of roads in riparian areas often constricts the stream flow and has in some cases redirected and forced the stream to erode the opposite bank. Roads within the riparian area, especially those within the floodplain, restrict stream sinuosity. Road fills adjacent to streams often channelize stream flow and cause the incision of the streambed and the rearrangement of stream substrates. Once incised, the stream may be incapable of moving outside it's banks to utilize associated side channels and overflow channels (floodplain). These side channels and overflow channels serve important roles hydraulically, hydrologically, and biologically. Side channels act as flood control features during high water, releasing water downstream at a slower rate. In some instances, these channels act as sediment settling ponds for the stream system providing a "built-in" filtering system to the watershed. These backwater areas/alcoves also act to recharge ground water/subsurface water aquifers and provide salmonids and other aquatic organisms escape cover or resting cover during high winter flows and peak springtime runoff flows.

There are approximately 231 miles of roads in the DD WAU. The average road density for the WAU is 5.76 miles per square mile. The highest road density is in the Dompier Creek subwatershed at 6.77 miles per square mile and the lowest road density is in the East Deadman subwatershed at 5.14 miles per square mile. The ratio between miles of roads and miles of streams is 1.2. This means for every mile of stream there are 1.2 miles of roads in the DD WAU. Stream and road densities by subwatershed are shown in Table 7. An exhaustive study in the Elk Creek Watershed near Drain, Oregon using aerial photographs by a Roseburg soil

scientist found that a significant number of roads have yet to be included in the Roseburg BLM GIS theme. In the study, road densities almost doubled in two compartments.

Research indicates that forest roads greatly increase the drainage efficiency of basins and intensify peak flow events following winter storms and/or rain-on-snow events (Wemple 1994). Runoff from warm rain-on-snow events and storm runoff intercepted by compacted roads and their ditches become surface flow instead of moving as shallow baseflow. Wemple developed a process to determine the extension of stream networks resulting from road drainage through road ditches and ditch-relief culverts. Roads in Wemple's study area extended the stream network 40% over storm event stream lengths and 60% over winter base flow stream lengths. Wemple found these results in the study of two watersheds where the road density was 1.61 miles per square mile. This process has not been applied in this watershed analysis. However, it was applied in the Jackson Creek Watershed Analysis conducted by the Forest Service in 1995. Jackson Creek lies in the South Umpqua River Basin. That effort found the existing road system extended the stream network by 26%, based on winter base flow stream lengths.

Table 7. Miles of Roads, Streams, and Densities in the Deadman/Dompier WAU.

Area	Acres	Square Miles	Miles of Roads	Road Density (miles per square mile)	Miles of Streams	Stream Density (miles per square mile)	Stream Crossing Density (numbers per stream mile)
East Deadman	5,826	9.10	46.76	5.14	36.60	4.02	1.64
Lower Deadman	3,223	5.04	28.26	5.61	21.13	4.19	1.75
Middle Deadman	3,339	5.22	31.61	6.06	32.42	6.21	2.13
Schultz Creek	2,753	4.30	24.99	5.81	18.28	4.25	1.86
West Deadman	3,450	5.39	29.10	5.40	28.78	5.34	1.77
Deadman Watershed	**18,591**	**29.05**	**160.72**	**5.53**	**137.21**	**4.72**	
Dompier Creek	3,833	5.99	40.58	6.77	28.16	4.70	2.52
Salt Creek	3,311	5.17	30.17	5.84	27.52	5.32	1.78
Dompier Creek Watershed	**7,144**	**11.16**	**70.75**	**6.34**	**55.68**	**4.99**	
TOTAL IN WAU	**25,735**	**40.21**	**231.47**	**5.76**	**192.89**	**4.80**	

Areas with greater numbers of stream crossings and drainage densities are likely to experience greater peakflow increases due to road-influenced runoff than areas with lower drainage densities (Jones and Grant 1996). The entire watershed has potentially high risks from increased peak flows due to stream crossing densities as high as approximately 3 crossings per square mile and road densities averaging 5.76 miles per square mile. The road and stream crossing numbers can be utilized for watershed restoration, identifying culverts needing to be replaced to withstand 100-year floods, and allowing fish passage in areas where historical passage has been documented.

A study of Willamette River tributaries determined peak flows increased by as much as 50% in small basins and 100% in large basins over the past 50 years in managed watersheds These increases are attributable to changes in flow routing (due to roads) rather than to changes in water storage due to vegetation removal (i.e. evapotranspiration, rain-on-snow, fog drip) discussed in early analyses of small basin hydrology (Jones and Grant 1996).

4. Streamflow

Timber harvesting, road building, and other forest management activities can result in changes in the volume and timing of runoff. Changes in the size of peak flows and discharge at low flows are not considered water quality parameters, but can affect water quality. Peakflows in the winter months that result in a bankfull condition affect channel stability, turbidity, suspended sediment, and the overall aquatic habitat condition.

There are no streamflow gaging station records for the DD WAU. A USGS stream gage on Elk Creek near Drew, Oregon may provide insight into the type of flow regimes expected within the DD WAU. The drainage area, geology and soils of Elk Creek are very similar to the DD WAU. The drainage area is 54 square miles for the Elk Creek gaging station and 40 square miles for the Deadman/Dompier WAU. Stream discharge, in cubic feet per second, at the Elk Creek gaging station for the indicated recurrence interval and the annual exceedance probability are listed in Table 8. The maximum discharge at the Elk Creek gaging station from 1954 to 1987 was 8,880 cubic feet per second with a gage height of 10.61 feet, on December 22, 1964.

Table 8. Elk Creek Near Drew, OR (Gaging Station #14308500)

Recurrence Interval	1.25	2	5	10	25	50	100
Exceedance Probability	80	50	20	10	4	2	1
Discharge	1,680	3,000	5,300	7,130	9,760	11,900	14,300

The recurrence interval, annual exceedance probability, and stream discharges calculated from USGS flood frequency equations for Deadman and Dompier Creek Watersheds are listed in Table 9. The standard error for the equations are 40 percent or more. However, the equations seem to accurately estimate the flows measured at the Elk Creek gaging station.

Table 9. USGS Flood Frequency Equations for DD WAU.

Recurrence Interval (years)	2	5	10	25	50	100
Exceedance Probability %	50	20	10	4	2	1
Deadman Watershed Discharge (cfs)	1,549	2,465	3,035	3,900	4,625	5,244
Dompier Watershed Discharge (cfs)	673	1,050	1,293	1,646	1,933	2,191

Bankfull discharge maintains the morphologic characteristics of channels by transporting sediment supplied from upstream sources, forming and removing bars, and forming or changing bends (Dunne and Leopold 1978). At bankfull discharge water flows in road ditch-lines and sediment causes cross drains and culverts to become plugged. Bankfull discharges may be determined by a Level 2 Rosgen Stream Classification.

5. Channel Stability

Physiographic landform and channel type determine sediment routing and channel maintenance. A number of researchers and scientists have studied river mechanics and hydraulics, but Rosgen developed a universally accepted method of stream classification. The Rosgen classification of rivers and streams was developed to better understand stream morphology and channel function, and determine proper restoration techniques for a particular stream type without the use of large check dams, rip rap, and gabion baskets. These "hard control" measures were used extensively in the past, and were very expensive and often nonfunctional.

Nine major stream types have been identified. They have been labeled Aa, A, B, C, D, DA, E, F, and G. The stream types are based upon office and field verification of the dimension, pattern, and profile of streams. A stream may shift from one stage to another, such as from a G to a C stream type, from changes to stream bank stability. The changes could be natural or human-caused. The classification allows assessing changes in channel stability over time and learning what caused those changes.

A Rosgen Level 1 classification, which is conducted in the office determined the Deadman/Dompier WAU is a valley type 2. A valley type 2 is characterized by moderate relief, relatively stable, moderate side slopes, and valley floor slopes of 4% with soils developed from parent material (Rosgen 1994). The stream type most commonly found within this valley type are "B" channels. Stream types are predominately "B" type channels for the mainstem streams in the DD WAU, and "A" and "Aa" type channels for tributaries of the mainstem streams. Steep gradient, well entrenched, laterally controlled streams having low width/depth ratios are classified as "A" stream types. Streambeds with "A" stream types typically have step/pool morphology with

chutes, debris flows, and waterfalls. "B" stream types exist in moderately steep terrain, with a predominant landform of narrow to moderate sloping basins. "B" stream types are limited in floodplain development, moderately entrenched, have moderate width/depth ratios, and tend to be stable.

A Rosgen Level 2 classification is more detailed, and requires field visits to verify the Level 1 classification. A Level 2 classification addresses sediment supply, stream sensitivity to disturbance, channel response to flow regime, fish habitat potential, and natural recovery potential (Rosgen 1994). Level 2 surveys were performed at the mouth of the Middle Fork of Deadman Creek and on Deadman Creek just above where the Middle Fork of Deadman Creek drains into Deadman Creek. These Level 2 surveys established reference reaches. Deadman Creek and the Middle Fork of Deadman Creek are "B3" stream types.

Deadman Creek is increasing its width/depth ratio. The width/depth (W/D) is defined as the ratio of bankfull surface width to the mean depth of the bankfull channel. The width/depth ratio is the most sensitive and positive indicator of channel instability. Streams within the Deadman/Dompier WAU exhibit high bedload movement and very little sediment storage within stream reaches. The shear stress exerted on the stream beds by elevated peak flows, gravity, and streambanks has eroded some reaches to bedrock (Osborn and Stypula 1987). Land management activities can have a lasting effect on the low-flow wetted stream width. The stream width of Deadman Creek increased from 3.7 feet in 1937 to 6.6 feet when measured between 1989 and 1993 (Dose and Roper 1994). The amount of Large Woody Debris (LWD) is an important component in maintaining stream width, as well as attenuating peak flows and maintaining habitat complexity. Generally, the Deadman/Dompier WAU lacks LWD in many stream reaches due to past management activities. Increases in the width/depth ratio can significantly alter the hydraulics of streams.

Pfankuch stream inventories and channel stability surveys were done in the DD WAU in 1995 and 1996. Pfankuch surveys provide a baseline of current channel conditions and aid in determining stream restoration opportunities. The length of stream reaches surveyed varied from 1,000 to 4,000 feet. The majority of the reaches surveyed in the DD WAU were given a poor rating due primarily to the condition of the upper banks, which includes landform slope and the lack of large wood in some reaches. Landform slopes are greater than or equal to 60%, thereby restricting channel meander and increasing potential sloughing into channels. Some reaches also exhibited excessive cutting and deposition. However, one might expect cutting and deposition on steeply graded "A" type channels. The variability between reaches can be quite high because of past land management and stream types. Portions of reaches lack large woody debris due to past timber harvesting and/or road building activities. Sediment input is primarily due to natural sloughing of streambanks in the reaches surveyed.

6. Proper Functioning Condition

In 1991 the BLM Director approved a Riparian-Wetland Initiative for the 1990s, which establishes national goals and objectives for managing riparian-wetland areas on public lands.

The primary goal is to maintain and restore riparian-wetland areas so that 75 percent or more are in a proper functioning condition by 1997.

Approximately five miles of main stem Deadman Creek were surveyed for proper functioning condition. The surveys indicated that most of the riparian zones were Functioning - at risk, but it is not apparent if the trend is towards declining or improving conditions. Those stream reaches interacting with the floodplain and the adjacent riparian zone have more diverse riparian vegetation and wider riparian zones. Frequent bankfull discharges and floodplain inundation is promoting vegetation growth in these areas. The presence of bedrock substrates indicates gradient and flow are too high to support gravel/cobble substrates and channels may increase width to depth ratios. This would limit the growth of riparian vegetation.

The Middle Fork of Deadman Creek was rated as Functioning - at risk. The reaches surveyed indicated the floodplain was not regularly inundated and lacked the complexity to dissipate stream energy and reduce channel widening. The entrenched reaches prevent riparian zones from widening. Channel substrates will move downstream exposing bedrock. The apparent increase in width to depth ratios reduces the amount of riparian area due to streambank erosion.

7. Transient Snow Zone

Approximately 84 percent of the Deadman Watershed and 49 percent of the Dompier Creek Watershed fall within the transient snow zone. The amount of area within the transient snow zone (TSZ) and canopy closure can affect the timing and magnitude of peak flows. Snow that accumulates in forest openings and in stands with less than 70 percent crown closure are susceptible to rapid snowmelt during warm winter rain storms. Generally, stands less than 40 years old have less than 70 percent crown closure. Forest stands with less than 70 percent crown closure have a higher potential to deliver water to the soil and ultimately increase peak flows (Harr and Coffin 1992). This is particularly important in soil/hydrologic groups with low infiltration rates and high runoff potential.

The Hydrologic Recovery Percent in the DD WAU was based on the methodology presented in the Umpqua National Forest Standard and Guideline Procedures for Cumulative Effects and Water Quality (Hofford et al. 1990). Hydrologic recovery was calculated from a digital elevation model and is based on the percent stand "recovered" for a given site class. Stand recovery can vary for different areas, but is between 27 and 32 years old. Table 10 identifies the percent of acres currently hydrologically recovered (by site class) within the TSZ. Middle Deadman, East Deadman, and West Deadman subwatersheds have not recovered to optimum percentages, and have a high potential for superfluous water delivery to stream channels.

Table 10. Hydrologic Percentages For Deadman/Dompier Subwatersheds by Site Class

SUBWATERSHED	% HYDROLOGIC RECOVERY		
	SITE CLASS III	SITE CLASS IV	SITE CLASS V
DEADMAN			
East Deadman	81	79	75
Lower Deadman	95	93	92
Middle Deadman	72	66	62
Schultz Creek	87	83	80
West Deadman	81	77	75
DOMPIER CREEK			
Dompier Creek	90	88	86
Salt Creek	82	79	77

Table 11 shows hydrologic recovery percentages for the Deadman/Dompier WAU dating back to 1960. The percentages decline to a current low of 78% for the DD WAU.

Table 11. Deadman/Dompier Watershed Hydrologic Recovery (Assuming Site Class IV).

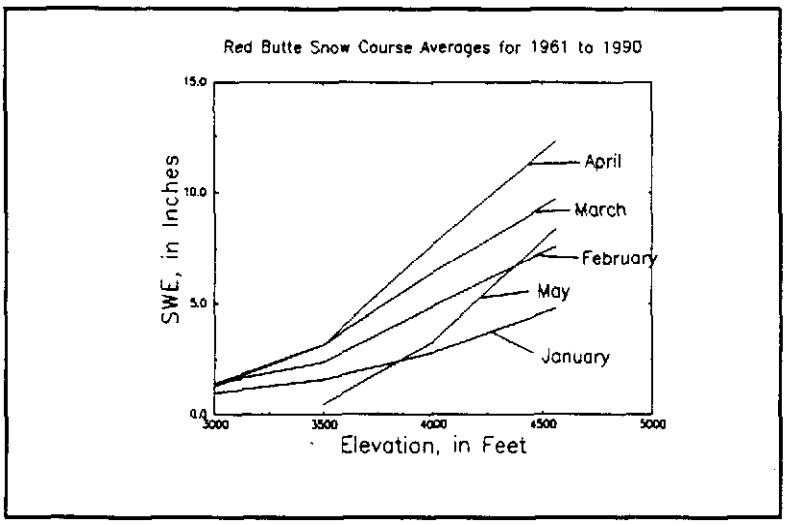
YEAR	% HYDROLOGIC RECOVERY
1960	100
1975	97
1980	82
1985	86
1994	78

Since much of the watershed is within the TSZ, snow course snow water equivalent (SWE) data (1961-1990) was plotted against elevation to depict the amount of runoff available during warm rain-on-melting snow events (Figure 4). The data was gathered at sites near Red Butte (T28S R2W and R3W). The SWE averaged 3.0 inches in 1992, 12.1 inches in 1993, 4.0 inches in 1994, 5.9 inches in 1995, and 4.9 inches in 1996.

8. Large Woody Debris

Large woody debris (LWD) is one of the most important sources of habitat and cover for fish populations in streams (MacDonald et al. 1990). Large woody debris that is well distributed and occurs frequently in the stream, interacts with pools in the channel through time and a wide range of flows to create a diversity of aquatic habitat types. Relationships exist between LWD, habitat complexity, and salmonid production (Bisson et al. 1987). Reeves et al. (1993) noted that greater numbers of LWD pieces were found in basins with lower levels of timber harvest and that the level of harvest was strongly correlated with salmonid community diversity.

Figure 4. Comparison of Snow Water Equivalent Averages for January through May from 1961 to 1990 at the Red Butte Snow Course.



Large woody debris is a major component of channel form in smaller streams. Smaller streams usually contain more wood than larger systems, due to the ability of larger streams to flush LWD downstream (Bilby and Ward 1987). Large woody debris influences channel meandering, bank stability, variability in channel width, and affects the form and stability of gravel bars. A close look at Pfankuch surveys, completed during the summers of 1995 and 1996 for streams within the WAU, should indicate any changes in channel stability due to flooding, debris torrents, and timber harvest. Large woody debris in the upper stream reaches slows the timing and energy associated with peak flows, and increases sediment storage and local hydraulic variability. The Record of Decision Standards and Guidelines and Best Management Practices provide guidance for maintaining LWD in the upper stream reaches in stands 80 years old and greater (or trees greater than 20" dbh) in the WAU. The recruitment of LWD is equally important in aquatic habitats where fish migration occurs. Large woody debris is a limiting factor to the aquatic and hydraulic components of this WAU. Stream reaches needing large woody debris should be identified as part of watershed restoration.

D. Species and Habitats

1. Fisheries

The Deadman/Dompier Watershed Analysis Unit (WAU) is located within a Tier 1 Key Watershed. Tier 1 Key Watersheds were selected to conserve anadromous salmonids and should be given highest priority for watershed restoration (SEIS ROD B-19). Key Watersheds were designated to act as anchors for the potential recovery of depressed or at-risk anadromous and resident fish stocks by maintaining high quality aquatic habitat and recovering degraded aquatic habitat (SEIS ROD B-18).

a. Historic and Current Fish Use in the South Umpqua Basin

The South Umpqua River historically supported healthy populations of resident and anadromous salmonid fish. A 1937 survey conducted by the Umpqua National Forest reported that salmon, steelhead, and cutthroat trout were abundant throughout many reaches of the river and its tributaries (Roth 1937). Excellent fishing opportunities for resident trout and anadromous salmon and trout historically existed within the South Umpqua River (Roth 1937). The historical condition of the riparian zone along the South Umpqua River favored conditions typical of old-growth forests found in the Pacific Northwest. Roth noted the shade component that existed along the reaches of streams surveyed. The majority of the stream reaches surveyed were "arboreal" in nature, meaning "tall timber along the banks, shading most of the stream" (Roth 1937). The river and its tributaries were well shaded by the canopy closure associated with mature trees. Streambanks were provided protection by the massive root systems of these trees.

Since 1937, many changes have occurred within the South Umpqua Basin and in the stream reaches surveyed by Roth. A comparative study conducted by the Umpqua National Forest during the summer low-flow periods between 1989 and 1993 surveyed the same stream reaches in the 1937 report. The results of the study show 22 of the 31 stream segments surveyed were significantly different from the 1937 survey (Dose and Roper 1994). Nineteen stream segments became significantly wider while the remaining three stream segments were significantly narrower. Of the eight streams surveyed within designated wilderness areas, only one stream channel increased in width since 1937. In contrast, 13 of the 14 stream segments located in timber harvest emphasis areas were significantly wider than in 1937.

The stream widening could have resulted from increased peak flows. Peak flows typically occur due to the removal of vegetation (tree canopy) and the increase in compacted areas within a watershed, especially within the transient snow zone (Meehan 1991). Peak flows can introduce sediment into the channel from upslope and upstream and can also simplify the channel by rearranging instream structure. Excessive sediment delivery to streams usually changes stream channel characteristics and channel configuration. These stream channel changes normally result in decreasing the depth and the number of pool habitats and reducing the space available for rearing fish (Meehan 1991).

Winter steelhead and resident rainbow trout (Oncorhynchus mykiss), fall and spring chinook salmon (Oncorhynchus tshawytscha), coho salmon (Oncorhynchus kisutch) and sea-run cutthroat and resident cutthroat trout (Oncorhynchus clarki) have been documented using the DD WAU. Over the last 150 years, salmonids have had to survive dramatic changes in the environment where they evolved. The character of streams and rivers in the Pacific Northwest has been altered through European settlement, by urban and industrial development, and by land management practices. Modifications in the landscape and waters of the South Umpqua River Basin, beginning with the first settlers, have made the South Umpqua River less habitable for salmonid species (Nehlsen 1994).

Results from the recent United States Forest Service (USFS) study document changes in low-flow channel widths within the South Umpqua Basin since 1937 (Dose and Roper 1994). Land management activities (road construction and timber harvest) have contributed to the changes in the channel characteristics. These changes in channel condition may have resulted in the observed decline of three of the four anadromous salmonid stocks occurring in the South Umpqua River Basin (Dose and Roper 1994).

The South Umpqua River once supported abundant populations of chinook and coho salmon, and steelhead and cutthroat trout. These species survived in spite of the naturally low streamflows and warm water temperatures that occurred historically within this subbasin (Nehlsen 1994). Currently, salmonid populations throughout the Pacific Northwest are declining. A 1991 status report identified a total of 214 native, naturally spawning stocks in the Pacific Northwest as vulnerable and at-risk of extinction (Nehlsen et al. 1991). According to this 1991 report, within the South Umpqua River, one salmonid stock is considered extinct, two stocks of salmonids are at-risk of extinction, and two stocks were not considered at-risk. The following information discusses the historic and present status of fish species in the South Umpqua River Basin.

Historically steelhead runs in the South Umpqua River were strongest in the winter (Roth 1937). Currently, winter steelhead are considered to be the most abundant anadromous salmonid in the South Umpqua River (Nehlsen 1994). In 1937 Roth reported summer steelhead above the South Umpqua Falls. Summer steelhead are now considered to be extinct (Nehlsen et al. 1991).

Roth (1937) reported the principal run of chinook was in the late spring and summer. Presently, spring chinook runs are considered to be depressed by ODFW. Nehlsen et al. (1991) reported the spring chinook run at high risk of extinction. Fall chinook are considered to be healthy by ODFW (Nehlsen 1994).

Coho salmon were considered abundant in the South Umpqua River Basin in 1972 by the Oregon State Game Commission (Lauman et al. 1972). An estimated 4,000 fish spawned in the basin with the largest number of fish (1,450) spawning within Cow Creek. Presently, coho salmon in the South Umpqua River Basin are suffering the same declines as other coastal stocks. These declines may be due to several factors, including the degradation of their habitats, the effects of extensive hatchery releases, and overfishing (Nehlsen 1994). No coho salmon were sampled within the survey area (i.e., upper stream reaches of the South Umpqua River) during the 1937

survey. A subsequent study conducted during the summer of 1989 in Jackson Creek, a major tributary to the South Umpqua River, documented the common presence of coho salmon within this tributary (Roper et al. 1994). The documentation of coho salmon using Jackson Creek qualifies this species existence in the upper reaches of the South Umpqua River Basin. Coho salmon have been observed and sampled within the DD WAU as well.

Sea-run cutthroat are assumed to be depressed from historic levels. The information provided in the 1937 Roth report noted cutthroat trout were common and/or abundant throughout the stream segments surveyed in the Upper South Umpqua River Basin. There are limited historical records on cutthroat population size within the South Umpqua River.

The assumption that sea-run cutthroat trout abundance is currently below historic levels throughout the Umpqua Basin has been based upon the information provided by the fish counting station at Winchester Dam on the North Umpqua River. Between the years of 1947 and 1957 the North Umpqua River boasted runs of sea-run cutthroat trout averaging approximately 900 fish per year. The highest number return of 1,800 fish occurred in 1954 and the lowest return for the ten year period was 450 fish in 1949. In the late 1950's the sea-run cutthroat trout returns declined drastically.

The stocking of Alsea River cutthroat trout into the Umpqua system began in 1961 and was continued until the late 1970's. The stocking of this genetically distinct stock of trout into the Umpqua system has apparently led to compounding the problem for the sea-run cutthroat trout native to the Umpqua River Basin. Sea-run cutthroat trout returns have been extremely low since discontinuing the hatchery releases in the late 1970's. The levels of returns resemble prehatchery release conditions of the late 1950's, with an average return of <100 fish/year (ODFW 1994 - overhead packet). In 1992, no sea-run cutthroat returned to the North Umpqua River. In subsequent years, sea-run cutthroat trout numbers have been a total of 29 fish in 1993, 1 fish in 1994, 76 fish in 1995, and a total of 70 fish through 31 October 1996.

According to the data available, the South Umpqua River appears to have supported a larger run of sea-run cutthroat trout than the North Umpqua River. In 1972, a total of 10,000 sea-run cutthroat trout were estimated within the South Umpqua River Basin. Sea-run cutthroat trout populations seemed to have the highest occurrence in those streams occupied by and accessible to coho salmon (Lauman et al. 1972). Today, these fish are limited to the upper portion of the mainstem South Umpqua River and Cow Creek, one of the major tributaries to the South Umpqua River. Warm water temperatures, lack of over-summering pool habitats, and low flows have precluded their use of the lower stream reaches in the basin (Nehlsen 1994).

The Umpqua Basin cutthroat trout has been listed by the National Marine Fisheries Service (NMFS) as an endangered species under the Endangered Species Act (ESA) of 1973, as amended. The coastal coho salmon and West Coast steelhead have been proposed for listing by NMFS as threatened species under the ESA. Two fish species, the Pacific lamprey (Lampetra tridentata) and the Umpqua chub (Oregonichthys kalawatseti) are on the United States Fish and Wildlife

Service (USFWS) list as species of concern and are considered Bureau Sensitive species by the BLM (Manual 6840). All these species have been documented within the South Umpqua River.

Current anadromous fish distribution limits have been mapped, using GIS, for streams with documented barriers within the DD WAU (see Map 8). Distribution limits of anadromous and resident fish are determined by the extent these fish are able to migrate upstream. Natural waterfalls, log or debris jams, beaver dams, and road crossings are potential barriers to fish movement and migration.

Aquatic habitat inventories have been completed for Deadman Creek and it's tributaries. The Deadman Creek inventory covers 19 miles of the approximate 193 total stream miles within the Deadman/Dompier WAU (see Table 12). The inventories are used to describe the current condition of the aquatic habitat with a focus on the fish bearing stream reaches within a watershed. Dompier Creek and Salt Creek have not been inventoried for aquatic habitat condition.

The aquatic habitat inventory is not a fish distribution or fish abundance survey. The habitat inventory is designed only to survey physical habitat features. However, fish use and distribution information was noted in the habitat inventories. The stream surveyors noted fish use by visual observation only. Fish distribution surveys are currently underway on the Roseburg District BLM to determine the upper limits of resident fish use on BLM administered lands. The Deadman Watershed was surveyed for resident fish use during the summer of 1995. The information available on the habitat condition and the distribution of fish species in the streams that have not been surveyed is in the form of personal communications and observations by ODFW and BLM biologists.

The data collected through the ODFW Aquatic Habitat Inventory can be used to analyze the components that may limit the aquatic habitat and the fishery resource from reaching their optimal functioning condition. The Habitat Benchmark Rating System is a method developed by the Umpqua Basin Biological Assessment Team (BAT team) to rank aquatic habitat conditions. The BAT team consists of fisheries biologists from the Southwest Regional Office of the ODFW, Coos Bay District BLM, Roseburg District BLM, Umpqua National Forest USFS, and Pacific Power and Light Company. The intention of the matrix designed by the BAT team is to provide a framework to easily and meaningfully categorize habitat condition. This matrix is not intended to reflect equality of the habitat condition of each stream reach, but is intended to summarize the overall condition of the surveyed reaches. The matrix is a four category rating system consisting of an *Excellent*, *Good*, *Fair*, or *Poor* rating.

Map 8. Deadman/Dompier WAU - Stream Reaches

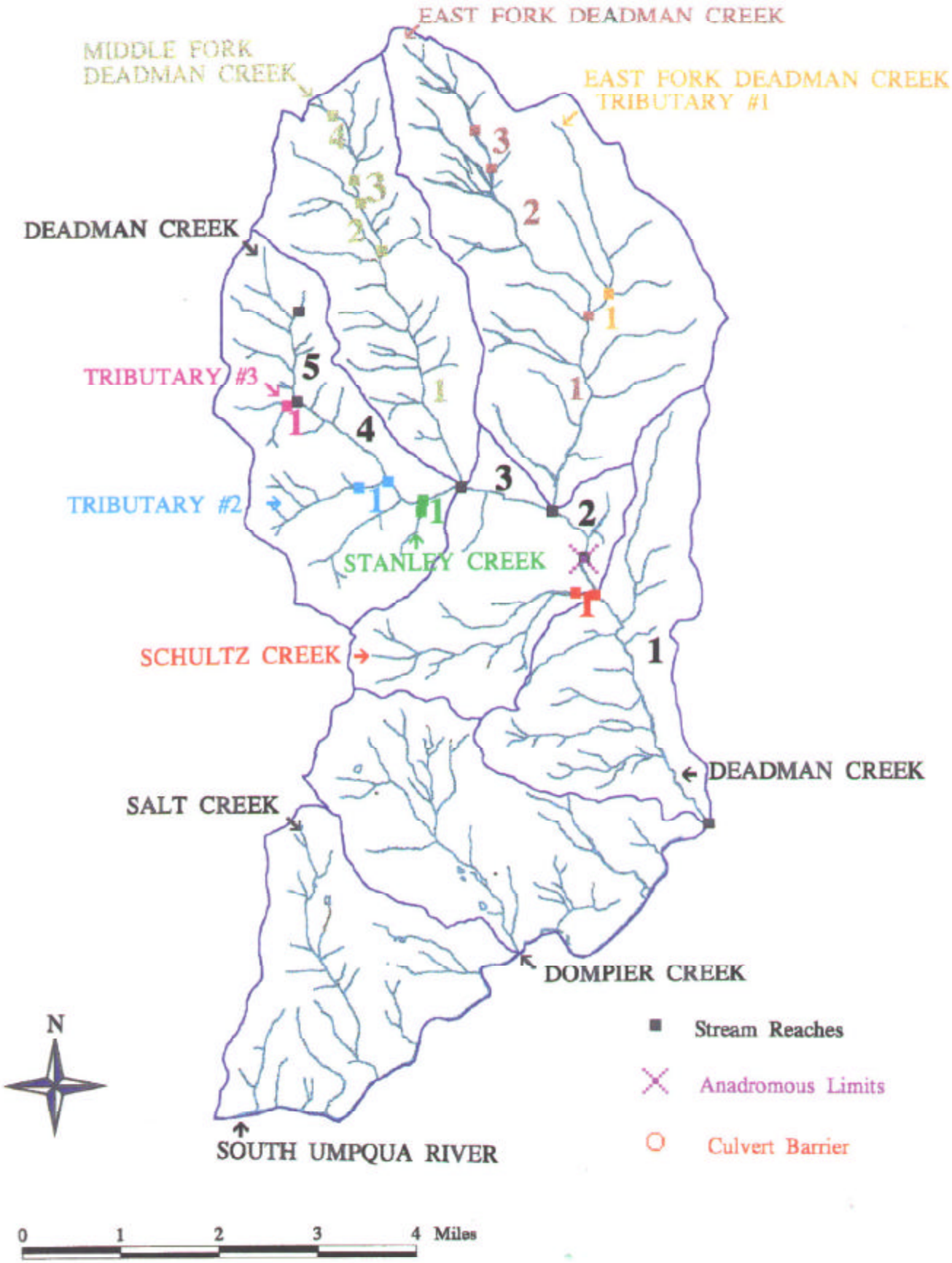


Table 12. Stream Inventory Summary for Deadman/Dompier WAU.

Stream	Total Miles	Total BLM Miles	Total Miles Anadromous	BLM Miles Anadromous	Total Miles Resident	BLM Miles Resident
Deadman Watershed	137.2	71.9				
Deadman Creek			3.4	0.1	8.0	4.0
East Fork Deadman Creek			0.0	0.0	3.5*	0.0
Middle Fork Deadman Creek			0.0	0.0	4.0	4.0
Stanley Creek			0.0	0.0	n/a	n/a
Schultz Creek			n/a	0.0	n/a	0.0
Unnamed tributary to Deadman Creek #2			0.0	0.0	0.4	0.4
Unnamed tributary to Deadman Creek #3			0.0	0.0	0.1	0.1
Unnamed tributary to East Fork Deadman Creek #1★			0.0	0.0	n/a	0.0
Dompier Creek Watershed	55.7	18.3				
Dompier Creek°			n/a	n/a	n/a	n/a
Salt Creek°			n/a	n/a	n/a	n/a
Slate Creek			n/a	n/a	n/a	n/a
Deadhorse Creek°★			n/a	0.0	n/a	0.0

\# Streams surveyed by ODFW-Aquatic Habitat Inventory methodology
n/a Not available (not sampled/surveyed - no information available).
* Fish distribution data from Aquatic Habitat Inventory (by visual observation only)
° Potential presence of warm water fish species.
★ No BLM administered lands occur in these drainages.

Data from the ODFW Aquatic Habitat Inventories for Deadman Creek were analyzed to determine an overall aquatic habitat rating (AHR) for each stream. How the ratings correlate to the NMFS Matrix (see Appendix C) are shown in Table 13.

Each stream contains different limiting factors. Limiting factors for the fishery resource may include conditions where there has been a reduction in instream habitat structure, an increase in sedimentation, the absence of a functional riparian area, a decrease in water quantity or quality, or the improper placement of drainage and erosion control devices associated with the forest road network.

Table 13. Aquatic Habitat Ratings (AHR)

ODFW Aquatic Habitat Inventories	NMFS Matrix
Excellent or Good	Properly Functioning
Fair	At Risk
Poor	Not Properly Functioning

b. Current Stream Habitat Conditions

1) Deadman Watershed

Streams inventoried in the Deadman Watershed include the mainstem of Deadman Creek, East Fork Deadman Creek, Middle Fork Deadman Creek, Schultz Creek, Stanley Creek, two smaller tributaries of Deadman Creek and one small tributary of East Fork Deadman Creek. There are approximately 137 miles of streams within this watershed. The major land uses within the Deadman Watershed include timber production and rural residential.

The overall aquatic habitat ratings for the mainstem of Deadman Creek, the East Fork of Deadman Creek, the Middle Fork of Deadman Creek, and unnamed tributary #2 of Deadman Creek are *Fair*. The limiting factor for the fisheries resource all these streams have in common is the relatively high amounts of sediment within the channel. Other limiting factors one or more stream may have include the low volume of LWD, low numbers of pools, low pool volume, and a low percentage of gravel present in the riffle habitat units.

The overall aquatic habitat ratings for Stanley Creek, Schultz Creek, unnamed tributary #3 to the mainstem of Deadman Creek, and unnamed tributary #1 to East Fork Deadman Creek are *Poor*. The limiting factors for the fisheries resource all these streams have in common include low numbers of pools, relatively high amounts of sediment within the channel, and a low percentage of gravel present in the riffle habitat units. Other limiting factors one or more stream may have include the low number and low volume of LWD, and low pool volume.

Anadromous fish habitat is limited within the Deadman Watershed. A 165 foot high waterfall located on the mainstem of Deadman Creek, approximately 3.4 miles upstream from the confluence with the South Umpqua River, impedes upstream anadromous fish migration. Schultz Creek is the only major tributary that flows into Deadman Creek below the waterfall and is accessible to anadromous salmonids.

Deadman Creek has the most available and accessible habitat for anadromous salmonids of the streams within this WAU. The BLM administers approximately 0.1 mile of the available 3.4 miles of anadromous fish habitat in Deadman Creek. The majority of the habitat is managed by private landowners and timber companies. The ability of the BLM to improve anadromous fish habitat in this watershed is limited. However, the BLM and the Forest Service manage the

majority of the lands upstream from the anadromous fish habitat, which lies below Deadman Falls.

The principal means of improving anadromous fish habitat in Deadman Creek would be through improving cumulative water quality conditions. Current and future management activities on federally administered lands would be designed and conducted to maintain or restore proper watershed conditions and would thus meet the objectives of the Aquatic Conservation Strategy as discussed in the SEIS ROD.

2) Dompier Creek Watershed

The major streams in the Dompier Creek Watershed consist of Dompier Creek, Salt Creek, Slate Creek, and Deadhorse Creek. There are approximately 56 miles of streams within this watershed. The major land uses within this watershed include agriculture/grazing, rural residential (the town of Tiller lies within this watershed), and timber production. The aquatic habitat within these streams has not been inventoried by the ODFW stream inventory crews. Survey information for this watershed would be added to this watershed analysis report at a later date.

Fish distribution surveys are limited for the Dompier Creek Watershed. No fish were observed in the portion of Dompier Creek surveyed during the summer of 1996. However, unsurveyed portions of Dompier Creek under BLM management and downstream from the portion surveyed are suspected to be fish-bearing.

2. Wildlife

A variety of wildlife species use the different plant communities present in the WAU. The various vegetation types provide habitat to over 200 vertebrate species and thousands of invertebrate species. Forty-one animal species are of special concern because they are federally threatened (FT), endangered (FE), Bureau sensitive (BS) or Bureau assessment species (BA). In addition to these species, the Standards and Guidelines in the Record of Decision (ROD) for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (USDA and USDI 1994b), lists species to survey and manage for in Oregon, Washington, and California (USDA and USDI Appendix J2 1994a).

a. Threatened and Endangered Species

Five species known to occur in the Roseburg District are legally listed as federally threatened (FT) or federally endangered (FE). These include the American Bald Eagle (Haliaeetus leucocephalus) (FT), the Marbled Murrelet (Brachyramphus marmoratus) (FT), the Northern Spotted Owl (Strix occidentalis caurina) (FT), the Peregrine Falcon (Falco peregrinus anatum) (FE), and the Columbian White-tailed Deer (Odecoilus virginianus leucurus) (FE). The northern spotted owl is the only federally listed threatened or endangered species known to occur within the DD WAU.

1) The Northern Spotted Owl

The northern spotted owl is found in the Pacific Northwest, from northern California to lower British Columbia in Canada. The geographic range of the northern spotted owl has not changed much from its historic boundaries. However, available habitat historically used by spotted owls has changed to the point that owl population numbers have declined and distribution rearranged. These changes are considered to be a result of habitat alteration and removal by timber harvest, fire, and land development (Thomas et al. 1990). An extensive review of the history, biology, and spotted owl population changes is available elsewhere (Thomas et al. 1990, USDI 1992a).

In the Deadman/Dompier WAU, the spotted owl is found in ten areas on BLM administered land and one area on Forest Service administered land. Suitable forest habitat where spotted owls are located are known as spotted owl activity centers or master sites. Based on direction in the SEIS ROD, all activity centers in matrix lands located prior to January 1994 must be protected by maintaining the best 100 acres of suitable habitat in the vicinity of known owl sites. Seven owl sites within the Deadman/Dompier WAU are protected with 100 acre activity centers (core areas).

Habitat important to the spotted owl was identified by Roseburg District BLM biologists based upon on-the-ground knowledge, inventory descriptions of forest stands, and known characteristics of the forest structure. These habitats have been named Habitat 1 (HB1) and Habitat 2 (HB2). Habitat 1 describes forest stands that provide nesting, foraging and resting components. Habitat 2 describes forest stands that provide foraging and resting components but lack nesting components. Other areas not fitting into the HB1 or HB2 category and greater than 40 years old are considered dispersal habitat. Dispersal habitat refers to forest stands greater than 40 years of age that provide cover, roosting, foraging, and dispersal components spotted owls use while moving from one area to another (Thomas et al. 1990, USDI 1992a; USDI 1994). Tables 14 and 15 give the acres of HB1 and HB2 present in the Deadman/Dompier WAU. Map 9 shows suitable habitat on BLM and Forest Service administered lands in the DD WAU.

Table 14. Spotted Owl Suitable Habitat Within The Deadman/Dompier WAU.**

	BLM (% of TOTAL BLM SUITABLE HABITAT)	USFS*	PERCENT OF SUM OF TOTALS	TOTALS
Suitable Habitat (SHB1&SHB2)		5,049	50	5,049
SHB1	2,191 (43%)		22	2,191
SHB2	2,943 (57%)		29	2,943
Total	5,134	5,049	100	10,183

*Suitable habitat on Forest Service administered land is based on stands 80 years old and older.

Map 9. Deadman/Dompier WAU Suitable Spotted Owl Habitat

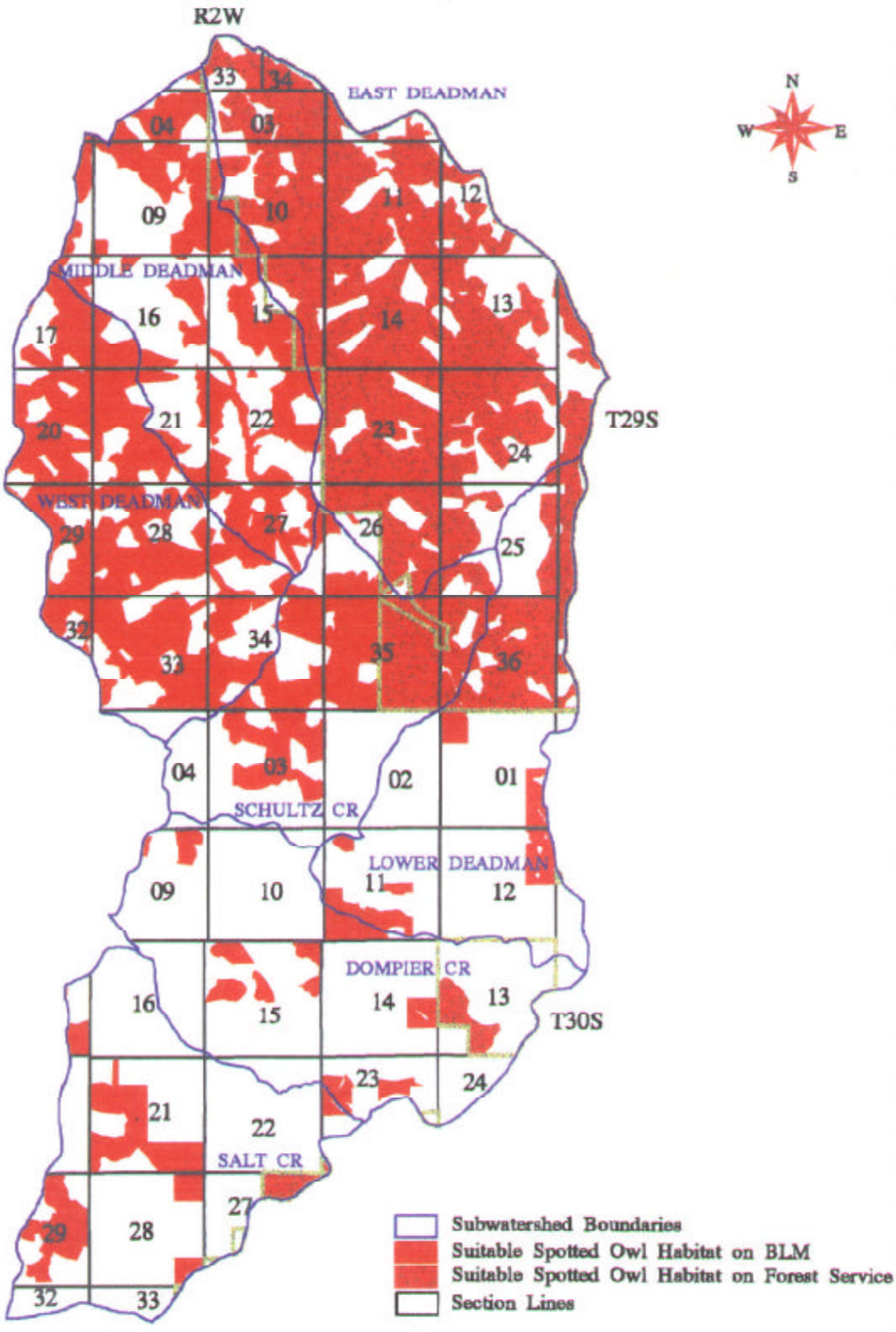


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Table 15. Number of Acres and Percent Of the Deadman/Dompier WAU in Habitat 1 and Habitat 2. (Includes Only Federal Land)

HABITAT 1	HABITAT 2	HABITAT 1 AND 2 (USFS)	TOTAL AREA IN DEADMAN/DOMPIER WAU
2,191	2,943	5,049	25,735
9%	11%	20%	100%

** See text for definition of habitat 1 & 2.

Another habitat component that can be measured is the amount of 50-11-40 acres. This number (50-11-40) refers to the condition where 50% of forested land within a quarter township is composed of 11 inch diameter trees with a minimum of 40% canopy closure (Thomas et al. 1990). This habitat condition is important as dispersal habitat outside of Late-Successional Reserves (LSR). Table 16 gives the acres of 50-11-40 present in the Deadman/Dompier WAU in each quarter township that overlaps the WAU boundary. Four quarter townships overlap the WAU but are outside the South River Resource Area boundary (Table 16).

Table 16 shows the amount of 1140 acres available per quarter township. Another way to view this, is to look at the 1140% column; the percent shown includes the level above 50% for the township.

Critical Habitat for the Recovery of the Northern Spotted Owl

The Deadman/Dompier WAU boundary overlaps critical habitat unit (CHU) OR-29, designated by the United States Fish and Wildlife Service (USDI 1992b) for the recovery of the northern spotted owl under the Endangered Species Act of 1973, as amended. Gross acres for this critical habitat unit are 97,151 acres. Bureau of Land Management administered lands make up 12 percent (11,654 acres) and Forest Service administered lands make up 88 percent (85,497 acres) of CHU-OR-29. Of the 11,654 BLM acres, 67 percent (7,576 acres) is suitable spotted owl habitat (Chris Cadwell, November 1992 Final Critical Habitat, OSO). Federally administered lands (BLM and USFS) in the Deadman/Dompier WAU and within CHU-OR-29 equals 10,028 acres. The portion of the Deadman/Dompier WAU that overlaps CHU-OR-29 contains 6,428 acres (64%) of suitable spotted owl habitat (4,978 BLM acres and 1,451 USFS acres).

Table 16. Acres of 50-11-40 Habitat In The Deadman/Dompier WAU.

QUARTER TOWNSHIP	TOTAL AVAILABLE	1140 ACRES	1140 AVAILABLE	1140 %
28-02-SE[A]	ND	ND	ND	ND
28-02-SW[B]	1,371	1,211	526	88
29-01-NW[A]	ND	ND	ND	ND
29-01-SW[A]	ND	ND	ND	ND
29-02-NW	4,374	3,014	727	66
29-02-NE	457	168	0	37
29-02-SE	2,211	1,230	125	56
29-02-SW	5,732	4,147	1,276	72
30-01-NW[A]	ND	ND	ND	ND
30-02-NE	1,768	799	0	45
30-02-NW	2,310	1,453	298	63
30-02-SE	254	192	70	79
30-02-SW	1,527	875	112	57
TOTALS	20,004	13,089	3,134	65

TOTAL AVAILABLE: Total forested acres including 50-11-40 acres.
1140 ACRES: Amount of 50-11-40 acres in the total forest acres.
1140 AVAILABLE: Number of acres above the 50% level of total acres available.
1140%: Percent of 50-11-40 acres in the township (1140 acres/total available).
A- Quarter township within the WAU boundary but outside the South River Resource Area.
B- Quarter township overlaps small portion of BLM land in the northern tip of WAU.
ND- No Data available

2) The American Bald Eagle

Historic distribution of the bald eagle included the entire northwestern portion of the United States (California, Oregon, Washington), Alaska, and western Canada. Bald eagle populations probably started declining in the 19th century but noticeable declines in numbers did not start until the 1940s (USDI 1986).

Throughout the North American range, drastic declines in bald eagle numbers and reproduction occurred between 1947 and the 1970s. In many places, the bald eagle disappeared from the known breeding range. The reason for this decline was the impact organochloride pesticide (DDT) use had on the quality of egg shells produced by the eagles (USDI 1986). Bald eagle

numbers probably declined on the Roseburg District because DDT was used in much of western Oregon from 1945 to the 1970s (Henny 1991). Other causes of eagle decline included shooting and habitat deterioration (Anthony et al. 1983). Historically, the removal of old growth forests near major water systems (e.g., South Umpqua River) contributed to habitat deterioration through loss of bald eagle nesting, feeding, and roosting habitat.

Data collected by Fierstine and Anthony (1978) found no bald eagle nest sites in the South Umpqua Planning Unit (SUPU), an area included within the current boundary of the DD WAU. In 1979, the Roseburg District Biologist believed the SUPU was "never a high density nesting area, but prior to timber harvest activities adjacent to the South Umpqua River the carrying capacity in the planning unit could have been as high as four nesting pairs" (SUPU 1979).

Current information collected from yearly inventories (1971-1995) by Isaacs and Anthony (1995) of known bald eagle sites does not list any sites, nests, or territories along or near the South Umpqua River within the DD WAU. This portion of the South Umpqua River is considered possible winter habitat but no data is available to support this. Potential bald eagle habitat is present in the southern portion of the WAU. There are 252 acres of BLM administered lands and 152 acres on Forest Service administered land within one mile of the South Umpqua River that may be suitable bald eagle habitat. Sporadic observations and reports of bald eagles along the South Umpqua River may represent migrating individuals. Midwinter surveys, from Days Creek to Melrose, have not detected bald eagles wintering along this stretch of the South Umpqua River (Isaacs 1995). On occasion, bald eagles are observed during the winter but the eagles do not stay and do not appear to use the area as a long term wintering ground.

3) The Peregrine Falcon

In Oregon, peregrine falcons were a "common breeding resident" along the Pacific coastline and were present in many areas including southwestern Oregon (Haight 1991). Peregrine falcon populations in the Pacific Northwest declined because of organochloride pesticide use, shooting, other chemicals (avicides, such as organophosphates) used to kill other bird species considered pests, and habitat disturbance (loss of wetlands, loss of fresh water marsh environments in interior valleys, and increased rural development) (Aulman 1991).

Although the peregrine falcon occurs in the South River Resource Area (reported sightings) no nest locations are known within the DD WAU. Some areas in the Deadman/Dompier WAU have exposed bedrock as a result of erosion and other geological processes. An aerial photo evaluation and some ground evaluation show that this WAU lacks the rock outcrops or cliff habitats usually used by peregrine falcons. The Upper South Myrtle Watershed west of the DD WAU contains areas which have physical materials and structures that qualify as possible peregrine falcon habitat. These areas are approximately three to five miles from the Deadman/Dompier WAU boundary. An evaluation of potential peregrine habitat in the DD WAU is ongoing. Inventorying and evaluating potential suitable peregrine falcon habitat in the Deadman/Dompier WAU started in 1995 and continued in 1996.

4) The Marbled Murrelet and The Columbian White-tailed Deer

The marbled murrelet is found in the Roseburg District, but is unlikely to be found in the Deadman/Dompier WAU. The western edge of the WAU is 78 air miles inland from the Oregon coast, which is beyond zone 2 established by the northwest forest plan (USDA and USDI 1994b) and the 50 mile zone used by the BLM. Because of this, the Deadman/Dompier WAU will not be surveyed for the presence of the marbled murrelet.

Another species, the Columbian white-tailed deer, is not present in the WAU. Historically this species may have been present in the lower elevations of the WAU. Today the known population of this species is located northeast of Roseburg, in oak savannah type habitats, approximately 20 air miles from the northern boundary of the WAU.

5) Remaining Species of Concern

Other animal species of concern not threatened or endangered, fall into either a federal candidate, Bureau sensitive, or Bureau assessment category. For species of concern located on the Roseburg District, no federal candidate species occur on the Roseburg District, 23 are Bureau sensitive, and 14 are Bureau assessment species.

Although there is information about the biology and habitat requirements of these species, population levels and current distribution are not available. Many of these animals require unique features (ponds, seeps, caves, or talus) found throughout the landscape and associated vegetation cover. In the DD WAU, the forest inventory of age classes is available, but the distribution patterns and abundance of unique habitats are not available at this time.

An inventory of amphibians in the South River Resource Area was completed in 1994 (Bury 1995). This inventory documented the amphibian species in the area. A species like the spotted frog is not expected in the WAU and was not found during the 1994 inventory. The tailed frog is present in the vicinity of the DD WAU. This species serves as an indicator of watershed water quality, because of its sensitivity to changes in sediment loads and water temperature. Two other species, the Cascades Frog and the Southern Torrent salamander (Rhyacotriton variegatus) were documented in the WAU.

Amphibian species such as the northern red-legged frog, foothill yellow-legged frog, and clouded salamander have been documented in the South River Resource Area and are suspected to occur in the DD WAU. These amphibian species use unique habitats that are often found across vegetation classes. These unique habitats include large down woody material, talus slopes, creeks, seeps, ponds, and wetlands. These features are abundant throughout the WAU.

During the summer of 1994, a survey to identify the bat species present in the South River Resource Area was conducted under contract by Dr. Steve Cross of Southern Oregon College, Ashland, Oregon. Bat species use unique habitats like caves, talus, cliffs, snags, and tree bark for roosting, hibernating, and maternity sites. In addition they will utilize other unique habitats

(ponds, creeks, and streams) for food and water. Special status bat species are present in the Roseburg District and are expected to occur in the DD WAU.

Mammals like the white-footed vole and the red tree vole, which have a geographic range that includes the Roseburg District, are expected to be present in the DD WAU. Information about the biology and life history of the white-footed vole is limited (Marshall 1991). This species is associated with riparian zones, woody materials, and heavy cover. More recent information suggests an association with mature forests (Marshall 1991). The red tree vole is an arboreal rodent, which lives inside the canopy of trees in Douglas-fir forests of Oregon and Northern California. It's primary food is the needle of the Douglas-fir, but needles from Sitka spruce, western hemlock, and grand fir are also eaten by red tree voles (Huff et al. 1992). Surveys have not been done for these species.

Information about the Northern goshawk is readily available (Marshall 1991). However, most of the work with this species has been done east of the Cascades. Current geographic distribution suggests that the goshawk would not be expected in most of the Roseburg District. However, observations recorded since 1984, show the goshawk is present north of the expected distribution range. In the early 1980s, two nest sites were found on the Roseburg District but were not located within the DD WAU. Surveys to detect adult goshawks and/or goshawk nesting sites were conducted in 1995 in adjacent watersheds. Goshawks were not detected but surveys in these areas will continue. Eventually surveys will be conducted in the Deadman/Dompier WAU.

Suitable spotted owl habitat has physical characteristics which makes it potential goshawk habitat. Stands greater than 70 years old in the northern portion of the DD WAU are considered potential goshawk habitat. These larger areas of continuous forest habitat increase the chance goshawks will use the area for territories and nesting.

The DD WAU supports bird of prey species common to the region but estimates of local populations are not available. Raptor species are present and occur where suitable habitat is present.

Some information is available about ospreys. This WAU has the South Umpqua River as the south boundary. The river provides ideal hunting habitat for ospreys and nesting habitat is present on BLM or private land along the river. In the WAU, osprey nesting habitat is present within approximately one half mile of the river. Osprey surveys have been conducted along the section of the river in the WAU. One osprey nest is present in BLM forest stands in this portion of the WAU. This information is based on osprey survey data collected from 1989 to 1995. Two other nest sites along this stretch of the river are located on private lands.

6) Neotropical Species

Oregon has over 169 bird species that are considered neotropical migrants; these birds breed north of Mexico and migrate south to Mexico, Central America, and South America to spend the winter. Over 25 of these species have been documented to be declining in numbers (Sharp 1990).

Widespread concern for neotropical species, related habitat alterations, impacts from pesticide use, and other threats began in the 1970s and 1980s (Peterjohn et al. 1995). Population trends of neotropical migrants in Oregon show declines and increases. Oregon populations of 19 bird species show statistically significant declining trends while nine other bird species show significant increasing trends (Sharp 1990). Including all species that show declines, increases, or almost statistically significant trends as a proportion of routes there are a total of 33 decreasing species and 12 increasing species in Oregon (Sharp 1990).

During 1993, 1994, and 1995 neotropical birds were captured and banded, and habitat evaluations were conducted. However, none of this work was done in the higher elevations common in the DD WAU. General observations of neotropical birds indicate various habitat types and age classes are used by neotropical bird species during migration and the breeding season. No information is available about the local neotropical bird population numbers in the DD WAU.

7) Big Game Species (Elk and Deer)

Historically, the range of Roosevelt Elk extended from the summit of the Cascade Mountains to the Oregon coast. In 1938, the elk population in Oregon was estimated to be 7,000 (Graf 1943). Elk numbers and distribution changed as people settled in the region. Over time, elk habitat areas shifted from the historic distribution to "concentrated population centers which occur as islands across forested lands of varying seral stages" (SUPU 1979). Information about the historic distribution of elk within the DD WAU and the equivalent Dixon management unit (set by ODFW) is not available. Given the increased number of people in the area, road construction, and home construction, it is suspected that elk numbers have declined as reported in other parts of the region (Brown 1985).

The Deadman/Dompier WAU includes a portion of the Deadman Mountain elk management area, identified in the Roseburg District ROD/RMP (USDI 1995) and the Proposed Roseburg District Resource Management Plan/EIS (USDI 1994). Communication with the Oregon Department of Fish and Wildlife identified this area as lacking current estimates of the elk population (ODFW personal communication). The quality of elk habitat in this management area was evaluated in the Proposed Roseburg District Resource Management Plan/EIS (USDI 1994). Using the Wisdom model (Wisdom et al. 1986), cover quality, forage quality, and road density indices were calculated. All three indices are below the minimum levels considered important for optimum use by elk in the Deadman/Dompier WAU. These numbers are not absolute and serve as a guide to the concerns that should be addressed within these management areas.

The current, and historic, black-tailed deer range is throughout Oregon. During the logging that occurred after WWII, suitable young seral age stands (less than 20 years old) were abundant and black-tailed deer populations increased to the point that liberal hunting seasons were permitted. Overall black-tailed deer numbers remained stable through the late 1970s in the SUPU (1979). Creation of early seral stands as a result of timber harvest benefited deer and elk as a byproduct not as part of a specific management plan for these game species.

Current numbers on the Roosevelt Elk and black-tailed deer populations in the DD WAU are not available (Personal communication from ODF&W). Both species are present and use similar habitats. Elk and deer forage for food in open areas where the vegetation includes grass-forb, shrub, and open sapling communities. Both species use a range of vegetation age classes for hiding. This hiding component is provided by large shrub, open sapling, closed sapling, and mature or old-growth forest communities (Brown 1985).

3. Plants

Field surveys have been conducted for Special Status Plants on portions of the Deadman/Dompier WAU. One Special Status Plant, Astragalus umbraticus (Woodland Milk Vetch), has been documented in the WAU. The woodland milk vetch has been found in the Deadman Watershed on both BLM and Forest Service administered lands.

Astragalus umbraticus; Assessment Species
Woodland milk vetch grows in open woods at low to mid elevations from Southwest Oregon to Northwest California. Woodland milk vetch has been observed in habitat impacted by fire and logging. Research and monitoring on the effects of disturbance has not been conducted (Holmes 1991). It is likely this species has become rarer because of fire suppression activities.

Many suspected "Survey and Manage" plant species, as well as "protection buffer species" identified in the SEIS ROD, have not had surveys conducted since survey protocols have not been developed. For some suspected species, the survey would start at the watershed analysis level with identification of likely species locations based on habitat. The following special status plants have been documented in the South River Resource Area and could be suspected to occur in the DD WAU.

Aster vialis; "Survey and Manage" Species
Aster vialis is a rare locally endemic taxon known only from Lane, Linn, and Douglas Counties in Oregon. It occurs primarily along ridges between Eugene and Roseburg. Aster vialis is not a shade tolerant species. Plant succession resulting in canopy closure of the forest over these plants could be a significant management concern. Long term survival of this species may depend on controlled disturbance of the habitat to allow more light to penetrate the canopy and improve conditions for Aster vialis reproduction. The role of fire is probably important to maintaining viability. Plant vigor and flower production appear to be inversely proportional to canopy coverage (Kaye 1993).

Lupinus sulphureus var. kincaidii
This is one of the three varieties of Lupinus sulphureus found in Oregon. It is known in the Willamette Valley and south into Douglas County, with a disjunct population reported in Lewis County, Washington (Eastman 1990). Lupinus sulphureus has been observed growing in road cuts and jeep trails. Long term survival of this species may depend on controlled disturbance of the habitat to allow more light to penetrate the canopy and improve conditions for lupine reproduction (Kaye et al. 1991).

Cypripedium montanum; Tracking, "Survey and Manage" Species
Cypripedium montanum populations are small and scattered; less than 20 are extant west of the Cascades. Small populations may reflect the slow establishment and growth rate of this species. Cypripedium montanum seems to persist in areas that have been burned. This species ranges from Southern Alaska and British Columbia, south to Montana, Idaho, Wyoming, Oregon, and California. Survival of the species may depend on protection of known populations and development of a conservation plan (USDA and USDI Appendix J2 1994a).

Dichelostemma ida-maia; Tracking Species
The firecracker plant grows in open woods, grassy hillsides, and roadsides from Douglas County, Oregon south through the Siskiyous into California, where it is more common.

Other "Survey and Manage" plant species suspected to occur in the Deadman and Dompier Creek Watersheds include Bryophytes Brotherella roelli, Marsupella emarginata var. aquatica, Ptilidium californicum, Schistostega pennata, and Ulota meglospora; Vascular plants Allotropa virgata, Bensoniella oregana, and Cypripedium fasciculata; Rare False Truffles Gautieria otthii; False Truffles Rhizopogon truncatus; Chanterelles Cantharellus cibarius, Cantharellus subalbidus, and Cantharellus tubaeformis; Noble Polypore (rare and endangered) Oxyporus nobilissimus; Rare Resupinates and polypores Otidea leporina, Otidea onatica, and Otidea smithii; Rare Cup Fungi Aleuria rhenana; Rare Leafy (arboreal) Lichens Hypogymnia duplicata; Rare Nitrogen-fixing Lichens Nephroma occultum and Pseudocyphellaria rainierensis; and Riparian Lichens Usnea longissima. "Protection buffer" species suspected to occur in the Deadman/Dompier WAU include Buxbaumia piperi, Buxbaumia viridis, and Rhizomnium nudum. These species are suspected to occur in the Deadman/Dompier WAU since habitat in this WAU is similar to habitat used by these species.

Noxious Weeds

Noxious weeds have been identified near the Deadman/Dompier Watershed. The encroachment of noxious weeds has been steadily reducing natural resource values. Invasion of noxious weeds is known to dramatically affect native plant communities reducing their abundance and distribution (Bedunah 1992).

The intent of an integrated weed management program is to implement a strategy that will facilitate restoration and maintenance of desirable plant communities and healthy ecosystems. Currently, the Bureau of Land Management has an agreement with the Oregon Department of Agriculture (ODA) where locations of noxious weed invasions are identified and monitored by the BLM and control measures are administered by the ODA.

The following goals are important in the implementation of integrated weed management:
-Inventory by species
-Identification of potential invaders
-Monitoring
-Prioritization of noxious weed species
-Habitat management and restoration

The Yellow Starthistle has been documented near the Deadman/Dompier WAU. Yellow Starthistle (Centaurea solstitialis) has been designated by ODA as a Target weed species. Because of the economic threat to the state of Oregon, action against these weeds will receive priority. Yellow Starthistle is native to dry, open habitats in Southern Europe. A single Yellow Starthistle plant can produce up to 150,000 seeds under optimum conditions. Invasions of Yellow starthistle will be documented for control by ODA. The area will be monitored by BLM for resurgence.

E. Human Uses

1. Timber

Timber harvesting has been the dominant human use within the DD WAU during the past 40 years. Nearly all of the private lands and approximately 51% of BLM administered lands have been harvested. The production of forest products is important to the local economy, providing jobs and revenue to local inhabitants.

2. Minerals

Mineral production is another human use within the WAU. The area has moderate to high potential for locating gold, silver, copper, mercury, lead/zinc, and chromium/nickel deposits. The Maude S and Buena Vista (Umpqua) mines located in the West Deadman and Schultz Creek subwatersheds produced mercury earlier this century, mainly in the 1920's and 1930's. Mineralization occurs along a fault system in the area but the overall size and grade appears to be low.

The construction of roads within the Deadman/Dompier WAU has led to the development and mining of rock quarries to provide surfacing material. Surfacing rock will continue to be in demand in these watersheds, and may be used to reduce sediment and soil runoff through upgrading roads.

The Deadman/Dompier WAU does not contain any rock quarries with good quality rock. These watersheds have been extensively explored resulting in numerous, small, mostly mined out quarries and four larger community pits. Opportunities for reclamation exist at several smaller quarries and one community pit where some reclamation has taken place. Two community pits may be designated regional quarries since they contain reasonably large quantities of rock, even though it is low quality rock that does not stand up to winter traffic. Further investigation,

including core drilling, would be needed to determine if these community pits should be designated regional quarries.

3. Agriculture

There are approximately 547 acres (2%) of agriculture/farm land in the WAU. These lands contain pastures for grazing cattle and sheep, fields for grain production, and farmlands for seasonal crops of fruits and vegetables.

4. Recreation

Lands within most of the South River Resource Area and all of the Deadman/Dompier WAU are managed for dispersed recreation. This management style complies with the Extensive Recreation Management Area designation in the RMP. The mix of land ownership, forest types, and stand ages determines the recreation uses of the area. There are no developed recreation sites within the WAU, nor are there any recreation forms that require a Special Use Permit. The most common forms of dispersed recreation found in this area include driving for pleasure, photography, picnicking, camping, hunting, gathering (berries, flowers, mushrooms, greens, and rocks), and target shooting.

The recreation opportunity spectrum (ROS) designation for the area is Roaded Natural, allowing for a natural appearance, yet still accounting for the moderate evidence of man. Resource modification and utilization practices are evident, but harmonize with the natural environment.

The off highway vehicle (OHV) designation under the RMP is 'Limited' to existing roads and trails, except for some designated areas such as Progeny Test Sites that are listed as Closed to OHV. Under this designation, existing roads and trails are open to motorized access unless otherwise identified (ie. hiking trails). Licensed vehicles may use maintained roads and natural surfaced roads and trails, however, registered OHVs such as All Terrain Vehicles (ATV) and motorcycles not licensed for the public roads may only use existing roads and trails that are not maintained.

The majority of lands in the Deadman/Dompier WAU are classified as visual resource management (VRM) Class IV. The objective is to provide for management activities that allow major modifications to the existing character of the landscape. The level of change to the character of the landscape can be high. Management activities may dominate the view and may be the major focus of the viewer's attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture.

A small portion of the WAU (the north half of T 30 S, R 2 W, sec. 23) is classified as VRM Class III. These are BLM lands that lay within three quarters of a mile of the South Umpqua River, and are mapped on district VRM Themes. The objective of the Class III lands is to retain

the existing character of the landscape. Management activities may attract the attention of the viewer, but should not dominate the landscape.

Potential recreation development includes trails from Red Top Pond to Windy Camp, from Windy Camp to Tin Hat Pond, along the Middle Fork of Deadman Creek from Red Top Pond to the confluence with the mainstem of Deadman Creek, and a wildlife/wetlands trail around Red Top Pond. Other developments may be an equestrian camp near Red Top Pond for accessing the Red Top to Windy Camp trail and future trail extensions and a boat ramp near Pickett Bridge on the South Umpqua River bank across from the WAU.

The Myrtle Creek to Canyonville Scenic Historic Tour Route travels along County Rd. 1, and BLM and Forest Service roads, basically following the North, East, and South boundaries of the WAU. Along the south and southeast boundaries of the WAU the Tour Route follows the South Umpqua River. The South Umpqua River was identified in the RMP as having potential for designation as a wild and scenic river, but did not meet minimum suitability requirements.

IV. Interpretation of Information and Recommendations

A. Vegetative Condition

Although private and Forest Service administered lands are a major component of this Watershed Analysis Unit, the focus of interpretation will be on BLM administered lands. Private lands are in a constant state of change, and although we can assume that stands more than 30 years old will continue to be harvested, we cannot predict the timing or amount of harvest. Forest Service administered lands are in the Matrix land use allocation established by the SEIS ROD, and could be expected to be managed following the SEIS ROD Standards and Guidelines.

Bureau of Land Management administered lands available for intensive forest management are those lands outside Riparian Reserves and other withdrawn areas. The WAU contains approximately 6,072 acres (56%) that are available for intensive forest management. Based on the age class of the various stands, they would be available for the following treatments.

Age Class: < 10 Years Old
Treatments prescribed for this age class would be those designed to promote the survival and establishment of conifers and other vegetation by reducing competition from undesired plant species and protecting them from natural hazards. Maintenance and protection actions would include mulching, cutting or pulling unwanted species, grazing, herbicide application, tubing/netting, shading, and trapping. Survival of sugar pine seedlings may depend upon planting blister rust resistant seedlings in mixtures with other species.

Age Class: 10-20 Years Old
Treatments prescribed for this aggregation of age classes would involve precommercial thinning and release designed to control stand density, maintain stand vigor, and influence species

dominance. Thinning in Riparian Reserves would occur with the specific objective of hastening the restoration of large conifers to areas where they are currently deficient. Fertilization would be employed after thinning to augment the supply of soil nutrients, further enhancing stand growth. The WAU appears to have high Ribes populations and summer weather conditions favorable for the blister rust fungus. Pruning and thinning may improve sugar pine survival in plantations by making the microclimate drier and less favorable for blister rust. Pruning sugar pine to a height of ten feet eliminates many of the most favorable infection sites.

Age Class: 30-70 Years Old
Treatments prescribed for this age class would be pruning and commercial thinning. These activities would enhance wood quality through the production of clear wood, increase timber yields through the harvest of merchantable trees that would otherwise be lost due to mortality, and improve the growth rates of residual trees. Timing of thinning activity would depend on stand density, minimum average diameter for an economic entry, site quality, and previous silvicultural treatments, but would not likely occur before age 35. Thinning in Riparian Reserves would occur with the specific objective of hastening the restoration of large conifers to areas where they are currently deficient.

Age Class: 80 Years Old and Older
Treatments prescribed for this aggregation of age classes could involve commercial thinning, density management, or regeneration harvest depending upon the Land Use Allocation (General Forest Management Area versus Connectivity). For GFMA, regeneration harvest with a retention of six to eight green conifers per acre greater than 20" in diameter would be programmed at culmination of mean annual increment (CMAI). Culmination of mean annual increment is at 80 to 110 years on the average for this area. For Connectivity, commercial thinning and density management would be the priority harvest in stands less than 120 years old. Regeneration harvest resembling a shelterwood cut with a retention of 12 to 18 green conifers per acre greater than 20" in diameter would be programmed using a 150 year rotation.

The Deadman/Dompier WAU contains approximately 5,180 acres (48%) in stands 80 years old or older, with 2,525 acres (23%) 200 years old or older. The Deadman Watershed contains 50% in stands 80 years old or older, while 38% of the Dompier Creek Watershed is in stands 80 years old or older.

Management direction from the Roseburg District RMP states that 15 percent of all federal lands, considering all land use allocations, within fifth field watersheds should remain in late-successional forest stands. By determining the percentage of Riparian Reserve acres in older age classes for each watershed, it is possible to gain a general idea of how much late-successional forest stands are in this reserved land use allocation and how well the Riparian Reserves are currently meeting the objectives. At this time, 20 percent of the Deadman Watershed and 16 percent of the Dompier Creek Watershed are stands 80 years old or older and located in the Riparian Reserves.

Management direction for Connectivity Blocks are to maintain 25 to 30 percent of each block in late-successional forest at any point in time. The percentage of habitat includes stands in other land use allocations, such as Riparian Reserves (USDI 1995). There are approximately 4,002 acres of Connectivity Blocks within the Deadman/Dompier WAU, approximately 46 percent are in stands 80 years old or older. Approximately 23 percent of Connectivity Blocks within the WAU are in late-successional stands (80 years old and older) and within Riparian Reserves or other withdrawn areas. The Connectivity Blocks in the Dompier Creek Watershed contain 31 percent late-successional habitat within Riparian Reserves and withdrawn areas and the Deadman Watershed contains 21 percent. In order to maintain at least 25 percent of each block in late-successional forest, at least 95 acres in stands 80 years old or greater in the Deadman Watershed outside of Riparian Reserves and withdrawn areas would need to be retained at this time.

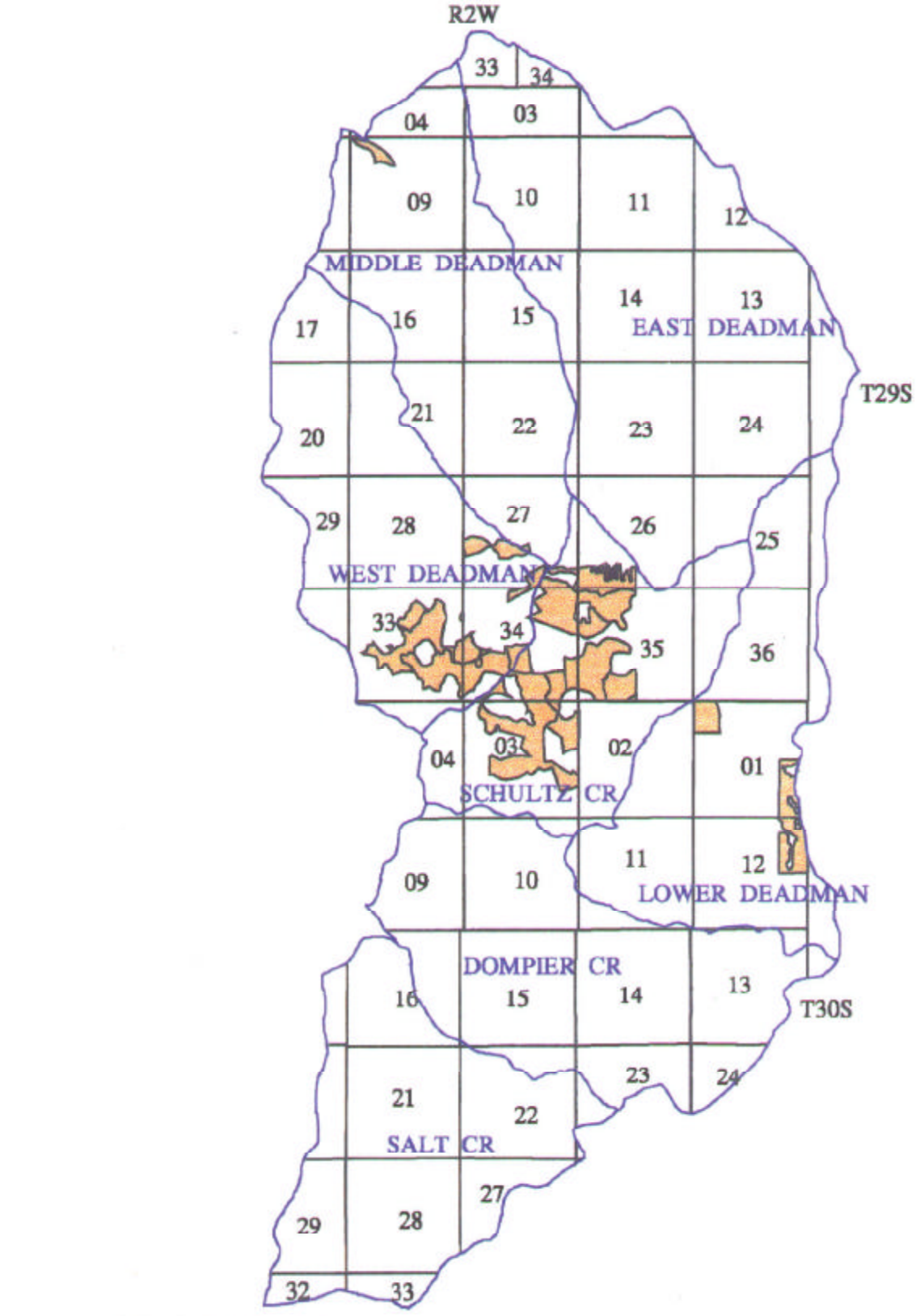
Matrix lands within the Deadman/Dompier WAU are to be managed for timber production to help meet the Probable Sale Quantity (PSQ) established in the Roseburg District RMP. Table 17 shows acre estimates of GFMA and Connectivity land use allocations to be harvested per decade. If the Matrix lands are harvested at this rate, all of the stands greater than 80 years old in the WAU will be harvested in approximately 40 years.

Table 17. Acres of Proposed Harvest (per decade) in Matrix in the DD WAU.

Watershed	Acres of GFMA per decade	Acres of CONN per decade
Deadman	409	69
Dompier Creek	53	10

Forest health and timber management concerns in the Deadman/Dompier WAU include the decline and mortality of large sugar pine and blowdown from recent storms. Activities to control or prevent epidemic outbreaks of bark beetles may include the following. 1) Thinning around sugar pines greater than 14 inches at DBH that appear to be healthy to reduce competition. Basal area around each sugar pine should be reduced to below 140 square feet per acre. All trees from under the sugar pines and within 10 to 20 feet of the projected drip line of their crowns should be removed (Goheen 1994). Unless preventive measures are taken, sugar pine could be virtually eliminated from these watersheds. Map 10 shows possible locations where sugar pine may be thinned around to improve their health and protect them from bark beetle attacks. 2) Salvage logging down material before the second spring following the blowdown event may limit additional tree mortality. If large amounts of slash or numerous broken and windthrown trees are available when adult bark beetles emerge from the trees, large populations can build up by mid-summer and significant numbers of nearby standing trees may be attacked (Southwest Oregon Forest Insect and Disease Technical Center 1996). Trees killed by bark beetles may be retained as snags or could be salvaged for lumber. Salvaging trees already killed by bark beetles will not affect insect populations nor reduce the risk of insect attack of other trees. By the time that foliage changes color and beetle-infested trees are readily detectable, the next generation of insects has already emerged from that tree. The benefit from salvaging the dead trees would be to reduce the risk of a wildfire in the area.

Map 10. Stands Greater Than 80 Years Old Containing Large Sugar Pine in the Deadman/Dompier WAU



B. Soils / Erosion

The main soils related concern is focused on the granitic soils. Past management practices have shown that these soils are fragile and not very resilient. Management activities on granitic soils should follow or adhere to Best Management Practices. On-site investigation by a soil scientist is recommended for any ground disturbing activity on granitic soils.

Best Management Practices (BMPs) should be applied during all ground and vegetation disturbing activities. See Appendix D, Roseburg District Record of Decision and Resource Management Plan (USDI 1995) for a list and explanation of BMPs. Along with the BMPs, the Standards and Guidelines brought forth from the Record of Decision (USDA and USDI 1994) should be implemented in order to achieve proper soil management. Best Management Practices should be monitored for implementation and effectiveness in order to document if soil goals are being achieved.

C. Hydrology / Water Quality

The DD WAU has been heavily managed within the past 35 years, contributing to high road densities, high stream crossing densities, low hydrologic recovery percentages in some sub-watersheds, and evidence of elevated peak flows. The watershed seems to route sediment efficiently, but swift moving water erodes streambanks and ultimately increases the width to depth ratios. The lack of Large Woody Debris in most stream reaches does not attenuate the effects of peak flows. The overall hydrologic recovery for the WAU is 78%, with several sub-watersheds at or below the 75% guideline. The Snow Water Equivalent data indicates water is available for runoff from rain-on-snow events throughout most of the WAU. A high potential exists for road-related landslides and culvert failures to occur. Rosgen Level 2 classification stream surveys would identify changes to channel stability. The Rosgen Level 2 classification employs field techniques to address questions of sediment supply, stream sensitivity to disturbance, potential for natural recovery, channel responses to changes in flow regime, and fish habitat potential.

Recommendations include deferring scheduled regeneration harvests for at least ten years in some subwatersheds, decreasing road densities in the WAU, continuing stream temperature monitoring, and conducting Rosgen Stream Classification surveys and Proper Functioning Condition Assessments. Defer scheduled regeneration harvesting activities for at least ten years in the East, West, and Middle Deadman subwatersheds so that they may recover hydrologically. Strive for a net decrease in road densities in the WAU, especially in the East, West, and Middle Deadman subwatersheds. One road to possibly decommission is the road along Deadman Creek above the Middle Fork of Deadman Creek. This segment of road does not allow riparian areas to widen and contributes sediment to Deadman Creek.

D. Fisheries

The available aquatic habitat data suggests the fisheries resource has been negatively influenced by past human management activities within the Deadman/Dompier WAU. Limiting factors affecting the fisheries resource are similar for each watershed but have different levels of effects on the aquatic system. Harvesting practices reduced the LWD component left adjacent to stream channels. Roads were constructed adjacent to streams and harvest activities took place in the draws further reducing the future recruitment of LWD into the stream channel. Roads located in Riparian Reserves are considered a high priority for renovation, obliteration, or decommissioning due to their location and direct influence on the stream system (PRMP/EIS Chapter 2-58&59).

Riparian Reserves aid in mitigating the adverse impacts associated with sedimentation. The Riparian Reserves in the DD WAU are currently in a less than properly functioning condition according to the NMFS guidance presented in the Matrix of Factors and Indicators in Appendix C (see Table 18). Riparian Reserves with greater than 80 percent in late seral conditions (greater than 80 years old) are considered to be in a properly functioning condition. Stands greater than 80 years old are assumed to be in a properly functioning condition because they provide Large Woody Debris, shade and favorable microclimatic conditions, litter used in nutrient cycling, and substantial root strength providing streambank and upslope soil stability. In the majority of the DD WAU Riparian Reserves would reach properly function conditions in approximately 60 to 70 years (see Table 18).

Table 18. Deadman/Dompier WAU Future Riparian Reserve Conditions

AREA	Current % of Riparian Reserves Greater than 80 Years Old	Year when Riparian Reserves have Greater than 80% Stands Greater than 80 Years Old
East Deadman	23	2062
Lower Deadman	81	1994
Middle Deadman	37	2063
Schultz Creek	59	2056
West Deadman	63	2056
Dompier Creek	40	2050
Salt Creek	60	2067

Beneficial uses associated with these watersheds differ to a certain degree. These watersheds provide water for irrigation and land for timber production and for the extraction of minerals.

Impacts associated with each activity eventually influence the habitat conditions of the aquatic system.

These watersheds are influenced by ownership patterns and different land management schemes and objectives associated with a variety of land owners and administrators. The recovery of at-risk and depressed stocks of anadromous salmonids within these watersheds may be difficult due to the ownership pattern. Cooperative agreements between county, state, and federal agencies, and private landowners should be fostered to encourage the rehabilitation and restoration of aquatic habitats.

The BLM administers land along resident fish bearing streams upstream of the privately owned lands along Deadman, Dompier, Salt, and Slate Creeks. The BLM may affect water quality and anadromous fish bearing streams located on private land by diligently applying Best Management Practices in the Roseburg District RMP/ROD (USDI 1995) and the Standards and Guidelines in the SEIS ROD (USDA and USDI 1994b).

The combination of high road densities and recent timber harvesting activities indicate limiting management activities within some subwatersheds in the Deadman/Dompier WAU. Road densities are greater than five miles per square mile in every subwatershed. The Deadman/Dompier WAU is within a Tier 1 Key Watershed which are priority areas for restoration and where no net increase in roads should occur. Road decommissioning, restoration, and renovation are strongly recommended due to the relatively high road densities. The priorities would be roads providing the greatest threat to aquatic and fisheries resources. Transportation Management Objectives (TMOs) would identify priorities for road decommissioning, restoration, and renovation opportunities in the DD WAU.

Undersized or old, dilapidated culverts located in fish-bearing streams should be replaced with structures that would accommodate a 100-year flood event. The new structure should also provide passage for anadromous and resident fish (USDI 1995). The location of culverts to be replaced would be noted in the TMOs or on the fish distribution maps.

The disturbance history and amount of recent timber harvesting activities suggests some subwatersheds in the DD WAU have been heavily impacted in the past 30 years. Approximately 28 percent of the West Deadman and 43 percent of the Middle Deadman subwatersheds have been harvested in the past 30 years. Also, within the past ten years approximately 579 acres (17 percent) of the Middle Deadman subwatershed has been harvested. From fisheries and water quality concerns scheduled regeneration harvests should be deferred for approximately ten years in the West Deadman subwatershed and for approximately ten to 20 years in the Middle Deadman subwatershed.

Approximately 35 percent of the BLM administered lands in the Deadman Watershed have been harvested in the past 30 years (see Table 19). Using the estimated decadal harvest of 478 acres in the Deadman Watershed the percentage of acres less than 30 years old would increase slightly to 36 percent after the first decade (1995 to 2004). The percentage of acres less than 30 years

old would decrease to 24 percent after harvesting 478 acres the second decade (2005 to 2014). After the third decade of a harvest level of 478 acres the percentage of acres less than 30 years old would decrease to 17 percent which would be sustained at this level when 478 acres are harvested per decade.

Table 19. Percent of Deadman Watershed Less Than 30 Years Old.

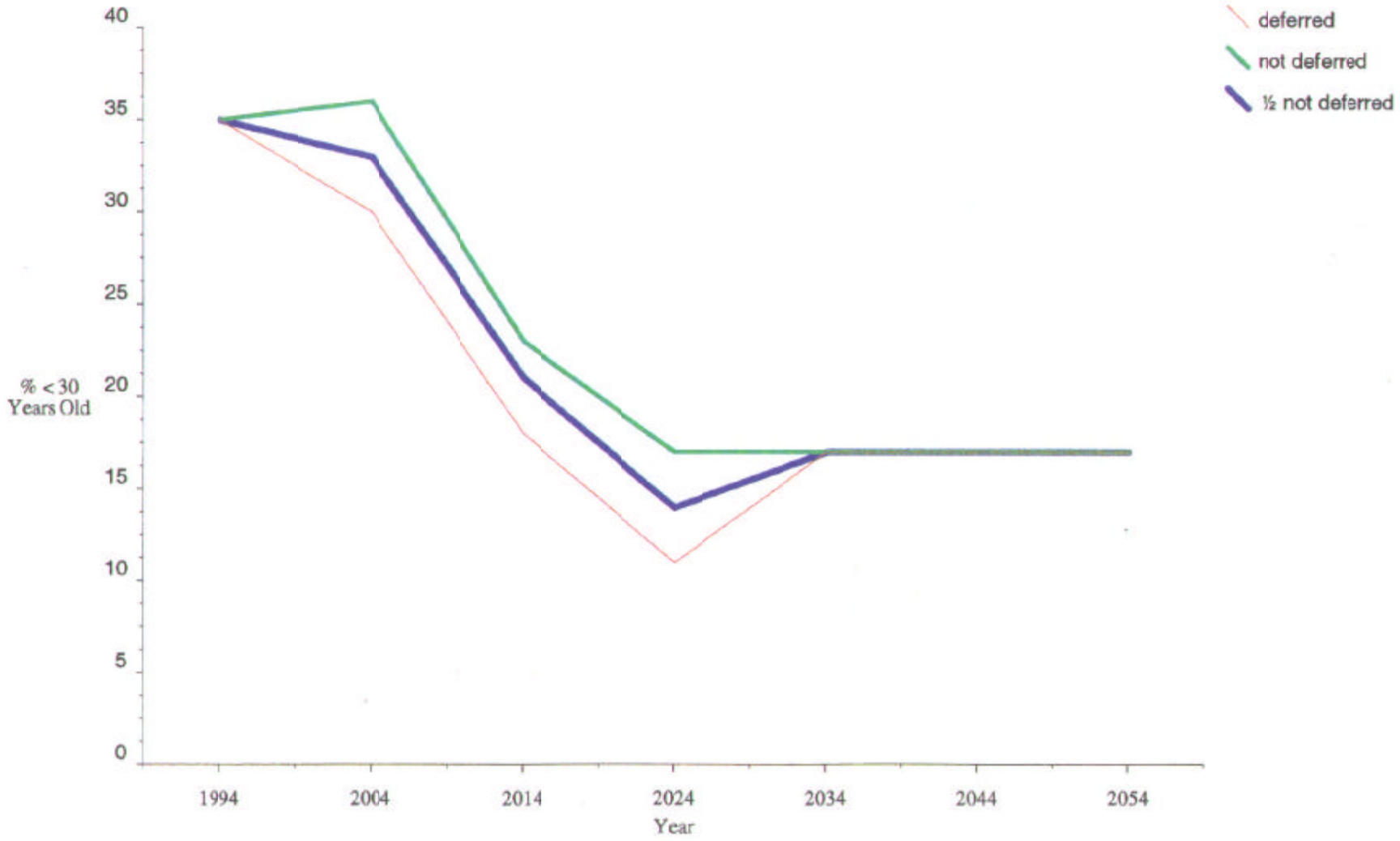
Year	Not Deferred	Deferred (Scenario 1)	Half of the Acres Deferred (Scenario 2)
1994	35	35	35
2004	36	30	33
2014	23	18	21
2024	17	11	14
2034	17	17	17
2044	17	17	17
2054	17	17	17

Two alternative scenarios that may be considered are deferring scheduled regeneration harvests for the first decade (scenario 1) or harvesting at a level of half the estimated number of acres (239 acres) to be harvested in the Deadman Watershed (scenario 2). The results of the analysis using these two scenarios are given below and shown in Graph 5.

Scenario 1

1. By deferring scheduled regeneration harvests for the first decade (1995 to 2004) the percentage of acres less than 30 years old would decrease from the current 35 percent to 30 percent.
2. After deferring scheduled regeneration harvests for the first decade and harvesting the estimated harvest level of 478 acres in the Deadman Watershed the second decade (2005 to 2014) the percentage of acres less than 30 years old would decrease to 18 percent.
3. After deferring scheduled regeneration harvests for the first decade, harvesting the estimated harvest level of 478 acres in the Deadman Watershed the second decade, and harvesting the estimated harvest level of 478 acres in the Deadman Watershed the third decade (2015 to 2024) the percentage of acres less than 30 years old would decrease to 11 percent.
4. After four decades under this scenario the percentage of acres less than 30 years old would increase to 17 percent which would be sustained at this level when 478 acres are harvested per decade.

Graph 5. Projected Number of Acres Less Than 30 Years Old in Deadman Watershed



Scenario 2
1. By harvesting only half (239 acres) of the estimated number of acres to be harvested in the Deadman Watershed in the first decade the percentage of acres less than 30 years old would decrease from the current 35 percent to 33 percent.
2. After harvesting 239 acres in the Deadman Watershed in the first decade and harvesting the total estimated number of acres (478 acres) in the second decade the percentage of acres less than 30 years old would decrease to 21 percent.
3. After harvesting 239 acres in the Deadman Watershed in the first decade, harvesting the total estimated number of acres (478 acres) in the second decade and 478 acres in the third decade the percentage of acres less than 30 years old would decrease to 14 percent.
4. After four decades under this scenario the percentage of acres less than 30 years old would increase to 17 percent which would be sustained at this level when 478 acres are harvested per decade.

Timber harvesting may result in substantial changes to the timing and magnitude of peak and base stream flows and increase sediment in streams. Increased peak flows can alter stream channel stability, size and quantity of bed material, and sediment transport rates. By deferring or decreasing the number of acres scheduled for regeneration harvest, cumulative impacts from regeneration harvests may be reduced.

Activities to consider in the Deadman/Dompier WAU include salvage, commercial thinnings, PCT, road maintenance, road renovation, and road decommissioning. These activities would have minimal negative impacts in the short term and beneficial effects in the long term for the aquatic and fisheries resources.

Surveys should be conducted to collect information on fish diversity/populations, fish distribution, and stream reaches that may benefit from placing LWD into the stream channel in the Deadman/Dompier WAU. Fish diversity/population sampling would locate "hot spots" (productive flats where fish spawn, rear, and/or oversummer), determine the number of species present in the WAU, and estimate the number of fish utilizing the WAU (i.e. population estimates). This survey may be limited for anadromous salmonids in the Deadman Watershed due to the small amount of land BLM administers below Deadman Falls.

Fish distribution surveys determine the upper limits of fish use in a stream. This type of survey is recommended for Dompier Creek (in T30S-R2W-Sec.15) downstream from the surveys conducted in 1996.

Field reviews/surveys determine which stream reaches may benefit from the placement of LWD into the stream channel. Methods used to add LWD could be by felling trees from the adjacent riparian area, pulling trees adjacent to the stream channel, or placing logs and boulders with heavy mechanized equipment (i.e. tracked excavator or rubber tired skidder) into the stream. Potential sources of LWD may be from road side salvage sales, removing hazard trees, removing windfall from road prisms, or from designated stockpile areas where logs and rootwads are placed and stored for use in future instream structure projects.

E. Wildlife

1. Northern Spotted Owl

Within the Deadman/Dompier WAU, eight spotted owl sites are protected with 100 acre activity centers (core areas). Seven of these core areas are on BLM administered lands and one is on Forest Service administered land. Reserved or withdrawn BLM administered lands (including Riparian Reserves) within the Deadman/Dompier WAU total approximately 5,907 acres. The remaining Matrix lands are designated to meet the PSQ. The Roseburg District RMP/ROD (USDI 1995) and the SEIS ROD (USDA and USDI 1994b) identified Matrix lands for timber management while providing for forest connectivity, various habitat types, a variety of forest successional stages, and ecological functions like dispersal of organisms. Managing the timing and spacing of harvest activities in Matrix is important to minimize impacts to spotted owls and other species associated with late-successional habitat.

Connectivity of late-successional forest stands is important in areas with checkerboard ownership. Even birds require connectivity of habitat for traveling between large stands of suitable habitat. The ability to move within the forest from one place to another becomes more important to species that require or have dependency on the older age classes, have small territories, or move along the ground.

The spotted owl is an example of a species that requires habitat connectivity, dispersal areas, and nesting areas. To assist in the decision making process, and to guide the selection of areas where projects, such as timber harvests, roads, or recreation sites may be located, a ranking of the owl master sites using the provincial radius (1.3 or 1.2 miles) and the 0.7 mile radius surrounding each owl site is presented in Table 20. Table 20 also includes information about the status of use, habitat acres, occupation, and reproduction success of owls in these activity centers. Ranking provides an evaluation of the spotted owl sites based on the number of years occupied, number of years unoccupied, general history, reproduction history, habitat present, and professional judgement about the function of a site based on field experience. This ranking is to provide management with a guide and does not represent a clearance as needed, or may affect determination as required by section 7 of the Endangered Species Act (ESA) of 1973, as amended.

Information about dispersal habitat is also presented as a guide. Some quarter townships in the Deadman/Dompier WAU are currently below the 50% threshold for dispersal habitat. The data in Table 16 shows two quarter townships are below the 50% threshold level, two townships are at the 51-59% level, two quarter townships are in the 60-69% level, and three quarter townships are above the 70% level.

Management actions should maintain dispersal habitat at or above 50% in each quarter township and physically connected to other forest areas. Projects that further reduce dispersal habitat in quarter townships currently below 40% should be avoided. Projects planned in quarter townships currently below the 50% level require "may affect" assessment and consultation with the USFWS.

Table 20. Spotted Owl Activity Center Ranking Data within the Deadman/Dompier WAU in the South River Resource Area (1995).

MSNO	YEAR SITE WAS LOCATED	LAST YEAR OF KNOWN ACTIVE PAIR (PAIR STATUS + # JUVENILES)	LAST YEAR OCCUPIED (PAIR STATUS)	No. OF YEARS OF REPRODUCTION/ PAIR STATUS SINCE 1985	ACRES IN PROVINCIAL RADIUS (1.2 MILES)	ACRES IN 0.7 MILE RADIUS	OCCUPANCY RANK	ACRES RANK	HISTORY RANKING
2088	1989	94(P+0J)	95(M+F)	1/4	1,319	592	1	A	2
2089	1989	95(P+0J)	95(P)	2/4	1,069	454	1	D	2
2203	1990	93(P+0J)	93(P)	1/1	253	179	1	D	2
2203A	1995	95(P+0J)	95(P)	0/4	301	99	1	D	3
3102	1992	94(P+2J)	94(P)	2/2	591	279	1	D	1
3102A	1995	95(P+0J)	95(P)	0/1	523	231	1	D	1
3264	1991	92(P+2J)	95(P)	1/2	1,722	632	2	A	1
3795 USFS	1990	90(P+NDJ)	95(P)	0/5	1,578	551	1	A	2
3998	1995	95(P+0J)	95(P)	0/1	820	338	1	C	1
4046	1993	94(P+0J)	95(PU)	0/2	1,804	592	2	A	3

Definitions 8/96

OCCUPANCY RANK - 1: Sites with this ranking have current occupancy and have been occupied by a single owl or pair of owls for the last 3 years; 2: Sites with this ranking have been occupied in the past, show sporadic occupancy by a single owl or an owl pair, or may be currently occupied; 3: Sites with this ranking have not been occupied during the last 3 years.

LAST YEAR OF KNOWN ACTIVE PAIR - Gives the year, pair status and young produced; NP = site has not had a pair; ND = No Data.

ACRES RANK - These acres are in regards to suitable spotted owl habitat. A: These sites have greater than 1,000 acres in the provincial radius and greater than 500 acres within the 0.7 mile radius; B: These sites have greater than 1,000 acres in the provincial radius but less than 500 acres within the 0.7 mile radius; C: These sites have less than 1,000 acres in the provincial radius and greater than 500 acres in the 0.7 mile radius; D: These sites have less than 1,000 acres in the provincial radius and less than 500 acres in the 0.7 mile radius.

HISTORY RANKING - This ranking includes occupancy ranking, reproduction data, acres ranking, habitat evaluation, field experience about the site (location, quality, and forest structure). 1: A site considered stable due to consistent occupation by spotted owls and has produced young consistently; 2: Site is consistently used by spotted owls but reproduction has been sporadic; 3: Site shows no reproduction, occupation has been sporadic, or no occupation.

PAIR STATUS - M = MALE; F = FEMALE; J = JUVENILE; P = PAIR STATUS; (M+F) = TWO ADULT BIRDS, PAIR STATUS UNKNOWN; PU = PAIR STATUS UNDETERMINED; ND = INCOMPLETE OR NO DATA.

NUMBER OF YEARS OF REPRODUCTION/PAIR STATUS SINCE 1985 - The first number gives the number of years with spotted owl reproduction at this site since 1985. The second number gives the number of years for the entire history of the activity center since 1985 (including the original and alternate sites, i.e. 2203A).

Site 3102 and site 3102A are almost at the same location. Both numbers represent the same use area but nest trees are in different forest stands. In this case both locations can be evaluated as one. Other sites that show an alternate (A) designation (e.g. 2203A) are evaluated as independent areas.

Critical Habitat

About nine sections in the northern half of the Deadman/Dompier WAU overlap critical habitat unit OR-29. This critical habitat unit continues into the watersheds to the west. This portion of OR-29 has less fragmented suitable habitat than other areas where critical habitat units overlap BLM administered land in the South River Resource Area. This is the result of having only BLM administered lands in the western portion and Forest Service administered lands in the eastern portion of the Deadman Watershed.

Critical habitat objectives are to provide suitable habitat for a recovering population. The well connected suitable owl habitat currently present in CHU-OR-29 makes this critical habitat unit important to manage so fragmentation does not reduce or eliminate its role as critical habitat. Planning should take this into account when determining project areas.

2. The American Bald Eagle

Potential bald eagle habitat is present near the South Umpqua River in the southern portion of the WAU. Forest stands within one mile of the river facing the river corridor should be managed to provide habitat characteristics used by bald eagles. In the Deadman/Dompier WAU this refers to forest stands on BLM administered lands in sections 14, 15, 21, 23, 28, and 29 of T30S-R2W. Managing for functional older forest stands within one mile of the South Umpqua River would provide potential eagle habitat and continue to provide habitat for ospreys and other raptor species that use the valley margin along the South Umpqua River.

Management options to enhance bald eagle habitat in these forest stands may include managing all stands within one mile of the South Umpqua River for bald eagle habitat, particularly for dominant old-growth trees. Another option could be to select only the forest stands that currently have the suitable habitat characteristics, like larger diameter, dominant trees, close to (within 1/2 mile) and facing the river. These stands could be managed so that suitable habitat characteristics are maintained using harvest prescriptions other than regeneration harvest. A third option could include no management for bald eagle habitat along the river in the Deadman/Dompier WAU since it has a small amount of potential bald eagle habitat. Management may be more productive downriver from the Deadman/Dompier WAU.

3. The Peregrine Falcon

Guides for management include locating a no activity buffer around active peregrine falcon sites, seasonal restrictions during the peregrine falcon breeding season from March 1 to July 15, and maintaining the integrity of medium to high potential sites (USDI 1995). The buffer should include a no activity area a minimum of 1/4 mile radius around known active sites. A secondary zone (1/2 to 1 1/2 mile radius) should be established where no management activities, such as timber harvesting, road construction, or helicopters are allowed during the peregrine falcon breeding season. Activities may resume in the secondary zone 14 days after fledgling or nest failure is confirmed. Projects that require a disturbance, such as blasting, in the vicinity of any

medium to high potential habitat located in the future must be surveyed prior to project initiation. To maintain site integrity, potential peregrine nesting sites should be managed as if they were occupied.

4. Neotropical Birds

Impacts to neotropical birds come from all actions that modify habitat. This usually serves to alter the bird species that use a particular area. Brushing, precommercial, and commercial activities impact neotropical birds by removing habitat and physically displacing birds. Displacement includes removing habitat occupied during the breeding season.

Ways to benefit neotropical bird species would be to reduce impacts from broadcast burning, brushing, precommercial thinning (PCT), commercial thinning, regeneration harvests, and other activities that manipulate habitat. Management activities should be scheduled to avoid disturbing birds during nesting and breeding periods. Local populations of neotropical birds start breeding in April and May and continue through the end of August. However, most species have young capable of flight by the beginning of July or August. Projects that impact nesting habitat should occur before April 1 or after July 30 of any given year.

From a wildlife standpoint, stands should not be managed as uniform, even aged plantations. Management activities should take into account the diversity, abundance, and location of tree species, understory shrubs, and other vegetation present. Small canopy gaps could be created in areas of dense vegetation or clumps of vegetation could be left when thinning or brushing stands. Brushing and PCT should include different prescriptions for Riparian Reserves. This could include not brushing or thinning in the Riparian Reserves, or increasing the number of shrubs and non-commercial tree species retained. Matrix lands outside of Riparian Reserves also provide brush and non-commercial tree species used by neotropical birds. Prescriptions in these areas should retain brush and non-commercial tree species that are not competing directly with desired conifer species. Brushing and PCT projects recently accomplished are planned to be reviewed for wildlife concerns.

5. Elk

The opportunity is present to develop an elk management goal for the Deadman Mountain management area and the overlapping watersheds. The main question that needs to be addressed before developing specific methods is what level of elk management is envisioned by the Roseburg District and the Resource Area? A potential conflict is the goal of habitat manipulation for elk and spotted owl habitat.

Possible options for managing the Deadman Mountain area are to manage for elk numbers through careful habitat management or manage for habitat only and let the elk numbers be what they will be (any habitat benefit would be achieved as a by-product of mature forest conversion to younger age classes). Some benefits to elk could be obtained from preventing early age classes (20 years old and younger) that are less than 40 acres in size from developing into older

age classes, limiting harvest units to 40 acres or less to accommodate use by elk and deer, reducing road construction, closing roads, or using harvest methods that do not require roads to influence habitat use by elk. Road construction usually leads to road use by people. The human use often determines the use of foraging areas by elk and deer. To achieve the most from management actions, roads should be selected for closure as outlined on page 39 of the Roseburg RMP ROD, and constructing new roads should be minimized or avoided. This should be done after careful identification of elk use within the Deadman Mountain management area.

Any approach to elk management would benefit from information about distribution and use of the WAU by elk. This information is not currently available.

F. Priorities for restoration in the Deadman/Dompier WAU

Roads in the Deadman/Dompier WAU should be evaluated using the Transportation Management Objectives (TMOs) as a guide. A list would be compiled of roads that were rated of low value for future resource access needs. Roads would be divided into the following categories: surfaced roads on BLM to decommission, natural surfaced roads on BLM to decommission, natural surfaced roads that access private lands to decommission, surfaced roads that access private lands to decommission, and roads to be improved. Roads to be improved are identified as important for access, but are in need of some treatment. Roads that access private land would not be decommissioned without the adjacent landowners concurrence. Natural surfaced roads on BLM administered lands to decommission are the top priority.

Decommissioning, also referred to as hydrologic obliteration, to meet Tier 1 objectives could be accomplished by removing those elements of a road that reroute hillslope drainage and present slope stability hazards. Decommissioning can include removal of culverts, decompaction of the road surface (ripping), outsloping, waterbarring, and removal of unstable or potentially unstable fills. With decommissioning, most of the road bed is left in place, facilitating inexpensive reconstruction should the need arise, but hydrologic risks are greatly reduced (FEMAT, Appendix V-J).

Roads identified by TMOs are known as "system" roads. System roads have road numbers, road records, and usually require some type of maintenance. Non-system roads are characterized by jeep roads and trails, usually unsurfaced roads that are not recorded. At the project level, non-system roads should be identified for decommissioning using aerial photos and other local resources.

G. Priority for identification of treatment areas

Matrix lands within the Deadman/Dompier WAU are designated as available for timber harvest. Careful scheduling of harvest areas can help to minimize the short term effects to wildlife and maintain connectivity of late-successional habitat blocks over time. Points to consider include minimizing the rate of forest fragmentation, maintaining physical connectivity of suitable spotted

owl habitat, the current status of spotted owl dispersal habitat, and the role of Connectivity blocks in Matrix lands in relation to owl habitat and owl sites.

Maintaining large blocks of late-successional forests would provide habitat for species that use late-successional forests, including the northern spotted owls on Matrix lands. This would serve to provide for important ecological functions such as dispersal of organisms and maintenance of ecologically valuable structural components such as down logs, snags, and large trees (Roseburg District RMP/ROD).

Forest stands large enough to provide undisturbed interior habitat (area within a forest stand greater than 400 feet from nearby adjacent stands younger than 70 years old) are an important component of retaining biological diversity. Selecting harvest units on Matrix lands using the priority list established for spotted owl sites will help contribute to the goal of minimizing fragmentation and maintaining physical connectivity. This will also help provide habitat for other animal species that use late-successional forest stands.

When planning projects that manipulate suitable spotted owl habitat, project areas should be selected using the evaluation and ranking of owl sites in the Deadman/Dompier WAU presented in Table 20. This table lists the owl sites located within the Deadman/Dompier WAU, suitable habitat present in the provincial radius (1.3 or 1.2 miles) and the 0.7 mile radius, occupancy ranking, acres ranking, history ranking, reproduction history, year the site was first located, and pair status. Occupancy Ranking evaluates the duration and consistency of occupation of owl sites over the past three years. Acres Ranking evaluates the amount of suitable habitat within the provincial radius (1.2 or 1.3 miles) and 0.7 mile radius. History Ranking combines the Occupancy and Acres Rankings with a field evaluation of habitat. The goal is to evaluate the habitat, connectivity and fragmentation of the habitat, and owl site history to create a priority list. This list can be used to locate project areas while taking into account the location of active spotted owl sites. Using the rankings in Table 20, project areas should be selected based on the following hierarchy.

1) Areas where owl sites are **not** present should be considered first.

2) If sites can not be avoided then sites that have above 1,000 acres in the provincial radius and above 500 acres in the 0.7 mile radius with occupancy and history ranking of "3" should be considered **second.**

3) Sites with suitable habitat below 1,000 acres in the provincial radius and below 500 acres in the 0.7 mile radius with occupancy and history ranking of "3" should be considered **third.**

4) Sites with suitable habitat above or below 1,000 acres in the provincial radius and above or below 500 acres in the 0.7 mile radius with occupancy ranking of "2" and history ranking of "3" should be considered **fourth.**

5) Sites with suitable habitat above or below 1,000 acres in the provincial radius and above or below 500 acres in the 0.7 mile radius with occupancy ranking of "3" and history ranking of "2" should be considered **fifth.**

6) Sites with suitable habitat above 1,000 acres in the provincial radius and above 500 acres in the 0.7 mile radius with occupancy and history ranking of "2" should be considered **sixth.**

7) Sites with suitable habitat below 1,000 acres in the provincial radius and below 500 acres in the 0.7 mile radius with occupancy and history ranking of "2" should be considered **seventh.**

8) Sites with suitable habitat above 1,000 acres in the provincial radius and above 500 acres in the 0.7 mile radius with occupancy ranking of "1" and history ranking of "2" should be considered **eighth.**

9) Sites with suitable habitat above 1,000 acres in the provincial radius and above 500 acres in the 0.7 mile radius with occupancy ranking of "2" and history ranking of "1" should be considered **ninth.**

10) Sites with suitable habitat above 1,000 acres in the provincial radius and above 500 acres in the 0.7 mile radius with occupancy ranking of "1" and history ranking of "2" should be considered **tenth.**

11) Sites with suitable habitat below 1,000 acres in the provincial radius and below 500 acres in the 0.7 mile radius with occupancy ranking of "1" and history ranking of "2" should be considered **eleventh.**

12) Sites with suitable habitat below 1,000 acres in the provincial radius and below 500 acres in the 0.7 mile radius with occupancy ranking of "2" and history ranking of "1" should be considered **twelfth.**

13) Sites with suitable habitat above or below 1,000 acres in the provincial radius and above or below 500 acres in the 0.7 mile radius with occupancy ranking and history ranking of "1" should be considered **last.**

The results of the evaluation is to implement activities that modify or remove suitable owl habitat in areas outside of known spotted owl territories should be considered first. When it is not possible to avoid modifying or removing suitable owl habitat within an owl territory then modification or removal of suitable habitat should occur around MSNO 4046 first, MSNO 3264, 2088, or 2089 second, and MSNO 2203, 3102, or 3998 last. An area wildlife biologist should be consulted for more details during the ID team review of the proposed project.

One spotted owl site (MSNO 3795) is located on US Forest Service administered land. Modification or removal of suitable habitat around this site should occur last. Management actions conducted by the Roseburg BLM should have very little impact on this site, since there

are only approximately eight acres of BLM administered land within the provincial radius and the stands are less than 20 years old.

V. Monitoring

General objectives of monitoring are:
1) To determine if the plan is being implemented correctly.
2) Determine the effectiveness of management practices at multiple scales, ranging from individual sites to watersheds.
3) Validate whether ecosystem functions and processes have been maintained as predicted.

The Roseburg RMP, Appendix I provides monitoring guidelines for various land use allocations and resources discussed by the plan. Implementation, effectiveness, and validation monitoring questions are addressed. Management actions on the Roseburg District BLM may be monitored prior to project initiation and following project completion, depending on the resource or activity being monitored.

Some key resource elements to monitor in the DD WAU are as follows:

A. All land use allocations

Are surveys for the species listed in the Roseburg District RMP, Appendix H conducted before ground disturbing activities occur?
Are protection buffers being provided for specific rare and locally endemic species and other species in the upland forest matrix?
Are the sites of amphibians, mammals, bryophytes, mollusks, vascular plants, fungi, lichens, and arthropod species listed in Appendix H of the Roseburg District RMP being surveyed?
Are the sites of amphibians, mammals, bryophytes, mollusks, vascular plants, fungi, lichens, and arthropod species listed in Appendix H of the Roseburg District RMP being protected?
Are high priority sites for species management being identified?

B. Key Watersheds

Was watershed analysis completed prior to implementation of management activities?
Has the number of miles of roads been reduced or at least no net increase in roads been achieved?
Are at-risk fish species and stocks being identified?
Are fish habitat restoration and enhancement activities being designed and implemented which contribute to attainment of Aquatic Conservation Strategy objectives?
Are potential adverse impacts to fish habitat and fish stocks being identified?

C. Riparian Reserves

Is the width and integrity of the Riparian Reserves maintained?
Are management activities within Riparian Reserves consistent with SEIS ROD Standards and Guideline, RMP management direction, and Aquatic Conservation Strategy objectives?
Has Watershed Analysis been completed prior to on-the-ground actions being initiated in Riparian Reserves?

D. Matrix

Are suitable numbers of snags, coarse woody debris, and green trees being left following timber harvesting as called for in the SEIS ROD Standards and Guidelines and Roseburg RMP management direction?
Are timber sales being designed to meet ecosystem objectives for the Matrix?
Are forests growing at a rate that will produce the predicted yields?
Are forests in the Matrix providing for connectivity between Late-Successional Reserves?

E. Monitoring Specific to Fisheries and Hydrology

Continue stream temperature monitoring in Deadman Creek and Middle Deadman Creek.

Appendix A

Glossary

Appendix A

Glossary

Age Class - One of the intervals into which the age range of trees is divided for classification or use.

Aquatic Conservation Strategy - Plan developed in Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, designed to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats.

Anadromous Fish - Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon, steelhead, and shad are examples.

Beneficial Use - The reasonable use of water for a purpose consistent with the laws and best interest of the peoples of the state. Such uses include, but are not limited to, the following: instream, out of stream and groundwater uses, domestic, municipal, industrial water supply, mining, irrigation, livestock watering, fish and aquatic life, wildlife, fishing, water contact recreation, aesthetics and scenic attraction, hydropower, and commercial navigation.

Best Management Practices (BMPs) - Methods, measures, or practices designed to prevent or reduce water pollution. Not limited to structural and nonstructural controls, and procedures for operations and maintenance. Usually, Best Management Practices are applied as a system of practices rather than a single practice.

Bureau Assessment Species - Plant and animal species on List 2 of the Oregon Natural Heritage Data Base, or those species on the Oregon List of Sensitive Wildlife Species (OAR 635-100-040), which are identified in BLM Instruction Memo No. OR-91-57, and are not included as federal candidate, state listed or Bureau sensitive species.

Bureau Sensitive Species - Plant or animal species eligible for federal listed, federal candidate, state listed, or state candidate (plant) status, or on List 1 in the Oregon Natural Heritage Data Base, or approved for this category by the State Director.

Candidate Species - Those plants and animals included in Federal Register "Notices of Review" that are being considered by the United States Fish and Wildlife Service (FWS) for listing as threatened or endangered.

> Category 1. Taxa for which the Fish and Wildlife Service has substantial information on hand to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work.

Commercial Thinning - The removal of merchantable trees from an even-aged stand to encourage growth of the remaining trees.

Connectivity - A measure of the extent to which conditions between late-successional/old-growth forest areas provide habitat for breeding, feeding, dispersal, and movement of late-successional/old-growth-associated wildlife and fish species.

Connectivity / Diversity Block - A land use classification under Matrix lands managed on 150 year area control rotations. Periodic timber sales will leave 12 to 18 green trees per acre.

Core Area - That area of habitat essential in the breeding, nesting and rearing of young, up to the point of dispersal of the young.

Critical Habitat - Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species when it is determined that such areas are essential for the conservation of the species.

Density Management - Cutting of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated. Density management harvest can also be used to improve forest health, to open the forest canopy, or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

District Defined Reserves (DDR) - Areas designated for the protection of specific resources, flora and fauna, and other values. These areas are not included in other land use allocations nor in the calculation of the Probable Sale Quantity.

Endangered Species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA) - A systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required; and to aid an agency's compliance with National Environmental Protection Agency when no Environmental Impact Statement is necessary.

Ephemeral Stream - Streams that contain running water only sporadically, such as during and following storm events.

50-11-40 Rule - A proposed guideline requiring maintenance of adequate spotted owl dispersal habitat on lands outside designated "habitat conservation areas" for the Northern Spotted Owl. It would assure that, on the quarter township basis, 50 percent of the stands would have conifers averaging 11 inches dbh and a 40 percent canopy closure.

General Forest Management Area (GFMA) - Forest land managed on a regeneration harvest cycle of 70-110 years. A biological legacy of six to eight green trees per acre would be retained to assure forest health. Commercial thinning would be applied where practicable and where research indicates there would be gains in timber production.

GIS - Geographic Information System, a computer based mapping system used in planning and analysis.

Intermittent Stream - Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Issue - A matter of controversy or dispute over resource management activities that is well defined or topically discrete. Addressed in the design of planning alternatives.

Land Use Allocations - Allocations which define allowable uses/activities, restricted uses/activities, and prohibited uses/activities. They may be expressed in terms of area such as acres or miles etc. Each allocation is associated with a specific management objective.

Late-Successional Forests - Forest seral stages which include mature and old-growth age classes.

Late-Successional Reserve (LSR) - A forest in its mature and/or old-growth stages that has been reserved.

Matrix Lands - Federal land outside of reserves and special management areas that will be available for timber harvest at varying levels.

Mitigating Measures - Modifications of actions which (a) avoid impacts by not taking a certain action or parts of an action; (b) minimize impacts by limiting the degree or magnitude of the action and its implementation; (c) rectify impacts by repairing, rehabilitating or restoring the affected environment; (d) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (e) compensate for impacts by replacing or providing substitute resources or environments.

Monitoring - The process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

Nonpoint Source Pollution - Water pollution that does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition or percolation, and normally is associated with agricultural, silvicultural and urban runoff, runoff from construction activities, etc. Such pollution results in the human-made or human-induced alteration of the chemical, physical, biological, radiological integrity of water.

Peak Flow - The highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial Stream - A stream that has running water on a year round basis.

Precommercial Thinning (PCT) - The practice of removing some of the trees less than merchantable size from a stand so that remaining trees will grow faster.

Probable Sale Quantity (PSQ) - Probable sale quantity estimates the allowable harvest levels for the various alternatives that could be maintained without decline over the long term if the schedule of harvests and regeneration were followed. "Allowable" was changed to "probable" to reflect uncertainty in the calculations for some alternatives. Probable sale quantity is otherwise comparable to allowable sale quantity (ASQ). However, probable sale quantity does not reflect a commitment to a specific cut level. Probable sale quantity includes only scheduled or regulated yields and does not include "other wood" or volume of cull and other products that are not normally part of allowable sale quantity calculations.

Proposed Threatened or Endangered Species - Plant or animal species proposed by the U.S. Fish & Wildlife Service or National Marine Fisheries Service to be biologically appropriate for listing as threatened or endangered, and published in the Federal Register. It is not a final designation.

Resident Fish - Fish that are born, reared, and reproduce in freshwater.

Resource Management Plan (RMP) - A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act.

Riparian Reserves - Designated riparian areas found outside Late-Successional Reserves.

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows.

Stream Order - A hydrologic system of stream classification. Each small unbranched tributary is a first order stream. Two first order streams join to form a second order stream. A third order stream has only first and second order tributaries, and so on.

Stream Reach - An individual first order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach end points are normally designated where a tributary confluence changes the channel character or order. Although reaches identified by BLM are variable in length, they normally have a range of 1/2 to 1-1/2 miles in length unless channel character, confluence distribution, or management considerations require variance.

Survey and Manage - Those species that are listed in Table C-3 of the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl for which four survey strategies are defined.

Transportation Management Objectives (TMO) - An evaluation of the current BLM transportation system to assess future need for roads, and identify road problem areas which need attention, and address future maintenance needs.

Watershed - The drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.

Watershed Analysis - A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis is a stratum of ecosystem management planning applied to watersheds of approximately 20 to 200 square miles.

Appendix B

References

Appendix B - References

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Appendix C

Fisheries

ODFW Aquatic Habitat Inventory Data Table

Stream	Reach	% Pool Area	Residual Pool Depth	Riffle W/D Ratio	% Fines in Riffles	% Gravel in Riffles	Riparian Vegetation (dom/subdom)	Riparian Conifer Size	% Shade	LWD pieces per 100m	LWD vol per 100m	AHR
Deadman Creek	1	34	0.7	19.4	8	23	hdwd/con	small	64	8.8	3	Fair
	2	50.8	0.8	27.6	34	45	hdwd/con	medium	58	46.5	10	Fair
	3	41.5	0.6	20.1	18	37	hdwd/con	medium	74	51.6	12	Fair
	4	19	0.5	17.9	34	19	con/hdwd	med/large	86	46.1	31	Fair
	5	7.7	0.5	17.3	44	24	con/hdwd	med/large	92	50.5	43	Fair
E Fork Deadman	1	21.8	0.7	45.3	14	31	hdwd/con	medium	83	24.8	20	Fair
	2	5.1	0.7	17.3	31	28	con/hdwd	med/large	92	53.5	54	Fair
	3	0	0	17.8	15	30	con/hdwd	large	91	28.9	30	Fair
Mid Fork Deadman	1	11.8	0.5	21.5	25	24	con/hdwd	med/large	87	75.2	63	Fair
	2	13.9	0.6	21.4	33	23	con/hdwd	medium	91	85.3	89	Fair
	3	2.1	0.3	10	36	30	con/hdwd	small	91	25.4	21	Fair
	4	3.3	0.4	21.7	25	25	con/hdwd	small	92	17.7	16	Fair
Stanley Creek	1	0	0	--	20	30	con/hdwd	small	97	17.2	20	Poor
Schultz Creek	1	9.3	0.5	--	20	20	hdwd/con	medium	80	11	16	Poor
Unnamed Trib to Deadman Cr #2	1	8.1	0.4	17.1	20	25	con/hdwd	small	93	20.4	22	Fair
Unnamed Trib to Deadman Cr #3	1	0	0	--	60	20	hdwd/con	small	100	16.1	18	Poor
Unnamed Trib to E Fork Deadman Cr #1	1	3.7	0.6	25.5	20	30	con/hdwd	medium	93	19	28	Fair

AHR = Aquatic Habitat Rating

-- = no data available

TABLE 2. MATRIX OF FACTORS AND INDICATORS
Western Cascades Physiographic Region

FACTORS	INDICATORS	PROPERLY FUNCTIONING	AT RISK	NOT PROPERLY FUNCTIONING
Water Quality:	Temperature	2nd-3rd order basins: <58 degrees F. 4th and larger basins: <65 " "	2nd-3rd order: 59-65 degrees F 4th+ order: 66-72 degrees F.	2nd-3rd order basins: >65 degrees F. 4th order and larger: > 72 degrees F.
	Sediment/ Turbidity *	<12% fines (<0.85 mm) in gravel, turbidity low, or cobble imbeddedness <35%.	12-17% fines (<0.85mm) in gravel.	> 17% fines (<0.85mm) in gravels, turbidity high, or cobble embeddedness >35%.
	Chemical Contamination/ Nutrients	Low levels of chemical contaminants from agricultural, industrial and other sources, no excess nutrients, no CWA 303d designated reaches.		Mod+ levels of chemical contamination from agricultural, industrial and other sources, any level of excess nutrients, one or more CWA 303d designated reaches.
Habitat Access:	Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows of age 1+ salmonids.		Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at a range of flows of age 1+ salmonids
Habitat Elements:	Substrate *	*Dominant substrate is gravel or* cobble (interstitial spaces clear), embeddedness <20%.	*Gravel and/or cobble is* sub-dominant, or if dominant, embeddedness 20-35% (3)	Bedrock, sand, silt, or small gravel dominant, or if gravel and cobble dominant, embeddedness >35% (2)
	Large Woody Debris	>60 pieces/mile, >24" diam, and >50 feet in length. Adequate sources of future LWD to maintain the above standard. Little evidence of stream clean-out or management related debris flows.	30-60 pieces/mile, >24" and >50 ft. in length or lacks potential sources of LWD sufficient to maintain or achieve the fully fuctioning standard.	<30 pieces/mile, >24" and >50' long and lacks potential sources of LWD. Evidence of stream clean-out and/or management related debris flows.
	Pool Characteristics * 1)	>30% pool habitat by area. Little reduction in pool volume due to filling by fine sediment or unsorted substrates.	>30% pool habitat by area but with obvious filling by fines or unsorted substrates or <30% pool habitat by area and little reduction in pool volume due to filling.	<30% pool habitat by area and obvious reduction in pool volume due to filling with fines and/or unsorted substrates.
	Off-channel Habitat *	Water velocity refugia present. Backwaters frequent and the result structural influence (LWD). Side channel connectivity maintained.		Little or no velocity refugia. Few or no backwaters, no off-channel ponds. Evidence of abandoned side channels due to past management activities.

1) Pool characteristic numerics are applicable to 3rd order or larger basins.

. Numeric values for Elements followed with the "" symbol will be determined by measurements or estimates taken in low-gradient (<2%) , adjustable segments. These elements are not applicable if none are present.

Habitat Elements (Con't):				
	Refugia (important remnant habitat for sensitive aquatic species)	Habitat refugia exist and are adequately buffered (e.g. by intact riparian reserves); existing refugia are sufficient in size, number and connectivity to maintain viable populations or sub-populations	Habitat refugia exist but are not adequately buffered (e.g. by intact riparian reserves); existing refugia are insufficient in size, number and connectivity to maintain viable populations or sub-populations	Adequate habitat refugia do not exist.
Channel Condition and Dynamics:	Width/Depth Ratio	W/D ratio and channel types are within historic ranges and site potential as per Rosgen typing.		W/D ratios and channel types are outside of historic ranges and site potentials.
	Streambank Condition *	Basinwide, in low gradient reaches, > 90% stable; i.e., on average, less than 10% of banks are actively eroding.	Basinwide, in low gradient reaches, stream banks 80-90% stable. Active erosion limited to outcurves.	<80% of streambanks are stable. Active erosion widespread throughout basin in low gradient reaches.
	Floodplain Connectivity *	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland functions, riparian vegetation and succession.		Obvious reduction in hydrologic connectivity between off-channel, wetland, floodplain and riparian areas; wetland extent noticably reduced and riparian vegetation/ succession altered significantly.
Flow/Hydrology:	Drainage Network	Little increase in drainage network due to roads.		Substantial increases in drainage network density due to roads (e.g., ~20-25%)
Watershed Conditions:	Road Density & Location	<2 mi/mi square , with no valley bottom roads	2-3 mi/mi square, with some valley bottom roads.	>3 mi/mi square and/or substantial amount of valley bottom roads.
	Disturbance History	<5% ECA/decade (entire watershed) with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or riparian reserves.		>5% ECA/decade (entire watershed) and disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian reserves.
	Riparian Reserves	Riparian Reserves are intact, with >80% in late seral condition.		Riparian Reserves are fragmented, poorly connected or provide inadequate protection of habitats and refugia for sensitive aquatic species. <80% are in late seral condition.
	Landslide Rates	Within 20% of historic natural rates. Stream conditions not evidently altered due to management related landslides.		Not within 20% of historic natural rates. Stream conditions obviously altered by management related landslides.

Habitat Bench Marks Related to Category Types

	Bench Mark Weighing Scale 1-5	4-Excellent	3-Good	2-Fair	1-Poor	Row Totals
Pools						
a) Pool Area %	2	≥ 45	30-44	16-29	≤ 15	
b)Residual Pool						
small (1-3 ordered)	4	≥ 0.55	0.35-0.54	0.15-0.34	0-0.14	
Large (4th order & greater)	4	≥ 0.95	0.76-0.94	0.46-0.75	≤ 0.45	
Riffles						
a)Width/Depth (wetted) (ODFW)	3	≤ 10.4	10.5-20.4	20.5-29.4	≥ 29.5	
b) Width/Depth (bank full) (USFS)	3	≤10	11-15	16-19	≥20	
c) Silt/Sand/Organics (% area) (ODFW)	2	≤1	2-7	8-14	≥ 15	
d) Embeddedness (% by unit) (USFS)	2	0	1-25	26-49	≥50	
e) Gravel % (Riffles)	3	≥ 80	30-79	16-29	≤ 15	
f) Substrate dominant	3	Gravel	Cobble	Cobble	Bedrock	
subdominant (USFS)	2	Cobble	Large Boulder	Small Boulder	Anything	
Reach Average						
a) Riparian condition Species-dom/subdom. (>15cm)	2	conifer/hdwd* Klam-hdwd*	conifer/hdwd* Klam-hdwd*	hdwd*/conifer	alder/anything	
Size (Conifers)	3	≥ 36" Klam- ≥ 24"	24 - 35" Klam.: 12 - 23"	7 - 23"	≤6"	
ihade (%) (ODFW)						
Stream Width < 12M	1	≥80	71-79	61-70	≤60	
Stream Width > 12 M	1	≥70	61-69	51-60	≤50	
LWD						
a)Pieces (lg/sm) 100 M Stream	3	≥29.5	19.5-29.4	10.5-19.4	≤10.4	
b) Vol/100M Stream	2	≥39.5	29.5-39.4	20.5-29.4	≤20.4	
USFS - Pieces 50' or more long and 24" dbh per mile	5	≥70	45-69	31-44	≤30	
Temperatures	1	≤55	56-60	61-69	≥70	
Macroinvertebrates						
Totals for Category						

*Hardwood category does not include alder.

*Where USFS designations appear, either USFS or ODFW measurements may be used but not both.

HABITAT BENCHMARK RATING SYSTEM

100-82 EXCELLENT
81-63 GOOD
62-44 FAIR
43-25 POOR

Current Condition in Deadman/Dompier Creek Watershed

Watershed Subwatershed Name	Road density	Stream drainage density	% BLM ownership	stream crossing density	ECA %	HRP %	Acres of Riparian Reserves at least 80 Years Old
Deadman Watershed							
East Deadman	5.14	4.02	3	1.64	31	70	24%
Lower Deadman	5.61	4.19	12	1.75	20	91	81%
Middle Deadman	6.06	6.21	97	2.13	44	69	37%
Schultz Creek	5.81	4.25	54	1.86	20	88	58%
West Deadman	5.40	5.34	95	1.77	28	81	63%
Dompier Creek Watershed							
Dompier Creek	6.77	4.70	38	2.52	29	94	29%
Salt Creek	5.84	5.32	26	1.78	28	95	60%