# V. Management Implications

## Geology

**Synthesis**: *What are the influences and relationships between erosion processes and other ecosystem processes in the watershed?*

**Issue: Erosion and Sediment Delivery**

| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| **Physical**: A history of large scale, stand replacing fires as well as underburning has shaped this watershed. But fire, especially intense, severe stand replacing fire, has also been a primary physical influence on erosion processes in this watershed. | High | Medium |
| **Physical**: Gravity (topography) in combination with climate (water and wind) influence the amount of erosion on hillsides. | Medium | No |
| **Physical**: Types of soils (natural instability) also influence the amount of hillside erosion | Medium | No |
| **Biological**: Rate of vegetative re-establishment following disturbance influences erosion rates. | Medium | High |
| **Biological**: Vegetative material, especially large woody material and intact root systems, help to stabilize slopes from erosion. | Medium | Medium-High |
| **Biological**: Leaf litter and organic matter, help to shield soils from raindrop impact and erosion. When disturbance removes these elements and their shielding effects, erosion rates increase for a time. | Medium | Medium-High |
| **Social:** Fire suppression has increased the fuel loading on the landscape. In the absence of fire, fuel loadings gradually build up over time. With more fuel, wildfires will burn with greater intensity than under natural conditions. More intense fires increase erosion potential. | High | Medium-High |
| **Social**: With fire suppression, vegetation persists on the landscape to hold the soil in place and erosion rates may decrease well below some long term rates. | High | Medium-High |

# V. Management Implications

## Geology

**Recommendations**: *What and where are the opportunities for management, restoration or improvement within the watershed?*

**Issue: Erosion and Sediment Delivery**

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| • Moderate some of the negative impacts of fire on erosion processes by decreasing hazard and risk of intense, stand replacing fires | • Reduce fuel loading by a variety of techniques including prescribed fire, handpiling, etc. in high hazard areas to control intensity of wildfire. | |
| None | None | N/A |
| None | None | N/A |
| • Restore erosion prone areas | • Promptly re-vegetate erosion-prone, denuded areas using native vegetation.<br>• Promptly re-vegetate following harvest activities. | |
| • Minimize erosion potential from management activities | • Retain large woody material according to standards defined in the Forest Plan<br>• Promptly re-vegetate disturbed areas<br>• Retain vegetation contributing to slope stability in erosion prone areas | |
| • Retain duff layer | • Suspend logs during yarding as appropriate to maintain duff layer<br>• Time slash treatment operations to coincide with higher fuel moistures so duff layer not consumed during burning | |
| • Minimize fire hazard and risk of large scale, intense stand replacing fires | • Reduce fuel loading in high hazard areas, by low-intensity prescribed fire or other method such as handpiling, etc.<br>• In some instances instead of suppressing fires, use prescribed natural fire to achieve ecosystem goals. | |
| • Minimize vegetative losses to large scale fires | • Implement fire suppression strategies | |

| Issue: Erosion and Sediment Delivery (Continued)) | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence<br>High, Medium, Low | How likely to change by management actions?<br>High, Medium, Low, No |
| **Social**: Land management activities (timber harvest, road construction, etc.) influence erosion processes. The type of logging systems, suspension requirements, road construction techniques, and silvicultural prescriptions. can all affect erosion rates, soil compaction, displacement, and productivity. | Medium | High |

| Issue: Erosion and Sediment Delivery (Continued) | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Minimize erosion potential from management activities | • Identify areas of active slope instability or areas that are potentially highly unstable (not necessarily unsuited) and avoid management activities such as timber harvest on these areas.<br>• Retain green trees on critical sites (stream headwalls, sites with land movement).<br>• Evaluate the re-introduction of large woody material into deficient stream channel reaches.<br>• Implement geotech. review of future roading options to reduce or eliminate potential erosion problems.<br>• Locate and design roads to minimize soil and water resource impacts.<br>• Prevent, limit and mitigate erosion, sedimentation and resulting water quality degradation with construction and maintenance activities through timely implementation of erosion control practices and traffic control during wet periods.<br>• Minimize erosion by conducting operations during minimal runoff periods.<br>• Minimize erosion by road cuts, fill slopes, and the travelways by various soil stabilization measures (seeding, mulching, straw bales, erosion netting, etc.)<br>• Minimize erosive effects of concentrated water and the degradation of water quality by the proper design and construction of road drainage systems and drainage control structures.<br>• Insure that debris generated during road construction is kept out of streams and to prevent slash and debris from subsequently obstructing channels (unless stream channel objectives are being achieved).<br>• Maintain all roads in a manner which provides for soil and water resource protection by minimizing rutting, sidecasting, and blockage of drainage facilities. | High |
| • Monitoring management activities | • As the proposed project is initiated, it will be monitored to evaluate implementation efficiency, prescription adequacy, and to update sale area rehabilitation needs or protection. Specific monitoring questions in Chapter V of the Land and Resource Management Plan that will be addressed include V-M22 through V-M34. | |

| Issue: Erosion and Sediment Delivery (Continued)) | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| | | |
| **Social**: Erosion is generated from wave action on Detroit Reservoir shoreline caused by boaters and wind, as well as, from fluctuations of reservoir levels. | Medium | Yes/No (reservoir levels are controlled by Corps of Engineers) |
| **Issue: Long-term Soil Productivity** | | |
| **Physical**: Severe wildfires consume duff and other organic matter and can cause soil damage and nutrient loss | High in areas affected by severe fires | Medium-High |
| **Biological**: Creation of duff and organic layer by natural processes increases long-term soil productivity | High | No |
| **Social**: Slash burning during periods of low soil/fuel moisture and/or with high fuel concentrations can consume duff and organic matter, cause soil damage and nutrient loss. | High in areas affected by this type of burning | High |
| **Social:** Ground-based skidding equipment used for harvest during periods of high soil moisture can cause soil compaction and can affect long-term soil productivity. | High in areas affected | High |

| Issue: Erosion and Sediment Delivery (Continued) | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Restore erosion prone areas | • Develop a road and traffic management plan which includes priorities for road decommissioning and storm proofing<br>• Aggressively decommission and storm proof high risk local roads, to reduce risk of catastrophic failure during storm events.<br>• Sidecast pullback of unstable road fills on steep hillsides. The major focus initially will be on Cliff Creek (78r) on Forest Road 1012-820 and its tributaries where the worst problems occur.<br>• Promptly re-vegetate erosion-prone, denuded areas using native vegetation | High |
| • Reduce shoreline erosion from wave action and fluctuations in reservoir levels | • Plant willow and other vegetation. Also, use other techniques to stabilize shoreline | |
| **Issue: Long-term Soil Productivity** | | |
| • Maintain long-term soil productivity | • Fire suppression<br>• Control fuel loading to reduce fire severity | |
| None | None | |
| • Maintain long-term soil productivity | • Time slash treatment operations to coincide with higher fuel moistures so duff layer and large woody material is not consumed during burning<br>• Consider use of non-fire/ fuel treatment methods to treat slash where risk of soil damage is high. | |
| • Minimize soil compaction and displacement | • Minimize use of ground-based yarding systems. When used, confine to pre-designated skid trails.<br>• Implement appropriate log suspension requirements and yarding system to minimize compaction and displacement.<br>• Repair unstable roadfills<br>• Repair cutbank problems<br>• Suspend logs during yarding as appropriate to maintain duff layer | |

## Hydrology

**Synthesis**: *What are the influences and relationships between hydrology and other ecosystem processes in the watershed?*

**Issue: Flows, especially peak flows and low flows**

| How do other physical, biological and social ecosystem processes influence this issues? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| **Physical**: Fire removes vegetative cover, which can influence snow accumulation, etc. During a rain-on-snow event, areas denuded by fires can contribute to increased peak flows. Damage from these flows can have social ramifications. | High | High |
| **Physical**: Soil type influences water holding capacity. | Low – Medium | No |
| **Physical**: Regional weather patterns and topography can influence rain-on-snow events in the transient snow zone, which are associated with peak flows. Precipitation type and intensity influences the amount of water entering the system that contribute to peak and low flows. | High | No |
| **Biological**: Vegetative re-growth and plant/tree cover types influence the amount of water that contributes to peak flows. Expanding root systems extract water from the system, tree canopies and canopy closure influence snow accumulation and the timing of water reaching stream courses. | High | Medium-High |
| **Biological**: The spatial distribution of vegetation across the landscape, topography, and the amount of large woody material influence how much water reaches stream channels. | Medium-High | Medium |
| **Biological**: Rate of tree growth influences the length of hydrologic recovery. | High | Medium-High |
| **Social**: Management activities such as regeneration harvest, road construction, etc. decrease vegetative cover in the short term, resulting in less precipitation intercept and may result in increased peak flows. | Medium | Medium |

## Hydrology

**Recommendations**: *What and where are the opportunities for management, restoration or improvement within the watershed?*

**Issue: Flows, especially peak flows and low flows**

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| • Minimize effects of peak flows by managing fire and vegetation | • Fire prevention and fuel treatment to minimize risk of stand replacing fires and resultant fire impacts on soil infiltration rates, etc. that contribute to peak flows<br>• Fire suppression to limit size of fires and allow vegetation to persist on the landscape. | High |
| | None | None |
| | None | None |
| • Maintain 7th field watershed in a recovered state greater than or equal to 70% canopy closure (70% of area) depending on threshold. | • Encourage rapid regrowth of vegetation, following site disturbances such as fires.<br>• Replant quickly following harvest activities.<br>• Use appropriate harvest prescriptions to maintain desired canopy cover. | High |
| | • Spatially distribute timber harvest across the landscape.<br>• Retain large woody material as per standards and guidelines in Forest Plan. | High |
| | • Encourage tree growth through various silvicultural techniques.<br>• Meet ARP requirements, as specified in Forest Plan, to provide adequate watershed recovery. | High |
| • Manage stands to maintain 70% canopy closure where possible. Where regeneration is necessary, keep the disturbed area below threshold percentage. For example 70% threshold = 30% threshold percentage. | • Within other resource constraints, encourage development of at least 70% canopy closure within managed stands to intercept snow, etc. thereby regulating the amount of precipitation reaching stream channels (highest priorities are in drainages below ARP levels)<br>• Reduce drainage network through actively decommissioning and storm proofing roads<br>• Optimize tree growth in plantations and fire regenerated young stands to reduce effects of peak flows. Activities such as pre-commercial thinning and commercial thinning are tools to accomplish this goal. These activities will also optimize tree growth within riparian reserves that are in the same seral stage as other plantations and fire regenerated young stands. | High |

| Issue: Flows, especially peak flows and low flows (Continued) | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issues? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Physical**: Flood events removed large woody material from stream channels, causing floodplain erosion and reduction of water storage areas. | High | Low |
| **Social**: Road construction disconnected some streams with their floodplains, thus affecting water storage capacities | Medium | Low-Medium |
| **Social**: Stream cleanout removed large woody material from stream channels causing floodplain erosion and reduction of water storage areas, thereby affecting minimum flows. | Medium | Medium |

| Issue: Flows, especially peak flows and low flows (Continued) | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Maintain desired level of minimum flows | • Create additional water storage areas in the floodplains by reconnecting stream channels to their floodplains.<br>• Ensure adequate large woody material availability for stream channels. | High |
| | • Locate new roads in a manner that minimized floodplain impacts, whenever possible.<br>• Capitalize on opportunities to re-connect streams with their floodplains as roads are decommissioned or obliterated, etc. | Medium |
| • Reestablish large woody material within streams to a natural level. | • In specific stream reaches and with interdisciplinary and public input, add structure to stream channels in the watershed.<br>• Stabilize areas with large woody material to reduce stream energies so sediments are deposited. This will reduce downcutting and the channels will begin to build up to the level of the floodplains. | Medium |

## Stream Channels

**Synthesis**: *What are the influences and relationships between stream channels and other ecosystem processes in the watershed?*

| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| **Issue: Channelbank stability and headwall protection as they relate to erosion and sedimentation** | | |
| **Physical**: Rain on snow events which generate peak flows have a profound influence on channel bank stability and de-stabilization of headwater portions of streams | High | No |
| **Physical**: Fires can either consume wood and make it unavailable to stream channels or it can create downed wood for stream channel structure. The amount of available structure in the channel influences channelbank stability | High | Medium |
| **Biological**: Natural tree mortality, insects or diseases, or other damaging agents that kill large trees can provide structure for stream channels and help to stabilize channel banks | Medium | Medium |
| **Biological**: Vegetation and root strength can increase channel bank stability and headwater stability | High | High |
| **Biological:** Canopy closure affects snow interception during rain on snow events which can generate peak flows. Peak flows have a profound influence on channel bank stability and de-stabilization of headwater areas. | High | High |
| **Social:** Water and the associated riparian areas attract recreational use. This recreation use leads to multiple access trails to the water bodies, removal of down woody material for use as firewood, soil compaction which can affect infiltration rates, etc. which in turn can impact channel bank stability. | Low | High |
| **Social**: Regeneration timber harvest, road construction and other management activities that decrease vegetative cover and can decrease channel bank stability | Medium | High |
| **Issue: Floodplain and stream channel interactions** | | |
| **Social:** Past stream cleanout practices contributed to higher stream energies, stream down cutting, and less sediment storage capabilities this resulted in streams becoming disconnected to their floodplains. | High | No |
| **Social**: Some road locations have caused channelization of streams. This has increased stream energies and caused downcutting. Without sediment to build floodplains, streams can become disconnected with floodplains | Medium | Medium - Low |
| **Issue: Diversity poor stream channels** | | |
| **Physical:** Floods and fires have either directly or indirectly had an impact on stream channel diversity. | High | Medium |

## Stream Channels

**Recommendations**: *What and where are the opportunities for management, restoration or improvement within the watershed?*

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| **Issue: Channelbank Stability and headwall protection as they relate to erosion and sedimentation** | | |
| None | None | |
| • Minimize adverse effects of erosion and sedimentation by promoting channelbank and headwall stability | • Minimize impacts of large, scale stand replacing fires through fire suppression and control fuel loading to reduce fire severity. | Low |
| | • Retain vegetation in riparian areas along stream courses<br>• Encourage stand conditions that contribute to development large trees that could eventually contribute to stream channel structure.<br>• Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands. | High |
| | • Retain vegetation along riparian zones as prescribed in the Forest Plan as amended by NW Forest Plan. | High |
| | • Within other resource constraints, encourage development of at least 70% canopy closure within managed stands to intercept snow, etc. thereby regulating the amount of precipitation reaching stream channels (highest priorities are in drainages below ARP levels)<br>• Meet ACS objectives in riparian reserves. | High |
| | • Educate the public about recreational impacts to riparian areas and their influence on channel bank stability.<br>• Encourage use of established developed recreational sites rather than use of dispersed sites, where possible.<br>• Discourage dispersed recreational use in sites with channel bank stability problems. | Medium |
| | • Retain riparian reserves along stream courses. | High |
| **Issue: Floodplain and stream channel interactions** | | |
| • Maintain stream channel/floodplain interactions. | • Retain current stream channel structure and encourage development of stand conditions that ensure that future structure is available to stream channels. | Medium |
| | • Locate new roads in a manner that minimized floodplain impacts, whenever possible.<br>• Capitalize on opportunities to re-connect streams with their floodplains as roads are decommissioned or obliterated, etc. | Low |
| **Issue: Diversity poor stream channels** | | |
| • Create diversity | • Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands. | Medium |

# Water Quality

**Synthesis**: *What are the influences and relationships between water quality and other ecosystem processes in the watershed?*

| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| **Issue: Water Temperature** | | |
| **Physical**: Solar radiation increases stream temperatures | Medium | No |
| **Biological**: Vegetation distribution and development influences stream shade which can affect the amount of solar radiation reaching streams, so can affect stream temperatures | High | Medium |
| **Social**: Recreation and timber management, and road construction can affect shade and therefore stream temperatures. | Medium | High |
| **Social**: Management guidelines for retention of riparian reserves can provide thermal regulation to streams. | Medium/High | Meduim |
| **Issue: Type and timing of sediment input into streams** | | |
| **Social**: Road densities are high within the watershed. Road related sediment sources are fill failure, shotgun culverts, drainage patterns being interrupted, and surface erosion | Low – Medium (This is due to the high natural background in watersheds with roads. Less of an influence than other watersheds.) | Medium |
| **Issue: Turbidity and domestic water use** | | |
| **Physical**: Fire, as a mechanism, removes vegetative cover. When combined with weather patterns, this loss of vegetation permits accelerated erosion from which sediment increases can generate an increased level of turbidity. | High | Low |
| **Physical**: Type of soil (i.e. size of material- clay, etc) can influence the amount of turbidity, those prone to deep seated earth flows introduce more sediments affecting turbidity than those that are not so prone. | High | Low |
| **Physical**: Type and intensity of precipitation can influence erosion rates and thus turbidity. | Low | No |
| **Biological**: Lack of large wood in stream channels can decrease sediment storage and can result in an increase in turbidity | Low | No |
| **Biological**: Large wood in stream stores sediments which decreases turbidity. | Low | No |
| **Biological:** Vegetation distribution and development influences erosion processes which can affect turbidity. | Medium | Medium |
| **Social**: Recreation, fire, and timber management, road construction potentially affects erosion causing sediments which can affect turbidity | Medium | Medium |
| | | |

# Water Quality

**Recommendations**: *What and where are the opportunities for management, restoration or improvement within the watershed?*

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| **Issue: Water Temperature** | | |
| None | None | |
| • Maintain water temperature within State Water Quality guidelines | • Retain riparian reserves along stream courses<br>• Retain at least 70% canopy closure adjacent to stream channels | High |
| **Issue: Type and timing of sediment input into streams** | | |
| • Sediment control | • Road maintenance<br>• Rehabilitation of identified erosion sites<br>• Sidecast pullback and road stabilization<br>• Riparian planting<br>• Re-vegetation of riparian areas<br>• Road objectives<br>• Remove drainage structures on temporary roads | Medium – High |
| **Issue: Turbidity and domestic water use** | | |
| • Manage vegetation to ensure low erosion potential from site. | • Prescribe burn to reduce fuel loadings<br>• Burn within prescription to maintain duff layer | |
| • Avoid accelerating earthflows by maintaining vegetative cover.<br>• None | • Utilize silvicultural methods to increase vegetative growth on earthflows.<br>• None | |
| • Maintain diversity within stream channels | • Survey wood loading and prescribe additional input if not at expected environmental levels. | |
| • Maintain vegetation on the landscape that will minimize erosion potential | • Revegetate disturbed sites or utilize erosion control measures. | |
| • Sediment control. | • Utilize Best Management Practices to control the loss of sediments from project sites. | |
| | | |

## Vegetation

Synthesis: *What are the influences and relationships between erosion processes and other ecosystem processes in the watershed?*

| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| **Issue: Old Growth** | | |
| **Physical**: Fire occurrence is one of the largest physical influences on old growth distribution in the watershed. | High | Medium |
| **Physical**: Wind, climate | High | No |
| **Biological**: Fuel loads, insects and diseases can set the stage for catastrophic fires, thus influencing amount and distribution of *old growth.* | High | Medium |
| **Social**: Management activities and road construction, as well as, human-caused fires influence the amount and distribution of *old growth.* | High | High |
| **Issue: Plant Association and Seral Stage Distribution/ Management goals compatible with natural systems** | | |
| **Physical**: Fire, soil, slope, aspect, microclimate, precipitation, wind, etc. | Medium | No |
| **Biological**: Insects and diseases can have localized effects on stand seral stages (e.g. root rot) | Medium | Low |
| **Social**: Management activities such as timber harvest affect seral stage distribution across the landscape | High | High |
| | | |
| **Riparian Reserves**: Commercial thinning can develop desired stand structure within riparian reserves with emphasis on growing large trees and logs and other late successional characteristics. | High | High |

## Vegetation

Recommendations: *What and where are the opportunities for management, restoration or improvement within the watershed?*

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| **Issue: Old Growth** | | |
| • Minimize risk of stand replacing fires | • Fuel reduction, fire suppression, stocking level control, underburning. | Priority is dependent on management allocation |
| None | None | |
| • Re-introduce role of fire in the ecosystem | • Identify stands with history of short-term return intervals. Reintroduce fire as applicable. | Medium. Higher where hazards exist |
| | | |
| • Meet Forest Plan standards and guidelines for old growth protection | • Implement standards and guidelines to protect late-successional characteristics in LSRS (owl activity centers), riparian reserves and in required acres within Matrix and appropriate land allocations. | High |
| • Meet Forest Plant standards and guidelines for old growth harvest. | • Implement Forest Plan objectives in Matrix land | Medium |
| **Issue: Plant Association and Seral Stage Distribution/ Management goals compatible with natural systems** | | |
| | | |
| • Reintroduce the role of fire into the ecosystem | • Treat stands that have a shorter fire return interval and evidence of underburning. | High |
| • Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands | • Salvage when present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected. | |
| • Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian dependent species. | • Apply Silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives. Examples would be commercial thinning, precommercial thinning. | High |
| • Develop late successional components in Riparian Reserves by developing desired stand structure with emphasis on growing large trees and logs and other late successional characteristics | • Commercial Thinning (Maximum potential acres):<br>• Commercial thin in riparian reserves when:<br>• Riparian reserves are intact but not do not have late successional structure.<br>• In places where fire exclusion created more stems, and the development of late successional characteristics may delayed. | High |

| Issue: Insects and Diseases | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Physical**: Climate, especially drought, windstorms and the blowdown they bring, floods and the down wood resulting, have a significant physical influence on *insect and diseases* severity. | Medium | No |
| **Biological:** Vegetative competition, including inter-tree competition, can affect *insect and diseases* by increasing demands for nutrients, moisture and light | Medium | High |
| **Biological**: The spread of dwarf mistletoe is influenced by stand structure and species competition. Root rots may be more severe in single species stands. | Medium | Medium - High |
| **Biological:** The amount of dead material can increase the severity of insects and diseases and contribute to their spread. | High | Medium |
| **Social**: Management activities can increase root rots. | High | Medium |
| **Issue: Noxious Weeds** | | |
| **Physical**: Wind distributes seeds so has a large influence on the spread of *noxious weed* | Medium | High |
| **Biological**: Lack of competition from native plants, spread of seeds by animals, and lack of natural predators and diseases influence the rate of spread of *noxious weeds*. | Medium | Medium |
| **Social**: Human movement, and travel corridors can spread seeds of noxious weeds from one place to another. | Medium | Medium |
| **Social**: Activities that create bare soil especially adjacent to roads and trails | Low-Medium | Medium |

| Issue: Insects and Diseases | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Design timber harvest units to minimize blowdown. Improve stand vigor attained through stocking control while maintaining species diversity. | • Locate and prescribe timber sale units considering local wind patterns.<br>• Thin stands to reduce mortality from competition to increase resistance to insects and disease. | High |
| | | |
| • Minimize spread of insects and diseases (such as dwarf mistletoe, root rots, beetles, etc.) | • Stand replacement harvest and replanting with non-host species can reduce dwarf mistletoe and root rot infected stands. | Medium |
| • Reduce the severity of insects and diseases by removal of dead material. | • Salvage harvest in areas with a buildup of dead material in excess of forest plan standards and guidelines for snags and down woody material | Medium |
| | | |
| **Issue: Noxious Weeds** | | |
| • Minimize spread of noxious weeds | • Target for removal large seed producing noxious weed populations where wind patterns may deposit seeds in uninfected areas. | Medium |
| | • Plant competitive species in areas where there is a risk of noxious weed spread | Low |
| | • Road closures, education, vehicle cleaning C-clauses, etc. | |
| | • Re-establish vegetation in disturbed areas.<br>• Along highways and roads are good places to concentrate manual, biological, and minimal chemical control on knapweeds, scotch broom, tansy ragwort, and sweet clover | Medium |

| Issue: Biodiversity | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Physical**: Fire, climate, wind, and topography influence landscape level *biodiversity*. | High | Low-Medium |
| **Biological**: Insects and diseases, and vegetative competition influence *biodiversity* | Medium | High |
| **Social**: Management activities (most ground disturbing activities) can change, remove, or add vegetation, which influences biodiversity. | High | High |
| Prevention of large scale stand replacing fires may reduce plant diversity. | Low | Medium |
| Matrix Allocations | | |
| | | |
| | | |

| Issue: Biodiversity | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Preserve and promote biodiversity at the following levels: genetic, within the plant communities, and between the plant communities | • Implement reforestation and revegetation programs that emphasize genetic diversity in plant materials used(e.g. use of native plant species, multiple species tree planting).<br>• Protect of within plant community diversity by precluding disturbance of species rich habitats. (maintain special habitat buffers)<br>• Maintain representation of all plant community types across the landscape.<br>• Increase ecological diversity by providing early successional habitat. | High |
| • Increase ecological diversity by providing early successional habitat | • Create big game forage by regeneration harvest, seeding in winter range . Converting stands in the stem exclusion stage to stand initiation stage. | |
| • Reintroduce role of fire in the ecosystem, while preventing large scale fires.<br>• Production of commercial yields of wood (Commercial timber) | • Understory removals and underburning. Field identification of areas of the watershed may identify areas that have historically underburned.<br>• Timber Harvest: regeneration, partial, salvage, and commercial thinning harvests | Medium-High<br><br>High |
| • Retention of moderate levels of ecologically valuable old-growth components such as snags, logs, and relatively large green trees | Regeneration Harvest:<br>• Stands which have reached 95% of culmination of mean annual increment<br>• Stands too old or stagnated to respond to release from thinning.<br>• Stands where regeneration harvest will address insects, diseases and wind throw<br>• Stands where creating openings meet other resource objectives (wildlife, recreation, etc)<br>• Late successional stands, if in excess of 15% of specific 5th field watersheds. | Medium |
| • Improve Stand Vigor | Commercial Thinning:<br>• In matrix, stands in these size classes will be considered for thinning if they need stocking control to achieve recommended stocking levels for optimum growth or to maintain stands for longer periods. | |
| | • Post harvest activities: reforestation, pre-commercial thinning, fertilization, pruning, vegetation control, and animal control. | |
| | • | |

| Issue: Biodiversity (Continued) | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | Amount of Influence High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| | | |

| Issue: Biodiversity (Continued) | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| **Special Forest Products:**<br>• Stocking control of trees, thinning and post and pole harvest, which may increase tree growth, reduce canopy closure and stimulate understory vegetation.<br>• Pruning which may reduce canopy closure and stimulate understory vegetation, increase future wood quality, reduce blister rust frequency on white pine and sugar pine<br>• Clipping of plants may increase new shoot growth which may either reduce competition to other plants or provide available forage for animals.<br>• Provides employment, economic diversity, and revenue to the Government.<br>• Allows for harvest for personal use. | • Special forest products represent a wide variety of commercially valuable products that may have a variety of effects on vegetation depending on the nature of the activity or the level of harvest. In some cases, harvesting is used to meet Silvicultural objectives and uses similar techniques such as thinning or pruning to generate products. In these cases, the previous discussions applying to these Silvicultural treatments would follow for special forest product harvesting.<br>• A potential list of products includes: Boughs, Christmas trees, beargrass, sword ferns, salal, princess's pine, mosses, Oregon grape, clippings of various shrub species, huckleberries, mushrooms, tree cones, and posts and poles.<br>• Harvest is acceptable where compatible with Forest Plan Standards and Guides and with objectives for Riparian Reserves and LSR's. | Medium-High |

## Aquatic

**Synthesis**: *What are the influences and relationships between aquatic species and their habitats and other ecosystem processes in the watershed?*

**Issue: Having habitat components (food, water, shelter, etc.) necessary to sustain a variety of species native to the area.**

| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| **Physical**: Solar radiation can reduce the quality of aquatic habitat through increasing water temperature. | Medium | Medium |
| **Physical:** Fire can remove shade and large wood from streams and riparian areas. | Medium | Medium |
| **Physical**: Erosion and the resulting deposition of sediment in the stream can impact survival and reproductive success. | Medium | Medium |
| **Physical**: The complexity of a stream channel(pools, riffles and structure) can affect the carrying capacity of aquatic habitat. | High | High |
| **Biological**: Vegetation such as trees and shrubs can provide: channel structure that can affect stream bank stability and fish carrying capacity; shade that can moderate stream temperature; and organic input that can affect productivity. | High | High |
| **Biological**: Salmon that die after spawning provide nutrient enrichment to streams and riparian vegetation. | Medium | High |
| **Social**: road construction, timber harvest, and various human uses can affect stream shade and sediment input to stream courses and may affect fish and aquatic insect survival and productivity | Medium | High |
| **Social**: Recreation activities near stream and lakes can affect riparian habitat through compaction and the removal of streamside vegetation. | Low-Medium | Low |

## Aquatic

**Recommendations**: *What and where are the opportunities for management, restoration or improvement within the watershed?*

**Issue: Having habitat components (food, water, shelter, etc.) necessary to sustain a variety of species native to the area.**

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| • Maintain stream temperatures within State water quality standards. | • Manage riparian reserves on perennial streams to provide adequate shade to maintain water temperatures appropriate for aquatic insects and spawning and rearing native fish species. | Medium |
| • Maintain streamside downed and standing large woody material | • Prevent large scale fires by decreasing fire hazard and risk | Medium |
| • Manage amount and timing of sediment input as a result of management activities | • Follow recommendations for timing of instream work issued by the Oregon Department of Fish and Wildlife (1997)<br>• Minimize erosion from Management Activities through implementation of BMP's and Forest Plan standards and guidelines | High |
| • Maintain or restore stream habitat complexity | • Evaluate current habitat conditions and determine appropriate restoration projects, such as large woody material placement, to develop adequate habitat complexity in areas were it is lacking.<br>• Manage vegetation along streams for future large woody input<br>• Retain riparian reserves along stream courses.<br>• Meet objectives of Aquatic Conservation strategy in riparian reserves. | High<br>High |
| • Supply nutrients to the stream ecosystem | • Distribute salmon carcasses from the hatchery throughout the stream system<br>• Introduce live fish to the system to spawn and die and provide nutrients. | Low – Medium |
| • Maintain or restore stream habitat complexity | • Evaluate current habitat conditions and determine appropriate restoration projects, such as large woody material placement, to develop adequate habitat complexity in areas were it is lacking.<br>• Manage vegetation along streams for future large woody input<br>• Retain riparian reserves along stream courses.<br>• Meet objectives of Aquatic Conservation strategy in riparian reserves. | High |
| • Manage amount and timing of sediment as a result of management activities | • Keep sediment producing activities that are in or near streams to those times when fish spawning and incubation of eggs is not taking place. | High |
| • Decrease resource impacts and improve aesthetics at recreational areas | • Decrease resource impacts at dispersed and developed recreation sites | Low- Medium |

| Issue: Re-introduction of Native Aquatic Species | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Biological**: Introduced fish species may out compete native fish populations | High | High |
| Lack of retention of organic matter due to the lack of complexity can reduce the overall carrying capacity of a stream | High | Medium |
| **Social**: Construction of Detroit and Big Cliff Dams blocked the migration of fish up the North Santiam River and eliminated salmon and steelhead from this watershed and also blocked movements of bull trout and cutthroat trout. | High | Low |
| **Social Influences:** Forest management activities such as stream cleanout, some timber harvest, and some road construction have reduced the potential carrying capacity of existing habitat | Medium – High | Medium |
| Recreational fishing pressure can affect native fish populations | Medium | High |
| Stocking of Non-native fish species for angler use can affect native fish populations | Medium – High | High |

| Issue: Re-introduction of Native Aquatic Species | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Reduce competition between native and non-native species | • Increase stream shade complexity and reduce temperature to favor native species. | Medium |
| • Provide adequate habitat to sustain populations of migratory fish when access around migration barriers (dams) have been resolved | • Increase stream habitat complexity by increasing the amount of large woody material in the stream with restoration projects. | Medium |
| • Provide access for salmon and steelhead to the area above Detroit Dam. | • Remove dams<br>• Trap and truck adults above the dams. | High |
| • Maintain riparian management areas around streams. | • Keep ground disturbing activities outside riparian areas. | High |
| • Maintain viable native fish populations. | • Work together with ODOT to get regulations to maintain populations<br>• Maintain, restore and enhance aquatic habitat through projects and improved management. | High |
| • Minimize conflicts between native and non-native fish. | • Work closely with fish management agencies to make sure that non-native fish are not introduced into areas that may impact native species. | High |

## Wildlife

**Synthesis:** *What are the influences and relationships between wildlife species and their habitats and other ecosystem processes in the watershed?*

**Issue: Having habitat components (food, water, shelter, etc.) necessary to sustain a variety of species native to the area.**

| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| **Physical**: Climate, topography (elevation, aspect, etc.) and soils can influence the composition and distribution of vegetative communities across the landscape. This can affect the type of food, water and shelter available to animal species. | High | No |
| **Physical**: Fire affects vegetative seral stage distribution and the habitat of species dependent on them. Fires often burn in mosaic patterns that can affect the landscape with varying intensities. In some areas stands are completely replaced by fires and in others fires only underburn the stands and most trees are preserved. Fires have both short and long-term impacts on habitat components necessary to sustain a variety of wildlife species. | High | Medium |
| **Physical**: Climate (wind storms, snow storms, etc.) can cause trees to blowdown etc. and can influence fragmentation of interior habitat and development of edge habitat, but can also create habitat for species dependent on down woody material. | High | Low-Medium |
| **Physical**: Climatic patterns and topography can influence amount, type distribution and storage of precipitation which influences the availability of life-sustaining water for animal species and plant life they depend on for survival. | High | Low |
| **Biological**: Vegetative species composition and seral stage affects both food and shelter availability for animal species. | High | High |
| **Biological**: Species adaptation to certain habitat types can influence what species are present in given habitats. | Medium-High | Low |
| **Biological**: Insects and diseases can affect vegetative conditions which can affect habitat quality for various species. | Low | Medium |
| **Social**: Management activities such as timber harvest and road construction can influence habitat effectiveness and connectivity | High | High |
| **Social**: Management activities can influence biodiversity | Medium-High | High |
| **Social**: Human uses can influence habitat disturbance and degradation, reproductive success, habitat removal, harassment, predation, etc. | Medium | High |

## Wildlife

**Recommendations**: *What and where are the opportunities for management, restoration or improvement within the watershed?*

**Issue: Having habitat components (food, water, shelter, etc.) necessary to sustain a variety of species native to the area.**

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| None | None | None |
| • Simulate beneficial ecological effects of fire on the landscape.<br>• Prevent large scale stand replacing fires by decreasing fire hazard and risk. | • Using a combination of underburning and various prescriptions for timber harvest to simulate habitat needs of various species.<br>• Fuel treatments, fire prevention and suppression | Priority varies by area. |
| • As prescribed, minimize blowdown along the edge of harvest units. | • Unit design, location and harvest prescription | Medium |
| None | None | None |
| • Maintain habitat components for native terrestrial wildlife species | • Harvest prescription, unit sizes, landscape patterns, etc.<br>• Management Plant Standards and Guidelines | High |
| • Determine which species of concern exist in the watershed<br>• Determine habitat needs of species of concern in the watershed. | • Conduct surveys for species of concern within the watershed<br>• Harvest prescription, units size, unit shape, location, landscape patterns, etc. | High<br>High |
| | | |
| • Maintain habitat effectiveness and connectivity | • Develop harvest proposals that address the habitat needs of various species.<br>• Consider harvest prescriptions, unit locations, unit sizes, past harvest, etc. | High |
| • Maintain biodiversity | • Timber harvest with varying harvest prescriptions including varying tree densities, and replanting with multiple species.<br>• Expand meadows by removing encroaching trees, burning meadows (T11S, R5E, Sections 8, 15, and 17)<br>• Create openings in large contiguous stands -harvest 3 to 5 acre patches in large contiguous stands in Box Canyon | High<br>High<br>Medium |
| • Increase of awareness of wildlife needs and habitat characteristics | • Education programs | Medium |

| **Issue: Conflicting habitat needs for various species (big game and spotted owls)** | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Physical**: Fires, especially stand replacing fires can modify habitat to favor one species over another. Managing and/or suppressing fires may favor one species over another. | High | Low |
| **Biological**: Species natural adaptations to various niches in the ecosystem | High | No |
| **Social**: Management plans affect species habitat, protection of one species can be detrimental to another with differing habitat needs. | High | High |
| **Social**: Fire suppression may favor one species over another. | | |

| **Issue: Conflicting habitat needs for various species (big game and spotted owls)** | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| | | |
| None | None | None |
| • Maintain viable populations of all indigenous species | • Develop effective management plans that address habitat needs of the various species native to the watershed. Regional, basin and watershed level. | |
| | • Develop fire suppression, burning plans on a landscape scale to consider | |

## Human Uses

**Synthesis**: *What are the influences and relationships between human uses and other ecosystem processes in the watershed?*

| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| **Issue: Heritage site degradation** | | |
| **Physical:** Erosion, freeze-thaw cycles and wind thrown trees | Medium | Low |
| **Biological:** Root growth of plants and trees, burrowing by small mammals, and trampling by large animals such as big game | Low | No |
| **Social:** Artifact collection | Medium - Low | Low |
| **Social**: Management disturbance | Medium - High | High |
| **Issue: Interpretation** | | |
| **Social**: People are interested in learning about historic properties but very little has been accomplished toward interpreting past human activities. | Low | Medium |
| **Issue: Economic Sustainability** | | |
| **Physical:** Soil, slope, aspect, elevation, climate, etc. influence vegetative growth, which in turn influences the potential products available from the forest. | Low | Low |
| **Biological:** Vegetation, especially trees, provide the primary forest products utilized by local communities. | High | Medium |

## Human Uses

**Recommendations**: *What and where are the opportunities for management, restoration or improvement within the watershed?*

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| **Issue: Heritage site degradation** | | |
| | • Manage stands to minimize susceptibility of windthrow. | Medium |
| | | |
| • Site Protection | • Provide education to the public on the value of heritage resources and their protection. | Medium |
| • Site Protection | • Develop a management plan that establishes priorities for site testing and/or protecting those sites that are at risk of losing their integrity, context, and character from natural causes and human activities. In the process of testing these sites, other resources can gain information to help in planning their various projects. | High |
| | • Recover pollen core samples from several bogs, ponds and wet meadows to help recreate the vegetative history of the area. This must be done prior to any disturbance to the stratigraphy of these areas. | Low |
| | • Develop a management plan that establishes priorities for nominating eligible historic sites and linear features to the NRHP, and maintenance of these sites and features. | High |
| **Issue: Interpretation** | | |
| • Public Education | • Create a thematic plan that looks at the interpretive value of the Blowout watershed and establishes priorities for those sites to be interpreted. This plan could benefit multiple resources, multiple agencies and the public. It should include all as partners in completing and administering the document | Low |
| **Issue: Economic Sustainability** | | |
| • Improve soil productivity through fertilization | • | Low – Medium |
| • Provide for a sustainable timber supply.<br>• Provide for a variety of forest products.<br>• Balance communities needs for increased tourism/recreation opportunities with other resource objectives. | • Set appropriate harvest levels within the management allocation requirements and the ecological limits of the watershed.<br>• Use commercial timber harvest as one method of achieving a variety of ecosystem objectives such as thinning to increase growth and therefore development toward late-successional habitat.<br>• Provide post and poles through pre-commercial thinning, beargrass, boughs, rocks, Christmas trees, etc.<br>• Work with local tourism organizations to analyze potential tourism opportunities on National Forest System lands and marketing strategies for these opportunities. | High |

| Issue: Economic Sustainability (continued) | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Social:** Detroit Reservoir and surrounding Forest lands have created an important economic resource to local communities.<br><br>Local tourism economy is dependent on high water levels of Detroit Reservoir. | High | Medium |
| **Social:** The forest products industry, and tourism generated from recreation in the Detroit Lake area and highway travel, support the diversifying economies of North Santiam Canyon communities. Species and watershed protection measures and changing public sentiment about selling forest resources (like old growth) as commodities, combined with a changing political climate, have resulted in a sharp reduction in the timber supply from National Forests and other public lands, to operate local mills. This reduction has threatened the economic sustainability of historically forest-dependent communities in the North Santiam Canyon, and have prompted them to develop economic strategies to adjust to a different future. | Medium - High | Medium - High |
| **Social:** Scientific research, public sentiment and political processes, etc. can influence forest management practices, which in turn, can influence the amount and types of products available to local communities. | Medium | Medium |

| Issue: Economic Sustainability (continued) | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Resolve the conflict of local recreation needs vs. downstream water quality and quantity needs. | • Participate with other agencies and entities in the resolution of conflicts with Detroit Reservoir water level needs. | Medium |
| | • Maintain a diverse set of recreation opportunities to enhance tourism in the area and provide benefits to the local economy. | |
| • Increase public understanding of resource management. | | Medium |

| Issue: Recreation Opportunities | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Social:** There is a demand for a diverse set of recreation opportunities (settings and activities) ranging from a Primitive to Roaded Natural setting. As the physical environment is changed through various resource management practices so may the desired proportion of settings available to the public, including roaded opportunities. The demand for Semi-primitive settings are not met in the Region, and future demand on the Forest will exceed the supply. | Low – Medium | Low – Medium |
| **Physical:** Landform and topography influence human use patterns. For example, steep topography concentrates visitor use mostly to the flat valley bottom around the reservoir.<br><br>Weather is a strong determining factor when people recreate and the type of activities which they engage in. | High | No |
| **Biological:** Old growth or mature Douglas-fir forests and other vegetation provide the recreational setting and influence the type of recreational activities that occur in the area. | High | Medium |
| **Biological:** Wildlife and fish provide recreation opportunities such as hunting, fishing, and wildlife viewing. | High | Medium - High |

| Issue: Recreation Opportunities | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| | • See Appendix A – Implementation Guide for the Coffin – Bachelor Mountain Dispersed Recreation Semi-primitive Motorized Area. | |
| | | |
| • Maintain and enhance desirable recreation settings through various vegetation management practices. | • See Vegetation Recommendations. | Medium |
| • Maintain habitat components for native terrestrial wildlife species. Increase awareness of wildlife needs and habitat characteristics. | • See recommendations under Maintaining habitat components for native terrestrial species. | Medium |

| Issue: Recreation Opportunities (continued) | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Social:** Construction of Detroit Dam, that formed Detroit Reservoir, serves as a recreational destination point and influences use. | High | No |
| **Social:** Improved highway access and proximity to urban areas provided easier access to recreational opportunities and has increased use. | Medium | No |
| **Social:** Population growth, socio-economic status and cultural background influences user demand. | High | No |
| **Social:** Social capacity in excess of resource capacity increases resource impacts such as soil compaction, etc. | High | Medium |
| **Issue: Dispersed Recreation Opportunities** | | |
| **Social:** Increased dispersed recreational use due to high and increasing demands for this opportunity may place additional pressures on resources. | Medium | Medium |
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| Issue: Recreation Opportunities (continued) | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Provide for a wide range of demanded recreational settings to achieve satisfactory user experience. | • Monitor and evaluate the effectiveness of recent recreational developments around the reservoir and update the Detroit Lake Composite Area Management Guide.<br>• Implement a carrying capacity study of the reservoir to help determine future development (i.e. marina and launching expansion, parking, etc.) and management strategies around Detroit Lake (restrictions, designated use areas, etc.)<br>• Develop an area interpretive plan. | High |
| • Decrease resource impacts and improve aesthetics at recreational areas. | • Restore and rehabilitate resource damage in high use campsite areas around Detroit and Blowout Creek, especially within riparian reserves. Provide sanitary facilities where feasible. | Medium |
| **Issue: Dispersed Recreation Opportunities** | | |
| • **Recreation/Scenic Resources** provide for more upland recreational opportunities to help alleviate the recreation pressure with increasing use around the lake. | • ***Pinnacle Peak Special Interest Area Plan***: The Forest Plan requires an area management plan to be developed for SIA's describing the site-specific management objectives, enhancement programs, and other acceptable uses and activities such as recreation nature trails, interpretive media, parking and sanitation facilities. | High |
| | • ***Area Interpretive Plan:*** There are many opportunities within Blowout to interpret natural and cultural resources. Some opportunities to consider include:<br>• Quartzville Byway Corridor<br>• Blowout Beaver Ponds, wildlife<br>• Pinnacle Peak-geological, wildlife<br>• Little Meadows-botanical, wildlife<br>• Coffin Mountain-fire history, lookout, views, landscape management<br>• Geology of Blowout<br>• Scar Mountain-cultural<br>• Self-Guided Tour Routes | Medium |
| | • ***Blowout Suspension Bridge***: The bridge is showing signs of aging and needs to be restored or replaced. | High |
| | • Provide additional dispersed campsites along the reservoir where demand exists. (For example: Blowout and Box Canyon Creek) | Medium |
| | • Provide trail opportunities that are in demand.<br>• Construct the Detroit Reservoir Shoreline Trail as identified in the LMP, and other suitable potential areas. For example: Box Canyon Creek, Coffin Mountain, Lost Creek, etc. | Medium – High |
| | • Enhance huckleberry opportunities within the Scar Mountain area. | |
| | | |
| | | |

| Issue: Scenic Quality | | |
|---|---|---|
| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
| **Physical:** Fire, geology, topography and water all influence the scenic character of the area. | Medium | Low |
| **Biological:** Vegetative reestablishment following management activities and or catastrophic events influences scenic quality. | High | Low |
| **Social:** Timber harvest, road construction, shoreline draw-down created by the dam, have altered natural scenic quality. | High | Medium |
| **Biological:** Diseases such as *Phellinus* affect management within visual allocations. Treatment of *Phellinus* pockets (clearcut) may conflict opening size within visual allocations. | Medium | Medium |
| **Issue: Public Safety** | | |
| **Physical:** Erosional Processes can create safety hazards or damage to facilities. | Medium | Low |
| **Biological:** Trees can create safety hazards or facility damage. | Medium | Medium – High |
| **Social:** Lack of adequate facilities, signing and enforcement creates safety issues. | Medium | Medium - High |
| **Issue: Firewood Supply & Demand** | | |
| **Social:** Decreasing firewood supplies are not able to keep up with the demand for fuel wood by people in the region. | High | Medium |

| Issue: Scenic Quality | | |
|---|---|---|
| Objective of Management Action | Potential Treatments | Priority |
| • Prevent large scale stand replacing fires by decreasing fire hazard and risk | | High |
| • Reestablish vegetation promptly. | • See Vegetation Recommendations. | Medium |
| • Implement management actions to minimize adverse impacts to scenic quality (harvest unit design, facility placement on the landscape).<br>• Maintain and enhance the inherent beauty and integrity of the watershed. | • Develop a Viewshed Implementation Guide.<br>• Implement the recommended guidelines defined in this watershed analysis for regeneration harvest.<br>• Develop standards and guidelines for Army Corps. of Engineer lands that are managed by the USDA Forest Service.<br>• Maintain and improve scenic overlooks of the reservoir along the highway and Blowout Road.<br>• Improve scenic opportunities (views, overlooks, diverse vegetation) along the Quartzville Back County Byway). | Medium – High |
| **Issue: Public Safety** | | |
| • Restoration of erosion prone areas. | • See Recommendations under erosion processes | |
| • Provide for public safety | • Remove hazard trees within developed recreation areas, popular dispersed sites, and within approximately 1 tree length from the prism of well traveled roads.<br>• Improve parking around the reservoir to reduce congestion along the highway and Blowout Road.<br>• Fire prevention and fuels management to reduce risk.<br>• Post warning signs of dangerous situations or facilities.<br>• Provide road maintenance on roads used by the public. | Medium - High |
| **Issue: Firewood Supply & Demand** | | |
| • Increase available firewood supplies without causing significant impacts on ecosystem values. | • Develop a program to allow the collection of firewood outside of established harvest areas | High |

# Facilities

**Synthesis**:

**Issue: Maintaining Facilities**

| How do other physical, biological and social ecosystem processes influence this issue? | How much influence do these processes have? High, Medium, Low | How likely to change by management actions? High, Medium, Low, No |
|---|---|---|
| | | |
| **Physical:** Topography and soil types determine facility location | High | No |
| **Physical:** Weather, such as snow, ice, floods, wind, etc. can damage facilities. | Medium | Low |
| **Physical**: Facilities deteriorate with age. | Low | Low |
| **Biological:** Vegetation can damage facilities | Medium | Low |
| **Social:** Vandalism and use (wear and tear) can be costly. | High | Medium |
| **Social:** Demand and need influences the type of facilities created. | High | No |
| **Issue: Sediment Production** | | |
| **Physical**: See similar processes under Geologic Resources | | |
| | | |
| | | |
| | | |
| | | |
| | | |

# Facilities

**Recommendations**:

**Issue: Maintaining Facilities**

| Objective of Management Action | Potential Treatments | Priority |
|---|---|---|
| | • | |
| | | |
| • Maintain facility condition at or above acceptable standards, and meet current public needs. | • Replace and maintain facilities reported in the Recreation Facilities Conditions Assessment | |
| | • Upgrade sanitary facilities at campgrounds and day use area to meet public expectations. Install sanitary facilities at dispersed areas that have sanitation problems, where feasible. | |
| | • Improve parking around the reservoir to accommodate current demand. | |
| | | |
| | • Update and inventory road system for GIS and TMS programs and revise Road Management Objectives | |
| **Issue: Sediment Production** | | |
| • Restoration of erosion prone areas | • Inventory road system to determine storm proofing and decommissioning needs | |
| • Maintenance of existing roads | • Upgrade stream crossing to allow for fish passage and design for 100-year stream flow | |
| | • Reroute drainage to stable receiving areas. | |
| | • Relieve inboard ditch line more frequently | |
| | • Replace deteriorated culverts, waterbar and outslope. | |
| | • Harden road prism through rock placement. | |
| | • Mulch and revegetate bare, erosion-prone surfaces such as cuts and fill slopes, wherever sediments have access to the stream system. | |

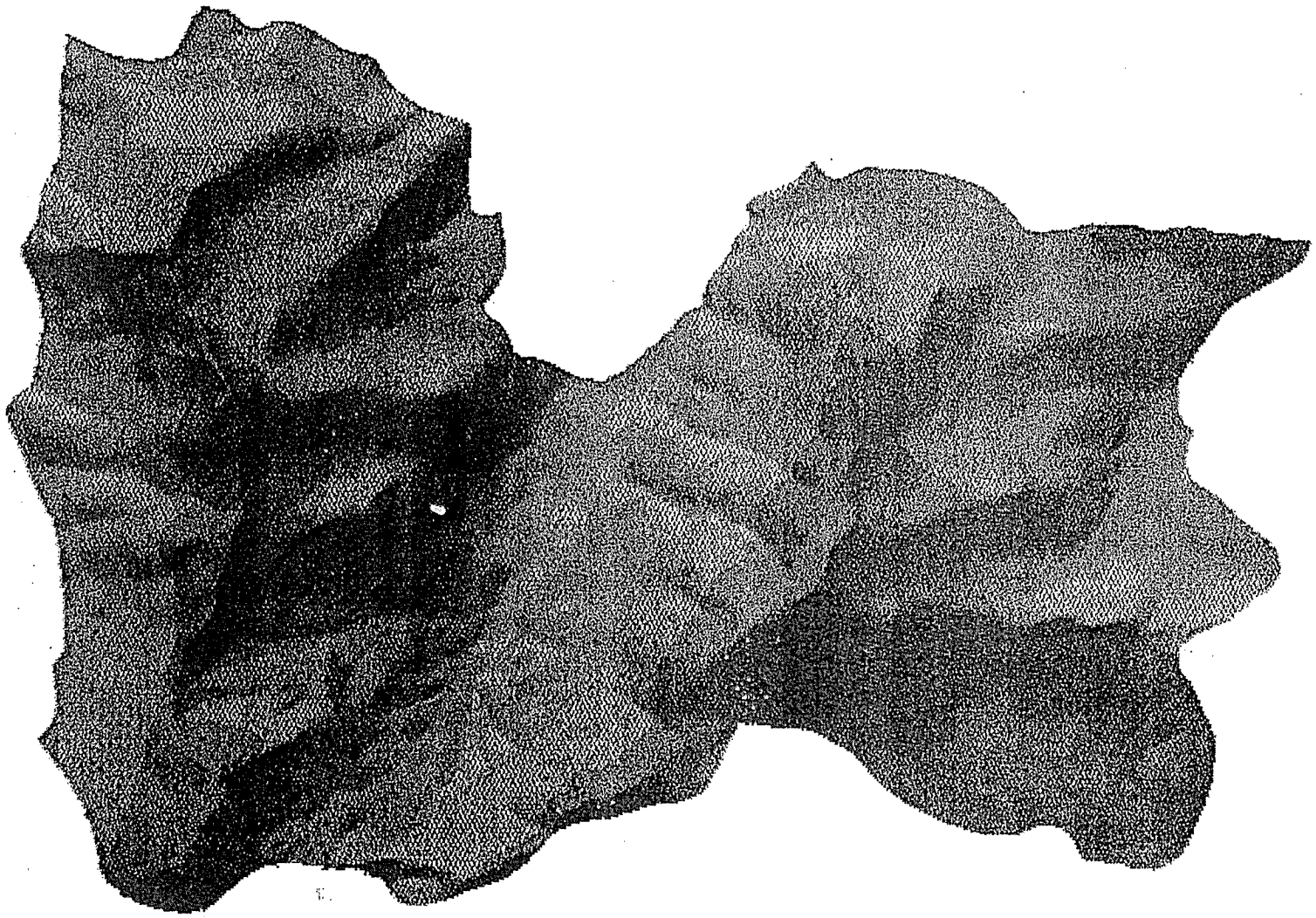
USDA Forest Service
Willamette National Forest
Detroit Ranger District

# Implementation Guide

*for the*
*Coffin-Bachelor Mountain Dispersed Recreation*
*Semiprimitive Motorized Area*

April 21, 1998

# Coffin - Bachelor Mountain Dispersed Recreation Semi Primitive Motorized Area Implementation Guide



Willamette National Forest
Detroit Ranger District

April 1998

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# Vicinity Map

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District

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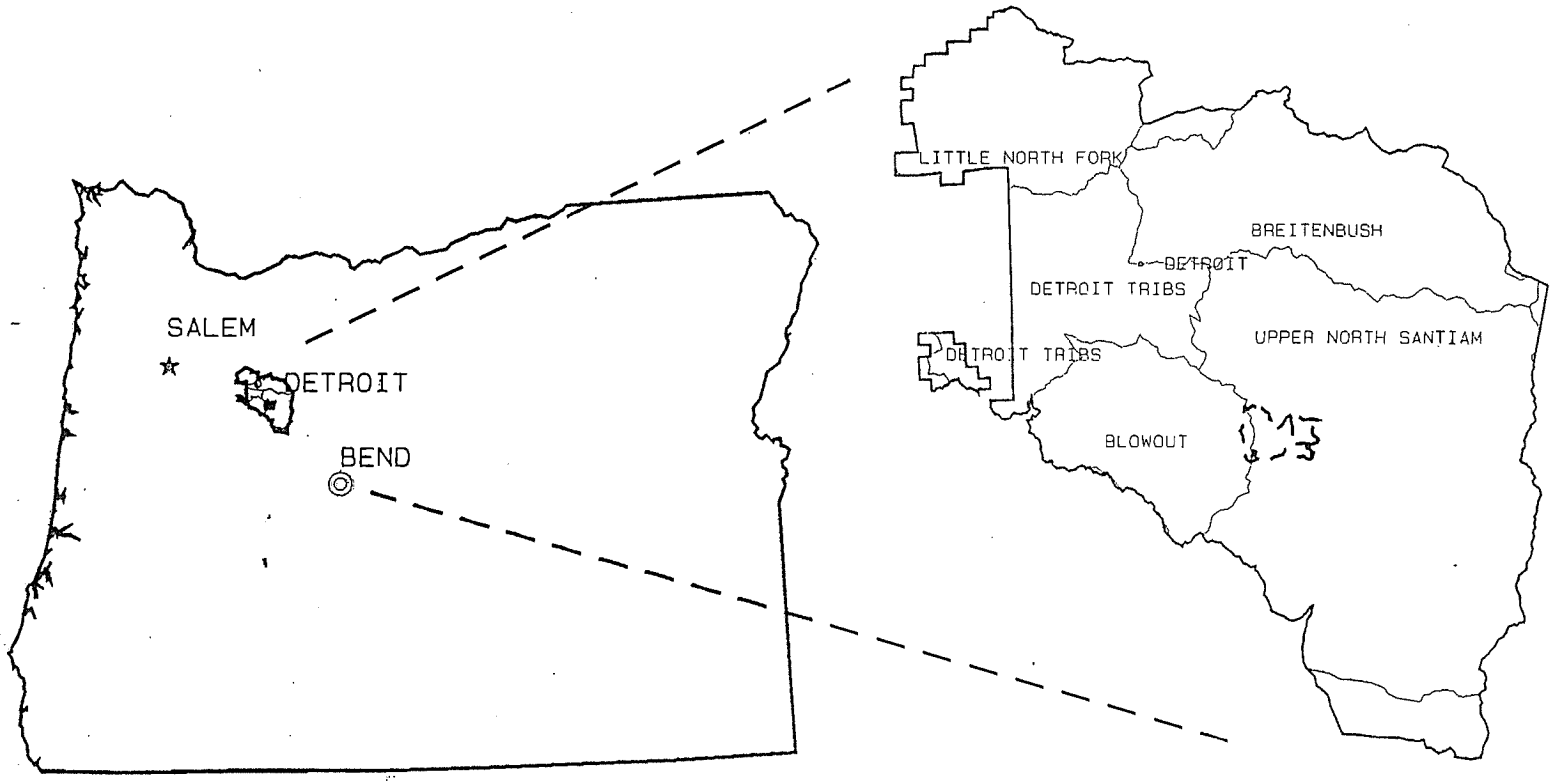


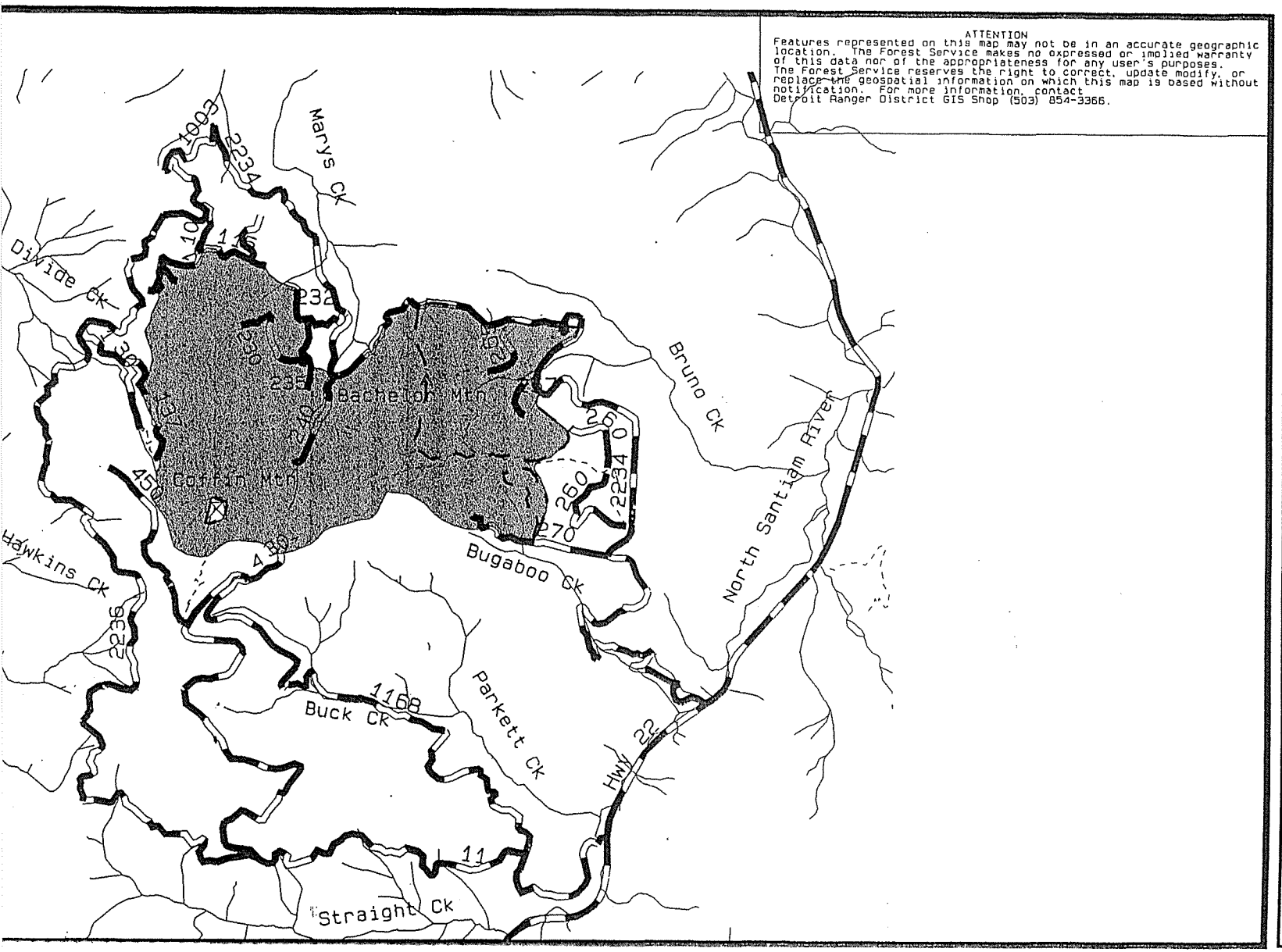

/✓ Mgt Alloc 10B and Lsr Bnd

Scale 1:6000000
04/14/98

Request #1727

Map No. 1

# Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District




Legend

- Administrative Site
- Coffin-Bachelor Mtn. Semi Primitive Area
- Lsr and Lsrs
- Roads
- Class 1 2 and 3 Streams
- Trails
- Coffin Mtn Lookout

Scale 1:75000
04/13/98

Request #1723

Map No. 2

## PURPOSE AND SCOPE

The 1990 Willamette National Forest Land and Resource Management Plan designated the area surrounding Coffin Mountain and Bachelor Mountain as a Dispersed Recreation Area managed to provide Semiprimitive Motorized settings and experiences. The Implementation Guide is required by the 1990 Forest Plan, and provides management direction and project implementation guidance specific to the Semiprimitive Motorized Area. The implementation guide is not a decision document. For any projects or activities proposed within the area, agency policies and procedures regarding the National Environmental Policy Act and planning regulations will be followed.

The 1990 Willamette National Forest Land and Resource Management Plan has since been amended by the *Record of Decision and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth related Species within the Range of the Northern Spotted Owl (1994)*. As part of the Forest Plan implementation process, Watershed Analyses were completed for the 137,000 acre Upper North Santiam Watershed during 1995, and for the 34,000 acre Blowout Watershed in 1994. As a result of these analyses, recommendations were proposed that would move the existing condition of these watersheds toward the desired condition envisioned in the amended Forest Plan. When the original Forest Plan was written requiring implementation guides, Watershed Analysis was unknown so many recommendations have already been identified through the Watershed Analysis process. For the purpose of this guide, pertinent recommendations discussed in Watershed Analyses will be included, and additional recommendations will result as part of this area-specific process.

Part of the Coffin-Bachelor Mountain Semiprimitive area lies within the Jefferson R0214 Late-Successional Reserve (LSR) in which an assessment is required under the Northwest Forest Plan. Assessments of the conditions and functions for each LSR or group of smaller individual LSRs are to provide information to managers, planners and the public from which to evaluate proposed activities and facilitate implementation of appropriate management activities for the LSRs that assure activities meet the LSR standards and guidelines and further LSR objectives. Currently, a draft Mid-Willamette Late Successional Reserve Assessment has been completed.

Recognizing that our current knowledge of the ecosystem and the actual conditions will change over time, a periodic review of Watershed Analyses and LSR Assessments should occur and be revised to reflect new information or changed conditions. Recommendations resulting from this Implementation Guide will be reviewed for any inconsistencies with future revisions of Watershed Analyses and the LSR Assessment.

## LOCATION

The Coffin-Bachelor Mountain Semiprimitive area encompasses approximately 3,513 acres and contains 770 acres of Late Successional Reserves. Most of the area east of Coffin Mountain (approximately 2977 acres) lies within a Tier II watershed, which provides a source of high quality water to downstream users.

The Coffin-Bachelor Mountain Semiprimitive Area lies in the North Santiam River basin on the western slope of the Cascade mountain range within Linn County. The area lies approximately 2.5 miles west of State Highway 22 and North Santiam River within Township 11S, in the northeast 1/4 of R6E, and northwest 1/4 of R7E. The area lies within the western Cascade physiographic province and occupies 2977 acres in the southern Marys and northern Straight Landform Blocks of the Upper North Santiam Watershed (Upper North Santiam Watershed Analysis, 1995); and 536 acres of the Hawkins subdrainage within the Blowout Watershed (Blowout Watershed Analysis, 1994).

## DESIRED FUTURE CONDITION

### *Social Setting*

The desired condition for the Coffin-Bachelor Mountain Dispersed Recreation-Semiprimitive Motorized Area, as described by the 1990 Forest Plan, is an area that provides for a wide range of recreation opportunities where visitors can experience a moderate degree of isolation from the sights and sounds of human activity. Recreational use will vary by season but will generally remain light and visitor interaction will be infrequent. There is moderate opportunity for solitude, tranquility, and closeness to nature; and a high degree of self-reliance, challenge and risk in using motorized equipment. Activities associated with this area are both motorized and nonmotorized in nature. Specific recreational activities are centered around consumptive and nonconsumptive use of land and water areas that could include, hiking, camping, hunting, horseback riding, mountain biking, off-road vehicle use, nature study, and fishing.

### *Physical Setting*

The setting of this management area will be characterized by an environment where the natural landscape may have been subtly modified but where alterations will not draw the attention of most users. The area will predominately be a natural or natural-appearing environment of moderate to large size. Vegetation alterations resulting from regeneration harvests are very small in size and few in number, widely dispersed and not obvious. Regeneration timber harvest in this management area will occur at a rate of up to 7% of the suitable and available acres during the first 10 years following Forest Plan implementation.

*Facilities*

Access to and within the area will be provided by trails and roads. Site modification for facilities is minimal. Except as necessary to protect fragile resources, signing and developments will be limited. Facilities will be limited to trail structures or other structures to meet sanitary or safety needs of visitors. Developments will be simple in design and constructed with materials that blend with features of the natural landscape. The area will be managed to minimize the presence of on-site controls and use restrictions. Visitor information services such as interpretation is through very limited on-site facilities but use of maps, brochures and guide books is acceptable.

## ISSUES AND CONCERNS

### Physical

*Soils/Geology*

- Excessive fuel accumulation creates potential for sufficient fire intensity to damage soil.

*Hydrology*

- Timber management activities can create soil disturbance that accelerates erosion processes and have the potential to affect water quality.

- Transportation management activities can create soil disturbance and redirect natural drainage patterns that accelerate erosion processes and have the potential to affect water quality.

- Motorized and non-motorized recreation can create soil disturbance that accelerates erosion processes and have the potential to affect water quality.

### Biological

*Vegetation*

- High stand densities have resulted in decreased stand vigor and increased tree mortality.

*Fire*

- The fire regime for this area is classified as a "High Severity Fire Regime" based on hazard risk. Historically, fires in this area are infrequent (100 year intervals), usually high-intensity, and stand replacing in character.

- Fuel loading has significantly increased in second growth stands during the last decade primarily due to tree mortality created by high stand densities, and blowdown. Fire suppression has contributed to long term fuel accumulation. Fuel buildup increases the risk of stand replacing fires. Untreated stands will continue to have mortality and will continue to contribute to these high fuel loadings.

*Wildlife*

- There is a lack of multi-storied structure within fire regenerated, even-aged stands created within the last 100 years.

- Younger stands in the area that resulted from fire and management activities, are lacking snags and down woody debris of adequate size and range of conditions. Most large down wood in these stands are in advanced stages of decay.

- High fuel loadings increase risk of stand replacement fires, especially within the Late Successional Reserve.

- The Coffin-Bachelor Mountain area lies within portions of five big game Management Emphasis Areas (MEA). Divide, Marys, Bugaboo and Bruno MEA's are below acceptable limits for overall habitat condition for big game due to high road densities and lack of forage.

- Quarter township 11061 lies within the Santiam Area of Concern and is located within a portion of the Coffin-Bachelor Mountain area. This quarter township falls below the 50-11-40 rule with 47.5% of the stands averaging at least 11 inches diameter breast height and 40% canopy closure.

- Studies show off-road vehicle (ORV) use may conflict with big game due to harassment or disturbance during nesting, calving and denning periods. Potential ORV use on trails is a concern due to noise disturbance that would be distributed over a wider area.

**Social**

*Heritage*

- A large prehistoric lithic scatter site is being impacted from recreation use, road maintenance and blowdown activity. Potential ORV use on area trails can impact heritage sites.

***Recreation/Scenic***

- Currently, there is conflicting direction on how the area is to be managed. According to the Forest Plan, the area is to be managed for semiprimitive motorized experiences which allows activities that are both motorized and nonmotorized in nature. Conversely, all area roads are closed to motorized use in order to meet big game management objectives identified in the Forest Plan. In addition, the current trail system was not constructed to a standard that would accommodate motorized travel.

- Area trails are not meeting maintenance standards. A declining trail management budget reduces the ability of adequately maintaining the existing trail system.

- Coffin Mountain lookout attracts visitors which can sometimes conflict with the lookout's ability for wildfire detection. Personal safety of and courtesy toward the lookout staff is

an issue.

- Large scale fires have the potential to impact the visual quality of the area, semiprimitive recreational experiences of visitors, forest commodities and administrative sites.

- Pre-1990 Forest Plan timber management created openings larger than current standards allow within this allocation. Some of these stands are still in a visually disturbed condition.

*Transportation*

- Declining road maintenance budgets reduces the ability to adequately maintain existing roads. Inadequately maintained roads affect user safety and the ability to use roads.

- The Flood of 1996 caused some road damage within the area.

- The 2236 road (Coopers Ridge Road), west of the area may continue to fail due to soil type. This road is not a high priority for maintenance.

## CURRENT CONDITION

### Physical

#### *Soils/Geology*

The most dominant landscape feature within this subwatershed is the formidable and protruding rock face on the escarpment of Coffin Mountain (elev. 5771 feet). Named for its ominous, box-like feature, Coffin Mountain is an erosional remnant of an extinct volcanic eruption and lava flow. Second in grandeur but first in height is Bachelor Mountain (at 5953 feet), located almost directly across the Marys Creek canyon from Coffin Mountain. The area contains a variety of landforms which are geomorphically diverse and highly complex. These landforms range from extensively glaciated upland benches and headwalls at the higher elevations; to stabilized slump/earthflow complexes; to steep, shallow soiled, highly dissected headlands with rock scarps and bluffs; and finally to extensive areas of lower elevation benches, flats and terraces that formed by glacial outwash processes.

Mid Pleistocene (one million years ago) glaciation was probably the principal force that carved the characteristic U-shaped valley into the underlying Western Cascade volcanic strata. These upland benches and flats now form the headwaters of Marys Creek. This glacier probably extended to the west of this analysis area, and may have completed its journey where Detroit Dam is presently located. It is unknown if glacial ice actually occupied the upper valleys of these tributaries during the last Ice Age (10,000 years ago). Late Pleistocene (10,000-500,000 years ago) glaciation probably had minimal direct effect in the area, except for the likelihood of localized ice fields on the northern aspects of the tallest peaks and ridges.

The steep sidewalls that comprise most of the analysis area are extensively dissected, show numerous rock outcrops and bluffs, and support an extensive blanket of fire-regenerated Douglas-fir and noble fir on the shallow, mostly rocky soils. By contrast, the gently sloping to flat lying terrace deposits of the valley bottom are comprised almost entirely of glacial outwash materials. On the steep, rocky sideslopes, ravel and slough predominate when vegetation is absent, such as after catastrophic fire events. Most sediment input into the system is a result of natural gradual downslope movement of soil from gravity and activity such as rainfall and freeze/thaw. Localized areas of active slope instability are present, primarily in the form of highly prone debris or snow chute zones. With the steep dissected nature of the valley walls, debris chutes would play a major role in the down slope movement of soil and debris in those localized areas. Since little evidence was found to indicate that this is a major source of sediment generation in this century, it would seem that this mechanism is highly episodic in nature, and related to fire and/or flood events of past centuries.

#### *Hydrology and Water Quality*

The Coffin-Bachelor Mountain area is located within the western Cascade physiography which

typically contains steep slopes and colluvial benches. The steep sideslopes contribute water to the stream systems through snow runoff and groundwater. Characteristics of these stream systems depend upon the location of the channel along the hillside. Headwater channels are steep, greater than 35 percent, and contain sideslopes greater than 65 percent. Channel material primarily consists of boulders and bedrock. There is past evidence of debris torrents, however, these areas have since revegetated with alder and willow. The area is still prone to snow avalanches. Midslope channels are moderately steep, 5 to 35 percent, and contain mostly small boulders and cobble. Colluvial benches have been created along these midslopes. At the slope break of these benches, the channels are steep and have similar characteristics to headwater stream channels.

The hydrology of the area is dominated by snow which contributes to the source of water within stream channels. Due to the high elevation ranging from 3500 to 6000 feet, and the north facing aspect of the Marys Creek drainage, snow doesn't melt until early summer. This snowpack keeps the groundwater table high and creates seasonal wet areas. The wet areas are primarily found on the colluvial benches due to the deeper soil depth and the ability of these areas to hold water. Water quality for the area is high. Headwater areas tend to produce seasonal flows following snowmelt, and perennial streams are associated with groundwater sources. Turbidity levels are low due to wet areas acting as a filtration system, trapping and storing fine sediments.

Large woody material is a key component within stream channels for energy dissipation and sediment storage. Most of the large woody material is decomposing and has some to no structural integrity. The areas with frequent fire frequency do not contain the level of woody material within the channel as those areas with less frequent fire. Past harvest activities have occurred along Marys Creek. The riparian vegetation has since reestablished but it will take time before the conifers reach adequate size to contribute large woody debris to the stream.

**Biological**

***Vegetation***

The Pacific silver fir plant association is the predominant series within the Coffin-Bachelor Mountain area. It also includes a lesser amount of mountain hemlock at higher elevations. These plant associations are generally influenced by heavy snowpack which provides good moisture but shorter growing seasons. The predominant tree species are noble fir, Douglas-fir, and western hemlock.

# Managed Stands (regeneration harvest)

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District

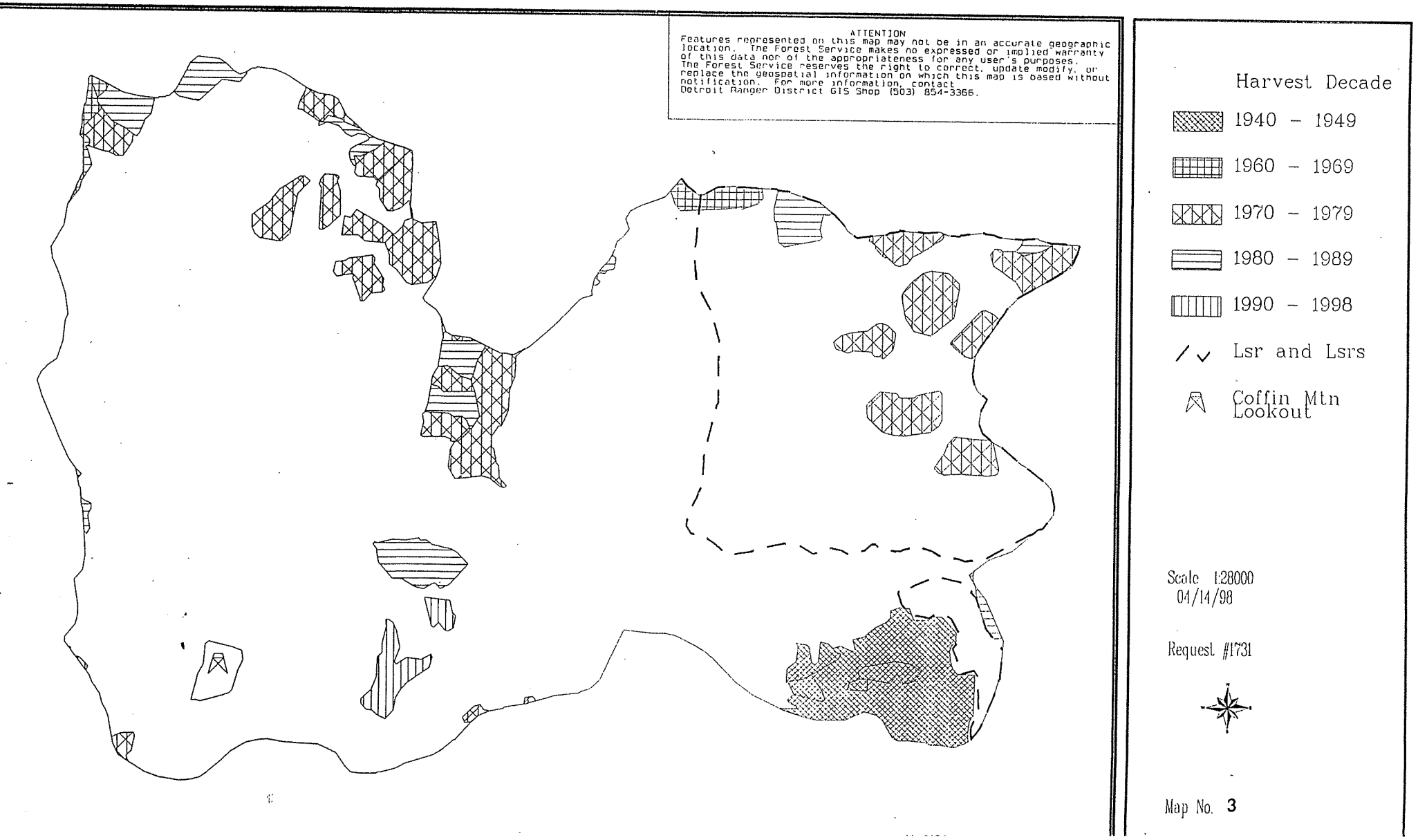


**Table 1. Harvest by Decade**

| Decade | Acres |
|---|---|
| 1940-1949 | 121 |
| 1960-1969 | 20 |
| 1970-1979 | 240 |
| 1980-1989 | 95 |
| 1990-1998 | 24 |
| Total | 500 |

Of the approximately 3,513 acres in the area, about 500 acres have been harvested for timber within the past 50 years (*Table 1 & Map 3*), primarily in 1948 and a period between 1979-1985. The earliest stands were harvested in 1948 and presently contain trees in the small diameter size class. Stands harvested in the 1960's are composed of pole sized trees. Stands harvested in the 1970-1979's have reached a sapling size class, and those harvested since the 1980's are reaching a sapling size class.

**Table 2. Tree Size Class Distribution**

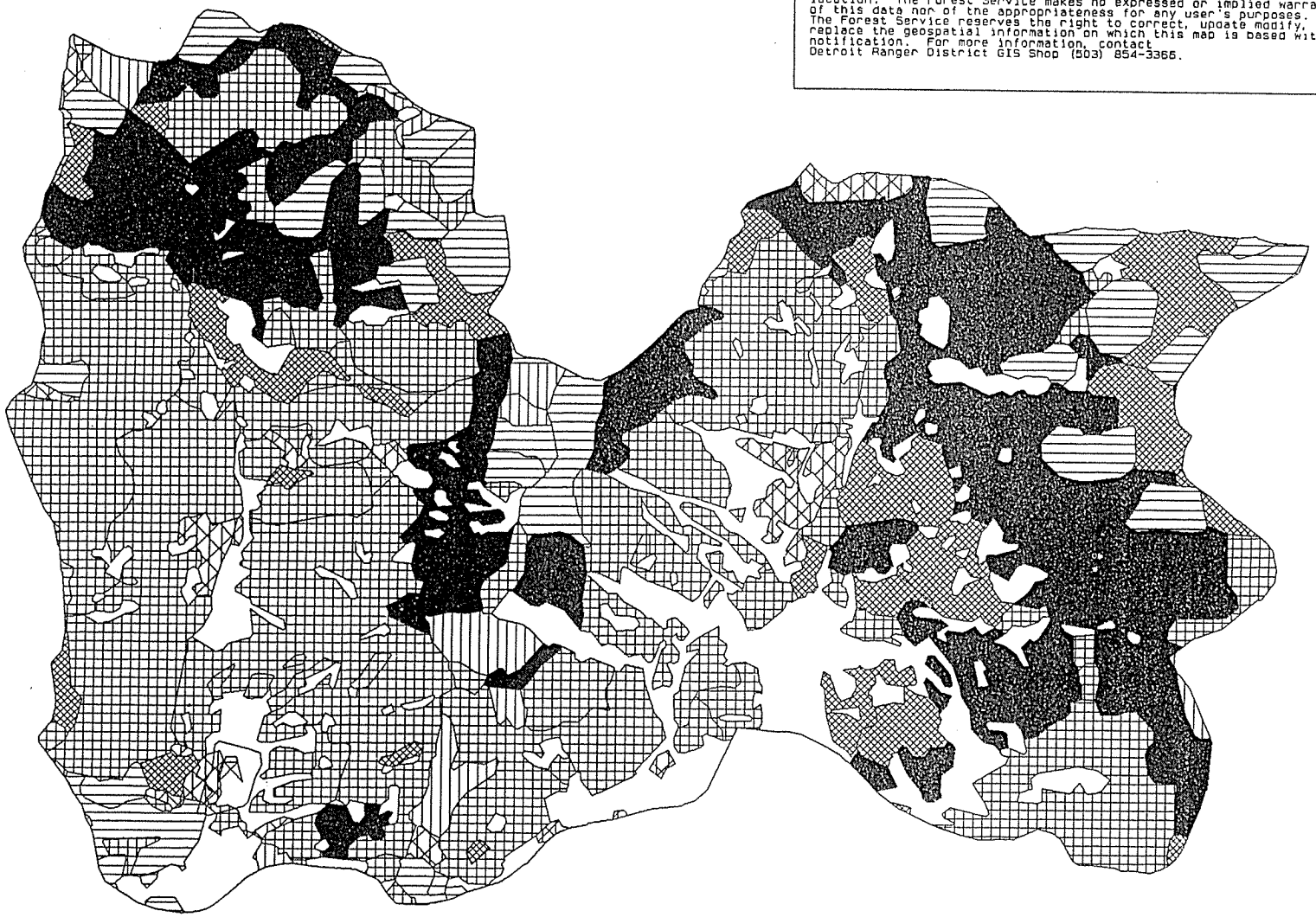
| Size Class | Acres |
|---|---|
| Seedlings | 84 |
| Saplings (1.0 to 4.9 d.b.h.) | 333 |
| Poles (5.0 to 8.9 d.b.h.) | 81 |
| Small (9.0 to 20.9 d.b.h.) | 1381 |
| Medium (21.0 to 31.9 d.b.h.) | 284 |
| Large (32 or greater d.b.h.) | 850 |
| Nonforest (e.g. meadows, etc.) | 500 |
| Total | 3513 |

In terms of tree size. the diameter class of 9 to 20.9 inches occupies the largest in total area at about 1381 acres *(Table 2, & Map 4)*. This size class owes most of its origins to a large stand replacement fire which occurred during the 1890's and burned approximately 1582 acres within the area. In 1967, the Buck Mountain fire burned approximately 251 acres in the southern portion of the area. This area is characterized as containing sapling to small sized trees with the upper rocky slopes containing unsuitable soil types for successful regeneration of trees.

Approximately 1634 acres of the Coffin-Bachelor Mountain area is in late successional condition. These stands are 21 inches in diameter or greater with an average age of about

# Size Classes

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District



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Legend

- Non Forest
- Seedlings
- Saplings
- Poles
- Small Trees
- Medium Trees
- Large Trees
- Coffin Mtn Lookout

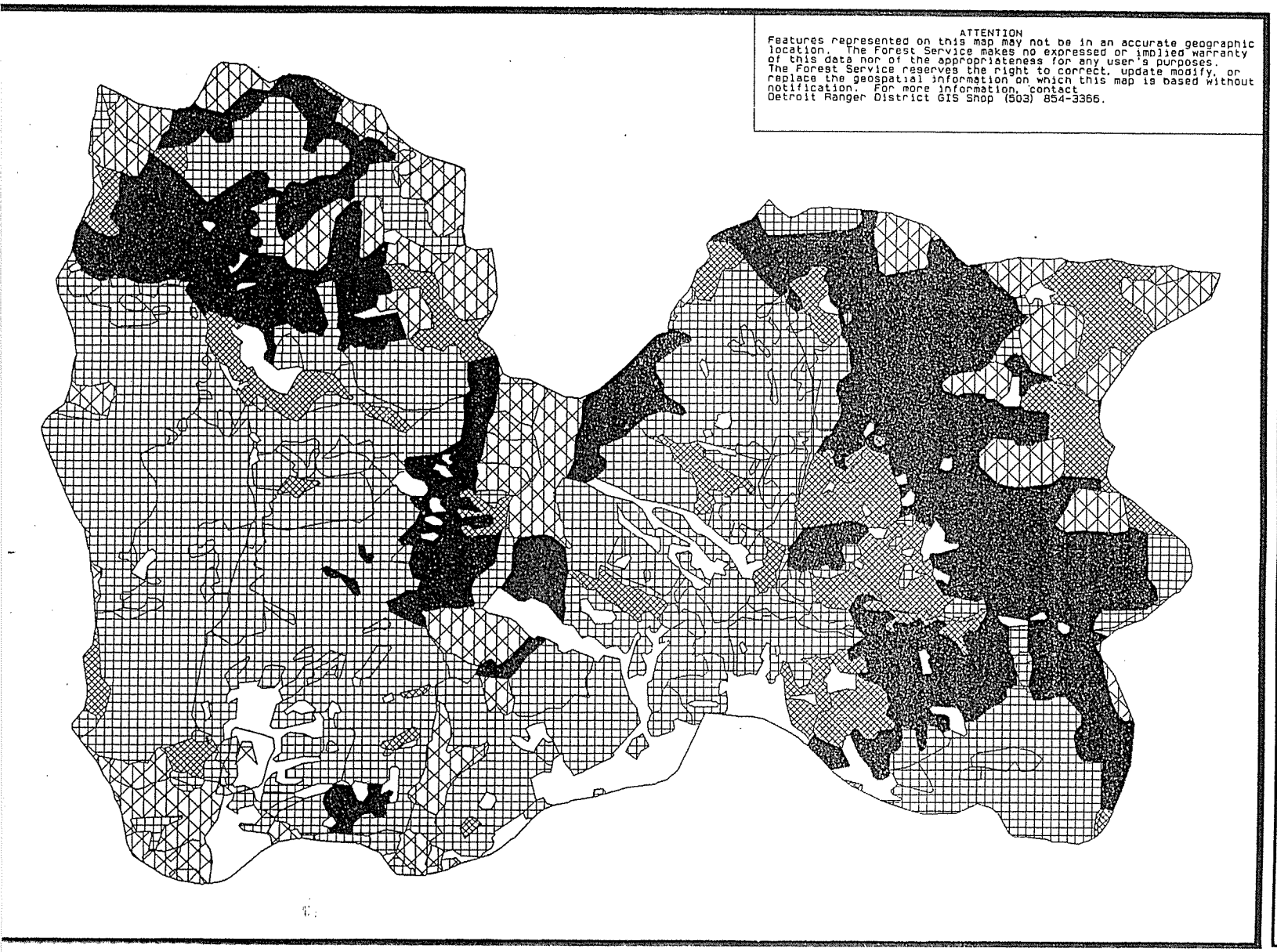
Scale 1:28000
04/16/98

Request #1720

Map No. 4

# Structural Stages

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District




Legend

- Non Forest
- Initiation
- Exclusion
- Reinitiation
- Old Growth
- Coffin Mtn Lookout

Scale 1:28000
04/10/98

Request #1721

Map No. 5

375-400 years, and primarily occur in the Late Successional Reserves, valley bottom of the Marys Creek drainage, and northwest corner of the analysis area *(Maps 4 & 5)*.

In areas where fires have occurred, natural regeneration has resulted with stands containing predominantly noble fir. The high elevation of the area creates favorable growing conditions for this tree species. The area is recognized as having high quality noble fir, a demand within the special forest products market, primarily for boughs. Areas identified for potential bough harvest include existing managed stands *(Map #3)*, and an area to the west of Coffin Mountain that burned during the Buck Mountain Fire.

According to the Forest Plan, scheduled even-aged (regeneration) harvest should not exceed 7% of the suitable and available acres during the first 10 years following Forest Plan implementation (Forest Plan MA-10b-06). Some variation in harvest rate is permitted in consideration of uneven-aged silvicultural systems, differences in rotation length due to site conditions or species-dependent growth rates, and operational feasibility of harvest treatments. The Coffin-Bachelor Mountain area contains 1167 acres of total suitable and available land base for regeneration harvest within Matrix. Based on this acreage, current decade even-aged harvest rate within the analysis area is at 2%. No commercial thinning or partial cut treatments have occurred.

Based on the current condition of stands and the area available within Matrix that would meet Forest Plan standards and guidelines, approximately 288 acres of land is suitable and available for regeneration harvest, and 700 acres is suitable and available for commercial thinning or partial cut treatments. However, no more than 58 acres can be regeneration harvested during the remainder of this decade. Commercial thinning treatments are permitted.

*Fire*

Historically, fire has been the key process working within this area. Extensive fire activity occurred during the 1890's and burned approximately 52% of the Coffin-Bachelor area *(Map 6)*. Fire patterns and fire frequency have affected aquatic habitat; soil productivity; vegetation patterns and species distribution; and the distribution and abundance of snag and down wood habitat within the area. Areas not affected by recent fires include; the Late Successional Reserve and area to the south, lower Marys Creek drainage and portions of the northwest corner of the Coffin-Bachelor Mountain area *(refer to the medium and large size classes, Map 4)*. The vast majority of these older stands date from the early 1600's when fires burned over most of the Upper North Santiam Watershed.

Fire suppression has changed the pattern and distribution of vegetation over the landscape. Fire suppression activities have been very successful in reducing the numbers and size of fires since early this century. Consequently, fuel loadings within stands have accumulated over time contributing to increased fire hazard.

# Past Fires

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District

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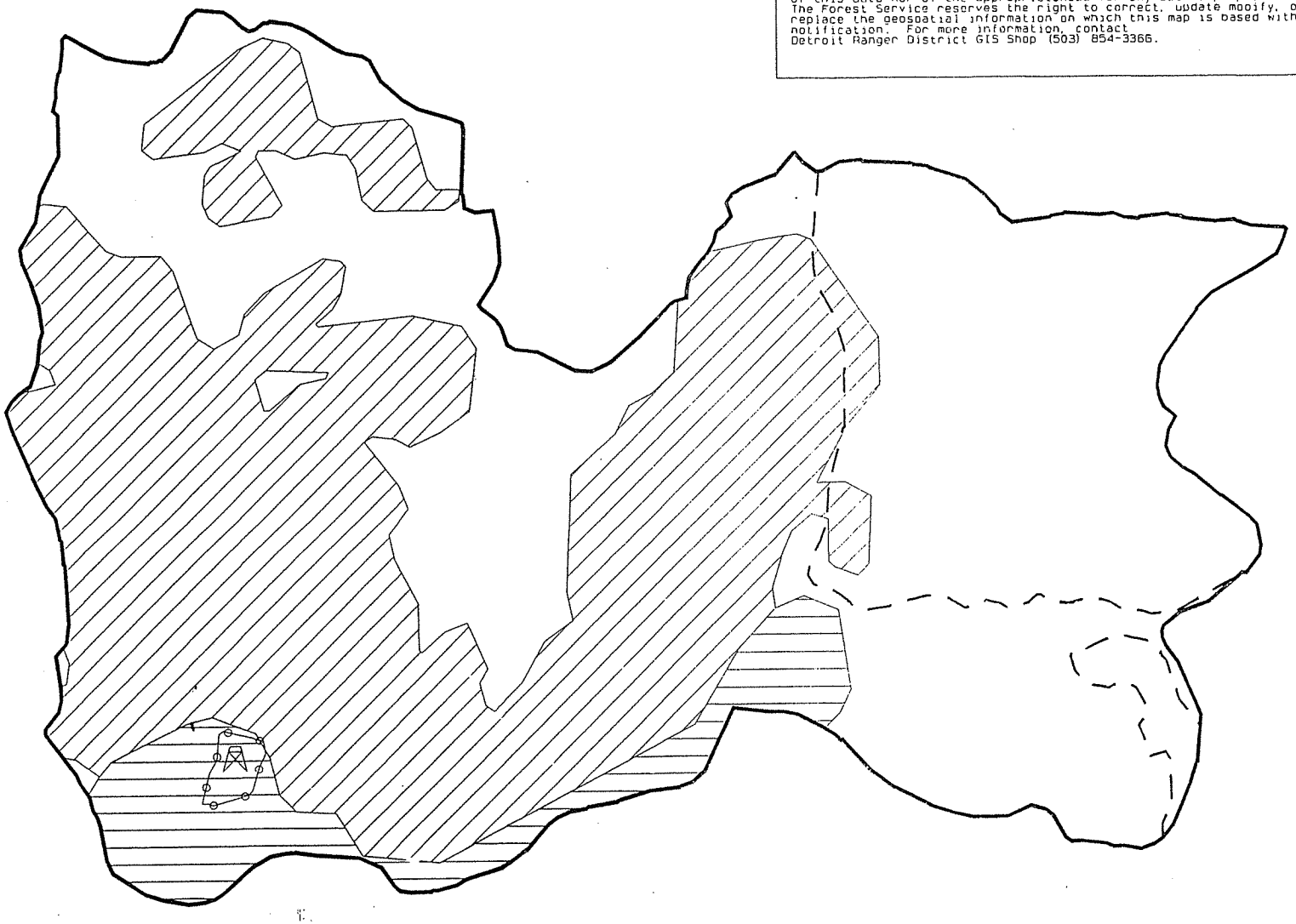


Legend

- 1890 fire
- 1967 (Buck Mountain Fire)
- Fp Mgt Alloc 10B
- Lsr and lsrs Boundary
- Admin Site Boundary
- Coffin Mtn Lookout

Scale 1:28000
04/16/98

Request #1725

Map No. 6

The fire regime for this area is classified as a "High Severity Fire Regime." In this regime, fires are characterized as infrequent, usually high-intensity and often result in stand replacement. The general area is susceptible to lightening starts due to the high ridge system. Potential for human caused fires also exist.

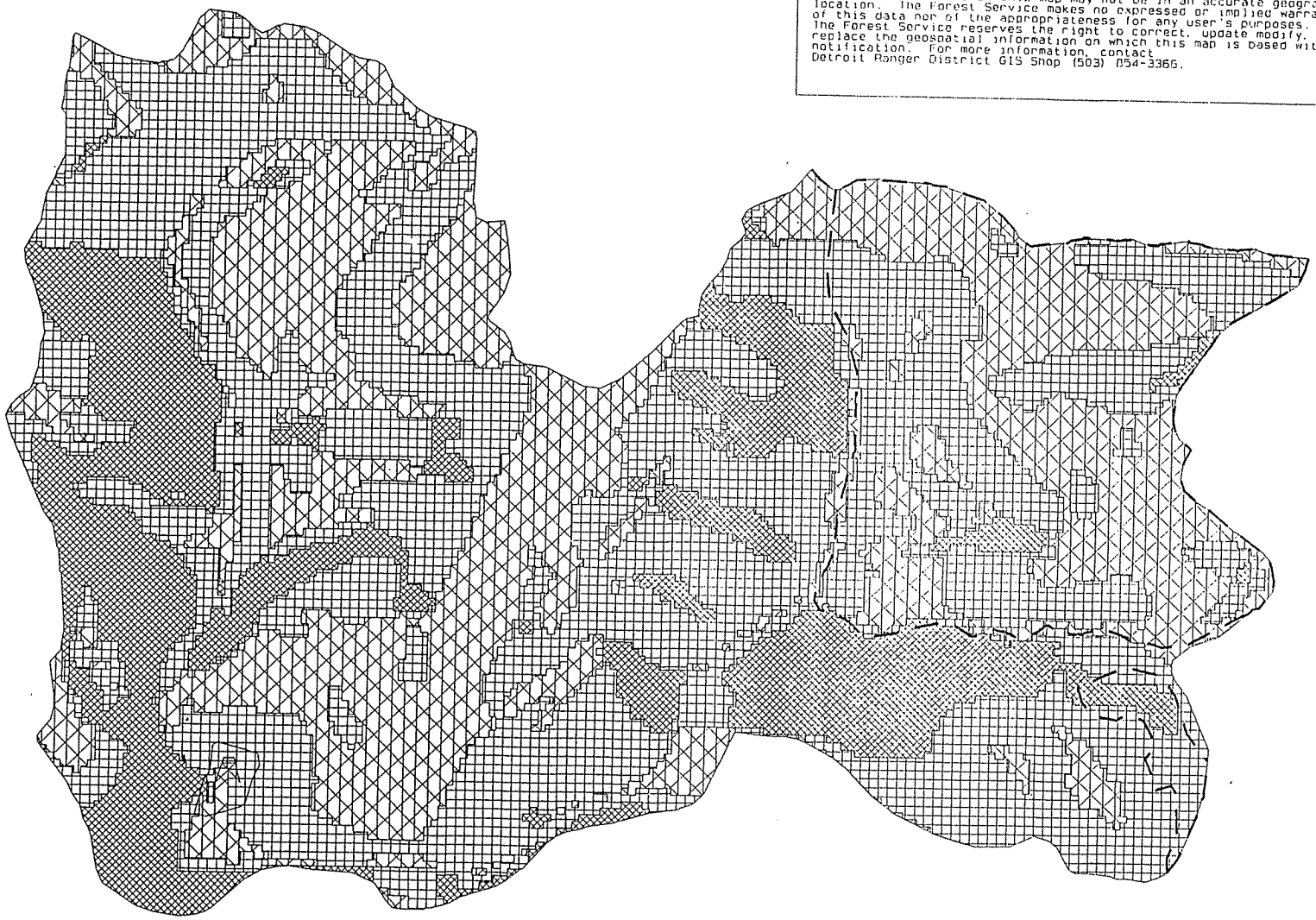
The Geographical Information System (GIS) was used to analyze fire hazard. Generally, south, southwest and west aspects over 40% slopes contribute to high fire hazard on the west side of the semiprimitive recreational area, and a portion to the south and west side of the LSR *(Map 7)*. Although not shown on the map, a high fire hazard also exists along the southern boundary outside of the Coffin-Bachelor Mountain area. Recent fire disturbance patterns closely correlates with this high hazard analysis. Within fire regenerated stands (9.0 to 20.0 dbh size class), high stand densities have resulted in decreased stand vigor and increased tree mortality. Mortality is occurring within these stands due to stocking levels in excess of optimum growing conditions. Tree mortality has significantly increased fuel loadings over the past decade, in addition to blowdown, snowdown and fire suppression. Field reconnaissance of these fire regenerated stands within the Marys Creek drainage indicate fuel loadings average 20 tons per acre. This accumulation is above maximum acceptable fuel loadings described in the Forest Plan Standards and Guidelines (FW-252).

Geographical Information System was also used to identify stands characteristic of fuel models that have a high fire hazard *(Map 8)*. A majority of the remaining area that did not burn within the last 100 years or has not been harvested is classified as a Fire Behavior Fuel Model 10. Most of these stands are located in moderate to low fire risk areas (slopes over 40% with N, NE and NW aspects and slopes under 40% with S, SE and SW aspects). Fuel Model 10 is characterized by overmature old growth stands that contain heavy accumulations of litter and down woody material. These areas are estimated to have 12 tons per acre of less than 3 inch (diameter) dead and live fuels. This indicates that fires in this fuel model are at the upper limit of control by direct attack should a fire escape initial attack or go undetected. Wind or drier conditions could lead to an escaped fire. A few Fuel Model 10 type stands are located along a ridge adjacent the south boundary of the LSR and within the LSR, and contain steep slopes and southern aspects that are a high hazard risk for fire.

The High Severity Fire Regime suggests with the combination of high fire risk (potential for lightning or human caused fires) and increased hazard with fuel loadings and steep slopes with south and west aspects (increased fire behavior intensity); this area has potential for a stand replacing fire should a fire go undetected or escape initial attack. Resources at risk of fire in the area include: water quality, facilities such as the Coffin Mountain lookout and area trails; young regeneration and mature stands of timber; the visual integrity of the semiprimitive area; and wildlife habitat, especially Late Successional Reserves.

# Fire Hazard Slopes and Aspects

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District



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Legend

- Low Hazard
- Medium Hazard
- High Hazard
- Lsr and Lsrs
- Coffin Mtn Lookout

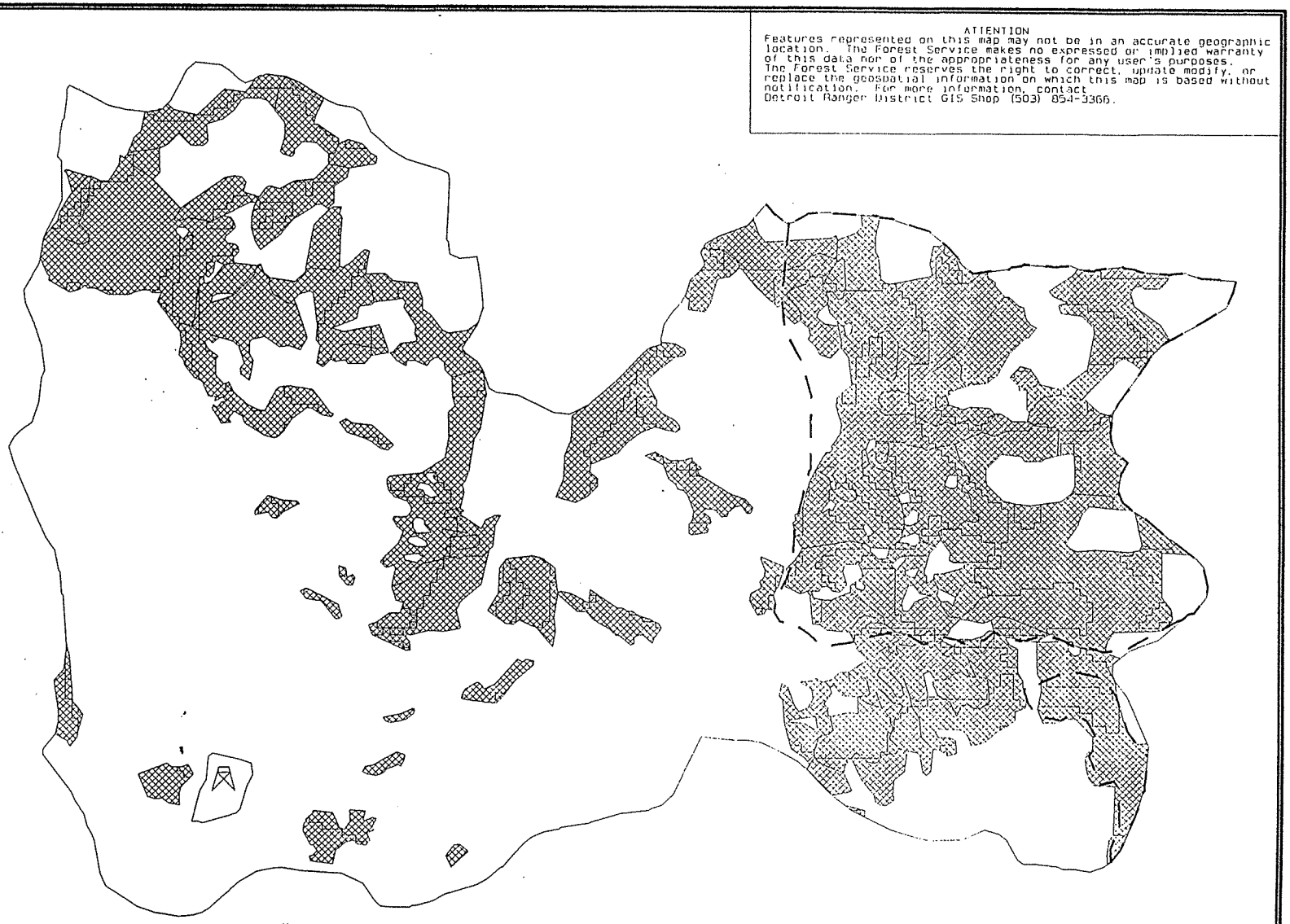
Scale 1:28000
04/13/98

Request #1722

Map No. 7

# High Fire Hazard Fuel Models

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District




Legend

Fuel Model G

Lsr and Lsrs

Coffin Mtn Lookout

Scale 1:28000
04/13/98

Request #1722b

Map No. 8

*Special Habitats*

The Coffin area is characterized by a high diversity of special habitat types. These special habitats tend to be scattered throughout the landscape creating a mosaic pattern with a background matrix of recently burned land in the Coffin-Bachelor area, a matrix of fire regeneration in most of upper Marys Creek drainage, and a matrix of late successional forest east of Bachelor Mountain. The most common types include dry rock gardens, sitka alder patches, and talus slopes/boulder fields. Other special habitat types found in this management area include mesic meadows, moist rock gardens, ponds, and one dry meadow. Plant species diversity is high on Coffin Mountain and Bachelor Mountain, both of which have rock gardens at a variety of elevations, aspects, and hydrological regimes. Most of the mesic meadows in the Coffin and Bachelor areas are semi-disturbed, indicative of high big game use.

Forest Plan Standard and Guideline FW-211 protects special wildlife and plant habitats through a buffered zone in areas where timber harvest is allowable.

Gorman's aster (Aster gormanii), a Region 6 sensitive plant, is found on the top of Coffin Mountain and on the ridges surrounding Bachelor Mountain. Gorman's aster is mostly restricted to small-grained scree slopes and higher elevations (4500 ft. to 6500 ft.). Rock paintbrush (Castilleja rupicola), a plant listed on the forest review list, also occurs on Coffin Mountain.

The Coffin area has a relatively low occurrence of noxious weed infestation. The west boundary has a higher abundance of noxious weeds, and these include Scotch broom, St. John's wort, Canada and bull thistles.

*Wildlife*

**Habitat Condition**

Large even-aged fire regenerated stands of approximately 90 year old trees with residual older trees cover about 40% of the area. These stands are interspersed with older stands that survived the fire. Past harvest activity has resulted in 20-25% of the area being fragmented, mainly within the northern and eastern areas *(refer to Maps 3 & 5)*. These harvested areas are separated by early to mid-seral stage stands with some mature to late-successional stands. With the exception the Buck Mountain Fire area, the remaining area is fairly contiguous with small nonforested habitats scattered throughout.

The younger stands in the area (less than 100 years old) that resulted from past fires and management activities have low snags densities and are lacking down woody debris of adequate size and range of conditions. Most of the large down wood in previously burned areas are in advanced stages of decay (class 4 and 5). Some large residual trees are scattered in these stands. Small patches of blowdown/snowthrow make up the majority of down woody debris in these stands. Within the Marys Creek drainage, there are patches of jackstrawed blowdown that have

very high levels of small (<12" dbh) down wood. Older stands minorly affected by the fire probably experienced underburning. Most of snags in the analysis area are located in these stands. In the Marys Creek drainage, these older stands mostly occupy the lower third of the slope and in the large riparian complexes.

Most of the forested areas are single storied or two storied stands. The single story stands are a result of recent stand replacement fires and contain high tree densities and canopy closure. Ground vegetation is virtually absent in these suppressed stands. The older stands tend to have an understory of brush and young trees, however, no mid-story.

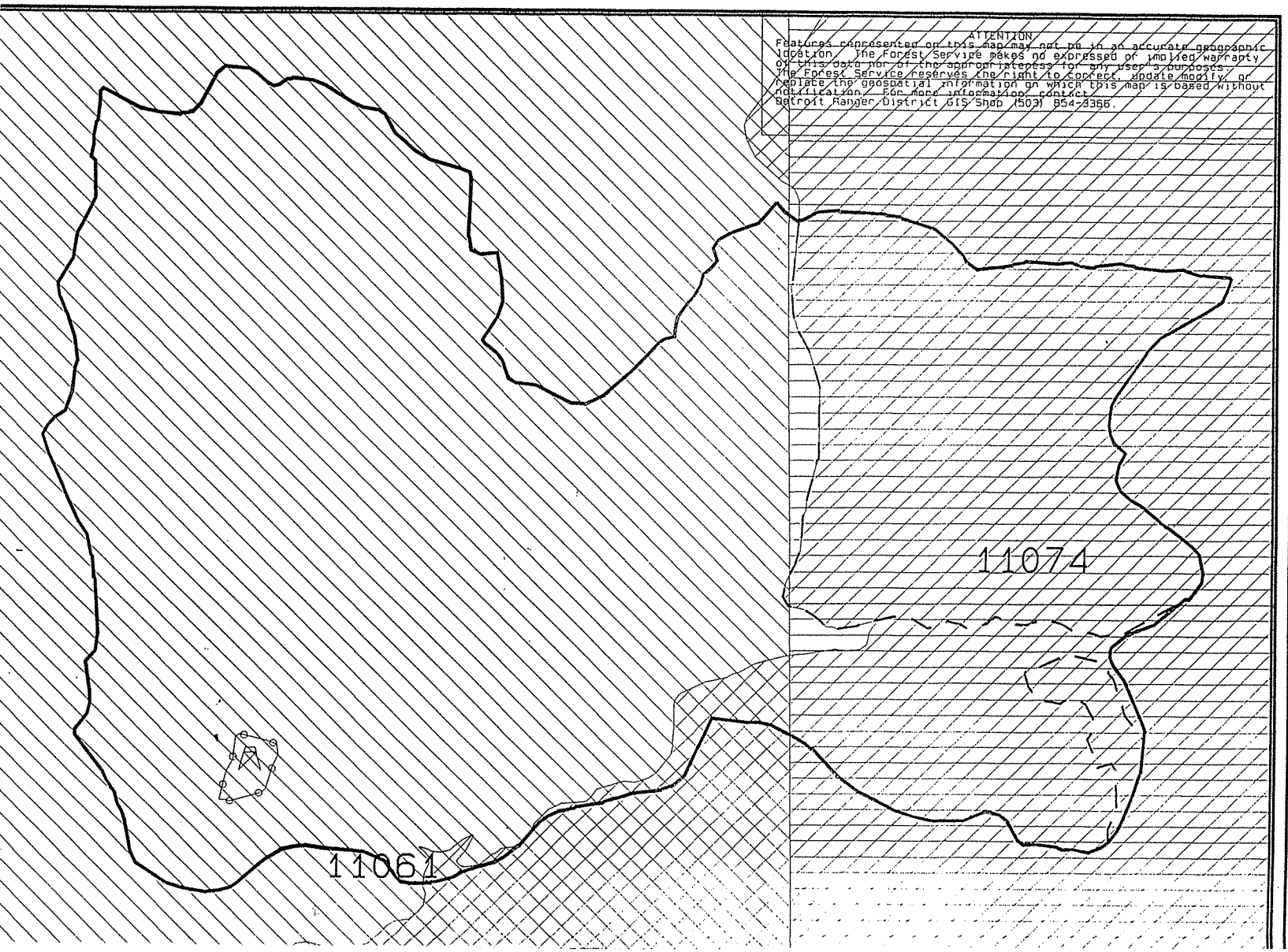
The Santiam Area of Concern (SAoC) was originally identified by the U.S. Fish and Wildlife Service because of concern over having adequate intra-provincial movement for northern spotted owls and other late seral dependent species. The SAoC was established to ensure the availability of adequate dispersal habitat and provide connectivity between Late-Successional Reserves. A boundary revision for the Santiam Area of Concern has been proposed based on new information provided by District and Forest wildlife biologists *(Map 9)*. The U.S. Fish and Wildlife Service and the Forest Service are in the process of reviewing these changes. When the new SAoC boundaries are implemented, the analysis area will occupy approximately 1200 acres within the SAoC but it will comprise a different portion of the area.

Currently, about 1200 acres of the Coffin-Bachelor area lies within the Santiam Area of Concern (SAoC) *(Map 10)*. Quarter townships within the SAoC are required to meet the 50-11-40 rule. The 50-11-40 rule stipulates that 50% of the stands must average at least 11 inches diameter breast height and 40% canopy closure. The Coffin-Bachelor Mountain area lies within quarter townships 11061 and 11074. Both quarter townships lie within the SAoC. Quarter township 11061 is just below the 50-11-40 rule at 47.5%, and quarter township 11074 is currently at 50.3%.

Special habitats such as meadows, rock outcrops, talus slopes and ponds are scattered throughout this area and account for approximately 14% of the land base. These special habitats are utilized by a wide range of species including, small mammals, raptors, and deer and elk.

# Proposed Santiam Area of Concern and 50-11-40 Conditions

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District




Legend

- Townships above 50-11-40
- Santiam Area of Concern
- Townships below 50-11-40
- Fp Mgt Alloc 10B
- Lsr and Lsrs Boundary
- Admin Site Boundary
- Coffin Mtn Lookout

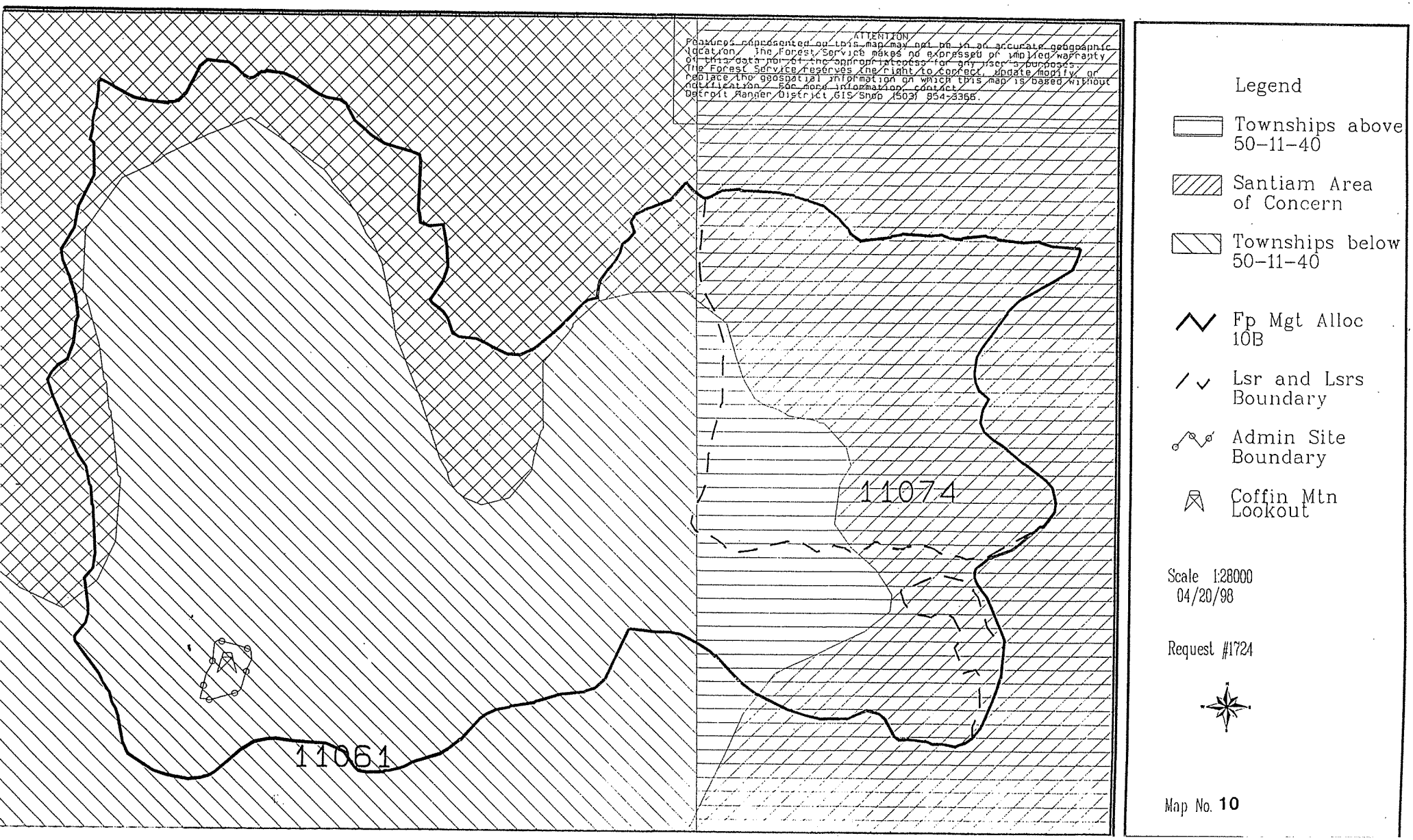
Scale 1:28000
04/20/98

Request #1724b

Map No: 9

# Santiam Area of Concern and 50-11-40 Conditions

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District



**Habitat Use**

*Big Game:*

The Coffin-Bachelor area lies within high and moderate management emphasis areas for elk. Part of Bruno, Marys, Straight, Bugaboo and Divide Creek Management Emphasis Areas lie within the analysis area and are managed for summer range *(Map 11)*. The plant associations in this area have the highest productivity for big game forage. The area is heavily used by deer and elk, particularly within plantations. Numerous game trails and sign can be found in and around these areas. The older plantations and forested areas provide hiding/thermal cover, while the younger plantations and meadows are used primarily for foraging.

The Wisdom Elk Habitat Suitability Model is used as a tool for providing information on the trends that are occurring concerning habitat effectiveness for big game. Observations have been made that the Wisdom Model may not depict all the actual conditions that are occurring on the landscape. For example, commercial thinning treatments can create forage but model outputs do not reflect this habitat condition. The Wisdom Model is currently being refined by the Forest Service and Oregon Department of Fish and Wildlife.

Wisdom Model results indicate Bruno, Marys, Bugaboo and Divide Creek drainages are below the objective value for Overall Habitat Effectiveness (HE) as specified in the Forest Plan *(Table 3)*. All these areas have habitat condition variables below acceptable standards for road densities and forage. In addition, the Bruno Creek drainage is below acceptable limits for cover. Straight Creek is above the objective value for Overall Habitat Effectiveness probably due to the large amount of forage available in the area burned by the Buck Mountain Fire. The Overall Habitat Effectiveness objective values and current condition values for summer range are shown in bold in *Table 3* on the following page.

**Table 3. Overall Habitat Effectiveness Values for Elk Management Emphasis Areas**

| Elk Management Emphasis Area | Objective Overall HE Value** 0.6 | Current Overall HE Value | Emphasis |
|---|---|---|---|
| *Marys* | | | |
| Winter Range | 0.6 | 0.51 | High |
| Summer/Winter | **0.6** | **0.55** | |
| *Divide* | | | |
| Winter Range | 0.6 | 0.48 | High |
| Summer/Winter | **0.6** | **0.49** | |
| *Bruno* | | | |
| Winter Range | 0.6 | 0.51 | High |
| Summer/Winter | **0.6** | **0.51** | |
| *Bugaboo* | | | |
| Winter Range | 0.6 | N/A | Moderate |
| Summer/Winter | **0.5** | **0.49** | |
| *Straight* | | | |
| Winter Range | 0.6 | 0.45 | Moderate |
| Summer/Winter | **0.5** | **0.53** | |

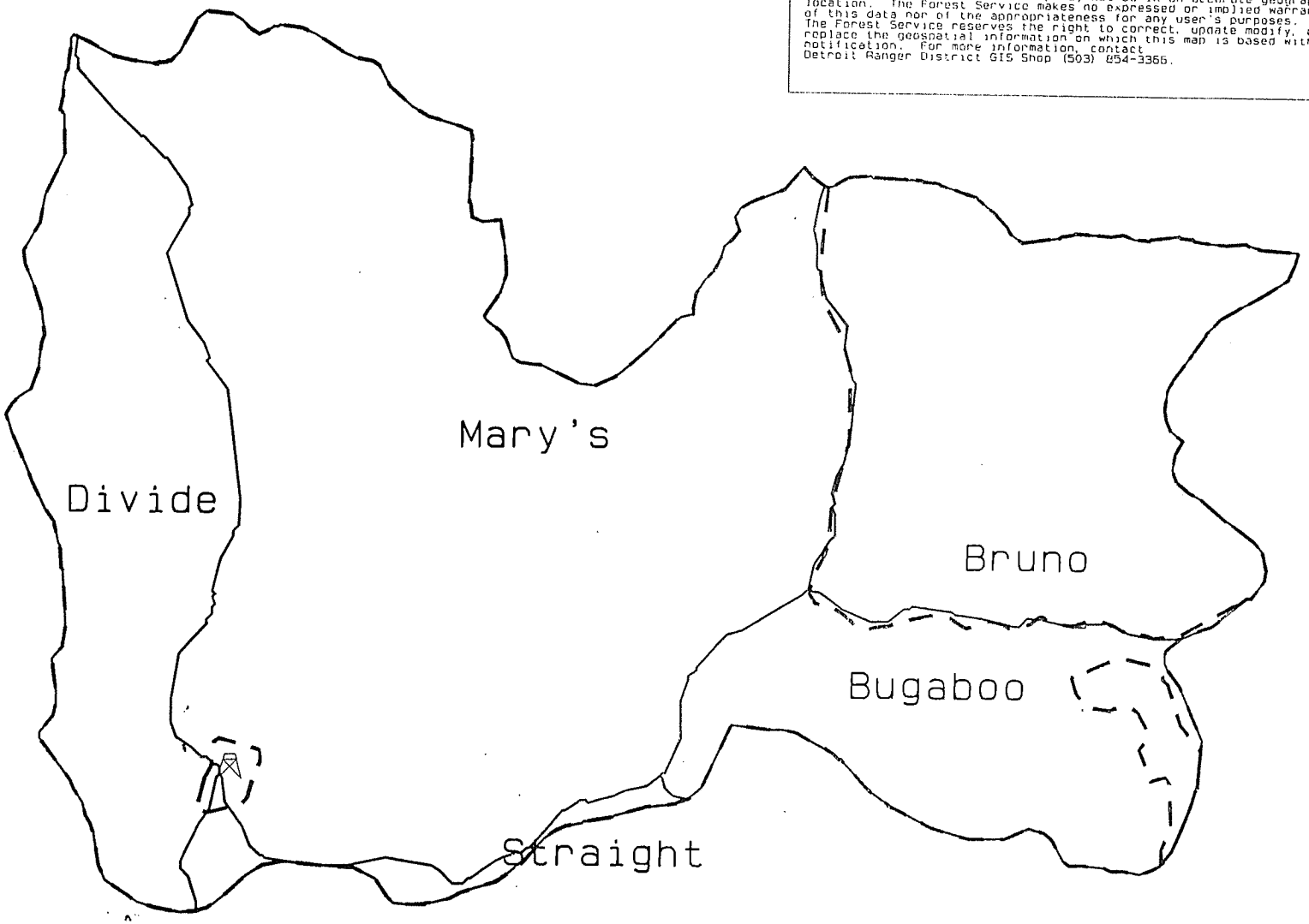
** Overall Habitat Effectiveness objectives that should be maintained or achieved during the first ten years following Forest Plan implementation (desired future condition). Viability ranges used are described in A Model to Evaluate Elk Habitat In Western Oregon

1.0 = Optimal
0.6 - 0.9 = Highly Viable
0.4 - 0.5 = Viable
0.2 - 0.3 = Marginal
0.05- 0.1 = Possible Non-Viable

Permanent road closures have not been enforced due to difficulty of maintaining gates primarily due to vandalism or lack of signing to inform the public of road closures. Public use of closed roads has led to disturbance of big game during critical times.

# Elk Emphasis Areas

## Coffin - Bachelor Mountain Semi Primitive Area
## Detroit Ranger District




ATTENTION
Features represented on this map may not be in an accurate geographic location. The Forest Service makes no expressed or implied warranty of this data nor of the appropriateness for any user's purposes. The Forest Service reserves the right to correct, update modify, or replace the geospatial information on which this map is based without notification. For more information, contact Detroit Ranger District GIS Shop (503) 854-3366.

Legend

- 1890 fire
- 1967 (Buck Mountain Fire)
- Mgt Alloc 10B and Lsr Bnd
- Coffin Mtn Lookout

Scale 1:28000
04/14/98

Request #1726

Map No. 11

*Threatened, Endangered and Sensitive (TES) Species:*

This area has habitat that would be suitable for Threatened, Endangered or Sensitive species such as great gray owl and northern spotted owl. Approximately 730 acres of the Jefferson Late Successional Reserve (R0214) lies within the northeast portion of the analysis area. Forty acres of a LSRs overlap into the southeast portion of this area. This LSRs is connected to the activity center of a pair of spotted owls. These areas will be managed to enhance late successional stand characteristics.

*Non-TES Species:*

This area currently provides habitat suitable for a variety of non-TES species. Riparian areas, meadows, ponds, and other special habitats; as well as various ages of forested areas provide habitat for a wide range of non-TES species. Special habitats and riparian areas account for 25% of the land base in this area.

*Fish:*

The Coffin-Bachelor area has no known fish bearing streams within its boundaries. Adjacent fish bearing waters include Lower Marys Creek and the North Santiam River which support populations of rainbow trout, cutthroat trout, white fish, kokanee salmon, land-locked spring chinook salmon, and several non-game fish such as dace and sculpin.

**Social**

***Heritage***

Approximately 650 acres have been surveyed for the occurrence of heritage resources within the Coffin-Bachelor Mountain Semiprimitive Area. The surveys resulted in the location of 23 (prehistoric/historic) sites and isolated finds.

Evidence of prehistoric use in the area appears in the form of "Open Air" lithic scatters of obsidian and crypotcrystalline sillica, and rock cairns. Historically, the Mololla are reported to have inhabited the western slopes of the Oregon Cascade Range. The Molalla were comprised of three subgroups: the Northern Molalla, Southern Molalla, and a the Upper Santiam band of the Kalapuya. This Santiam Drainage lies within the tribal area of the Upper Santiam.

Ethnographic evidence indicated that aboriginal groups, possibly Kalapuya, Molalla, and Warm Springs have used the area for seasonal hunting, huckleberry picking and gathering of other wild plants. Information on the use of the general area can also be inferred form the oral history of the Warm Springs Confederation as told by the elder women. They relate stories of their grandparents utilizing and maintaining the huckleberry grounds through fire near the Coffin Mountain area.

Historic use appears in the form of packer camps, land claims, early Forest Service administrative and communications networks, including lookout stations. These networks were maintained by Forest Service administrative personnel primarily through an extensive trail network (often adapting to pre-existing trails) connecting trail shelters and lookouts. The primary use of the stations was for forest fire control. The trails are recognized from numerous historical maps of the district (1913, 1920, 1931, 1937, 1948, 1950, and 1951). The trails were often confined to ridge and ridge slopes.

The Coffin Mountain trail #3425 served as a main arterial for access to and from the Coffin Mountain lookout. The lookout and trail first appear on a 1913 historical map depicting the Santiam National Forest lands. The two sites continue to appear on maps of the Santiam National Forest (1920, 1931), Willamette National Forest (1937, 1950), and the Detroit Ranger District (1948). According to these maps, the Hula Shelter, Coffin Mountain Lookout and Fish Lake Ranger Station were all connected by this trail, which also supported a telephone line for communication. The trail log from 1936 charts the course of the trail from the North Santiam near the location of Idanha to the Scar Mountain trail.

*Socio-economic*

The forest products industry, and tourism generated from recreation on the Detroit Ranger District contribute to the economic base and support the diversifying economies of local communities. The timber industry is still an important component of the North Santiam Canyon economy, however, timber related employment is not expected to reach levels as in the past. In recent years, the communities have been affected by declining timber supplies, and have developed economic development strategies to adjust to a different future.

The Forest Service is a partner with community economic and tourism organizations since many community goals depend upon National Forest lands. The canyon communities began exploring ways of attracting more tourism dollars. Communities have also looked into economic diversification through secondary wood products manufacturing or through new markets in nontraditional forest products.

Although public demand for firewood remains high, the ability to fulfill the need has diminished steadily since 1992 with the reduction of timber harvest and land management changes to protect nesting, denning and foraging habitat for various wildlife species.

***Recreation/Scenic***

Visitor use of this area is relatively low and primarily day use in nature. Since user interaction is very low, the area meets the social setting defined within the semiprimitive motorized classification of the Recreation Opportunity Spectrum. However, the activities and experiences associated within the area are nonmotorized in nature due to lack of facilities available for motorized types of activities.

Recreational use of this area will likely increase due to population growth, and increasing demand for semiprimitive settings and experiences (SCORP 1988, 1994). According to the Forest Plan, even if existing inventories of semiprimitive opportunities were maintained, future demand is expected to exceed capacity by the year 2010. In addition, between the year 2010 and 2030, use within all Wilderness Resource Spectrum (WRS) classes will exceed inventory capacity. It is likely with future demands at Mt. Jefferson Wilderness, strategies for managing use will be required. This may have implications on semiprimitive areas outside of Wilderness, potentially displacing users to limited existing non-Wilderness semiprimitive areas such as Coffin-Bachelor Mountain. "Promotion" of Coffin-Bachelor Mountain area trails on the Forest website (Internet), and depicting these trails on the Quartzville Backcountry Byway kiosk map and brochures, will likely encourage use.

Common activities occurring within the area include; hiking, hunting, viewing scenery, nature study, huckleberry picking and photography. Most dispersed camping occurs adjacent the Coffin-Bachelor Mountain area and at trailheads. Some dispersed camping occurs on Coffin Mountain near the lookout.

The season is fairly short due to early snowfall at high elevations. Snow typically melts by early June, and wildflowers begin to bloom in July which draws visitors to the area. The season typically ends in October and is a popular area for big game hunters between August through October. Coffin Mountain has recently gained attention by paragliders and is being considered and evaluated for feasibility by local paraglider/hang glider organizations. Bachelor Mountain may also have the desirable elements that are required for safe and reliable paragliding. There is no documented winter use within this area. The area was analyzed in the Detroit Ranger District Winter Sports Plan for potential winter recreation development, however, due to inaccessibility and steepness of terrain, the area is not suitable for winter recreation management.

The Coffin-Bachelor Mountain Semiprimitive area contains a network of trails that access prominent features within the area including Coffin Mountain, Bachelor Mountain, Bugaboo Ridge and Bruno Meadows. These trails offer spectacular panoramic views of the Cascades from vantage points, and cross a variety of habitat types such as: rock gardens and wet meadows that contain colorful displays of wildflowers; huckleberry fields created by historical and recent natural fires; and second and old growth Douglas-fir/Noble fir stands at lower elevations to sub-alpine species/mountain hemlock at higher elevations.

The following trail management classes were assigned by the Forest Plan, and established a specific level of management protection for each trail corridor (*Table 4)* ( Refer to Forest Plan Standards and Guidelines FW-043-056).

**Table 4. Coffin-Bachelor Mountain Area Trail Management Classification**

| Trail | Trail No. | Mgmt. Class | Mileage |
|---|---|---|---|
| Coffin Mountain | 3425 | III | 2.1 |
| Coffin Lookout | 3392 | IV | 1.0 |
| Bachelor Mountain | 3420 | III | 1.9 |
| Bugaboo Ridge | 3423 | III<br>IV | 1.9<br>1.2 |
| Bruno Meadows | 3424 | III | 1.5 |
| | | Total Trail Mileage | 8.4 |

In addition to trail management classes, trails are assigned a maintenance class. All trails except for Coffin Mountain, are managed to meet Class III maintenance standards. Coffin Mountain trail receives less maintenance and is classified as a level II. Level I trails receive minimal maintenance and maintain primitive characteristics while Level V are higher priority trails and are maintained at higher standards. Currently, trails are not meeting maintenance standards due to trail maintenance backlog. Access to the Coffin Mountain trailhead via 2236-137 Road was damaged during the Flood of 1996 and is not accessible by vehicle.

Coffin Mountain and Bachelor Mountain are currently under the three year National Recreation Demonstration Fee Program authorized by Congress that began in 1997. Visitors must purchase a "Trail Park" permit to park within 1/4 mile of designated trailheads. Funding collected through the program will be returned to maintain trails and trailheads in the Trail Park program.

Under the Forest Plan, the Coffin-Bachelor Mountain area was designated a semiprimitive motorized area which allows access by motorized vehicles such as snowmobiles, trail bikes and ORV's not greater than 42 inches in width. The general area is open for off road vehicles and mountain bikes. However, since the early 1990's, all area roads have been gated and year round closure orders enforced for big game habitat effectiveness objectives. In addition, existing trails were not designed for motorized use, however, use is permitted. All trails, except the Coffin Lookout Trail, are remnants of historic administrative trails. ORV use of trails in this area has not been observed. Travel on gated roads and trails is primarily by foot but equestrian use has occurred on occasion during the hunting season. Gates on several roads have been vandalized allowing illegal access on roads by motorized vehicles. ATV and trailbike use behind gates is an increasing problem across the District. Law enforcement officials have difficulty enforcing road closures due to broken gates, and lack of signing explaining closures.

Coffin Mountain Lookout Trail receives the highest visitor use among trails in the area. Use in 1997 was estimated at 225 visitors. Coffin Mountain contains an administrative site with a lookout structure that is seasonally staffed for detection of forest fires. The lookout staff expressed difficulties in keeping an "eagle eye" for fire detection when distracted by visitors on

the lookout deck. There have been occasions during the evening hours when the lookout has been confronted with drunk and verbally abusive visitors that make the lookouts personal safety a concern. Other lack of considerations on behalf of visitors has made lookout operation disruptive or inconvenient. Visitors often want to use the lookout's water supply or pit toilet which are intended for lookout use only. In addition, camping adjacent the lookout has been disruptive or inconsiderate to the privacy of the lookout. Recently, signs have been posted at the trailhead explaining courtesy and considerations while visiting the lookout.

The Coffin-Bachelor Mountain area is managed to maintain high scenic integrity. All design and implementation practices should meet the Visual Quality Objective of Partial Retention (Forest Plan, MA-10b-05). Standards and guidelines specify acceptable levels of timber management relating to even-aged management. The Forest Plan stipulates, created openings as a result of even-aged management should be no greater than 8 acres in size or 3 acres on major travel corridor frontage zones (Standard and Guideline MA-10b-07).

Approximately 500 acres of this area was harvested in the last 50 years *(Map 3)*. Past regeneration harvest activities, planned and implemented prior to the 1990 Forest Plan, were larger in size than what is currently acceptable; and design elements were not considered in layout of units. Some of the stands harvested since 1985 are in a visually "disturbed condition."

The sizes, arrangements, concentrations and geometric character of harvest treatments will have an effect on the scenic quality until seedling/sapling size stands recover within the next decade. In addition, the contrast to adjacent uncut stands will have a lasting effect on scenic quality for several decades. Some areas harvested since the 1980's can be characterized as meeting modification standards for visual quality. Regeneration harvests within these areas should not occur until these areas recover.

***Transportation***

There are two primary access routes from Highway 22 to the Coffin-Bachelor Mountain area. One is from the 11 Road to the 1168 road, and reaches the southwest portion of the area which accesses Coffin Lookout and Bachelor Mountain Trailheads. In addition, the 2236 Road is accessed from the 11 Road and reaches the western portion of the area. Finally, the second access is from the 2234 Road which reaches the west and north portion of the semiprimitive area including Marys Creek, Bruno Meadows and Bugaboo Ridge.

Only 4.6 miles of local roads currently exist within the analysis area. Most of these roads are deteriorating due to lack of maintenance. With declining road maintenance budgets, and concerns related to watershed quality and wildlife habitat effectiveness, road decommissioning and obliteration will need to be addressed across the District.

The majority of the Coffin-Bachelor Mountain area is located in a key watershed. Key watersheds are highest priority for watershed restoration. There should be no net increase of

roads, and a reduction of road densities where funding is sufficient.

The following pages contain information on the current condition of the transportation network, and definitions of maintenance and traffic service levels.

## Table 5. COFFIN/BACHELOR MOUNTAIN SEMIPRIMITIVE MOTORIZED RECREATION AREA CURRENT ROAD CONDITIONS

ACCESS TO COFFIN/BACHELOR MTN. IS BY FOREST ROAD 11 FROM STATE HIGHWAY 22 AT MP 69.59

| ROAD NUMBER | MAINTENANCE LEVEL | TRAFFIC SERVICE LEVEL | SURFACE | LANES | COMMENTS |
|---|---|---|---|---|---|
| 11 | 4 | B | asphalt | 2 | From the junction of State Highway 22 to MP 3.10 was reconstructed in 1997. From MP 3.10 to MP 4.13 junction of Forest Road 1168, some asphalt repair is needed but travel is not hindered. |
| 1168 | 2 | C | aggregate | 1 | MP 1.40 of Forest Road 11is MP 0.00 of Forest Road 1168 to MP 2.54 meets criteria shown in the cells left. Between MP 2.33 and MP 5.22 the integrity of the road prism is jeopardy and is not maintained to maintenance level 2 or to traffic service level C. There are two closed gates one at MP 1.84 and the other at MP 5.22. Road closure effective 8-15 through 11-30. |
| 1168 | 3 | C | aggregate | 1 | From MP 5.22 to MP 9.86 junction with Forest Road 11, Forest road criteria is shown in the cells left. The road is not maintained to maintenance level 3 or to traffic service level C. |
| 1168-430 | 2 | D | native | 1 | MP 5.24 of Forest Road 1168 is MP 0.00 of Forest Road 1168-430. Road is out sloped with no culverts. Road accesses trail # 3420. |
| 1168-450 | 2 | D | native | 1 | MP 5.94 of Forest Road 1168 is MP 0.00 of Forest Road 1168-450. Road is out sloped with culverts in drainage's, and is gated with an aluminum pipe and has a year round road closure. Road accesses trail #3392. |
| 1168-451 | 1 | D | native | 1 | At MP 0.05 of Forest Road 1168-450 is MP 0.00 of Forest Road 1168-451. Road gated with an aluminum pipe. Road is brushed in, is not derivable and has a year round road closure. |

ACCESS TO COFFIN/BACHELOR MTN. AREA BY FOREST ROAD 2234 FROM STATE HIGHWAY 22 AT MP 68.20.

| ROAD NUMBER | MAINTENANCE LEVEL | TRAFFIC SERVICE LEVEL | SURFACE | LANES | COMMENTS |
|---|---|---|---|---|---|
| 2234 | 3 | C | asphalt | 1 | From the junction of State Highway 22 to MP 1.61 will be reconstructed and maintained by Parkaboo Timber sale. Currently, this segment of the road is not maintained to maintenance level 3 or to traffic service level C. |
| 2234 | 3 | C | aggregate | 1 | From MP 1.61 to MP 3.36 will be maintained and reconstructed by Parkaboo Timber sale. Currently, this segment of the road is not maintained to maintenance level 3 or to traffic service C. |

ACCESS TO COFFIN/BACHELOR MTN. AREA BY FOREST ROAD 2234 FROM STATE HIGHWAY 22 AT MP 68.20

| ROAD NUMBER | MAINTENANCE LEVEL | TRAFFIC SERVICE LEVEL | SURFACE | LANES | COMMENTS |
|---|---|---|---|---|---|
| 2234 | 3 | C | aggregate | 1 | From MP 3.36 to 7.91 maintenance and reconstruction is required. Currently, this segment of the road is not maintained to maintenance level 3 or to traffic service C. |
| 2234 | 3 | C | asphalt | 1 | From MP 7.91 to 9.56 the asphalt surface is in bad condition and reconstruction is required. Currently, this segment of the road is not maintained to maintenance level 3 or to traffic service C. |
| 2234-230 | 2 | D | aggregate | 1 | MP 9.56 of Forest Road 2234 is MP 0.00 of Forest Road 2234-230. There is some minor water damage on this road. Gate is broken. Year round road closure |
| 2234-232 | 2 | D | aggregate | 1 | MP 0.44 of Forest Road 2234-230 is MP 0.00 of Forest Road 2234-232. This road is 0.38 miles in length and is out sloped with culverts in the drainage's. There is a large fill failure at about MP 0.32. Year round road closure. |
| 2234-235 | 2 | D | pit run | 1 | MP 0.76 of Forest Road 2234-230 is MP 0.00 of Forest Road 2234-235. This road is out sloped with no culverts. Year round road closures. |
| 2234-240 | 2 | D | pit run | 1 | MP 8.97 of Forest Road 2234 is MP 0.00 of Forest Road 2234--240. This road has a locked gate, and is out sloped with culverts in the drainage's. At the upper end of the road is a 5 Ft. culvert with a trash rack. There is water damage at the beginning of the road and major water damage at MP 0.15. Year round road closure. |
| 2234-255 | 2 | D | aggregate | 1 | MP 8.01 of Forest Road 2234 is MP 0.00 of Forest Road 2234-255. This road had a locked gate, and is out sloped with no culverts. Year round road closure. |
| 2234-257 | N/A | N/A | pit run | 1 | MP 5.60 of Forest Road 2234 is MP 0.00 of Forest Road 2234-257. This road has no Road Management Plan. The road is brushed in and is not derivable. Road is gated year round with an aluminum pipe gate. |
| 2234-260 | 2 | D | aggregate | 1 | MP 3.68 of Forest Road 2234 is MP 0.00 of Forest Road 2234-260. This road is out sloped with culverts in the drainages. There is water damage in the steeper areas of this road. Guardrail gate at MP 0.20 is broken. Year round closure. Road accesses Trail # 3424. |
| 2234-263 | 2 | D | aggregate | 1 | MP 0.99 of Forest Road 2234-260 is MP 0.00 of Forest Road 2234-263. This road is out sloped with culverts in the drainage's. There is water damage in the steeper areas of this road. Year round road closure. |

ACCESS TO COFFIN/BACHELOR MTN AREA BY FOREST ROADS 2234,1003 AND 2236 FROM STATE HIGHWAY 22 AT MP 55. 68.

| ROAD NUMBER | MAINTENANCE LEVEL | TRAFFIC SERVICE LEVEL | SURFACE | LANES | COMMENTS |
|---|---|---|---|---|---|
| 2234-270 | 2 | D | pit run | 1 | MP 3.36 of Forest Road 2234 is MP 0.00 of Forest Road 2234-270. This road has a ditch on the up hill side with no culverts. There is no water damage on this road. Gate at MP 0.02 is locked and lock can not be opened with a key. Year round road closure. |
| 2236-110 | 1 | D | pit run | 1 | MP 0.63 of Forest Road 2236 is MP 0.00 of Forest Road 2236-110. This road is out sloped with culverts in the drainage's. There is minor water damage on this road to MP 0.70. Beyond MP 0.70, as you start up the hill, the road is blocked by a slide, and beyond that a large fill failure has removed the entire road prism. Gate at MP 0.08 is locked. Year round road closure. |
| 2238-115 | 1 | D | pit run | 1 | MP 0.50 of Forest Road 2236-110 is MP 0.00 of Forest Road 2236-115. This road is a ditch with no culverts to MP 0.22. There is no water damage on this road segment. Just beyond MP 0.22, the road is blocked by fallen trees and cut failures. Year round road closure. |
| 2236-130 | NO RMP'S | D | pit run | 1 | MP 2.66 of Forest Road 2236 is MP 0.00 of Forest Road 2236-130. Road is derivable to MP 0.51 junction of Forest Road2236-173. From MP 0.51 the road is brushed in and at MP 0.75 the outside half of the road failed. Gate at MP 0.02. Year round road closure. |
| 2236-137 | NO RMP'S | D | pit run | 1 | MP 0.51of Forest Road 2236-130 is MP 0.00 of Forest Road 2236-137. Water damage from MP 0.03 to MP 0.20. Down timber makes the road difficult to drive to trail head (Trail #3425) at MP 1.00 Road is derivable using high clearance vehicles only. Year round road closure beyond trailhead. |

ROAD MAINTENANCE LEVELS
TRANSPORTATION SYSTEM MAINTENANCE HANDBOOK -FSH 6/83 R-6 SUPP 4-

Roads maintained to Level 1 and 2 standard do not need to meet Highway Safety Standards.

Level 1

Roads in this level are to be in a long-term storage category and not used fir motor vehicle access, except as required to perform corrective maintenance. Access for short-term project use is financed by the benefiting project for opening, operating and maintaining entrance devices and reclosing or blocking the facility.

Level 2

Roads maintained at Level 2 are high-clearance, vehicle-use roads and are not maintained for public passenger car travel, but may be used by Forest Visitors unless specifically prohibited. The condition of the road intersection, road surface and roadway conditions discourage passenger car use.

Maintenance standards in level 2 very, based on management's stated objectives, whether Forest Visitor high-clearance use is "encouraged" or merely "accepted."

Level 3

Roads in this and higher maintenance levels are subject to the applicable standards of the Highway Safety Act. They are maintained to be passable for public passenger cars operated at prudent driving speeds. Road geometric normally should comply with standards corresponding to Traffic Levels C or better.

Level 4

Road geometric should normally comply with standards corresponding to Traffic service Levels B or better, unless deficiencies are marked. User comfort is given more consideration than for Level 3; however, the prime consideration remains user safety.

Level 5

Roads in this level are maintained for safe travel at prudent driving speeds in excess of 35 mph. Aesthetics, user comfort and convenience are incorporated into maintenance practices.

ble 6.

| TRAFFIC SERVICE LEVELS<br>ROAD PRECONSTRUCTION HANDBOOK FSH 7709.54 FSH 5/87 AMEND | | | | |
|---|---|---|---|---|
| | A | B | C | D |
| Flow | Free flowing with adequate parking facilities. | Congested during heavy traffic such as during peak logging or recreation activities. | Interrupted by limited passing facilities, or slowed by the road conditions. | flow is slow or may be blocked by an activity. Two way traffic is difficult and may require backing to pass. |
| Volumes | Uncontrolled; will accommodate the expected traffic volumes. | Occasionally controlled during heavy use periods. | Erratic; frequently controlled as the capacity is reached. | Intermittent and usually controlled. Volume is limited to that associated with the single use. |
| Vehicle Types | Mixed; Includes the critical vehicle and all vehicles normally found on public roads. | Mixed; Includes the critical vehicle and all vehicles normally found on public roads. | Controlled mix; accommo dates all vehicle types including the critical vehicles. Some use may be controlled to vehicle types. | Single use; not designed for mixed traffic. Some vehicles may not be able to negogate. Concurrent use traffic is restricted. |
| Critical Vehicle | Clearances are adequate to allow free travel. Overload permits are required. | Traffic controls needed where clearances are marginal. Overload permits are required. | Special provisions may be needed. Some vehicles will have difficulty negotiating some | Some vehicles may not be able to negotiate. Loads may have to be off-laded and walked in. |
| Safety | Safety features are a part of the design. | High priority in design. Some protection is accomplished by traffic management. | Most protection is provided by management. | The need for protection is minimized by low speeds and strict traffic controls. |
| Traffic Management | Normally limited to regulatory, warning and guide signs and permits. | Employed to reduce traffic volume and conflicts. | Traffic controls are frequently needed during periods of high use by the dominant resource activity. | Used to discourage or prohibit traffic other than that associated with the single purpose. |
| User Cost | Minimize; transportation efficiency is important. | Generally higher than "A" because of slower speeds and increased delays. | Not important; efficiency of travel may be traded for lower construction costs. | Not considered |
| Alignment | Design speed is the predomant factor within feasible topographic limitations. | Influenced more strongly by topography than speed and efficiency. | Generally dictated by topographic features and environmental factors. Design speeds are generally low. | Dictated by topography environmental factors, and the design and critical vehicle limitations. Speed is not important. |
| Road Surface | Stable and smooth with little or no dust, considering the normal season of use. | Stable for the predominant traffic for the normal use season. Periodic dust control for heavy use or environmental reasons. Smoothness is commensurate with the design speed. | May not be stable under all traffic or weather conditions during the normal use season. Surface rutting, roughness and dust may be present, but controlled for environmental or investment protection. | Rough and irregular. Travel with low clearance vehicles is difficult. Stable during dry conditions. Rutting and dusting controlled only for soil and water protection. |

## MANAGEMENT OBJECTIVES

### Physical

*Soils/Geology*

- Long term maintenance of soil productivity and slope stability.

*Hydrology*

- Manage riparian reserve areas to encourage late successional characteristics.
- Manage transportation system, including roads and trails, and recreation uses to protect water quality.

### Biological

*Vegetation*

- Manage vegetation to meet a variety of resource objectives relating to scenic quality, recreation experiences, commodity production, big game habitat and late-successional characteristics.
- Increase stand vigor and health.
- Maintain local populations of Gorman's aster.

*Fire*

- Minimize the potential for large scale uncontrolled wildfires within the area.

*Wildlife*

- Promote and enhance late seral stand structure within the portion of the Coffin-Bachelor area that lies within the RO214S Late Successional Reserve.
- Increase the size of trees within riparian reserves to move stands toward late successional stage at a faster rate.
- Minimize potential for loss of late successional stands by catastrophic wildfire.
- Manage quarter townships, 11061 and 11074, that are within the Santiam Area of Concern

to meet the 50-11-40 rule.

- Increase the level of down woody debris and number of snags in the areas that are not meeting Standards and Guidelines.

- Maintain and enhance a high level of diversity and habitat types.

- Manage and enhance high quality big game habitat.

**Social**

***Heritage***

- Protect significant and eligible cultural sites from adverse effects due to ground disturbing activities and other activities, e.g. natural processes, vandalism, etc.

***Socioeconomic***

- Produce forest product commodities, including timber and special forest products. Increase future yields of commercial timber stands.

- Provide a variety of recreational opportunities to enhance and support the local tourism economy.

***Recreation/Scenic***

- Manage setting to enhance dispersed recreation opportunities for semiprimitive experiences.

- Minimize conflicts between recreation users and the operation of Coffin Mountain Lookout. Maintain personal safety of fire lookout personnel.

- Manage and enhance the landscape for a high scenic integrity.

***Transportation***

- Maintain appropriate roads and identify decommissioning opportunities.

## MANAGEMENT STRATEGIES

### Physical

*Soils*

- Minimize potential for uncontrolled wildfire of extreme severity that may damage soil by reducing excessive fuel accumulations.

- Decommission roads that can not be maintained.

*Hydrology*

- Decommission roads determined to be unnecessary for access to promote hydrologic stability.

- Accelerate the development of late-successional characteristics in riparian reserves to attain objectives outlined in the Aquatic Conservation Strategy through use of appropriate silvicultural techniques. For example, commercially thin stands within selected Riparian Reserves to accelerate tree growth, improve health of stands, and accelerate attainment of late successional characteristics.

- Incorporate General Water Quality Best Management Practices in the development of timber harvest plans.

- Incorporate Best Management Practices in the development and maintenance of trails and roads in the area.

### Biological

*Vegetation/Fire*

- Reduce stand density which is causing tree mortality in fire regenerated second growth stands through silvicultural treatments such as commercial thinnings and partial cuts. Reducing stocking levels will reduce future mortality and decrease fuel hazard in the long term. If left untreated, stands will continue to have accelerated mortality and will continue to contribute to higher fuel loadings.

- Reduce stocking levels of stands to increase tree spacing and diameters to reduce the ability for stands to carry fire, and to increase stand vigor and health. Commercial thinning will remove the smaller diameter suppressed trees which will reduce competition for larger dominant trees and improve their ability for future growth.

- Regeneration harvest in Matrix land that will not respond to commercial thinning, and by methods that will meet scenic quality objectives and improve habitat for big game.

- Maintain and enhance growth and health of managed stands through timber stand improvement projects such as precommercial thinning, fertilization and pruning.

- Salvage blowdown where conditions exceed Standards and Guidelines for down woody material.

- Continue to monitor Gorman's aster on Bachelor Mountain and manage the species in accordance with the Conservation Strategy for Aster gormanii (1994).

*Wildlife*

- Use thinning treatments to promote tree growth and improve 50/11/40 conditions, and encourage understory development which enhances herb and shrub layer, e.g. foraging habitat for big game.

- In Matrix, create small, irregular shaped openings within the landscape to improve big game habitat.

- Reduce road densities to improve big game habitat effectiveness.

- Accelerate old growth characteristics within stand initiation, stem exclusion and understory reinitiation stands within Riparian Reserves and LSR through use of appropriate silvicultural techniques including precommercial thinning, fertilization, and commercial thinning.

- Salvage blowdown concentrations that inhibit late successional development within LSR.

- Create snags and down wood in areas not meeting Standards and Guidelines through timber sales or Knutsen-Vanderberg funds.

- Promote stand diversity by various management projects such as thinnings including within Riparian Reserves where it would meet Aquatic Conservation Strategy Objectives. Create small openings within stands throughout Matrix.

- Maintain and enhance existing meadows by reducing trees that are encroaching on meadows due to fire suppression.

**Social**

*Heritage*

- Test high probability areas currently being impacted by road and recreational use for cultural significance and eligibility to the National Register of Historic Places. Implement mitigation methods by excavation or avoidance.

*Sustainable communities*

- Increase future yields of commercial timber stands by releasing dominant trees, precommercial thinning, fertilization, and regenerating stands that have achieved culmination of mean annual increment.

- In matrix land, provide for wood harvest production to meet Forest Plan objectives through small regeneration harvests, commercial thinnings, salvage (e.g. blowdown, insects and disease, catastrophic event) and partial cuts.

- Provide special forest product opportunities including but not limited to boughs, Christmas trees, etc.

- In matrix land, provide firewood opportunities created by timber harvesting.

*Recreation/Scenic*

- Future Implementation Guides should be incorporated as part of the Watershed Analysis revision process.

- Maintain trails at assigned maintenance levels and manage corridor to meet the Visual Quality Objective of partial retention. Improve tread and drainage on all area trails not meeting maintenance standards. Find alternative sources of accomplishing trail maintenance work through partnership efforts.

- Off-road vehicle use is not compatible with sensitive resources of this management area, including wildlife and heritage resources. In addition, the management area is not large enough to provide a suitable recreation attraction to ORV users who can access many miles of trails/roads and large acreage in a daily outing. Only 4.6 miles of local roads, all less than a mile, exist within the semiprimitive area. Also, the steep terrain does not provide adequate opportunity for an expanded or widened trail system necessary for a safe experience for motorized vehicles without disturbance to sensitive resources. No ORV use on trails had been documented and all roads are permanently closed for wildlife habitat effectiveness. Finally, with declining road maintenance funding, deteriorating road conditions and watershed concerns; road decommissioning opportunities have been

identified for many local roads within the area. A change in management allocation to a semiprimitive nonmotorized area or another appropriate management area is recommended for the next Forest Plan update.

- Improve all existing trailheads to provide for adequate parking, and improve signage. Signs should inform users of use ethics, regulations and opportunities, including a map of the area. Increase fire prevention education through signs at area entry points or by direct public contact.

- An outstanding opportunity exists for interpretation, however, on-site interpretation should be very minimal. Fire history, geology, cultural history, wildlife and special habitats, diversity of vegetation and wildflower identification could all be topics for interpretation that could be presented by a brochure, guidebook or sign at the trailhead. This would allow the visitor some sense of self-discovery while maintaining the semiprimitive character of the area with minimal developments. On-site interpretation would be appropriate near the lookout since developments already exist, and presence of the lookout would reduce the amount of vandalism. In addition, interpretive and informational signing may help reduce the amount of distractions to the lookout, including answering "the most common asked questions." Landscape interpretation could be presented at this site due to the panoramic view of a good portion of the area.

- To minimize conflicts to the lookout, a special order could be enforced to designate the lookout area beyond the upper lookout trail junction as a day use area only. Primitive signs could be posted to designate the day use area at the lookout junction. A gate could be placed on the lookout deck and closed to the public at the lookouts discretion. Finally, signs should be posted at the trailhead about rules and use ethics.

- The Coffin-Bachelor Mountain area can provide an alternative to Wilderness. Encouraging use to non-Wilderness areas such as this one could help alleviate overuse within the Mt. Jefferson Wilderness. Area trails are currently promoted on the Internet through the Forest Website, and by recommendations of District Frontliner staff to visitors seeking suggestions for places to visit. Monitor use levels to determine if opportunities for semiprimitive experiences are being maintained.

- Design size and shape of regeneration harvest to meet scenic objectives as prescribed in the Forest Plan, e.g. small, irregular openings that borrow from the landscape. Thinning and partial cuts are encouraged to maintain large scale contiguous vegetation patterns. In addition, reducing potential for fire and increasing stand vigor and health will improve scenic quality over the landscape and maintain the desirable setting for semiprimitive experiences to occur.

- To maintain semiprimitive objectives seek advise from a recreation Resource Advisor, and use "Light Hand Tactics" when suppressing wildfires when possible.

*Transportation*

- Complete an Access and Travel Management Plan for all District roads. Road maintenance and decommissioning plans should be based on resource protections needs, long term access needs, public safety and economics. Local roads are generally candidates for decommissioning. Roads to be decommissioned should meet the criteria identified in the Upper North Santiam Watershed Analysis.