STEP 6: RECOMMENDATIONS

The dominant processes that are affected by the increased road density, fire suppression, and timber harvest include erosion, fire intensity and size, and hydrologic recovery.

Issue 1: Road Condition, Density, Use and Location

Process, Habitat and Species

The following roads, with potential problems and high to moderate priority culverts, listed in Table 23, are recommended for further evaluation through the ATM process. The issues associated with the roads center around elk use in the area, resident fish passage, and sediment run-off and routing into the streams.

Table 23. Road management opportunities related to road density, age and location.

Subwatershed	Issue	Evaluate in ATM	Piority
Staley: Important Response reach for cutthroat habitat	Fish passage	Culvert on RD 2136 RD 2136/300	 High High
	Stream embeddedness Road condition Elk Use	Road Prism on RD 2134/243 RD 2144/370 RD 2136/300 RD 2137	 High High High High
Tumblebug	Stream embeddedness Road condition Elk Use	Road Prism on RD 2144/370 RD 2144/299	 High Moderate
Timpanogas	Road condition Elk Use	Road Prism on RD 2154/270 RD 2153/353	 High High
Swift	Fish Passage	Culvert on RD 2149	 Moderate
	Stream embeddedness Road condition Elk Use	Road Prism on RD 2120	 High
Simpson/Echo	Fish Passage Elk Use	Culvert on RD 2143/325 RD 2100	 Low Moderate

Wildlife Species

- Reassess Forest Plan Elk emphasis area concept, associated standards and guides, and the verbal agreement with ODFW to determine their compatibility with management direction provided by the 1994 NW Forest Plan Amendment (the President's Forest Plan).
- As a result of the 1994 NW Forest Plan Amendment, changes in land allocations and reduced timber management in Matrix reduce the ability to meet S & G's for elk habitat management.
- Lack of documentation and official approval of the 1990 verbal agreement presents a lack of mutual understanding of intended objectives and implementation of the verbal agreement. This agreement needs to be revisited with ODFW.

Table 24. Road closures necessary to meet elk emphasis, Forest Plan S & G's..

Emphasis Area	**Open Miles Exceeding Forest Plan Standards and Guidelines**	**Additional Miles to Close Per Agreement with ODFW**
Douglas Lane	0	1.8
Gorge Echo	0	8.7
Moss Mountain	0	1.9
Swift Bear	13	
Noisy	2	0.2
Paddy's	11.3	
Staley Dome	7	9.4
Simpson	14.2	4.7
Spider Plus (HEEA)	39	
Indigo Skunk (HEEA)	0*	
Total	**86.5**	**26.7**

* Although Indigo-Skunk emphasis area meets the minimum road density requirement, the winter range portion is a confined area with an extensive open road system which should be futher addressed in ATM.

Human Use

Improved access to the watershed has increased human use over reference conditions. This increased use is primarily associated with dispersed and developed campsites and trails located near lakes and streams. The result of the use has been localized degradation to riparian vegetation from both human and vehicular use, potentially increasing surface erosion. Management direction for the MFW River (the segment from Echo Creek to Timpanogas Lake) as an eligible scenic river for inclusion into the National Wild and Scenic River System, is to maintain the outstandingly remarkable values which consist of scenic, recreation, geologic/hydrologic, vegetation and ecology, wildlife and historic. Scenic includes the visual condition o the riparian vegetation. To alleviate the vegetation loss and surface erosion the following items are recommended:

- Implement as budget allows, Forest Plan recommendations for additional trails, including barrier free trails, to disperse recreation use. Begin planning of the proposed Middle Fork and Staley

Creek barrier free trails and fishing platforms to provide additional physically challenged use opportunities. These will help disperse use and provide greater variety of experiences for users.

- Upgrade spur road into Lizard Lake to reduce surface erosion; revegetate degraded bank and dispersed roads, and block vehicle access at lake edge.
- Prepare a revegetation plan for Indigo Springs Campground.
- Complete inventory of dispersed sites and prioritize restoration opportunities.
- Inventory spur roads as far as need for recreation access. Determine if they are consistent with the Aquatic Conservation Strategy.
- Inventory existing facilities to determine if they are consistent with Aquatic Conservation Strategy Objectives.
- Evaluate dispersed sites location, riparian condition, and vehicle access, for improved management of Riparian Reserves and human use.

To maintain access to campsites and trailheads, it is recommended that the following roads remain open:

- RD 21, 2154, 2134, 2134250, 2134251, 23, 2149, and 2160.

Issue 2: Vegetation Condition & Pattern

Fire Process

- Restore historical ecological processes by:
  - a) prescribing controlled burning to restore and retain fire-maintained non-forested special habitats and their zone of influence in historical conditions.
  - b) prescribing controlled burning in non-harvest allocated forest habitats (such as LSRs) to re-establish open stand characteristics where site-specific analysis determines an ecological need to maintain these conditions. Prime candidates for consideration would be upland Douglas fir stands on slopes less than approximately 60%.
  - c) developing a prescribed natural fire plan (PNC) for high elevation habitat (silver fir, mountain hemlock and lodgepole pine) in non-harvest allocations.
- Treat for fire management objectives by:
  - d) breaking up contiguous fuel loading patterns in matrix allocations.
  - e) Reducing fuel loading in:
    - f) Doug fir stands which are fuel model 10 or high fuel model 8 with heavy load of ladder fuels
    - g) High elevation stands which are fuel model 10
    - h) Western hemlock stands which are fuel model 10 and occur in large contiguous blocks or steep terrain.

Erosion Process & Hydrologic Recovery

Most of the harvest related debris slides occurred on steep slopes with shallow, rocky soils in the Simpson Creek Subwatershed. Approximately 6000 acres across the watershed have been harvested since 1980 and are in some stage of redeveloping pre-harvest root strength and groundwater levels. a small percent of these acres are at an elevated risk of producing a debris slide.

Forest type mapping for Lane and Douglas Counties, Pacific Northwest Forest and Range 1949 and 1947 respectively, indicate a range of hydrologically recovered stands from 73 to 80 percent of the watershed prior to management activities. The range in hydrologic recovery is a reflection of the generalized mapping in Douglas County which indicates 80 percent recovery, and a more finely differentiated classification of the Lane County mapping which indicated 73 percent of the landbase was hydrologically recovered.

The Subwatersheds of Swift, Simpson, and Pioneer respectively, are now at 56, 57 and 62 percent hydrologically recovered. This reduced recovery coupled with increased effective drainage density has the potential to shorten the response time of peak flow events following a storm, and potentially increase peak flows at that time. In addition, in channel erosive activity is potentially increased.

It is anticipated that the hydrologic recovery trend will depend on where harvest occurs. With continued harvest and recovery of harvested units the trend is expected to be flat to slightly improving given that the ratio of harvest within the storm response areas is likely to remain the same. The anticipated hydrologic recovery is given in Table 25.

If there are areas where the stream channels are having problems with excessive erosion and deposition, or deteriorated aquatic habitat, then harvest should be shifted away from those drainage so that hydrologic recovery and riparian recovery can take place, facilitating increased channel stability over time.

Table 25. Percent hydrologic recovery through time as compared to pre-management hydrologic recovery range of 73-80 percent, as indicated by forest type mapping in 1947 and 1949.

	% Hydrologic Recovery by Year						
	1996	2001	2006	2011	2016	2021	2026
Subwatershed	Current	(5 yrs)	(10 yrs)	(15 yrs)	(20 yrs)	(25 yrs)	(30 yrs)
Staley 23-1	65	70	74	79	83	92	100
Tumblebug 23-2	71	76	81	86	91	95	100
Paddy's Valley 23-3	68	73	79	84	89	95	100
Pioneer Creek 23-4	62	70	78	87	91	96	100
Swift Creek 23-5	56	60	63	78	93	97	100
Simpson Crk 23-6 North	57	62	68	73	82	91	100
Echo Creek 23-6 South	67	74	80	87	93	97	100

Channel Processes

V4/B Moderate Gradient Step/Pool Channels in Alluviated Mountain Valley Segments

F3/C, wide mainstem valley response reaches express high to moderate sensitivity to peak flows. It is recommended that:

- Retain integrity of downed trees in the floodplain be retained whenever possible.
- Use whole trees with root wads and branches attached to add and retain CWM.
- Reconnect and enhance historic side channels.

F4/B Moderate Gradient Step/Pool or Pool/Riffle on Alluvial/Colluvial Fans

A loss of floodplain connectivity has occurred in Swift Reach 1. Reduction of riparian functions from vegetation removal by harvest and flood is apparent in other step/pool dominant streams in alluvial or colluvial fans. To alleviate this occurrence it is recommended to:

- Reconnect and enhance side channels in Swift Reach 1

Lower retention of CWM in Staley Reaches 2 and 3 due to riparian impacts from harvest and floods is evident. In addition, fine sediments are accumulating in S. Fork Staley Reach 4. To alleviate this occurrence it is recommended to:

- Careful replication of natural debris jams in Staley Reaches 2 & 3
- Monitor fine sediment accumulation especially in restored section of S. Fork Staley Reach 4
- Locate and reduce fine sediment input to S. Fork Staley Reach 4

U1/C-U2/B Moderate to Low Gradient Pool/Riffle Channels in Glaciated U-Shaped Valleys

Supply of coarse and fine sediment may be approaching transport capacity in response segments located in cascade and step/pool dominant streams in u-shaped trough valleys, due to increases from erosive soils, roads run-off and unstable banks. Near-term CWM recruitment is has been reduced through harvest and past floods, reducing floodplain connectivity. It is recommended to:

- Construct a sediment budget for the watershed which accounts for input, storage, transport, and output
- Monitor channel adjustment through time
- Reduce sediment input from high risk roads
- Maintain floodplain connectivity

V1/A Steep Confined Step-Pool/Cascade Channels in V-Shaped Moderate Gradient Valleys

In cascade dominant streams in v-shaped moderate gradient valleys transport segments, accumulation of fines in upper reaches maximizes potential for downstream cumulative impacts. It is recommended to:

- Locate sources of fine sediment and reduce input
- Monitor fine sediment in channel

V2/A Step-Pool/Cascade in V-Shaped High Gradient Valleys

In cascade dominant streams in v-shaped moderate gradient valleys, anomalous accumulation of fine sediment in high energy channel types may have occurred. The streams position in upper channel network maximizes the potential for downstream cumulative impacts. It is recommended to:

- Investigate to confirm data

- Monitor and reduce sediment input as above

M1/B Moderate Gradient Step-Pool Channels in Moderate Slope Bound Valleys

Step/pool habitats in moderate slope bound valleys exhibit long stretches of subsurface flow. It is recommended to:

- Study unique hydrologic characteristics

H3/A Cascade Channels in Very High Gradient Headwaters

Cascade dominant channels in very high gradient headwaters are located in very high gradient headwaters. Sensitivity varies with channel stability and bank materials. It is recommended that the sensitivity of the reaches be evaluated on a site specific basis

Wildlife Habitat

Stand Characteristics

Structure and composition of many stands has been altered by fire suppression and timber harvest. In reserve allocations (i.e. 9-D, 100-acre LSRs), consider management activities which favor historic structure and composition occurring in these sites.

- Continue promoting stands of mixed conifers and hardwoods for maintaining a greater diversity of wildlife guilds.
- Thin managed stands. In LSRs design prescriptions to promote stand structure and composition predictable for the location. In matrix lands, design prescriptions which provide a diverse array of habitat types to meet the needs of a larger number of wildlife species.

Fragmentation & Interior Forest Habitat

Timber harvest activities and associated road building have contributed to a landscape which is uncharacteristically fragmented, with interior forest under-represented compared to reference conditions. To move towards historical conditions:

Within the scope of the Forest Plant, consider larger block management in harvest program to promote larger interior habitat blocks in future managed forests, thus providing habitat to maintain a greater number of wildlife species.

a) In gentle sloped areas (< approximately 60% slope) which were previously large blocks of open forest, consider harvest openings of several hundred acres in size with GTR/WLT simulating historic residual overstory conditions. Design future harvests to incorporate previous harvest units to form large blocks.
b) In steeper terrain (> approximately 60% slope) which were typically mosaics of denser forest with common 100-150 acre gaps and occasional 500+ acre gaps, consider a variety of harvest units sizes from small to several hundred acres with GTR/WLT clumped to simulate natural residual overstory conditions

- Within the scope of the Forest Plant, for the three large blocks of interior forest habitats (Lighthouse Rock, Bear Mountain, and harvest-allocated portion of Tumblebug Creek confluence, schedule harvest in this watershed to postpone entry into these large blocks, while promoting other large blocks of interior habitat, though of younger age (S&G FW-205)

Upslope Forest Connectivity:

Upslope connectivity has been altered in the Swift Creek drainage, in the section of Middle Fork Willamette above the confluence with Pioneer Creek, and in the matrix allocation of the Calapooya Ridge. To maintain connectivity in these areas while adjoining managed stands develop into forested habitat conditions, within the scope of the Forest Plan, consider:

- In Swift Creek drainage, schedule harvest to retain the remaining mature and old growth forest patch that provides connectivity across Swift Creek, joining the Juniper Ridge side on the north to the Bear Mountain side on the south; S&G FW-206.2.
- Along the Middle Fork Willamette River in the vicinity of Beaver Creek drainage, schedule harvest to retain the remaining mature/old growth forest patch that provides connectivity across the river, joining the Diamond Peak Wilderness side on the north to the Happy Prairie Ridge side on the south; S&G FW-206.2
- Along the Calapooya Ridge in Matrix allocation, timber sale analyses should assess the rate and distribution of harvest in relation to connectivity needs of wildlife associated with the high elevation habitat types (SG FW-206.2)

Interdrainage Connectivity

Interdrainage connectivity has been fragmented by previous management activities; interdrainage connectivity map identifies potential key areas to consider management for present and future connectivity between drainages. Project analyses should reference this information as a starting point, and also further validate and refine this information. Specific recommendations to maintain and enhance interdrainage connectivity function are:

- During project analyses, identify and prioritize interdrainage connections affected by past management activities which could be further managed for providing future interdrainage connectivity.
- Implement practices which promote future interdrainage forested connectivity such as:
  a) design future harvesting to establish similar-aged forested environment across the ridgeline; this might include harvesting leave strips between old harvest units to establish a single large block.
  b) design placement of GTRs, WLT and CWM in association with future harvest units.
  c) utilize non-harvest allocations and non-suitable lands in connectivity corridor design.
- During project analyses, prioritize interdrainage ridgeline connections and design projects that best maintain current interdrainage connectivity while other connections recover from past management activities.

Riparian Reserves: Vegetative condition

- Based on site analyses and ACS, treat to promote late successional structure in Riparian Reserve lands which are managed stands or second-growth stands lacking structural diversity such as multi-layered canopy and coarse woody material.
- During recovery of the Riparian Reserves' connectivity function, timber sale analyses should assess the scheduling of harvest in relation to maintaining corridors or large blocks of mature and old growth between the large Late Successional Reserves and the Cascades Crest.

To alleviate these conditions, it is recommended that the managed stands be thinned to appropriate levels to restore CWM recruitment, stream bank stability, and stream shading functions. In addition, with interdisciplinary site-specific analysis, trees in natural stands might be felled to facilitate stream recovery from past management or flood effects. High priority given to Subwatersheds where stream temperatures are elevated. Specifically:

- Where stand replacement fire was not a regular component of the riparian system (i.e. large perrenial streams), enhance the Riparian Reserve toward MOG mixed conifer/deciduous stands using management tools such as thinning and prescribed fire.
- In riparian reserves which periodically incurred stand-replacement fires, conduct interdisciplinary site-specific analysis to determine desired condition.

Large Woody Material in the Terrestrial Setting

- During site-specific project planning, identify priority areas which are deficit in CWM where reintroduction or promotion of CWM would be needed to meet specific ecological objectives such as connectivity or riparian function.
- The 1990 Forest Plan Standards for CWM were based on plant associations, and appeared to reasonably reflect the natural occurrences of CWM. During project analyses, use site specific information on plant association to develop CWM prescriptions.

Non-Forested Special Habitats

- Use prescribed burning to keep the disturbance regime in fire-maintained special habitat communities.
- Target non-forested special habitats for noxious weed survey and control using mechanical, biological and chemical methods within guidelines set by the Willamette National Forest's EIS for noxious weed control with chemical agents.
  - a) Set priorities for control efforts. Highest priority should be given to sites vulnerable to colonization by new invaders and sites which are sparsely infested. Lower priority should be given to sites with moderate to large infestations of established species.
  - b) Identify those 9D and FW211 habitats which are most vulnerable to invasion; this would include those special habitats which are adjacent to roads or timber harvest units, in the vicinity of a new invader population, or are in the vicinity of recent soil disturbance.
- Prepare a management plant for special habitats included in LMP 9D allocation.

Stream Temperatures

Approximately one mile of the MFW from the mouth of Staley Creek to the watershed boundary, plus the entire length of the river in the Lower Middle Fork of the Willamette Watershed is currently on the DEQ list of water quality limited streams for temperature. Recent data from Staley and Simpson Creeks indicates that lower reaches of these streams will likely be listed in the future.

Once a stream is listed as water quality impaired, a management plan designed to bring the temperatures into compliance is required by DEQ. Due to the cumulative effect of stream temperatures, this plan addresses factors affecting temperature throughout the perennial stream network. The plan should recognize the interaction of natural disturbance processes, such as floods, with the management related conditions of the watershed, such as riparian harvest.

Terrestrial Species

Wildlife Species

Threatened and Endangered Species

In the secondary and tertiary management zones for the peregrine falcon site, promote prescriptions for silvicultural treatments of managed units to maintain and enhance prey species richness and numbers.

Winter Range in Indigo-Skunk High Elk Emphasis Areas

Promote an increase in Habitat Effectiveness (HE) for cover quality in winter range by:

- Maintaining existing thermal and optimal thermal habitat
- Promoting thermal cover toward optimum thermal habitat

- Reducing the acreage of hiding cover which skews down the HE value for cover.

Botanical Species

- Monitor known sensitive plant locations for presence of invader species.

Aquatic Species Habitat

50 percent of the PACFISH standard for pools is reached or exceeded in the UMFW River, in Staley Creek and in Noisy Creek. None of the stream reaches meet or exceed the guidelines for CWM.

- If this information is coupled with stream temperatures, hydrologic recovery and potential for peak flows, stream embeddedness and fish passage, it is apparent that the most important response reach refugia area and protection for salmonid fish occurs in the UMFW River in the Timpanogas Subwatershed.

The Staley Subwatershed, while it is recovering, accounts for 25 percent of the total response reach segments in the watershed and is therefore very important to protect and restore for aquatic spawning and rearing life stages, particularly coastal cutthroat trout.

- Spider Creek, in addition, may be an important cool water refugia for the Staley Subwatershed.
- The relatively cool water Tumblebug Subwatershed makes the lower reaches important transport refugia and protection for salmonid fish.

It is recommended that these areas be protected and enhanced for salmonid species use.

Issue 3: Introductions of Non-Native Species

Wildlife Species Distribution

Since landscape-wide weed control may not be a viable objective, one concept in weed management is to give priority to eradicating and protecting core area such as Wilderness and OCRA lands, special habitats and botanically rich sites such as Rigdon Point RNA. The objective here would be to establish a line of containment which creates a buffer around each core area.

Aquatic Species Distribution

Stocking of lakes in the Beaver and Timpanogas Basins and warm stream temperatures has allowed downstream recruitment of brook trout into primarily native coastal cutthroat habitat. It is recommended to assess the impacts of this fishery, if any. on the resident fish and amphibian populations.

It is also recommended to be proactive with the Oregon Department of Fish and Wildlife and local interest groups in assessing future stocking activities.

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Glossary

Bankfull - Height of the floodplain surface, generally occurring at a 1.5 year frequency.

Baseflow - Baseflow is separated from stormflow for some analysis purposes. Stormflow is direct runoff from the storm event. for the MFW River at Sandprairie Campground, baseflow has been determined as 3,500 cfs.

Biological Diversity - Term used in the Forest Plan to provide goals and direction for evaluating the significance of old-growth stands, minimizing fragmentation of existing old-growth forests, and maintaining many of the structural components of unmanaged stands in managed stands.

Climax - The culminating stage in plant succession for a given site where the vegetation has reached a highly stable condition.

Colloids - Substances in a state of fine subdivision having peculiar properties because of their extremely high surface area. Fine-grained materials that are held in suspension.

Colluvium landtype - A landtype of loose and incoherent deposits, usually at the foot of a slope or cliff and brought there chiefly by gravity.

Commercial Thinning - Any type of tree thinning that produces merchantable material at least equal in value to the direct costs of harvesting.

Commodities - A transportable resource with commercial value; all resource products that are articles of commerce.

Dendritic drainage pattern - A drainage pattern characterized by irregular branching in all directions with the tributaries joining the main stream at all angles.

Ecosystem - An interacting system of organisms considered together with their environment.

Element Occurrence Number A unique number given to a rate plant population by the Oregon Natural Heritage Database which tracks populations statewide to determine endangerment.

Even-aged management - The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together.

Flow regime - Generally describes the pattern of monthly variation in the volume of water discharged from a stream or river.

Fluvial species - Plant or animal species that live in the water.

Forested Land - Land at least 10 percent occupied by forest trees or formerly having had such tree cover and not currently developed for nonforest use.

Fuels - Combustible wildland vegetative materials.

Geomorphic - Of, or pertaining to, the figure of the earth or the form of its surface; resembling the earth.

Green Tree Retention (GTR) - A stand management practice in which live trees as well as snags and large down wood are left as biological legacies within harvest units to provide habitat components over the next management cycle.

Habitat - The area where a plant or animal lives and grows under natural conditions. Habitat consists of living and non-living attributes, and provides all requirements for food and shelter.

Habitat Diversity - The number of different types of habitat found within a given area.

Land Use Allocation - The commitment of a given area of land or a resource to one or more specific uses.

Large Woody Material - Portion of a tree that has fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter.

Management Area - An area with a similar management objective and a common management prescription.

Mature Forest - In the WNF, areas containing trees whose average age is 120 - 200 years old. There is significantly less diversity of plant species and structure than in an old-growth forest.

Migration Corridor - The portion of the landscape serving as a routine passageway for fish or wildlife species as they move from one habitat to another, often on a seasonal basis.

Morphology - The observation of the form of lands.

Natural Regeneration - Reforestation of a site by natural seeding from the surrounding trees.

Non-forested Land - Lands that never have had or that are incapable of having 10 percent or more of the area occupied by forest trees; or lands previously having such cover and currently developed for non-forest use.

Old-Growth - A forest comprised of many large trees, large snags, and numerous large down logs; having a multi-layered canopy composed of several species of trees; the last stage in forest succession. In the WNF, forests begin to show some old-growth characteristics at 175-200 years.

Over-mature Timber - The stage at which a tree declines in vigor and soundness; past the period of rapid height growth.

Overstory - That portion of the trees forming the upper or uppermost canopy.

Piscivorous - One that eats fish.

Pole/sapling - A successional stage in which trees between five and nine inches in diameter are the dominant vegetation.

Precommerical Thinning - Removal of some trees in a stand before they attain merchantable size so the remaining trees will grow more quickly.

Probable Sale Quantity - Describes the allowable harvest levels for various alternatives that could maintained without decline over the long term if the schedule of harvests and regeneration were followed.

Reforestation - The natural or artificial restocking of an area with forest trees.

Regeneration - The renewal of a tree crop, whether by natural or artificial means. Also, the young crop itself.

Rehabilitation - The process of restoring a site to a former state or desired condition.

Release - Freeing trees from competition for light, water, and nutrients by removing or reducing the vegetation growth that is overtopping or closely surrounding them.

Removal Cut (final cut, regeneration cut) - The removal of the last seed bearers or shelter trees after regeneration is established under a shelterwood method.

Riparian - Pertaining to areas of land directly influenced by water or influencing water. Riparian areas usually have visible vegetative or physical characteristics reflecting this water influence. Stream sides, lake borders, or marshes are typical riparian areas.

Salvage - The cutting of trees that are dead, dying, or deteriorating (before they are "overmature", or materially damaged by fire, wind, insects, fungi or other injurious agencies) before they lose their commercial timber value.

Seral - A biotic community which is a developmental, transitory stage in an ecological succession.

Seven day peak period - The warmest consecutive 7 day period of the year used to determine compliance with temperature standards.

Silviculture - The art and science of controlling the establishment, composition, and growth of forests.

Slash - Residue (leaves, bark, twigs, roots, etc) left on the ground after logging.

Snag - A standing dead tree usually greater that 5 feet high and 6 inches diameter at breast height. Its interior may be sound or rotted.

Stand - An aggregation of trees or other vegetation occupying a specific area and sufficiently uniform in species composition, age arrangement, and condition as to be distinguishable from the forest or other vegetation or land cover on adjoining areas.

Stand Examination Surveys - Procedures to collect data on Forest stands.

Stocking - A loose term for the amount of anything in a given area, particularly in relation to pre-determined optimum.

Structure - The configuration of elements, parts, or constituents of a habitat, plant, or animal community.

Succession - The progressive development of vegetation from bare ground towards its highest ecological expression, the climax community; the replacement of one plant community by another.

Tuffs - Rocks formed of compacted volcanic fragments, generally smaller than 4 mm in diameter.

Vegetative management - Activities designed primarily to promote the health of the crop forest cover for multiple-use purposes.

Water yield Class - Classification based on the water retention properties of soil types. It is an indication of the rate and amount of water yield expected from each soil based on various factors.

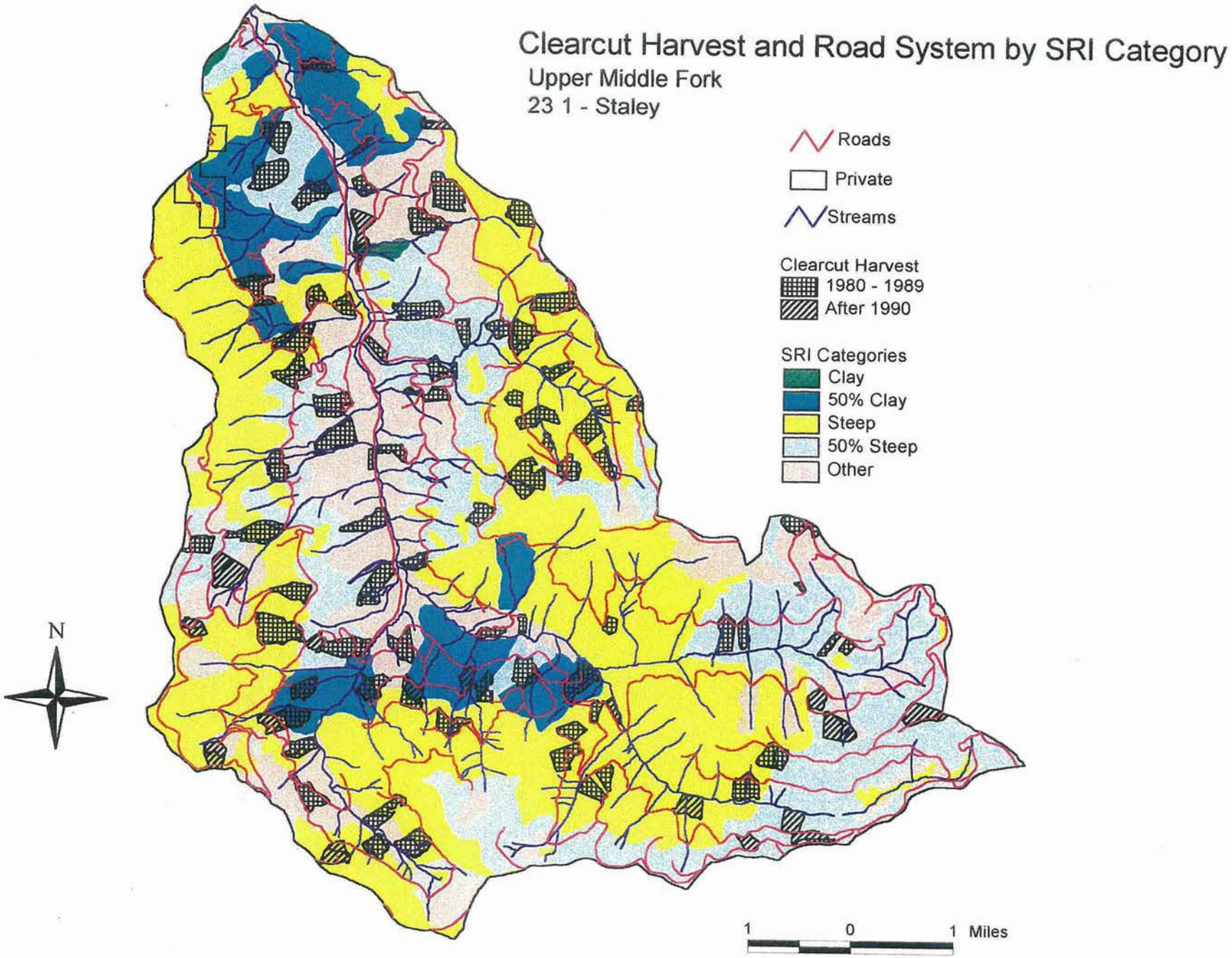
Appendix A. Landslide Data Sheets and Figures by Subwatershed

Upper Middle Fork Willamette River Watershed Analysis
Summary Sheet 3/96 MAL

Sub-Shed	SRI Category	% Area	Acres Total	Acres HCC	Ac HCC After 1980	Road Miles	Pre-Hist	Natural	Harvest	Road	Dam	Earthflow
23-1	1	0.2	56.5	8.7	8.5	0.1	0	0	0	0	0	0
	2	9.5	2477.6	758.5	235.8	10.8	0	4	2	1	0	3
	3	43.1	11177.3	2593.7	938.9	48.4	24	0	3	6	0	0
	4	26.6	6903.9	2541.0	717.8	37.0	3	4	1	1	0	0
	5	20.6	5335.1	2072.9	654.6	27.8	0	1	0	1	0	0
	Sev. Eros.	39.4	10236.0	3243.1	978.6	56.3	18	0	1	4	0	0
		TOTAL	25950.4	7974.7	2555.5	124.1	27	9	6	9	0	3
23-2	1	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
	2	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
	3	44.8	4724.4	1225.8	713.1	19.2	11	7	0	2	0	0
	4	19.1	2016.4	479.1	131.7	9.4	2	0	0	0	0	0
	5	36.1	3811.5	1237.4	599.2	23.8	0	0	0	0	0	0
	Sev. Eros.	55.0	5805.4	1902.6	970.9	30.4	5	5	0	2	0	0
		TOTAL	10552.3	2942.3	1444.0	52.5	13	7	0	2	0	0
23-3	1	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
	2	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
	3	27.7	7145.4	1221.3	564.7	23.3	7	2	3	1	0	0
	4	18.3	4723.2	541.9	220.8	10.6	2	0	0	0	0	0
	5	53.9	13881.2	1583.3	725.6	52.6	0	0	0	0	0	0
	Sev. Eros.	36.5	9394.4	1627.5	605.7	39.9	7	0	3	1	0	0
		TOTAL	25749.8	3346.4	1511.0	86.5	9	2	3	1	0	0
23-4	1	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
	2	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
	3	32.7	3731.8	578.5	429.8	9.4	3	4	1	0	0	0
	4	20.5	2338.1	130.7	75.1	2.5	0	0	0	1	0	0
	5	46.8	5348.9	987.0	399.1	30.7	0	0	0	0	0	0
	Sev. Eros.	15.3	1748.7	342.5	197.5	5.9	1	1	1	0	0	0
		TOTAL	11418.8	1696.1	904.0	42.5	3	4	1	1	0	0

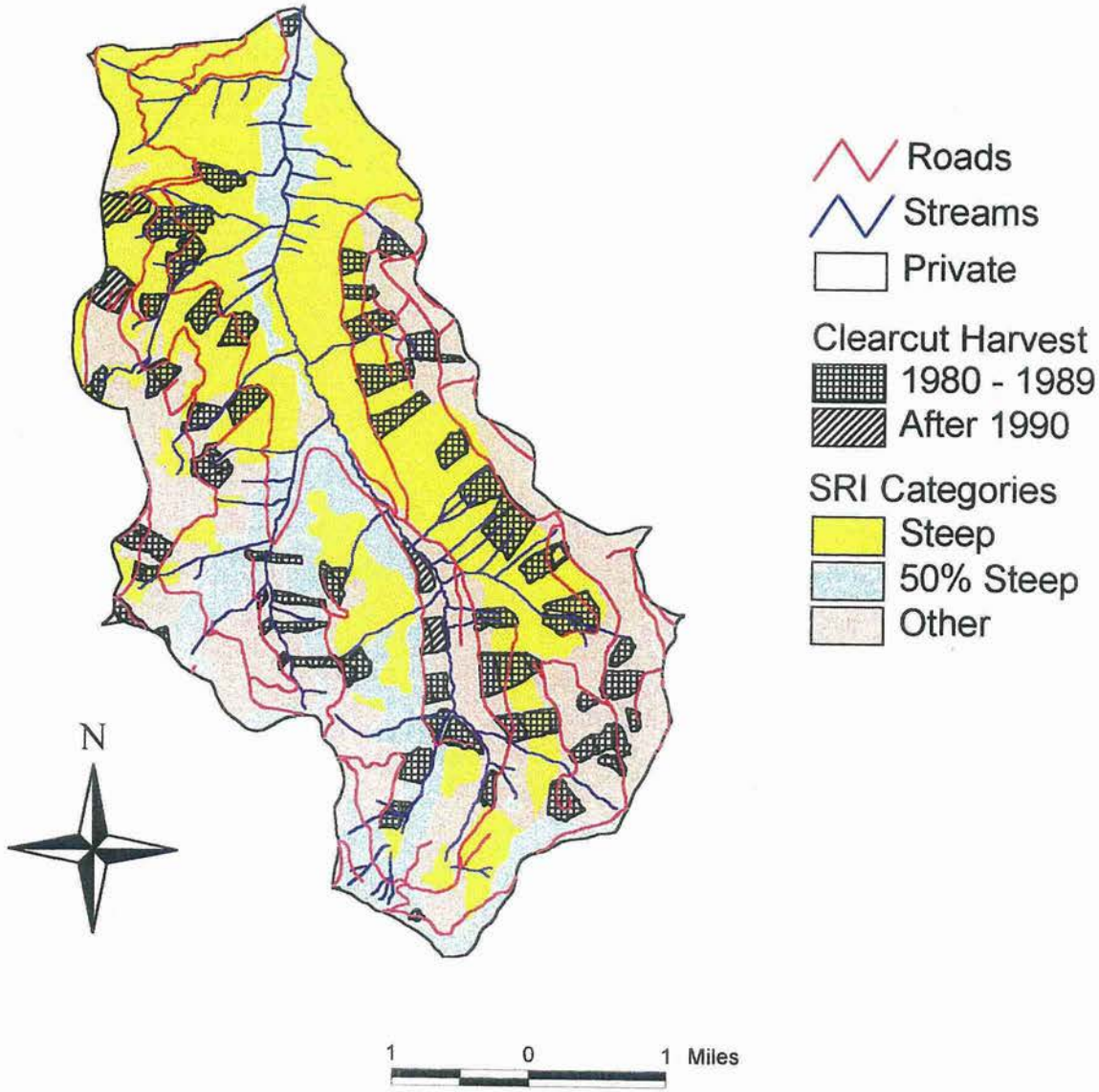
Sub-Shed	SRI Category	% Area	Acres Total	Acres HCC	Acres HCC After 1980	Road Miles	Pre-Hist	Natural	Harvest	Road	Dam	Earthflow
23-5	1	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
	2	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
	3	45.1	7600.3	2915.6	1045.3	35.5	8	5	1	4	0	0
	4	9.5	1606.0	103.1	5.8	1.6	0	1	0	0	1	0
	5	45.3	7629.8	1625.3	621.2	15.5	0	1	0	1	0	0
	Sev. Eros	26.3	4426.8	2227.3	596.7	23.2	7	5	0	4	1	0
		TOTAL	16836.1	4644.1	1672.3	52.5	8	7	1	5	1	0
23-6	1	1.705388	390.14	121.2	39.9	1.4	0	0	0	0	0	0
	2	4.596556	1051.55	666.4	218.3	7.4	0	0	0	0	0	0
	3	46.67724	10678.31	3243.2	1530.1	39.7	6	5	1	2	0	0
	4	11.40097	2608.19	1014.7	479.8	16.5	0	0	0	0	0	0
	5	35.6198	8148.71	4704.3	2262.8	54.2	0	0	1	0	0	0
	Sev. Eros	25.51136	5836.21	2329.8	949.3	30.4	6	4	1	2	0	0
		TOTAL	22876.9	9749.8	4530.9	119.2	6	5	2	2	0	0
Watershed 23 Totals	1	0.4	446.6	129.9	48.4	1.5	0	0	0	0	0	0
	2	3.1	3529.2	1424.9	454.1	18.2	0	4	2	1	0	3
	3	39.7	45057.6	11778.0	5221.9	175.5	59	23	9	15	0	0
	4	17.8	20195.8	4810.4	1630.9	77.6	7	5	1	2	1	0
	5	38.9	44155.1	12210.2	5262.5	204.5	0	2	1	2	0	0
	Sev. Eros	33.0	37447.5	11672.9	4298.6	186.1	44	15	6	13	1	0
Grand Total			113384.2	30353.4	12617.7	477.3	66	34	13	20	1	3

Explanation
SRI Category 1: Clay soils, usually on gentle slopes
SRI Category 2: 50% Clay soil, usually on gentle to moderate slopes
SRI Category 3: Shallow, rocky soil on steep slopes (>60%)
SRI Category 4: 50% Shallow, rocky soil on steep slopes (>60%) and 50% on moderate slopes
SRI Category 5: Sandy soils, usually on gentle slopes such as valley bottoms and benches
Severely Erosive category is a combination of SRI units and complexes included within the 5 SRI categories
Earthflow refers to known, active earthflow features of a size visible on 1:63,360 mapping


Clearcut Harvest and Road System by SRI Category
Upper Middle Fork
23 1 - Staley
Roads
Private
Streams
Clearcut Harvest
1980 - 1989
After 1990
SRI Categories
Clay
50% Clay
Steep
50% Steep
Other
N
1
0
1 Miles

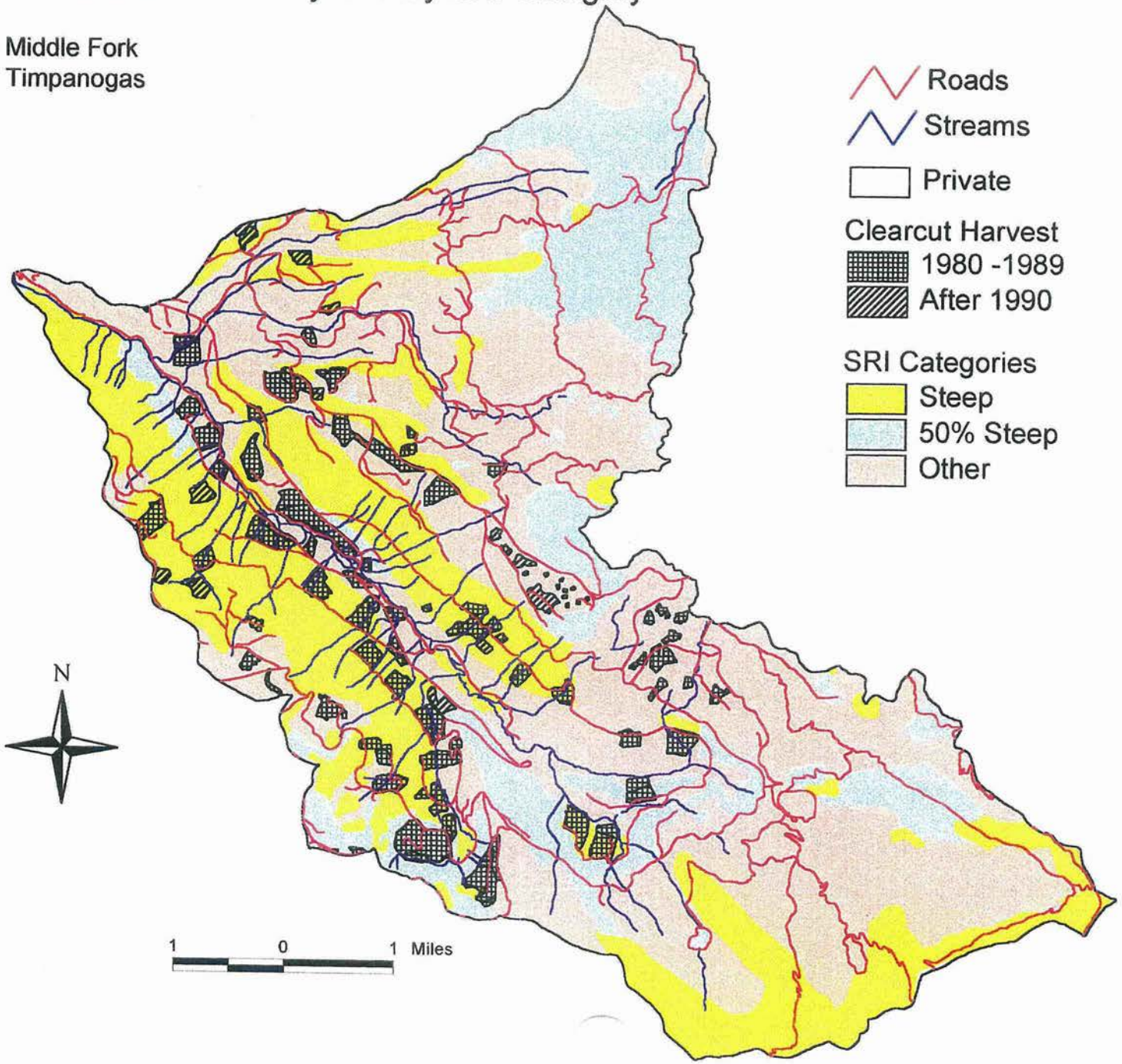
Clearcut Harvest and Road System by SRI Category

Upper Middle Fork
23 2 - Tumblebug



Clearcut Harvest and Road System by SRI Category

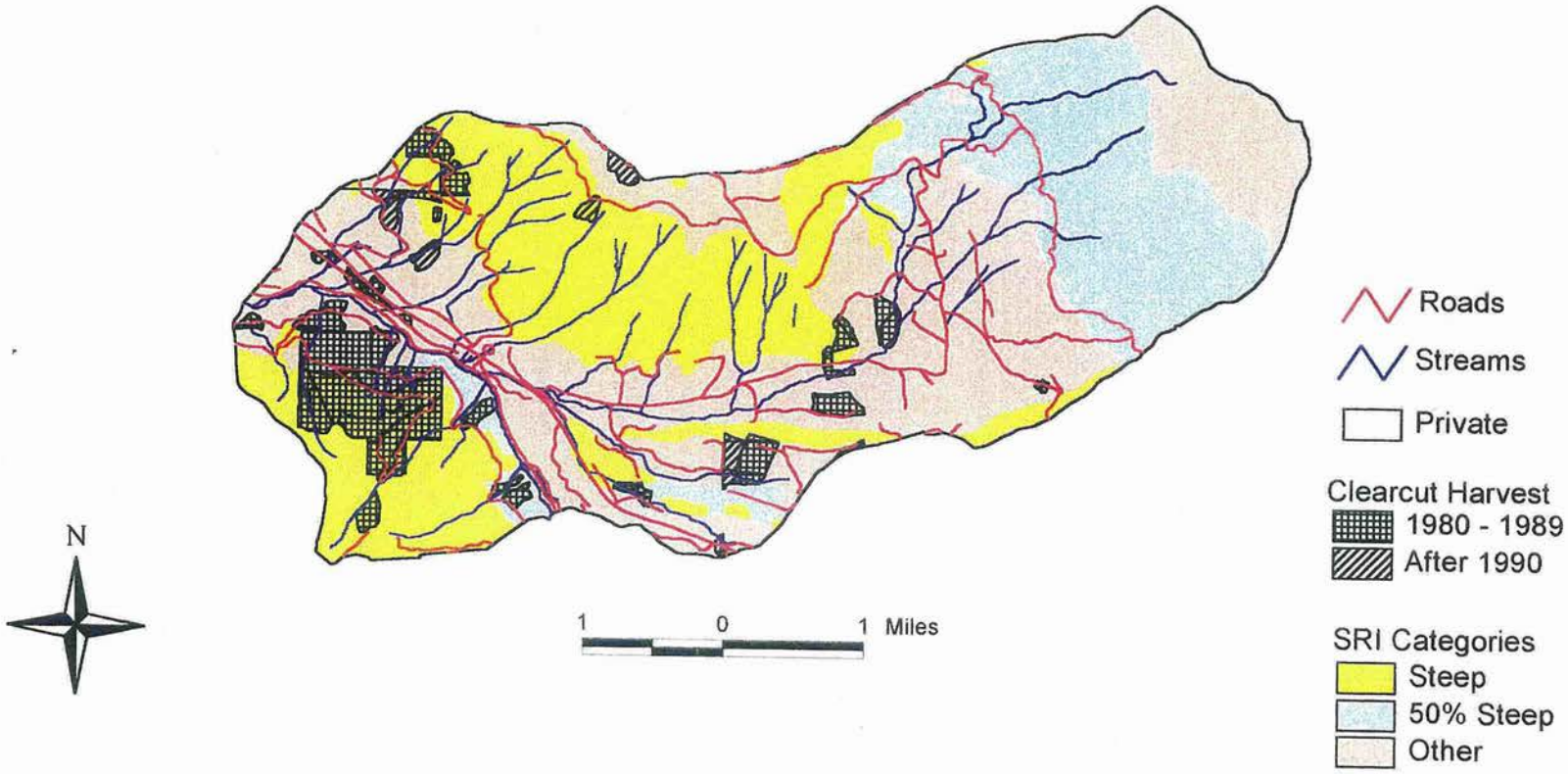
Upper Middle Fork
23 3 - Timpanogas



Clearcut Harvest and Road System by SRI Category

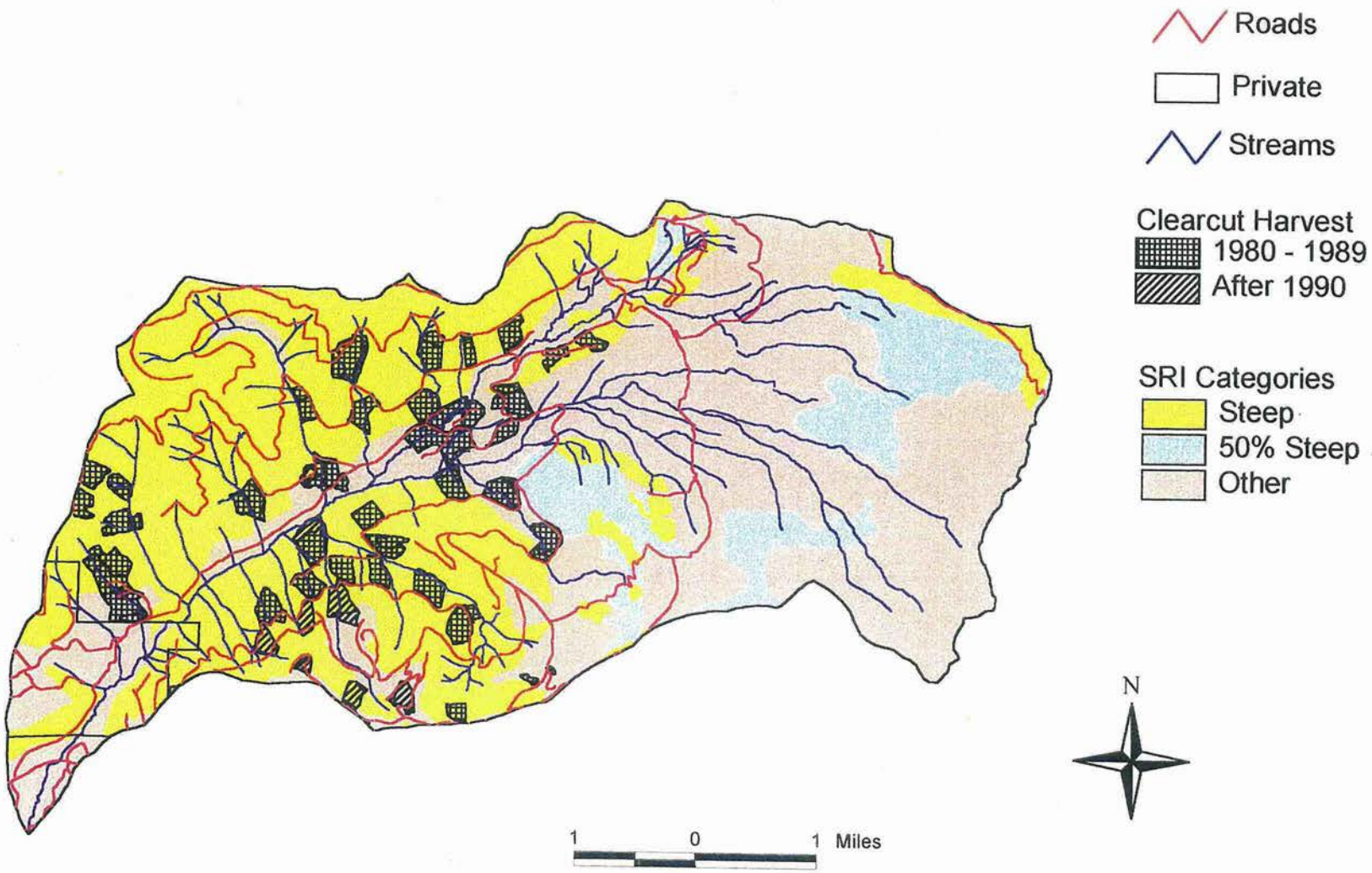
Upper Middle Fork

23 4 - Pioneer



Clearcut Harvest and Road System by SRI Category

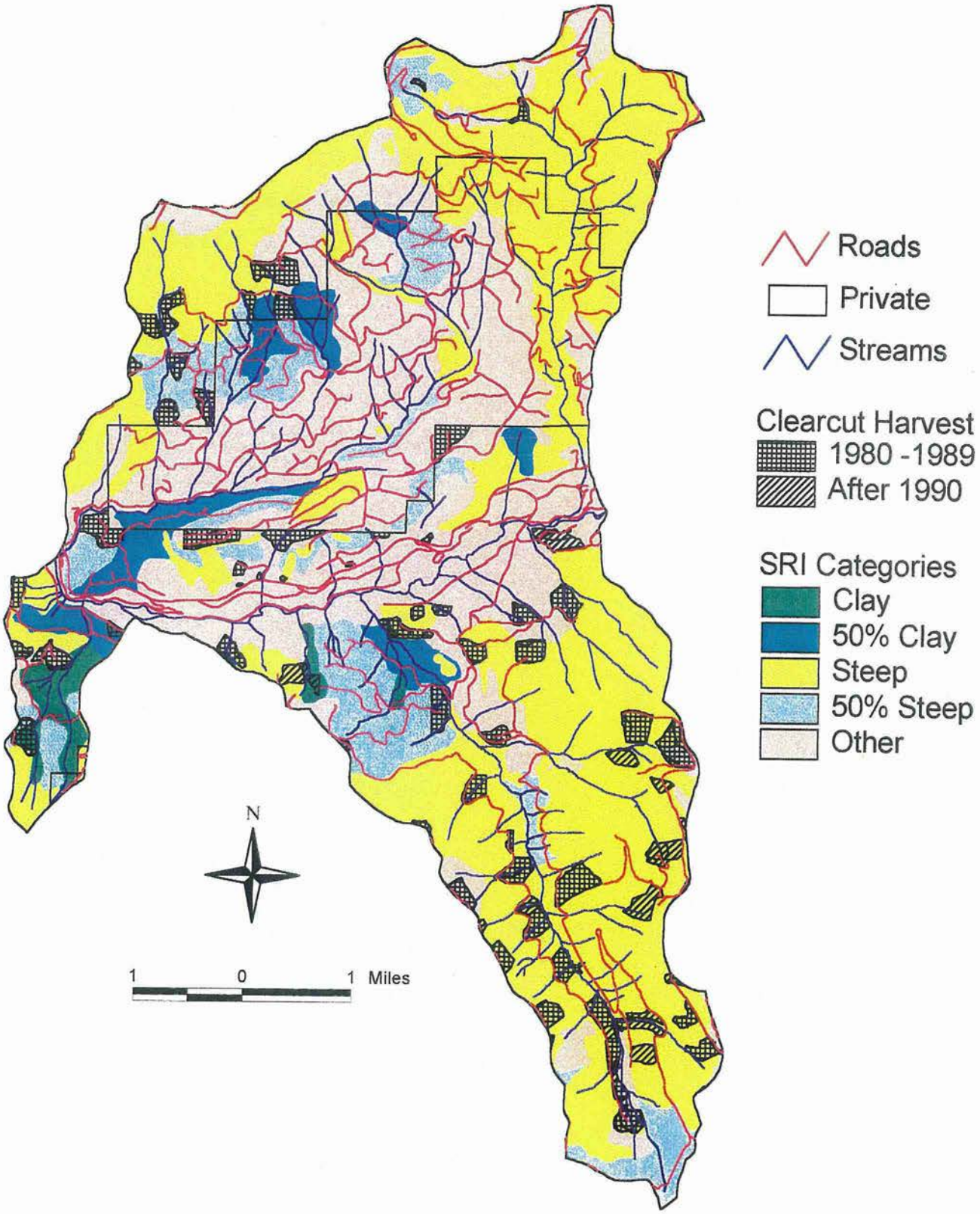
Upper Middle Fork
23 5 - Swift



Clearcut Harvest and Road System by SRI Category

Upper Middle Fork

6 - Simpson/Echo



Appendix B. Storm Response Explanation

Storm Response Category	=	Water Yield Class (SRI)	+	Snow Accumulation (Elevation)	+	Snow Melt Rate (Aspect & Elevation)

Water Yield Class Information

		Water Transmissivity	
Water Yield Class I	=	Low	low runoff rate & high water detention
Water Yield Class II	=	Moderate	moderate runoff & moderate water detention
Water Yield Class III	=	High	high runoff & low water detention

Snow Accumulation Assumptions:

Snow Accumulation	High	=	X > 4,000 feet elevation
	Moderate	=	X < 4,000 feet elevation

Snow Melt Rate Assumptions:

Low	=	North Aspect & X > 4,000 feet
Moderate	=	North Aspect & X < 4,000 feet
Moderate	=	South Aspect & X > 4,000 feet
High	=	South Aspect & X < 4,000 feet

Snow Response Factors = Snow Accumulation & Melt Rate

Aspect		**North**		**South**	
Elevation		**X > 4,000**	**X < 4,000**	**X > 4,000**	**X < 4,000**
Melt Rate	=	**Low**	**Moderate**	**Moderate**	**High**
Snow Accumulation		**High**	**Moderate**	**High**	**Moderate**
Snow Response		***Low***	***Moderate***	***Moderate***	***High***

Note: above the 4,000 foot elevation band where the shift out of the Transient Snow Zone occurs, the influence of snow melt is thought to be greater than that of snow accumulation so values of the melt rate were used instead. As it turns out the melt rate values ended up being the snow response values. This may also be a result of using elevation information to develop both snow accumulation and melt rate assumptions.

Storm Response Matrix:

		Water Yield					
		I		**II**		**III**	
Snow	**High**	h/l	**H**	h/m	**H**	h/h	**H**
Response	**Moderate**	m/l	**L**	m/m	**M**	m/h	**H**
	Low	l/l	**L**	l/m	**L**	l/h	**M**

Appendix C. Data Compilation Sheets for Channel Sensitivity Ratings

Channel Condition Data Compilation Sheet - Data Sources for All Reaches

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
most recent survey designation	start and end points	survey data	classification results	classification results	surveyed length
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	1946 forest photos	1967 forest photos	1990 forest photos.	interpretation	reference condition
Wetted Width	1937 BOF survey	1964 OSGC	GP, ODFW, R6, misc.	interpretation	theory
Pool Frequency (> 3' deep)	1937 BOF survey	1964 OSGC	GP, ODFW, R6, misc.	interpretation	PACFISH
LWD - field count	1937 BOF survey	1964 OSGC	GP, ODFW, R6, misc.	interpretation	reference condition
(photo count)	1946 forest photos	1967 forest photos	1990 forest photos		and PACFISH
Substrate (dom/subdom)	1937 BOF survey	1964 OSGC	GP, ODFW, R6, misc.	interpretation	theory
% Fines	1937 BOF survey	na	GP, ODFW, R6, misc.	interpretation	Forest Standard
Embeddedness			GP, ODFW, R6, misc.		Forest Standard
Banks (dom/subdom)	1937 BOF survey	1964 OSGC	GP, ODFW, R6, misc.	interpretation	reference condition
comments					and theory
Riparian Vegetation	1946 forest photos	1967 forest photos	1990 forest photos	interpretation	reference condition
Type (dom/subdom) & Size		1964 OSGC	GP, ODFW, R6, misc.		management direction
Channel Form	1946 forest photos	1967 forest photos	1990 forest photos	interpretation	reference condition
			GP, ODFW, R6, misc.		and theory

Survey Methodologies

1937 BOF - Summary Report for Bureau of Fisheries Stream Habitat Surveys Willamette River Basin 1934 - 1942. McIntosh, Clarke, Sedell. Pacific Northwest Research Station. USFS. Oregon State University, Corvallis. BPA Project No. 80-104

1964 OSGC - A Physical Inventory of Streams in the Upper Willamette Watershed Above the Confluence of the Middle and Coast Forks of Willamette River 1964. Thompson. Oregon State Game Commission Basin Investigations Section. Project F-69-R-2, Job No. 1

ODFW - Oregon Department of Fish and Wildlife Aquatic Habitat Inventory.

GP - Gifford Pinchot National Forest Stream Inventory

R6 - USFS Region 6 Stream Inventory

misc. - Pfankuch Channel Stability Index, Rigdon Ranger District Channel Assessment

Echo

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Echo 1	mouth to rd. 325	~5%	F4B/V1B	response/transport (35/65)	1.3 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	none visible	32'	7'	response with recovery	maintain
Surveyed Wetted Width	na	~6 - 10'	~18'	possible widening	maintain or decrease
Pool Frequency (> 3' deep)	small, shallow	na	some > 3'	indeterminate	maintain or increase
LWD - field count	many debris jams	na	some logs	indeterminate	maintain or increase
(photo count)	and fallen trees		present		(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co/sb	na	co/sb	apparently stable	stable size distribution
					over time
% Fines in Riffles	na	na	na	na	< 20% <.08" in riffles
Embeddedness					
Bank Conditions	na	na	sb/co	na	well vegetated banks
(dom/subdom), comments					access to floodplain
					where less confined
Riparian Vegetation	conif - lt	c/d - lt/st	d/c - st/lt	decreased conifer	LSOG conifer dom.
Type (dom/subdom) & Size				decrease in large trees	
Channel Form	single	single	single	stable	maintain
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
				lt = large tree 21-31.9" dbh	

Echo

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Echo 2	road 325 to rm 2.8	~6%	V1A	transport	1.5 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	none visible	visible widening	width persists	increased width	decrease
		mass wasitin input			
Surveyed Wetted Width	na	na	~16'	na	
Pool Frequency	na	na	na	na	(Pacfish std. ~56/mi.)
LWD - field count	na	na	some log jams	na	(Pacfish std. ~ 80/mi.)
(photo count)					
Substrate (dom/subdom)	na	na	sb/co	na	stable size distribution
					over time
% Fines in Riffles	na	na	na	na	< 20% <.08" in riffles
Embeddedness					
Bank Conditions	na	na	sb/co	na	well vegetated banks
(dom/subdom), comments					access to floodplain
					where less confined
Riparian Vegetation	conif - lt	conif - lt	d/c - st/sp	decreased conifer	LSOG conifer dom.
Type (dom/subdom) & Size		some areas removed		decreased large trees	
Channel Form	single	single	single	stable	maintain

Abbreviations					
Substrate				**Riparian**	**Other**
sa = sand <= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
				lt = large tree 21-31.9" dbh	

MFW

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
MFW 4	What Cr. to Staley Cr	1%	F3C	response	3.7 rm.
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	75'	173'	77'	response with recovery	maintain
Surveyed Wetted Width	na	~45'	~66'	possible increase	maintain or decrease
Pool Frequency (> 3' deep)	43/mi.	~17/mi.	2.6/mi.	large decrease	increase
					(Pacfish std. ~23/mi.)
LWD - field count	log jams noted	na	8.1/mi.	poss. decrease in LWD loading	increase LWD
(photo count)	(8)	(4)	(1)		(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co	sb >12"	co/gr	possible shifts in dom. size	stable size distribution
					over time
% Fines in riffles	~5% <.25" in reach	na	0% <.08" in riffles	no apparent increase	< 20% <.08" in riffles
Embeddedness			none visible		
Banks (dom/subdom)	na	na	sa/co	na	well vegetated banks
comments			erosion at bends		access to floodplain
Riparian Vegetation	c/d - lt	c/d - lt	d/c - 36%sp, 55% st	shift to decid. dom & small size	LSOG c-d mixed
Type (dom/subdom) & Size					
Channel Form	meandering single	meandering multiple	meandering single	response with recovery	stable meandering
					single channel
			Abbreviations		
Substrate		**Riparian**		**Other**	
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous		na = not available	
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh		LWD = 50' L x 24" W	
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh		rm = river mile	
		lt = large tree 21-31.9" dbh		LSOG = late successional old growth	

MFW

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
MFW 5	Staley Cr to Swift Cr.	2%	F3C	response	4.6 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	67.8'	196.9'	81.6'	response with recovery	maintain or decrease
Surveyed Wetted Width	~10' near Echo Cr.	~40 - 45'	~58'	probable increase	maintain or decrease
Pool Frequency (> 3' deep)	17 - 43/mi.	numerous ~17/mi	3.2/mi.	large decrease	increase to ~23/mi.
LWD - field count	log jams noted	na	15.4/mi.	indeterminate	increase LWD
(photo count)	(4.4)	(4.3)	(6.4)		(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co/gr	sb >12"	co/sb	apparently stable	stable size distribution over time
% Fines in riffles	~3 -5 % <.25" in reach	na	0% < .08" in riffles	no apparent increase	< 20% <.08" in riffles
Embeddedness			none visible		
Bank Conditions	na	na	sa/co	na	well vegetated banks
(dom/subdom), comments			large sloughs noted		access to floodplain
Riparian Vegetation	c/d - lt	c/d - lt	d/c - 38%sp, 43% st	shift to decid. dom & small size	LSOG c-d mixed
Type (dom/subdom) & Size					
Channel Form	meandering single	braided multiple	meandering multiple	response with partial recovery	stable meandering single channel

Abbreviations

Substrate		Riparian	Other
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	LSOG = late successional old growth

MFW

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
MFW 6	Swift Cr.to near Fizz Cr.	2%	F3C	response	1.4 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	43.7'	148.8'	46.7'	response with recovery	maintain
Surveyed Wetted Width	na	~40'	46.6'	stable	maintain
Pool Frequency (> 3' deep)	~17/mi.	numerous	2/mi.	large decrease	increase to ~23/mi.
LWD - field count	log jams noted	na	30.7/mi. - 3 jams	indeterminate	maintain /increase LWD
(photo count)	(6)	(4)	(4.7)		(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co/gr	na	co/gr	apparently stable	stable size distribution
					over time
% Fines in Riffles	~3 -5 % <.25" in reach	na	2% <.08" in riffles	no apparent increase	< 20% <.08" in riffles
Embeddedness			not visible		
Bank Conditions	na	na	co/sa	na	well vegetated banks
(dom/subdom), comments			frequent sloughing		access to floodplain
Riparian Vegetation	c/d - lt	c/d - lt	decid. 100% sp	shift to decid. dom & small size	LSOG c-d mixed
Type (dom/subdom) & Size					
Channel Form	meandering single	meandering single	meandering single	stable	stable meandering
					single channel
			Abbreviations		
Substrate		**Riparian**		**Other**	
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous		na = not available	
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh		LWD = 50' L x 24" W	
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh		rm = river mile	
		lt = large tree 21-31.9" dbh		LSOG = late successional old growth	

MFW

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
MFW 8	Tbug - 0.7mi. upstream	6%	V1A	transport	0.7 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	no visible widening	na	na	na
		post flood			
Surveyed Wetted Width	na	~30'	36.2'	stable	maintain
Pool Frequency (> 3' deep)	na	~54/mi. 2 -4' dee	28.8/mi.	possible decrease	maintain or increase
LWD - field count	na	na	42.9/mi. - 3 jams	na	maintain /increase LWD
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	~ sb/lb	lb/sb	stable	stable size distribution
					over time
% Fines in Riffles	na	na	0% < .08" in riffles	na	< 20% <.08" in riffles
Embeddedness					
Bank Conditions	na	na	br/sb	na	maintain
(dom/subdom), comments					
Riparian Vegetation	conif. - lt	conif - lt	conif - 61% lt	stable	maintain LSOG - conif. dom.
Type (dom/subdom) & Size					
Channel Form	single channel	single channel	single channel	stable	maintain

Abbreviations			
Substrate		**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	LSOG = late successional old growth

MFW

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
MFW 9	to Emmigrant Cr.	4%	V1B	transport	0.9 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	slight, not measured	visible increase	visible decrease	response with recovery	na
Surveyed Wetted Width	na	~30'	31.8'	stable	maintain
Pool Frequency (> 3' deep)	na	~54/mi. 2 -4' deep	10.3/mi.	probable decrease	increase to ~23/mi.
LWD - field count (photo count)	na	na	23.0/mi. - 6 jams	na	maintain /increase LWD (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	~ sb/lb	co/sb	stable	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	0% < .08" in riffles	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	br/co	na	maintain
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	conif - lt	c/d - 47% lt	probable decrease in large trees	LSOG - conif. dom.
Channel Form	single channel	single channel	single channel	stable	maintain

Abbreviations

Substrate		Riparian	Other
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	LSOG = late successional old growth

MFW

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
MFW 10	Emmigrant to L. bank trib.	3%	U1C	Response	1.3 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	slight, not measured	visible increase	visible decrease	na	na
Surveyed Wetted Width	na	~30'	28'	stable	maintain
Pool Frequency (> 3' deep)	na	~54/mi. 2 -4' deep	6.2/mi.	probable decrease	increase to ~23/mi.
LWD - field count (photo count)	na	na	23.1/mi.	na	maintain /increase LWD (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	~ sb/lb	co/sb	stable	stable size distribution over time
% Fines in Riffles	na	na	0% < .08" in riffles	na	< 20% <.08" in riffles
Embeddedness			visible embeddedness		
Bank Conditions (dom/subdom), comments	na	na	sb/co infrequent sloughs	na	well vegetated banks access to floodplain
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	conif - lt	conif. 50% st	decrease in large trees	LSOG - conif. dom.
Channel Form	single channel	single channel	single channel side channels, braiding	indeterminate	stable meandering channel

Abbreviations

Substrate		Riparian	Other
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	LSOG = late successional old growth

MFW

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
MFW 11	to Lane/Doug Co. line	2%	U2B/U1C	transport/response (50/50)	1.8 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	na
Surveyed Wetted Width	na	~20'	25.6'	stable	maintain
Pool Frequency (> 3' deep)	na	~54/mi. 2 -4' deep	6.0/mi.	probable decrease	increase to ~47/mi.
LWD - field count	na	several jams	26.7/mi.	indeterminate	maintain /increase LWD
(photo count)			several jams		(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	~ sb/lb	co/gr	possible decrease in dom. sizes	stable size distribution
					over time
% Fines in Riffles	na	na	3.0% < .08" in riffles	na	< 20% <.08" in riffles
Embeddedness			50% embeddedness		
Bank Conditions	na	na	co/gr	na	well vegetated banks
(dom/subdom), comments			erosion at bends		access to floodplain
			& near debris jams		
Riparian Vegetation	conif - lt	conif - lt	d/c - 7% lt	shift to d/c mixed, decreased lt %	LSOG - conif. dom.
Type (dom/subdom) & Size					
Channel Form	single channel	single channel	single channel	indeterminate	stable meandering
			side channels, braiding		channel

Abbreviations

Substrate		Riparian	Other
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	LSOG = late successional old growth

MFW

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
MFW 12	Co. line to Sp. Meadow Cr.	2%	U1C/F4DA	response	1.2 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	na
Surveyed Wetted Width	na	~20'	23.3'	stable	maintain
Pool Frequency (> 3' deep)	na	~54/mi. 2 -4' deep	9.9/mi.	probable decrease	increase to ~47/mi.
LWD - field count (photo count)	na	several jams	33.3/mi. many jams	indeterminate	maintain /increase LWD (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	~ sb/lb	co/gr	possible decrease in dom. sizes	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	1% < .08" in riffles	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	sa/gr erosion at bends & near debris jams	na	well vegetated banks access to floodplain
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	conif - lt	c/d - 33% lt	decreased lt %	LSOG - conif. dom.
Channel Form	single channel	single channel	single channel	stable	stable meandering channel

Abbreviations

Substrate		Riparian	Other
sa = sand <= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	LSOG = late successional old growth

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Noisy 1	mouth to rm 0.8	4%	F4B/V2A	response/transport (60/40)	0.8 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	none visible	visible widening	none visible	response with recovery	maintain
		in harvested areas			
Surveyed Wetted Width	na	~10'	12'	stable	maintain
Pool Frequency (> 3' deep)	**na**	**na**	**2/mi.**	**na**	**maintain/increase**
LWD - field count	na	several jams	9/mi.	possible decrease	increase
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	co/sb	co/gr(sb)	stable	stable size distribution
					over time
% Fines in Riffles	na	na	12%<.08"	na	< 20% <.08" in riffles
Embeddedness					
Bank Conditions	na	na	84% veg stabilized	na	well vegetated banks
(dom/subdom), comments			7.5% eroding		access to floodplain
					where less confined
Riparian Vegetation	c/d - lt	c/d - lt	mixed - lt/st	decreased large trees	LSOG mixed
Type (dom/subdom) & Size					
Channel Form	single	single	single	stable	maintain
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
				lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
Noisy 2	rm 0.8 to rm 1.1	12%	V2A	transport	.3 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	none visible	none visible	none visible	stable	maintain
Surveyed Wetted Width	na	~6 - 10'	12'	stable	maintain
Pool Frequency (> 3' deep)	**na**	**na**	**3/mi.**	**na**	**maintain/increase**
LWD - field count (photo count)	na	several jams	30/mi.	possible decrease	increase (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	co/sb	lb/co	possible increase	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	10%<.08"	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	56% non-erodible	na	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	c/d - lt	c/d - lt	c/d - st/lt	decreased large trees	LSOG mixed
Channel Form	single	single	single	stable	maintain

Abbreviations

Substrate

- sa = sand </= .08"
- sb = small boulder 10 - 40"
- gr = gravel .08 -2.5"
- lg = large boulder 40 - 144"
- co = cobble 2.5 - 10"
- br = bedrock > 144"

Riparian

- c = conifer, d = deciduous
- sp = sapling/pole 5.0-8.9" dbh
- st = small tree 9.0-20.9" dbh
- lt = large tree 21-31.9" dbh

Other

- na = not available
- LWD = 50' L x 24" W
- rm = river mile

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Noisy 3	rm 1.1 to 3.0 at USFS bndry	6%	V1A	transport	1.9 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	none visible	none visible	none visible	stable	maintain
Surveyed Wetted Width	na	~6'	10'	stable	maintain
Pool Frequency (> 3' deep)	**na**	**na**	**3/mi.**	**na**	**maintain/increase**
LWD - field count	na	na	3/mi.	na	increase
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	co/sb	co/sb	stable	stable size distribution
					over time
% Fines in Riffles	na	na	7%<.08"	na	< 20% <.08" in riffles
Embeddedness					
Bank Conditions	na	na	96% veg stabilized	na	well vegetated banks
(dom/subdom), comments					access to floodplain
					where less confined
Riparian Vegetation	conif - lt	c/d - lt	decid. - st	decreased conifer	LSOG conif. dom
Type (dom/subdom) & Size				decreased large trees	
Channel Form	single	single	single	stable	maintain
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
				lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
Noisy 4	USFS bndry to rm 4.1	11%	V1A	transport	1.1 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	none visible	none visible	none visible	na	maintain
Surveyed Wetted Width	na	na	9'	na	maintain
Pool Frequency (> 3' deep)	**na**	**na**	**2/mi.**	**na**	**maintain/increase**
LWD - field count (photo count)	na	na	20/mi.	na	increase (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	br(co)/lb(gr)	na	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	20% < .08"	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	52% veg stabilized	na	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	conif - lt	sparse conif - st	decreased conifer decreased large trees	LSOG conif. dom
Channel Form	single	single	single	stable	maintain

Abbreviations

Substrate		Riparian	Other
sa = sand <= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Simpson 1	mouth to N/S confluence	5.30%	V1B	transport	2 rm.
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	none visible	104' (rm. 0.75)	13.3' (rm 0.75)	response with recovery	maintain
Surveyed Wetted Width	na	10'	16.1'	possible increase	maintain or decrease
Pool Frequency (> 3' deep)	few and small	~34/mi. (2-4' deep)	5/mi.	probable decrease	increase
LWD - field count (photo count)	debris jams noted	debris jams noted	1.5/mi.	large decrease	increase Pacfish std. =~80/mi.
Substrate (dom/subdom)	~sb/co	lb/br	sb/gr	possible decrease in size	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	7% < .08" in riffles	indeterminate	<20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	scoured, exposed (1967 photos)	94% non-erodible	possible removal of erodible material	well vegetated banks
Riparian Vegetation Type (dom/subdom) & Size	conifer - lt	removed	mixed - st	disturbance and recovery decrease in large conifer	LSOG - conifer dom.
Channel Form	single	single	single	stable	maintain

Abbreviations			
Substrate		**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	LSOG = late successional old growth

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
Simpson 2	N/S confluence to rd 238 culvert	3.60%	V1A	transport	1.0 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	none visible	visible increase	none visible	response with recovery	maintain
Surveyed Wetted Width	na	not measured 10'	10.2'	stable	maintain
Pool Frequency (> 3' deep)	na	~34/mi. (2-4' deep)	2/mi.	probable decrease	increase
LWD - field count (photo count)	na	debris jams noted	1/mi.	large decrease	increase Pacfish std. =~80/mi.
Substrate (dom/subdom)	na	sb/br	co/gr/sb	possible decrease in size	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	9% < .08" in riffles	indeterminate	<20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	scoured, exposed (1967 photos)	56% veg stabilized 10% eroding	disturbance with some recovery	well vegetated banks
Riparian Vegetation Type (dom/subdom) & Size	conifer - lt	removed	mixed - st	disturbance and recovery decrease in large conifer	LSOG - conifer dom.
Channel Form	single	single	single	stable	maintain

Abbreviations

Substrate		Riparian	Other
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	LSOG = Late successional old growth

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Staley 1	mouth to Dome Cr. confl.	3%	F3C	response	2.5 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	62.4'	133'	42.8'	response with recovery	maintain
Surveyed Wetted Width	~30'	~20'	21.3	stable or decreased	maintain or decrease
Pool Frequency (> 3' deep)	~14/mi.	~34/mi. (2-4' deep)	~14/mi.	apparently stable	maintain or increase
					(Pacfish std. ~47/mi.)
LWD - field count	many log jams	na	3./mi.	probable decrease	increase LWD
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co/gr	co/gr(sb)	co/sb(gr)	possible reduction of gravel component	stable size distribution
	bedrock in spots	bedrock spots	bedrock spots		over time
% Fines in Riffles	18%<.25" in reach	na	8%<.08"	apparently stable	< 20% <.08" in riffles
Embeddedness					
Bank Conditions	co/gr/br	na	co/sb(gr)	apparently stable	well vegetated banks
(dom/subdom), comments	some erosion		17% eroding	likely response/recovery	access to floodplain
			75% veg stabilized		
Riparian Vegetation	conif - lt	conif - lt	c/d mixed - lt/st	decrease in large trees	LSOG conifer dom.
Type (dom/subdom) & Size				increase in deciduous trees	
Channel Form	single	mutiple	single	response with recovery	stable meandering
					single channel
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
			Page 1	lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
Staley 3	near Shelter Cr. to Davey C.	3%	V4B	response	1.1 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	23'	67'	20'	response with recovery	maintain
Surveyed Wetted Width	na	~15'	22'	apparently stable	maintain
Pool Frequency (> 3' deep)	na	~34/mi. (2-4' deep)	7/mi.	probable decrease	increase (Pacfish std. ~47/mi.)
LWD - field count (photo count)	na	na	2.7/mi.	na	increase LWD (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	co/sb	co/sb	apparently stable	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	3%<.08"	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	87% veg. stabilized	na	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	conif - lt	decid - st	decreased conifer decreased large trees	LSOG conifer dom.
Channel Form	single	single	single	stable	maintain

Abbreviations

Substrate

- sa = sand <= .08"
- gr = gravel .08 -2.5"
- co = cobble 2.5 - 10"
- sb = small boulder 10 - 40"
- lg = large boulder 40 - 144"
- br = bedrock > 144"

Riparian

- c = conifer, d = deciduous
- sp = sapling/pole 5.0-8.9" dbh
- st = small tree 9.0-20.9" dbh
- lt = large tree 21-31.9" dbh

Other

- na = not available
- LWD = 50' L x 24" W
- rm = river mile

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Staley 2	Dome Cr. to near Shelter C.	3%	F3C/V4B	response	2.8 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	27'	48.7'	33'	response with recovery	maintain
Surveyed Wetted Width	~31'	~15'	20'	apparently stable	maintain
Pool Frequency (> 3' deep)	~15/mi.	~34/mi. (2-4' deep)	20/mi.	apparently stable	maintain or increase
					(Pacfish std. ~47/mi.)
LWD - field count	many log jams	2 log jams	3.6/mi.	probable decrease	increase LWD
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	~co/gr	br/sb(co)	br/sb(co)	apparently stable	stable size distribution
				possible reduction of gravel component	over time
% Fines in Riffles	~5%<.25" in reach	na	3%<.08"	apparently stable	< 20% <.08" in riffles
Embeddedness					
Bank Conditions	co/gr/br	na	64% non-erodible	indeterminate	well vegetated banks
(dom/subdom), comments	some erosion			possible loss of erodible material	access to floodplain
					where less confined
Riparian Vegetation	conif - lt	conif - lt	mixed lt/st	decrease in large trees	LSOG conifer dom.
Type (dom/subdom) & Size				increase in deciduous trees	
Channel Form	single	single	single	stable	maintain
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
			Page 2	lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
S. Fork Staley 1	mouth to 0.7 rm	7%	V4B	transport	0.7 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	16'	na	
Pool Frequency	na	na	11.4/mi.	na	increase (Pacfish std. ~56/mi.)
LWD - field count (photo count)	na	na	41/mi.	na	increase LWD (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	co/sb	na	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	na no embeddedness	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	co(sb)/co	na	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	na	na	67% conif - lt	na	LSOG conifer dom.
Channel Form	na	na	na	na	

Abbreviations

Substrate

- sa = sand <= .08"
- gr = gravel .08 -2.5"
- co = cobble 2.5 - 10"
- sb = small boulder 10 - 40"
- lg = large boulder 40 - 144"
- br = bedrock > 144"

Riparian

- c = conifer, d = deciduous
- sp = sapling/pole 5.0-8.9" dbh
- st = small tree 9.0-20.9" dbh
- lt = large tree 21-31.9" dbh

Other

- na = not available
- LWD = 50' L x 24" W
- rm = river mile

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
S. Fork Staley 2	0.7 rm - 1.4 rm	7%	V4B	transport	0.7 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	12'	na	
Pool Frequency	na	na	4.3/mi.	na	increase
					(Pacfish std. ~56/mi.)
LWD - field count	na	na	8/mi.	na	increase LWD
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	co(gr)/sb	na	stable size distribution
					over time
% Fines in Riffles	na	na	na	na	< 20% <.08" in riffles
Embeddedness			no embeddedness		
Bank Conditions	na	na	br/co(sa)	na	well vegetated banks
(dom/subdom), comments					access to floodplain
					where less confined
Riparian Vegetation	na	na	67% conif - lt	na	LSOG conifer dom.
Type (dom/subdom) & Size					
Channel Form	na	na	na	na	
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
			Page 6	lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
S. Fork Staley 3	rm 1.4 - rm 3.6	7%	V4B/V2B	transport	1.2 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	10'	na	
Pool Frequency	na	na	5/mi.	na	increase (Pacfish std. ~96/mi.)
LWD - field count (photo count)	na	na	36/mi.	na	increase LWD (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	gr/co	na	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	visible embeddedness	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	br(sb)/co	na	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	na	na	78% conif - lt	na	LSOG conifer dom.
Channel Form	na	na	na	na	

Abbreviations			
Substrate		**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
S. Fork Staley 4	rm 3.6 to rm 5.4	4%	V2B/V4B	transport (response)	1.8 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	7'	na	
Pool Frequency	na	na	3/mi.	na	increase
					(Pacfish std. ~96/mi.)
LWD - field count	na	na	21/mi.	na	increase LWD
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	gr/sa	na	stable size distribution
					over time
% Fines in Riffles	na	na	visible	na	< 20% <.08" in riffles
Embeddedness			embeddedness		
Bank Conditions	na	na	sa/sa	na	well vegetated banks
(dom/subdom), comments					access to floodplain
					where less confined
Riparian Vegetation	na	na	71% <sp	na	LSOG conifer dom.
Type (dom/subdom) & Size					
Channel Form	na	na	na	na	
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
			Page 8	lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
N. Fork Staley 1	mouth to rm .09	10%	V2A	transport	.09 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	16'	na	
Pool Frequency	na	na	8/mi.	na	increase (Pacfish std. ~56/mi.)
LWD - field count (photo count)	na	na	24/mi.	na	increase LWD (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	co(gr)/co	na	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	na 35% embedded	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	sb/sa	na	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	na	na	67% conif - lt	na	LSOG conifer dom.
Channel Form	na	na	na	na	

Abbreviations

Substrate

sa = sand <= .08"
sb = small boulder 10 - 40"
gr = gravel .08 -2.5"
lg = large boulder 40 - 144"
co = cobble 2.5 - 10"
br = bedrock > 144"

Riparian

c = conifer, d = deciduous
sp = sapling/pole 5.0-8.9" dbh
st = small tree 9.0-20.9" dbh
lt = large tree 21-31.9" dbh

Other

na = not available
LWD = 50' L x 24" W
rm = river mile

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
N. Fork Staley 2	rm .09 - rm 3.1	10%	V2A	transport	2.2 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	12'	na	
Pool Frequency	na	na	5/mi.	na	increase
					(Pacfish std. ~56/mi.)
LWD - field count	na	na	29/mi.	na	increase LWD
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	co/co	na	stable size distribution
					over time
% Fines in Riffles	na	na	na	na	< 20% <.08" in riffles
Embeddedness			40% embedded		
Bank Conditions	na	na	co/co	na	well vegetated banks
(dom/subdom), comments					access to floodplain
					where less confined
Riparian Vegetation	na	na	67% conif - lt	na	LSOG conifer dom.
Type (dom/subdom) & Size					
Channel Form	na	na	na	na	
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
			Page 10	lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Swift 1	mouth to rm 1.8	3%	F4B	response	1.8 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	23'	115'	36'	response with recovery	maintain
Surveyed Wetted Width	~36'	~18'	25'	apparently stable	maintain
Pool Frequency (> 3' deep)	~11/mi.	~17/mi. (2-4' deep)	6/mi.	probable decrease	increase (Pacfish std. ~26/mi.)
LWD - field count (photo count)	many log jams	several log jams	48/mi.	possible decrease	increase (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co/gr	sb/co	sb/co/gr	stable	stable size distribution over time
% Fines in Riffles Embeddedness	~9% < .25" in reach	na	5% < .08"	apparently stable	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	sb/co/gr 94% veg stabilized	na	well vegetated banks access to floodplain
Riparian Vegetation Type (dom/subdom) & Size	c/d - lt	c/d - lt/st	d/c - sp/st	decreased conifer decreased large trees	LSOG mixed
Channel Form	single many side channels	multiple main channels	single no side channels	single meandering main channel	maintain reconnect side ch.

Abbreviations

Substrate		**Riparian**	**Other**
sa = sand <= .08"	sb = small boulder 10 - 40"	c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"	sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"	st = small tree 9.0-20.9" dbh	rm = river mile
		lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Swift 2	rm 1.8 to rm 4.2	4%	V1A	transport	2.4 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	none visible	visible	visible	some increase in width	decrease
Surveyed Wetted Width	~34'	~10'	25'	roughly stable	maintain
Pool Frequency (> 3' deep)	~13/mi.	~17/mi.	~11/mi.	apparently stable	maintain
LWD - field count (photo count)	log jams noted	many jams	30/mi.	possible decrease	maintain or increase (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co/gr	sb/co	sb/co/gr	stable	stable size distribution over time
% Fines in Riffles Embeddedness	~8% < .25" in reach	na	~6% < .08"	apparently stable	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	co/gr	na	well vegetated banks access to floodplain where less confined
		57-96% non-erodible			
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	removed	78% decid - sp	decreased conifer decreased large trees	LSOG conifer dom.
Channel Form	single	single	single	stable	maintain

Abbreviations				
Substrate			**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"		c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"		sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"		st = small tree 9.0-20.9" dbh	rm = river mile
			lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
Swift 2	rm 1.8 to rm 4.2	4%	V1A	transport	2.4 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	none visible	visible	visible	some increase in width	decrease
Surveyed Wetted Width	~34'	~10'	25'	roughly stable	maintain
Pool Frequency (> 3' deep)	~13/mi.	~17/mi.	~11/mi.	apparently stable	maintain
LWD - field count (photo count)	log jams noted	many jams	30/mi.	possible decrease	maintain or increase (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co/gr	sb/co	sb/co/gr	stable	stable size distribution over time
% Fines in Riffles Embeddedness	~8% <..25" in reach	na	~6% < .08"	apparently stable	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	co/gr 57-96% non-erodible	na	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	removed	78% decid - sp	decreased conifer decreased large trees	LSOG conifer dom.
Channel Form	single	single	single	stable	maintain

Abbreviations

Substrate

- sa = sand </= .08"
- gr = gravel .08 -2.5"
- co = cobble 2.5 - 10"
- sb = small boulder 10 - 40"
- lg = large boulder 40 - 144"
- br = bedrock > 144"

Riparian

- c = conifer, d = deciduous
- sp = sapling/pole 5.0-8.9" dbh
- st = small tree 9.0-20.9" dbh
- lt = large tree 21-31.9" dbh

Other

- na = not available
- LWD = 50' L x 24" W
- rm = river mile

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Swift 3	rm 4.2 to rm 5.9	6%	V2A	transport	1.7 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	~10'	16'	apparently stable	maintain
Pool Frequency (> 3' deep)	na	~17/mi.	~6/mi.	possible decrease	increase
LWD - field count (photo count)	na	several log jams	42/mi.	indeterminate	maintain or increase
Substrate (dom/subdom)	na	sb/co	co/sb	stable	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	16% < .08"	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	sb/co	na	well vegetated banks access to floodplain
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	conif - lt	65% decid - sp	decreased conifer decreased large trees	LSOG conifer dom.
Channel Form	single	single	single	stable	maintain

			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
				lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
Swift 3	rm 4.2 to rm 5.9	6%	V2A	transport	1.7 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	~10'	16'	apparently stable	maintain
Pool Frequency (> 3' deep)	na	~17/mi.	~6/mi.	possible decrease	increase
LWD - field count (photo count)	na	several log jams	42/mi.	indeterminate	maintain or increase
Substrate (dom/subdom)	na	sb/co	co/sb	stable	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	16% < .08"	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	sb/co	na	well vegetated banks access to floodplain
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	conif - lt	65% decid - sp	decreased conifer decreased large trees	LSOG conifer dom.
Channel Form	single	single	single	stable	maintain

Abbreviations

Substrate

- sa = sand <= .08"
- gr = gravel .08 -2.5"
- co = cobble 2.5 - 10"
- sb = small boulder 10 - 40"
- lg = large boulder 40 - 144"
- br = bedrock > 144"

Riparian

- c = conifer, d = deciduous
- sp = sapling/pole 5.0-8.9" dbh
- st = small tree 9.0-20.9" dbh
- lt = large tree 21-31.9" dbh

Other

- na = not available
- LWD = 50' L x 24" W
- rm = river mile

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Swift 4	rm 5.9 - 6.9	4%	U2B	response	1.0rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	9'	na	maintain
Pool Frequency	na	na	35/mi.	na	increase
LWD - field count	na	na	5/mi.	na	maintain or increase
(photo count)					
Substrate (dom/subdom)	na	na	co/gr	na	stable size distribution
					over time
% Fines in Riffles	na	na		na	< 20% <.08" in riffles
Embeddedness			>35% embedded		
Bank Conditions	na	na	co/sa	na	well vegetated banks
(dom/subdom), comments					access to floodplain
Riparian Vegetation	conif - lt	na	d/c - sp	decrease in large trees	LSOG conifer dom.
Type (dom/subdom) & Size				decrease in conifer	
Channel Form	single	na			maintain
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand <= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
				lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Tumblebug 1	mouth to rm 0.9	3%	V1B	transport	0.9 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	13'	47'	21'	response with some recovery	maintain or decrease
Surveyed Wetted Width	~19'	~12'	18'	stable	maintain
Pool Frequency (> 3' deep)	7/mi.	na	10/mi.	stable	maintain
LWD - field count (photo count)	log jams noted	na	56/mi.	indeterminate	maintain or increase (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	co/sb	co/sb	co/sb	stable	stable size distribution over time
% Fines in Riffles	6%<.25" in reach	na	na	indeterminate	< 20% <.08" in riffles
Embeddedness			<25% embedded		
Bank Conditions (dom/subdom), comments	na	na	co/gr	indeterminate	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	conif - lt	conif - lt	conif - lt	stable	LSOG conifer dom.
Channel Form	single	single	single	stable	maintain

Abbreviations				
Substrate			**Riparian**	**Other**
sa = sand <= .08"	sb = small boulder 10 - 40"		c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"		sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"		st = small tree 9.0-20.9" dbh	rm = river mile
			lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Tumblebug 2	rm 0.9 to rm 2.2	4%	V1B	transport	1.3 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	19'	na	
Pool Frequency	na	na	44/mi.	na	maintain/increase
					(Pacfish std. ~56/mi.)
LWD - field count	na	na	87/mi.	na	maintain
(photo count)					
Substrate (dom/subdom)	na	na	gr/co	na	stable size distribution
					over time
% Fines in Riffles	na	na	na	na	< 20% <.08" in riffles
Embeddedness			<25% embedded		
Bank Conditions	na	na	br/lb	na	well vegetated banks
(dom/subdom), comments					access to floodplain
					where less confined
Riparian Vegetation	na	na	conif - lt	na	LSOG conifer dom.
Type (dom/subdom) & Size					
Channel Form	na	na	na	na	
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
				lt = large tree 21-31.9" dbh	

Channel Condition Data Compilation Sheet

Reach Name	Description	Gradient	Valley/Rosgen	Gmorph Type	Length
Tumblebug 3	rm 2.2 to rm 3.6	4%	V1A	transport	1.4 rm

Parameter	Reference (1937 - 1946)	Transition (1964 - 1967)	Current (1990 - 1995)	Trend from past to present	General Goal
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	13'	na	
Pool Frequency	na	na	26/mi.	na	increase (Pacfish std. ~56/mi.)
LWD - field count (photo count)	na	na	34/mi.	na	increase (Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	gr/co	na	stable size distribution over time
% Fines in Riffles Embeddedness	na	na	na	na	< 20% <.08" in riffles
Bank Conditions (dom/subdom), comments	na	na	co/sb	na	well vegetated banks access to floodplain where less confined
Riparian Vegetation Type (dom/subdom) & Size	na	na	na	na	LSOG conifer dom.
Channel Form	na	na	na	na	

Abbreviations

Substrate

- sa = sand <= .08"
- gr = gravel .08 -2.5"
- co = cobble 2.5 - 10"
- sb = small boulder 10 - 40"
- lg = large boulder 40 - 144"
- br = bedrock > 144"

Riparian

- c = conifer, d = deciduous
- sp = sapling/pole 5.0-8.9" dbh
- st = small tree 9.0-20.9" dbh
- lt = large tree 21-31.9" dbh

Other

- na = not available
- LWD = 50' L x 24" W
- rm = river mile

Channel Condition Data Compilation Sheet					
Reach Name	**Description**	**Gradient**	**Valley/Rosgen**	**Gmorph Type**	**Length**
Tumblebug 4	rm 3.6 ro rm 4.3	5%	V1A	transport	0.7 rm
Parameter	**Reference**	**Transition**	**Current**	**Trend from past to present**	**General Goal**
	(1937 - 1946)	(1964 - 1967)	(1990 - 1995)		
Unvegeted Channel Width	na	na	na	na	
Surveyed Wetted Width	na	na	1.1'	na	
Pool Frequency	na	na	33/mi.	na	increase
					(Pacfish std. ~56/mi.)
LWD - field count	na	na	126/mi.	na	maintain
(photo count)					(Pacfish std. ~80/mi.)
Substrate (dom/subdom)	na	na	gr/co	na	stable size distribution
					over time
% Fines in Riffles	na	na	na	na	< 20% <.08" in riffles
Embeddedness					
Bank Conditions	na	na	co/sb	na	well vegetated banks
(dom/subdom), comments					access to floodplain
					where less confined
Riparian Vegetation	na	na	na	na	LSOG conifer dom.
Type (dom/subdom) & Size					
Channel Form	na	na	na	na	
			Abbreviations		
Substrate				**Riparian**	**Other**
sa = sand </= .08"	sb = small boulder 10 - 40"			c = conifer, d = deciduous	na = not available
gr = gravel .08 -2.5"	lg = large boulder 40 - 144"			sp = sapling/pole 5.0-8.9" dbh	LWD = 50' L x 24" W
co = cobble 2.5 - 10"	br = bedrock > 144"			st = small tree 9.0-20.9" dbh	rm = river mile
				lt = large tree 21-31.9" dbh	

Appendix D. Rosgen Classification and Valley Segment Definitions

Table 2
Summary of delineative criteria for broad-level classification

Stream type	General description	Entrenchment ratio	*W/D* ratio	Sinuosity	Slope	Landform/soils/features
Aa+	Very steep, deeply entrenched, debris transport streams.	< 1.4	< 12	1.0 to 1.1	> 0.10	Very high relief. Erosional, bedrock or depositional features; debris flow potential. Deeply entrenched streams. Vertical steps with/deep scour pools; waterfalls.
A	Steep, entrenched, cascading, step/pool streams. High energy/debris transport associated with depositional soils. Very stable if bedrock or boulder d ›minated channel.	< 1.4	< 12	1.0 to 1.2	0.04 to 0.10	High relief. Erosional or depositional and bedrock forms. Entrenched and confined streams with cascading reaches. Frequently spaced, deep pools in associated step-pool bed morphology.
B	Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.	1.4 to 2.2	> 12	> 1.2	0.02 to 0.039	Moderate relief, colluvial deposition and/or residual soils. Moderate entrenchment and *W/D* ratio. Narrow, gently sloping valleys. Rapids predominate with occasional pools.
C	Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well defined floodplains	> 2.2	> 12	> 1.4	< 0.02	Broad valleys with terraces, in association with floodplains, alluvial soils. Slightly entrenched with well-defined meandering channel. Riffle-pool bed morphology.

D	Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.	n/a	> 40	n/a	< 0.04	Broad valleys with alluvial and colluvial fans. Glacial debris and depositional features. Active lateral adjustment, with abundance of sediment supply.
DA	Anastomosing (multiple channels) narrow and deep with expansive well vegetated floodplain and associated wetlands. Very gentle relief with highly variable sinuosities. Stable streambanks.	> 4.0	< 40	variable	< 0.005	Broad, low-gradient valleys with fine alluvium and/or lacustrine soils. Anastomosed (multiple channel) geologic control creating fine deposition with well-vegetated bars that are laterally stable with broad wetland floodplains.
E	Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio.	> 2.2	< 12	> 1.5	< 0.02	Broad valley/meadows. Alluvial materials with floodplain. Highly sinuous with stable, well vegetated banks. Riffle-pool morphology with very low width/depth ratio.
F	Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.	< 1.4	> 12	> 1.4	< 0.02	Entrenched in highly weathered material. Gentle gradients, with a high *W/D* ratio. Meandering, laterally unstable with high bank-erosion rates. Riffle-pool morphology.
G	Entrenched "gulley" step/pool and low width/depth ratio on moderate gradients.	< 1.4	< 12	> 1.2	0.02 to 0.039	Gulley, step-pool morphology with moderate slopes and low *W/D* ratio. Narrow valleys, or deeply incised in alluvial or colluvial materials; i.e., fans or deltas. Unstable, with grade control problems and high bank erosion rates.

VALLEY SEGMENT TYPES

Valley Segment Type	Valley Bottom Gradient	Side Slope Gradient	Valley Bottom Width	Channel Pattern	Stream Order	Landform and Geographic Features
F1-Estuarine Delta	<=5%	<5%	>5X	Unconstrained highly sinuous; often braided	Any	Occur at mouth of streams on estuarine flats in and just above zone of tidal influence
F2-Alluvial lowlands	<=1%	>5%	>5X	Unconstrained highly sinuous	Any	Wide floodplains typically formed by present or historic large rivers within flat to gently rolling lowland landforms; sloughs, oxbows, and abandoned channels commonly associated with mainstem rivers
F3 Wide Mainstem Valley	<=2%	>5%	>5X	Unconstrained; moderate to high sinuosity; braids common	Any	Wide Valley floors bounded by mountain slopes; generally associated with mainstem rivers and the tributary streams flowing through the valley floor; sloughs and abandoned channels common
F4-Alluvial/Colluvial Fan	1%-3%	<=10%	>3X	Variable; generally unconstrained	1-4	Generally occur where tributary streams enter low gradient valley floors; ancient or active alluvial/colluvial fan deposition overlying floodplains of larger, low gradient stream segments; stream may actively downcut through deep alluvial fan deposition
F5-Gently Sloping Plateaus and Terraces	<=2%	<10%	1X-2X	Moderately constrained; low to moderate sinuosity	1-3	Drainage ways shallowly incised into flat to gently sloping landscape; narrow active flooplains; typically associated with small streams in lowlands, cryic uplands or volcanic flanks
F6-Palustrine Springfed Meandering Flats	<2%	<5%	75X	Unconstrained; high sinuosity	>=2	Associated with lakes, ponds or wetland outlets; often high elevation; fine sediment storage; grass/forb riparian communities
M1-Moderate Slope Bound	2%-5%	10%-30%	<2X	Constrained; infrequent meanders	1-4	Constrained, narrow floodplains bounded by moderate gradient sideslopes; typically found in lowlands and foothills, but may occur on broken mountain slopes and volcano flanks
M2-Alluviated Moderate Slope Bound	<=2%	<5%, gradually increase to 30%	2X-4X	Unconstrained; moderate to high sinuosity	1-4	Active floodplains and alluvial terraces bounded by moderate gradient hillslopes; typically found in lowlands and foothills, but may occur on broken mountain slopes and volcano flanks
V1-V-Shaped Moderate Gradient Bottom	2%-6%	30%-70%	<2X	Constrained	>=2	Deeply incised drainage ways with steep competent sideslopes; very common in uplifted mountainous topography; less commonly associated with marine or glacial outwash terraces in lowlands and foothills
V2-V-Shaped High Gradient bottom	6%-11%	30%-70%	<2X	Constrained	>=2	Same as V1, but valley bottom longitudinal profile steep with pronounced stairstep characteristics
V3-Bedrock Canyon	3%-11%	>=70%	<2X	Highly constrained	>=2	Canyon-like stream corridors with frequent bedrock outcrops; frequently stairstepped profile; generally associated with folded, faulted or volcanic landforms
V4-Alluviated Mountain Valley	1%-4%	Channel adjacent slopes <10%; increases to 30%	2X-4X	Unconstrained; high sinuosity; with side channels and braids common	2-5	Deeply incised drainage ways with relatively wide floodplains; distinguished as "alluvial flats" in otherwise steeply dissected mountainous terrain

Valley Segment Type	Valley Bottom Gradient	Side Slope Gradient	Valley Bottom Width	Channel Pattern	Stream Order	Landform and Geographic Features
U1-U-Shaped Trough	<3%	<5%; gradually increases to >30%	>4X	Unconstrained; moderate to high sinuosity; side channels and braids common	1-4	Drainage ways in mid to upper watersheds with history of glaciation, resulting in U-shaped profile; valley bottom typically composed of glacial drift deposits overlain with more recent alluvial material adjacent to channel
U2-Incised U-Shaped Valley, Moderate Gradient Bottom	2%-5%	Steep channel adjacent slopes, decreases to <30% then increases to >30%	2X	Moderately constrained by unconsolidated material; infrequent short flats with braids and meanders	2-5	Channel downcuts through deep valley bottom glacial till, colluvium or coarse glacio-fluvial deposits; cross sectional profile variable, but generally weakly U-shaped with active channel vertically incised into valley fill deposits; immediate sideslopes composed of unconsolidated and often unsorted coarse grained deposits
U3-Incised U-Shaped Valley, High Gradient Bottom	6%-11%	Same as U2	<2X	Same as U2	2-5	Same as U2
U4-Active Glacial Outwash Valley	1%-7%	Initially <5%, increases to >60%	<4X	Unconstrained; highly sinuous and braided	1-3	Stream corridors directly below active alpine glaciers; channel braiding and shifting common; active channel nearly as wide as valley bottom
U5-Incised U-Shaped Valley, Bedrock Channel	3%-5%	Same as U4	<2X	Highly constrained	2-5	Valley type is the result of channel downcutting through underlying bedrock of moderate gradient valley types
H1-Moderate Gradient Valley Wall / Headwater	3%-6%	>30%	<2X, may be >2X in headwater cirques	Constrained	1-2	Small drainage ways with channels slightly to moderately entrenched into mountain toeslopes or headwater basins
H2-High Gradient Valley Wall / Headwater	6%-11%	>30%	<2X	Constrained; stairstepped	1-2	Small drainage ways with channels moderately entrenched into high gradient mountain slopes or headwater basins; bedrock exposures and outcrops common; localized alluvial/colluvial terrace deposition
H3-Very High Gradient Valley Wall / Headwater	>11%	>60%	<2X	Constrained; stairstepped	1-2	Small drainage ways with channels moderately entrenched into very steep mountain slopes or headwater basins; bedrock exposures and outcrops frequent.

Appendix E. Seral Stage Classification

1. Stand initiation (SI): seedling stands to sapling/pole mixes with sapling size dominant; diameter measurement from 0 to 4.9" dbh, some stands with a component of poles (5-8.9"). Canopy is open; down woody material is limited by standards and guides in place at time of harvest. Stream shading is inadequate to maintain natural temperature regimes. Competition between conifers is nonexistent or minimal.

2. Stem exclusion (SE): pole stands to small tree/medium tree mixed stand; encompasses diameters from 5-20.9, with a component of medium trees 21.0-31.9" dbh within some stands. This category is further treated as two sub-categories:

   - Early Stem Exclusion (ESE): trees predominantly five to nine inches. Canopy is closed, single-layered and not deep. Large woody material has not developed within the stand. Relative density is greater than 35%, indicating competition between conifers, resulting in mortality and slowed growth. Streams receive inadequate shading due to thin canopy layer.

   - Late Stem Exclusion Trees predominantly nine to twenty-one inches. Canopy is closed, single-layered and moderately deep. Down woody material is minimal or not available. Relative densities are 45-55%, indicating conditions of continued mortality and slowed growth. Due to the increased canopy depth provides adequate stream shading.

3. Mature/Old Growth (MOG): Medium trees and larger; diameter measurements >21". Canopy is closed and deep. The youngest stands (approximately 35% of this group) are in the understory reinitiation stage, where understory is generated in small gaps and openings. In stands over 150 years (approximately 65% of this category), a multi-layered canopy is present. Stream shading is adequate, and large woody material is available within the stand.

Appendix F. Lands Unsuitable for Harvest

Date:December 11, 1990

To: Watershed Specialists

Subject: Lands Suitable for Timber Production

This is to clarify what lands are suited for timber production under the Forest Plan.

The definition of "not suited" in NFMA 219.14

1) the land is not forest land as defined in NFMA 219.3.
2) Technology is not available to ensure timber production form land without irreversible resource damage to soils productivity or watershed conditions.
3) There is not reasonable assurance that such lands can be adequately restocked as provided in 219.27(c)(3).
4) The land has been withdrawn from timber production by an Act of Congress, the Secretary of Agriculture or the Chief of the Forest Service.

The SRI types fitting criteria 1, 2 and 3 above for unsuited lands are:

	SRI	
Non-Forest	1,2,4,5,6,7	
Regeneration Difficulty	3	
	62	
	210	South
	310	South
	610	South
	710	
	920	
Irreversible Damage	5	
	81	
	91	
	910	
*Actively moving portions of -- (These are individually mapped areas.)	35	
	335	
	353	

On the Willamette NF. the amount of suited land was determined in "Prelimimary Assessment of Timberland Suitability" by H. Legard, in 1980. There is alot of good information in this report, let me know if you need a copy.

In addition the "high risk" areas adjacent to some Class IV streams were excluded from programmed harvest in order to lower the risk of adverse watershed effects. These are not technically "unsuited" areas according to the criteria.

Forest Plan Monitoring Table, M-22 states that the adequacy of these classifications in meeting resource objectives will be monitored.

//Margaret Beilharz//

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