V. Management Implications

A. Synthesis

* Influences are rated ***Low (L), Medium (M),*** and ***High (H)***

v-1. *What are the influences and relationships between EROSION PROCESSES and other ecosystem processes (e.g., vegetation, woody debris recruitment)?			
Issue: Management Related Erosion Processes			
Influences	**Influence Rating* *H, M, or L***	**Likely to be changed by Management Actions *Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: Fire, especially stand replacing fire, has been a primary physical influence on erosion processes in this watershed. This watershed has a history of large -scale, stand replacing fires. Some fires were stand replacing and others just underburned the stands.	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk *(See recommendations under Fire Hazard and Risk)*
After a fire has burned, gravity [topography (slope and aspect)] in combination with water and wind [Climate] influence the amount of erosion on the hillsides.	*M*	*N*	
Types of soils (natural instability) influence the amount of erosion on the hillsides.	*M*	*Y*	Restoration of erosion-prone areas
Biological Influences: The rate of vegetative reestablishment after natural or human events, is an important biological influence on erosion.	*M*	*Y*	Minimize erosion potential from management activities
In addition, vegetative material, especially large logs and intact root systems, help to stabilize slopes from erosion. Leaf litter and other organic matter, help to shield soils from raindrop impact and erosion. When stand replacing fires burn through an area, vegetation and its shielding effects are removed and erosion rates generally increase for a time.	*M'*	*Y*	

Issue: Management Related Erosion Processes (continued)			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Social Influences : Fire suppression can increase 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 when fires burned through areas with greater frequency and much less intensity. These intense fires tend to damage soils and consume vegetation, which when combined with climatic events, can increase erosion rates. Conversely, by having fire suppression, vegetation persists on the landscape to hold the soil in place and erosion rates may decrease well below some long term rates.	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk
Human-caused fires (see effects of fire)	*M*	*Y*	Reduce number of Human caused fires *(See recommendations under Fire Hazard and Risk)*
Land management activities such as timber harvest; road construction and maintenance; trail construction and use; etc. influence erosion processes as well. Harvest practices such as type of logging system, log suspension requirements, silvicultural prescription, etc. can influence erosion rates. Furthermore, road construction techniques and amount of road maintenance can influence erosion rates.	*M*	*Y*	Minimize erosion potential from management activities
Sunken grade on Highway 22: Cumulative effect of adding many layers of asphalt to repair road influence the amount creep down hill.	*L*	*N*	
Wave action on Detroit Reservoir shoreline: fluctuations of reservoir level affect shoreline erosion	*M/L*	*Y /N**	Reduce Shoreline erosion on flat areas such as Detroit Flats from wave action and fluctuations in the reservoir levels

* Corps of Engineers manages reservoir levels

v-2. What are the influences and relationships between HYDROLOGY and other ecosystem processes in the watershed (e.g., sediment delivery, fish migration)?

Issue: Flow (both peak and minimum flows)

Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated** ***High (H)*** **or** ***Medium (M)***
Physical Influences: Fire, topography, soil type and precipitation influence stream flows: fire removes vegetative cover, which can influence snow accumulation etc.; soil type influences water holding capacity, and precipitation type and intensity influences the amount of water entering the system that contribute to peak and low flows. Hotter burns resulted in potential headwall failures, channel bank erosion that can lead to increased high peak flows.	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk *(See recommendations under Fire Hazard and Risk)*
Biological Influences: Vegetation in combination with precipitation and topography influences stream flows: the size of tree canopies affect snow accumulation and the amount and timing of water reaching stream channels; root systems extract water; the spatial distribution of vegetation across the landscape and the topography, and the amount of large woody material influence how much water reaches the stream channels. Rate of tree growth influences the length of hydrological recovery. Canopy closure affects snow interception.	*H*	*Y*	Maintain desired level of minimum flows Minimize effects of peak flows Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands *(See recommendations under Land Management Goals and Dynamic Natural Systems)*

Issue: Flow (both peak and minimum flows) continued			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated** ***High (H)*** **or** ***Medium (M)***
Social Influences: The biggest social influences on peak flows and low flows was the construction of the Detroit and Big Cliff reservoirs in the early 1950's. Placing a structure this size on the North Santiam River altered the flow regime and the hydrology for downstream users	*H*	*N*	
Regeneration timber harvest, road construction and the power line right-of-way can result in decreased vegetative cover in the short term, less precipitation intercept, and may result in increased peak flows. Based on the best information available, commercial thinning harvest to an average canopy closure of 70% should not affect precipitation intercept and should have minimal effect on peak flows.1] Prescribed Burning: Cool burning has little effect on hydrologic processes Hotter burns could result have the same results as historical stand replacement fires.	*M*	*Y*	Minimize effects of peak flows

1] ***Development and Use of Hydrologic Recovery, Willamette National Forest ,1980-1990*** (May 1991)

v-3. What are the influences and relationships between STREAM CHANNELS and other ecosystem processes in the watershed (e.g., in channel habitat for fish and other aquatic species, water quality)?

Issue: Channel bank stability

Influences	Influence Rating* *H, M, or L**	Likely to be changed by Management Actions *Y or N*	Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)*
Physical Influences: Rain-on-snow events which generate peak flows have a profound influence on channel bank stability and destabilize headwaters portions of streams.	*H*	*N*	
Fire 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 stability	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk *(See recommendations under Fire Hazard and Risk)*
Wave action from the fluctuating levels of the reservoir can increase shoreline erosion.	*M*	*Y /N**	Reduce Shoreline erosion on flat areas such as Detroit Flats from wave action and fluctuations in the reservoir levels *(See recommendations under Erosion Processes)*
Biological Influences: Natural mortality, insects or diseases, or other damaging agents to can kill large trees that can provide structure for stream channels and help to stabilize channel banks	*M*	*Y*	Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands *(See recommendations under Land Management Goals and Dynamic Natural Systems.)*

* Corps of Engineers manages reservoir levels

Issue: Channel bank stability (continued)			
Influences	**Influence Rating*** *H, M, or L**	**Likely to be changed by Management Actions** *Y or N*	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Vegetation and root strength can increase channel bank stability and headwater stability.	*H*	*Y*	Promote channel bank stability
Canopy closure affects snow interception during rain-on-snow events which generate peak flows, which have a profound influence on channel bank stability and destabilize headwaters portions of streams.	*H*	*Y*	Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands
Social Influences: Detroit reservoir and riparian areas attract recreation use. This recreation use has several influences on channel bank stability. For instance, access trails to water and removal of down wood for firewood can affect channel bank stability, boating causes shoreline erosion, and intense recreation use creates compaction problems. Use and resulting effects more intensive around reservoir. Use and resulting effects is less intense in dispersed sites along creeks.	*L*	*Y*	Decrease resource impacts and improve aesthetics at recreational areas *(See recommendations under Recreational supply and demand)* Promote channel bank stability
Facility protection often results in channel constriction, so the stream does not occupy its flood plain, which in turn can decrease channel bank stability.	*M*	*Y*	
Regeneration Timber harvest, road construction and other management activities that decrease vegetative cover and can decrease channel bank stability	*M*	*Y*	
Management Practices such as retention of riparian reserve widths can increase channel bank stability.			

v-4. What are the influences and relationships between WATER QUALITY and other ecosystem processes in the watershed (e.g., mass wasting, fish habitat, stream reach vulnerability)?			
Issue: Water Temperatures			
Influences	**Influence Rating* *H, M, or L***	**Likely to be changed by Management Actions *Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: Solar radiation increases stream temperatures.	*M*	*N*	
Biological Influences: Vegetation distribution and development influences stream shade which can affect stream temperatures.	*H*	*Y*	Maintain year-round stream temperatures at 55 degrees F. or below Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands *(See recommendations under Land Management Goals and Dynamic Natural Systems)*
Social Influences: Recreation and timber management, road construction affect shade which can affect temperature.	*M*	*Y*	Maintain year-round stream temperatures at 55 degrees F. or below
Retention of riparian reserves provides thermal regulation of water.	*M/H*	*Y*	
Issue: Turbidity			
Physical Influences: Fire, in combination with vegetative cover and weather, produce erosion and sediment into stream channels that can increase turbidity	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk *(See recommendations under Fire Hazard and Risk)*

Issue: Turbidity (continued)			
Influences	**Influence Rating* *H, M, or L***	**Likely to be changed by Management Actions *Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Type of soil (i.e. size of material- clay, etc) can influence the amount of turbidity, those prone to debris torrents introduce more sediments affecting turbidity than those that are not so prone.	*H*	*Y*	Minimize erosion potential from management activities *(See recommendations under Erosional Processes)*
Type and intensity of precipitation can influence erosion rates and thus turbidity.	*L*	*N*	
Biological Influences: Lack of large wood in stream channels can decrease sediment storage and can result in an increase in turbidity	*L*	*N*	Balance social and biological turbidity needs within the physical parameters of the watershed
Large wood in stream stores sediments which decreases turbidity.	*L*	*N*	
Vegetation distribution and development influences erosion processes which can affect turbidity.	*M*	*Y*	
Social Influences: Recreation, fire, and timber management, road construction potentially affects erosion causing sediments which can affect turbidity	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk
Issue: Biological Contaminants			
Biological Influences: Organic decomposition can introduce biological contaminants to water.	*L*	*N*	
Social Influences: Human waste, fish stocking, fertilization, and other substances are contributing factors to biological contaminants.	*L*	*Y*	Monitor biological contaminants

v-5. What are the influences and relationships between FIRE and other ecosystem processes in the watershed?

Issue: Fire Hazard and Risk

Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: The climate */weather?* (e.g. microclimate, precipitation, wind, etc.) and topography (slope, aspect, etc.) have influenced fire history.	*H*	*N*	
Precipitation influences vegetation growth and fuel moisture, therefore fuels and rates of fire spread	*L*	*N*	
Should wind fan a fire in riparian reserves with steep side slopes and characteristic chimney effect topography, there is the risk of down woody material consumption (stand replacing fire)			Reduce potential fire intensity in Riparian Reserves Prevent large scale stand replacing fires by decreasing fire hazard and risk
Biological Influences: Insects and diseases can set the stage for stand replacing fires.	*M*	*Y*	
Vegetation on the slope determines fuel buildup	*H*	*Y*	
Social Influences: Fuels Reduction: Reduction of fuels will reduce the fire hazard in areas. Fuel reduction treatments along with prescribed burning can recreate cool underburns of the past, reducing the risk of a stand replacing fire.	*H*	*Y*	
Fire suppression: Fuel buildup can increase fire hazard and risk to resources. The amount and distribution of large down woody material left on the ground may increase fire intensity should a fire get started.	*M*	*Y*	
Human caused fires	*M*	*Y*	Reduce the number of human caused fires

v-6. What are the influences and relationships between VEGETATION AND SERAL PATTERNS and other ecosystem processes in the watershed (as they relate to the issues of old growth, plant community and seral stage distribution, insects and diseases, noxious weeds and biodiversity)?

Issue: Harvest of Old growth

Influences	**Influence Rating* *H, M, or L***	**Likely to be changed by Management Actions *Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: Fire occurrence is one of the larger physical influences on *old growth* distribution in the watershed.	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk *(See recommendations under Fire Hazard and Risk)*
Biological Influences: Fuel loads, insects and diseases can set the stage for catastrophic fires, thus influencing amount and distribution of *old growth.*	*H*	*Y*	Reintroduce role of fire in the ecosystem
Social Influences: Management activities and road construction, as well as, human-caused fires influence the amount and distribution of *old growth.*	*H*	*Y*	Stratify treatment areas by slope and aspect to meet landscape management objectives
			Meet Forest plan standards and guidelines for old growth protection
			Meet Forest plan standards and guidelines for old growth harvest

Issue: Plant association and seral stage distribution **Issue: Land Management Goals and dynamic natural systems**			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical influences: Fire, soil, slope, aspect, microclimate, precipitation, wind, etc.	*M*	*N*	Stratify treatment areas by slope and aspect to meet landscape management objectives
Biological Influences: Insects and diseases can have localized effects on stand seral stages (e.g. root rot)	*M*	*Y/N*	Reintroduce the role of fire into the ecosystem *(See recommendations under Fire Hazard and Risk)*
Social Influences: Management activities such as timber harvest affect seral stage distribution across the landscape	*H*	*Y*	
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.	*H*	*Y*	Develop late successional components in Riparian Reserves
Issue: Insects and diseases			
Physical influences: 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.	*M*	*N*	
Biological Influences: Vegetative competition, including inter-tree competition, can affect *insect and diseases* by increasing demands for nutrients, moisture and light	*M*	*Y*	Improve Stand Vigor *(See recommendations under Land Management Goals and Dynamic Natural Systems)* Reduce dwarf mistletoe and root rot infected stands

Influences	Influence Rating* *H, M, or L*	Likely to be changed by Management Actions *Y or N*	Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)*
Issue: Insects and diseases			
The amount of dead material can increase the severity of insects and diseases and contribute to their spread.	*H*	*Y*	Reduce the severity of insects and diseases by removal of dead material.
Issue: Noxious weeds			
Physical Influences: Soil disturbance and wind has a large influence on *noxious weed* spread.	*M*	*Y*	Minimize spread of noxious weeds
Biological Influences: 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*.	*M*	*Y/N*	
Social Influences: Human movement, and travel corridors (Highway 22, powerlines) can spread seeds of noxious weeds from one place to another.	*M*	*N*	
Activities that create bare soil especially adjacent to roads and trails	*L/M*	*Y*	Re-establish vegetation in disturbed areas
Issue: Maintaining plant biodiversity			
Physical Influences: Fire, climate, wind, and topography influence landscape level *biodiversity*.	*H*	*N*	
Biological Influences: Insects and diseases, and vegetative competition influence *biodiversity*	*M*	*Y*	Reintroduce role of fire in the ecosystem
Social Influences: Management activities (most ground disturbing activities) can change, remove, or add vegetation, which influences biodiversity.	*H*	*Y*	Preserve and promote biodiversity at the following levels: genetic, within the plant communities, and between the plant communities
Prevention of large scale stand replacing fires may reduce plant diversity.	*L*	*Y*	Reintroduce role of fire in the ecosystem

v-7. What are the influences and relationships between AQUATIC SPECIES AND HABITATS and other ecosystem processes in the watershed?

Issue: Maintaining habitat components for native aquatic wildlife species

Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated** ***High (H)*** **or** ***Medium (M)***
Physical Influences: Solar radiation and its influence on stream temperatures can affect the health of fish populations	*M*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk *(See recommendations under Fire Hazard and Risk)*
Fire can remove shade and large wood from streams and riparian areas	*M*	*Y*	Maintain or restore habitat complexity
Erosion and the resulting sedimentation can affect survival and reproductive success	*M*	*N*	Maintain or reduce stream temperatures with regard to fish habitat
The complexity of stream channels (pools, riffles, and large wood) can affect carrying capacity of fish habitat	*H*	*Y*	
Biological Influences: Vegetation such as trees provide channel structure that can affect streambank stability; shade that can moderate stream temperatures; and organic matter input that can affect productivity	*H*	*Y*	
Salmon that die after spawning provide nutrient enrichment to streams and riparian vegetation.	*M*	*Y*	
Social Influences: Construction of Detroit and Big Cliff Dams blocked the migration of fish up the North Santiam River and led to the elimination of anadromous salmon and steelhead above the dams.	*H*	*N*	

Issue: Maintaining habitat components for native aquatic wildlife species			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Some road construction, timber harvest, and various other human uses may affect sediment input to stream courses and may affect fish survival and productivity	***M-H***	***Y***	Maintain or restore habitat complexity
			Manage amount and timing of sediment as a result of management activities
Recreation activities near streams and lakes can affect riparian habitat through compaction and the removal of stream side vegetation.	***L-M***	***Y***	Decrease resource impacts and improve aesthetics at recreational areas *(See recommendations under Recreation Supply and Demand)*
Issue: Reintroduction of Native Aquatic Species			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: Dams and Reservoirs can change habitat conditions and access and limit existence and reproduction in former habitat	***H***	***N***	
Biological Influences: Introduced fish species may outcompete native fish populations	***L-M***	***N***	

Issue: Reintroduction of Native Aquatic Species (continued)			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated** ***High (H)*** **or** ***Medium (M)***
Lack of retention of organic matter due to the lack of complexity can reduce the overall carrying capacity of a stream	***M-H***	***Y***	Provide adequate habitat to sustain populations of migratory fish when access around migration barriers (dams) have been resolved
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	***M***	***Y***	
Recreational fishing pressure can affect native fish populations	***M***	***N***	
Stocking of Non-native fish species for angler use can affect native fish populations	***M***	***N***	
Detroit and Big cliff dams and the associated reservoirs have eliminated most of the anadromous fish habitat in the Detroit Tributary watersheds.	***H***	***N***	

v-8. What are the influences and relationships between TERRESTRIAL SPECIES AND HABITATS and other ecosystem processes in the watershed?			
Issue: Maintaining habitat components for native terrestrial wildlife species and wildlife biodiversity			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: Fire can influence vegetative seral stages and affect habitat of species dependent on them	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk *(See recommendations under Fire Hazard and Risk)*
Topography (i.e. elevational differences, etc.) can influence vegetative species composition, etc. and therefore habitat types.	*H*	*N*	
Climate (wind storms, snow storms, etc.) can influence fragmentation of interior habitat and development of edge habitats through blowdown or snowdown.	*H*	*N*	
Biological Influences: Vegetative condition can influence species dispersal, foraging, and reproduction.	*H*	*Y*	Maintain habitat components for native terrestrial wildlife species
Species adaptation to certain habitat types can influence what species are present in given habitats	*M-H*	*N*	
Social Influences: Management activities such as timber harvest, road construction, powerline development, etc. can influence habitat effectiveness, connectivity, etc.	*H*	*Y*	
Human uses can influence habitat disturbance and degradation, reproductive success, habitat removal, animal harassment, predation, etc.	*M*	*Y*	Increase of awareness of wildlife needs and habitat characteristics

Issue: Maintaining habitat components for native terrestrial wildlife species and wildlife biodiversity (continued)			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Riparian Reserves: Fire suppression has created a down woody material component that was not there before in high fire frequency areas. This buildup of down woody material can increase fire intensity, should a fire get started, increasing the risk of losing riparian habitat. On the other hand, the buildup of down woody material in these areas has led to increased use by wildlife populations that has lost its traditional down woody component through Forest management activities such as logging and stream cleanout. Salvage in riparian reserves that are in excess of down woody material requirements, especially on south and west facing slopes may reduce fire intensity within riparian areas, should a fire get started.	*H*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk Reduce potential fire intensity in Riparian Reserves
Regeneration timber harvest, road building and salvage in some areas can further fragment late successional habitat and allow access into areas not previously accessed. This could lead to disturbance which may or may not affect reproductive success. These activities have changed mid or late seral habitat to early seral habitat reducing critical habitat components. Connectivity may be reduced and edge effects are produced.	*H*	*Y*	Maintain habitat components for native terrestrial wildlife species
The introduction of exotic species, both plant and animal, have non-desired effects. Non-native plant species out compete native vegetation and may eliminate or reduce desired vegetation. This may displace or reduce populations able to utilize these areas. These plants may also be toxic to wildlife such as tansy ragwort. These do not offer any forage value but species such as scotchbroom may add cover to an area.	*M*	*Y/N*	

Issue: Maintaining habitat components for native terrestrial wildlife species and wildlife biodiversity (continued)			
Influences	**Influence Rating*** *H, M, or L*	**Likely to be changed by Management Actions** *Y or N*	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Non-native animal species such as the brown-headed cowbird and bullfrog, introduce elements into the system not previously present. Native wildlife may not have defense mechanisms to deal with these species. This could lead to over-predation, low reproductive success, and undue stress.	*M*	*N*	
Historical fish stocking has occurred in the watershed. Tumble Lake has been stocked with brown trout which is a predator to many aquatic invertebrates and amphibians. Fish stocking can upset a natural lake ecosystem by introducing a foreign predator into the system. Many endemic and native amphibians are declining and fish stocking may have played a small part in this. Future proposals of stocking should be discussed between Oregon Department of Fish and Wildlife and the District.	*M*	*N*	
Issue: Conflicting habitat needs			
Social Influences: Prescribed burning (cool underburning) can reintroduce fire into the ecosystem for species dependent on larger vegetative structure: Bald eagle, spotted owl, etc	*H*	*Y*	Reintroduce role of fire in the ecosystem *(See recommendations under Fire Hazard and Risk)*

v-9. What are the influences and relationships Between HUMAN USES and other ecosystem processes in the watershed?

Issue: Sustainability of forest-product/tourism dependent communities			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: Soil, slope, aspect, elevation, climate, etc. influence vegetative growth, which in turn influences the potential products available from the forest.	*L*	*Y - soil productivity*	Improve soil productivity through fertilization
Soils and slopes affect potential for development (i.e. roads, recreation facilities, etc.)	*M*	*N*	
Local tourism economy is dependent on high water levels of Detroit Reservoir.	*H*	*Y*	Participate in the resolution of conflicts in Detroit Reservoir water level needs.
Biological Influences: Vegetation, especially trees, provide the primary forest product utilized by local communities	*H*	*Y*	Provide for a sustainable timber supply
			Provide a variety of forest products
Social Influences: 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.	*M*	*Y*	Increase public understanding of resource management
Detroit Reservoir created an important economic resource to local communities	*H*	*Y*	Participate in the resolution of conflicts in Detroit Reservoir water level needs.
Increasing use of the watershed has created a need for improved infrastructure, such as a community sewer treatment facility, in order to achieve economic diversification goals	*H*	*Y*	Participate in the improvement of infrastructure to achieve economic diversification goals
Issue: Recreation Supply and Demand			
Physical Influences: Detroit Reservoir is a major recreational attraction in the North Santiam Basin. Fluctuations of the reservoir level influences use of the lake	*H*	*Y*	Participate in the resolution of conflicts in Detroit Reservoir water level needs.

Issue: Recreation Supply and Demand			
Influences	**Influence Rating* *H, M, or L***	**Likely to be changed by Management Actions *Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Landform and topography influence human use patterns. Steep topography concentrates use mostly in the flat valley bottom around the reservoir.	*M*	*N*	
Weather controls when people recreate and the type of activity in which they engage	*H*	*N*	
Biological Influences: Old growth or mature Douglas-fir forests and other vegetation provide the recreational setting and influence the type of recreational activities that occur in an area	*H*	*Y*	Maintain and enhance desirable recreation settings through various vegetation management practices
Wildlife and fish provide recreation opportunities such as hunting, fishing, and wildlife viewing	*H*	*Y*	Maintain habitat components for native terrestrial wildlife species Increase of awareness of wildlife needs and habitat characteristics *(See Recommendations under Maintaining habitat components for native terrestrial species)*
Social Influences: Construction of Detroit Dam, that formed Detroit Lake serves as a recreational destination and influences social crowding.	*H*	*Y*	Provide for a wide range of demanded recreational settings to achieve satisfactory user experience
Improved highway access and proximity to urban areas provided easier access to recreational opportunities and has increased social crowding.	*M*	*N*	
Population growth, socio-economic status and cultural background influences user demand	*H*	*N*	
Funding levels influence ability to provide for recreational demands.	*H*	*Y*	Provide stable funding to achieve recreational goals
Social capacity in excess of resource capacity increases resource impacts such as soil compaction, etc.	*M*	*Y*	Decrease resource impacts and improve aesthetics at recreational areas
User conflicts have occurred due to increasing use and the diversity of activities occurring in the same area.	*H*	*Y*	Reduce user conflicts

v-10. What are the influences and relationships between FACILITIES and other ecosystem processes in the watershed?			
Issue: Maintaining facilities			
Influences	**Influence Rating*** ***H, M, or L***	**Likely to be changed by Management Actions** ***Y or N***	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: Topography and soil types determine facility locations	*H*	*N*	
Weather such as snow, floods, wind, etc. can damage facilities	*M*	*Y*	Maintain facility condition at or above acceptable standards, and meet current public needs.
Facilities deteriorate with age	*L*	*Y*	
Biological Influences: Vegetation can damage facilities	*M*	*Y*	
Social Influences: Vandalism	*H**	*Y*	
Use (wear and tear)	*H**	*Y*	
Demand and need influences types of facilities created.	*H**	*N*	

H* = when road maintenance is deferred due to lack of funds

Issue: Public Safety			
Physical Influences: Erosional Processes can create safety hazards or damage to facilities	*M*	*Y*	Restoration of erosion prone areas *(See recommendations under erosion processes)*
Biological Influences: Trees can create safety hazards or facility damage	*M*	*Y*	Provide for public safety
Social Influences: Lack of adequate facilities, signing and enforcement creates safety issues	*M*	*Y*	

v-11. What are the influences and relationships between SCENIC QUALITY and other ecosystem processes?			
Issue: Management of the landscape for Scenic Quality			
Influences	**Influence Rating*** *H, M, or L*	**Likely to be changed by Management Actions** *Y or N*	**Management Objectives that can moderate the influences rated *High (H)* or *Medium (M)***
Physical Influences: Fire, geology, topography and water all influence the scenic character of the area	*M*	*Y*	Prevent large scale stand replacing fires by decreasing fire hazard and risk *(See recommendations under Fire Hazard and Risk)*
			Improve soil productivity
			Restoration of erosion prone areas *(See recommendations under Erosion Processes)*
Biological Influences: Vegetative reestablishment following management activities and or catastrophic events influences scenic quality	*H*	*Y*	Reestablish vegetation promptly
Social Influences: Timber harvest, road construction, facility development such as the power line and dam, have altered natural scenic quality	*H*	*Y*	Implement management actions to minimize adverse impacts to scenic quality (e.g. harvest unit design, facility placement on the landscape)
Diseases such as phillenus affect management within visual allocations. Treatment of phillenus pockets (regeneration harvest) may conflict opening size within visual allocations.	*M*	*Y*	

V. Management Implications

B. Recommendations

v-12. What and where are the opportunities for management, restoration or improvement within the watershed?

Issue: Erosion Processes

Management Objectives	Potential Treatments	Priority *H, M, L*
Restoration of erosion-prone areas	Develop a road and traffic management plan which includes priorities for road decommissioning and storm proofing	*H*
	Aggressively decommission and storm proof high- risk local roads, to reduce risk of catastrophic failure during storm events. Priorities will be concentrated in areas with older sidecast roads, in areas with high hazard and low amounts of existing structure in streams. Protection of existing facilities also makes good economic sense. A small investment in storm proofing or storage can result in considerable savings in reconstruction.*(see road commissioning under facilities)*	*H*
	Sidecast pullback of unstable road fills on steep hillsides.	*H*
	Revegetate erosion-prone, denuded areas using native vegetation	*M*
Minimize erosion potential from management activities	Avoid management activities such as timber harvest on areas of active slope instability or potentially highly unstable (not necessarily unsuited) terrain. *Map II-1*	*H*
	Retain green trees on critical sites (e.g. stream headwalls, sites with land movement.	*H*
	Evaluate the reintroduction of large woody material into deficient stream channel reaches	*M*
	Retain duff and large woody material standards defined in the Forest Plan.	*H*
	Reduce fuel loading, by low-intensity prescribed fire (meeting standards and guidelines) or other method such as hand piling or machine, in identified hazard areas that threaten soil stability.	*M*
	Repair unstable road fills	*L*

Issue: Erosion Processes (continued)		
Management Objectives	**Potential Treatments**	**Priority *H, M, L***
	Repair cutbank problems (e.g. Kinney Creek, Heater Creek)	*L*
Reduce Shoreline erosion on flat areas such as Detroit Flats and Santiam flats from wave action and fluctuations in the reservoir levels	Plant willow and other vegetation Detroit Flats: extend shoreline back to original place and riprap to stabilize.	*L**

*Low priority due to past effectiveness

V-13. What and where are the opportunities for management, restoration or improvement within the watershed?

Issue: Peak flows and Minimum flows

Management Objectives	Potential Treatments	Priority H, M, L
Minimize effects of peak flows	Fire prevention and fuel treatment to minimize risk of vegetation loss, fire impacts of soil infiltration rates, etc. that contribute to peak flows	*H*
	Spatially distribute timber harvest across the landscape	*H*
	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 thresholds)	*H*
	Reduce drainage network through actively decommissioning and storm proofing roads	*H*
	Optimize tree growth in plantations and fire regenerated young stands to reduce effects to 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.	*M*
Maintain desired level of minimum flows	In specific stream reaches and with interdisciplinary and public input, add structure to stream channels in the Detroit Tributary watersheds, stabilize the areas with large woody debris 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	*M*
	Create additional water storage areas in the floodplain by reconnecting stream channels to the floodplains	*M*

V-14. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Channelbank stability**		
Management Objectives	**Potential Treatments**	**Priority *H, M, L***
Promote channelbank stability	Prior to management activities, evaluate resistance of channelbank to erosion and design projects to fit the channel conditions	*H*
	Implement " Best Management Practices" as defined in the forest plan, during management activities such as timber harvest and road construction	*H*
	Restore unstable channelbanks through introduction of channel structure such as large wood and boulders and mechanically reshape channels to increase stability. (e.g. re-establish creek with flood plain)	*M*
	Facilitate vegetative growth on the channelbanks to promote stability	*H*
	Within other resource constraints, identify headwater areas for future large woody material recruitment into stream system.	*M*
	Revegetate broad flood plains with conifers, concentrate on portions that are stable.	*M*
	Evaluate fuel loading and fire risk within riparian reserves. Where appropriate, manage fuels to minimize risk of stand replacing fires.	*M*
	Mitigate channel bank destabilization that occurs in areas of high recreation use (e.g. reservoir near the City of Detroit), and other private properties.	*L*
	Apply Forest Plan riparian reserve widths during project implementation as this analysis did not identify any ecosystem process or species that would benefit from narrower widths.	*M*
	Monitor stream restoration work and stream dynamics for streams within Detroit Tributary watersheds	*M*

V-15. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Water Temperatures**

Management Objectives	Potential Treatments	Priority *H, M, L*
Maintain year-round stream temperatures at 55 degrees F. or below	Maintain forest plan riparian reserves on springs, streams and also on seeps contributing significantly to temperature regulation , to provide thermal regulation of water	*H*
	In selected areas where large conifers are not present in riparian areas, implement silvicultural practices (e.g. commercial thinning, precommercial thinning, pruning) to stimulate growth so trees will eventually shade streams. Evaluate locations based on various resource considerations such as biodiversity, etc.	*H*
	Commercial thin within riparian reserves that will respond to thinning by increased growth, developing late successional characteristics at a faster rate than with no treatment.	*M-H**
	Revegetate streamside areas where vegetation is not providing adequate shade	*H*
	Evaluate fuel loading and fire risk, and manage fuels to minimize risk of catastrophic in order to maintain vegetative cover, etc.	*M*

*Some stands will respond better than others. Will concentrate on the stands that have the highest probability of responding to this treatment.

V-16. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Turbidity**

Management Objectives	Potential Treatments	Priority *H, M, L*
Balance social and biological turbidity needs within the physical parameters of the watershed	Revegetate debris torrent prone headwall areas and other sites prone to erosion, where appropriate	*M*
	Minimize potential risk of wildfire through active fuels management and fuel treatment	*M*
	Implement standards and guidelines to retain large organic material (i.e. down logs) on the uplands	*H*
	Evaluate and design large wood placement opportunities within streams	*M*
	As directed by "Best Management Practices" as defined in the forest plan, and standards and guidelines, minimize erosion by careful selection of harvest units and other management activities outside of erosion-prone areas	*H*
	Clean out culverts and complete access and travel management plan to allow for road decommissioning and/or storm proofing.	*H*
	Develop a Fire/fuels Management Plan. Evaluate and treat areas at high risk for catastrophic fire, where appropriate.	*M*

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

Objectives	Potential Treatments	Priority *H, M, L*
Monitor biological contaminants	Study sources of contamination to determine what contaminants there are, where and why the occur, how they affect the ecosystem and develop methods to mitigate impacts	*M*
Mitigate impacts of biological contaminants	Implement recommended methods to decrease impacts of contaminants	*L*

V-17. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Fire Hazard and Risk**

Management Objectives	Potential Treatments	Priority *H, M, L*
Prevent large scale stand replacing fires by decreasing fire hazard and risk	Treat existing slash by prescribed fire, fuel breaks, prescribed natural fire	*H*
	Decrease fuel loading in areas where identified resources are at risk of being degraded by stand replacing fires.	
	Prioritize areas for the removal of down timber from recent windstorms and floods, where levels are in excess of Forest Plan Standards and Guidelines and where fire hazard is high.	*M*
Reduce the number of human caused fires	Continue to improve fire prevention patrols and fire prevention education.	*M*
	Monitor visitor use during high fire danger by prevention patrols	
Reintroduce role of fire in the ecosystem	Prescribed burning - Broadcast for site preparation, meadows enhancement, encouraging forage (e.g. elk) and fuels reduction Prescribed burning - underburning to take out fines for fuels reduction, thinning out stand, increasing wildlife habitat, forage. Possible areas for prescribed burning (underburning): • Areas with spotted owl habitat. For example vegetation in Dry Creek is good dispersal habitat. Most of the late successional habitat is within riparian reserves or rocks. It is the shortest dispersal route around the lake and will become foraging and nesting habitat in a shortest period of time. • South facing slopes such as Dome rock ridge. Fuel reduction treatments and prescribed fire can reduce the fuel buildup to levels prior to fire suppression. Vegetation influenced by past fire frequencies. There were a number of severe fires. There is now a fair amount of unsuited ground with vegetation that evolved with fire, yet this habitat is not getting the disturbance it needs to maintain these habitats.	*H*
Reduce potential fire intensity in Riparian Reserves	Priorities for salvage within riparian reserves with regard to potential loss of habitat from fire: • Those riparian reserves with south/west aspects with a large fuel buildup and risk of fire. • Edge habitat on Sw, W, and southern aspects • draws associated with steep canyons • draws off of W/SW facing ridges • Those riparian reserves with down woody material in excess of the amount needed to meet standards and guidelines.	*M*

***V-19. What and where are the opportunities for management, restoration or improvement within the watershed?* Issue: Harvest of Old Growth**		
Management Objectives	**Potential Treatments**	**Priority *H, M, L***
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.	*H*
Old growth harvest	Implement Forest Plan objectives in Matrix land	*M*

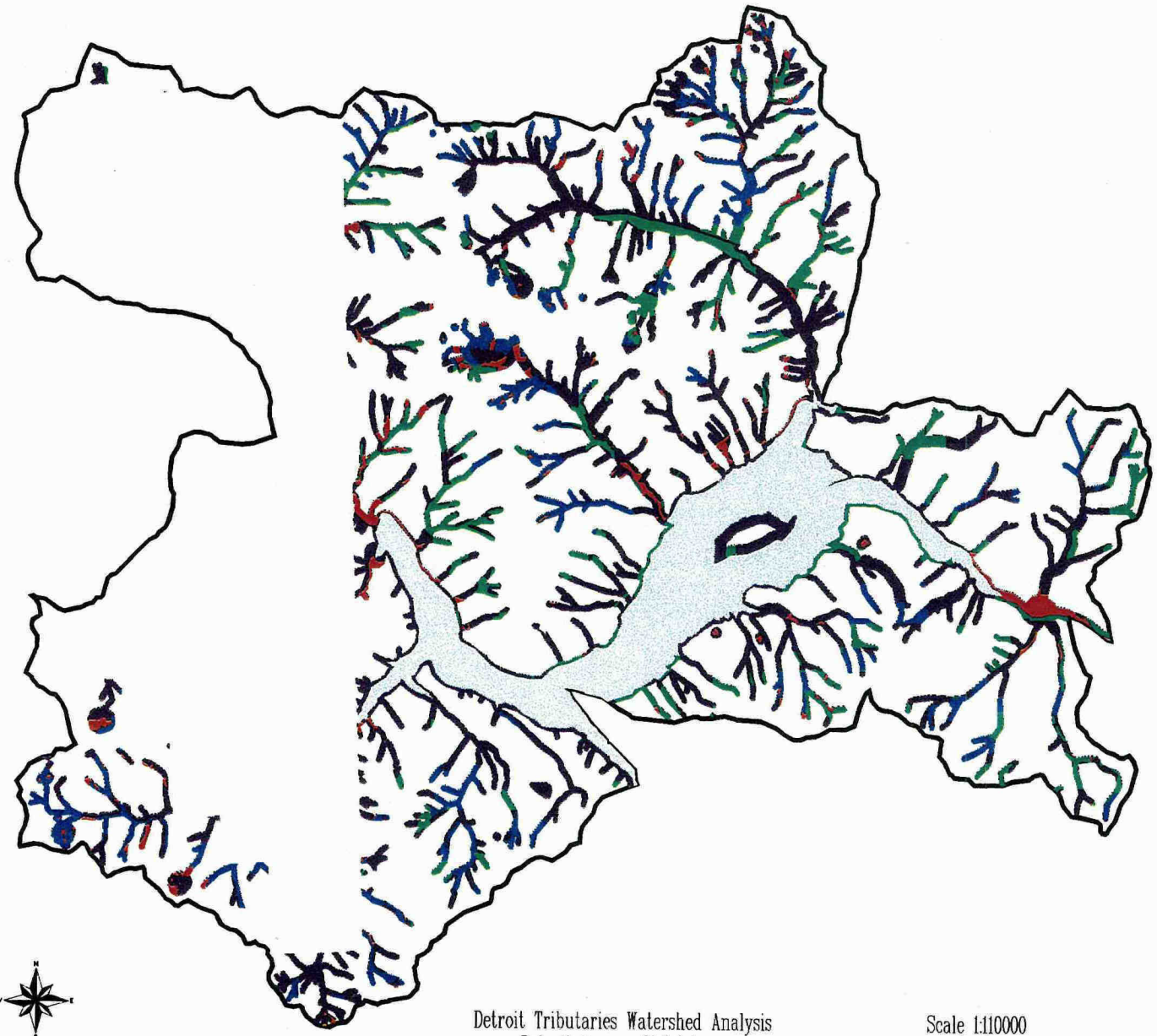
***V-20. What and where are the opportunities for management, restoration or improvement within the watershed?* Issue: Plant association and seral stage distribution**		
Management Objectives	**Potential Treatments**	**Priority *H, M, L***
Stratify treatment areas by slope and aspect to meet landscape management objectives	North Slopes - In sheltered drainages, such as French Creek Implement thinning prescriptions with the long term goal of longer rotations to emulate reference conditions on North slopes. Retain more sensitive areas, that usually occur on North slopes South Slopes - reduce fuel loading by variety of treatments including the reintroduction of fire (e.g. Dome Rock ridge, Dry Creek)	*M*

V-21. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Land Management Goals and dynamic natural systems**		
Management Objectives	**Potential Treatments**	**Priority *H, M, L***
Land Allocation: Riparian Reserves		
Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate winter and summer thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of course woody debris sufficient to sustain physical complexity and stability	Salvage when present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected.	*H*
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.	*H*
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. *Maps v-1a-1d* **show the comparison of structural stages within riparian reserves at years 30 and 60 with and without silvicultural treatment.**	Commercial Thinning (Maximum potential acres): Riparian -size class 3.5 - 4.0, not in LSR = 5262 acres Commercial thin in riparian reservess when: • Riparian reserves are intact but not do not have late successional structure. • In places where fire exclusion created more stems, and the development of late successional characteristics may delayed	*H*

Management Objectives	Potential Treatments	Priority *H, M, L*
Land Allocation: Matrix		
• **Production of commercial yields of wood (Commercial timber sales)**	Timber Harvest: regeneration, partial, salvage, and commercial thinning harvests	*H*
• **Retention of moderate levels of ecologically valuable old-growth components such as snags, logs, and relatively large green trees**	Regeneration Harvest: • Stands which have reached 95% of culmination of mean annual increment • Stands too old or stagnated to respond to release from thinning. • Stands where regeneration harvest will address insects, diseases and wind throw • Stands where creating openings meet other resource objectives (e.g. wildlife, recreation, etc) • Late successional stands, if in excess of 15% of specific 5th field watersheds. Total matrix in 21" + d.b.h. stands = 10,181 acres (maximum potential acres)	*M*
• **Improve Stand Vigor**	Commercial Thinning: 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. Matrix - size class 3.5 - 4.0 (9.0 - 20.9) " d.b.h. = 8087 acres (Maximum potential acres)*	*H*
	Post harvest activities: reforestation, pre-commercial thinning, fertilization, pruning, vegetation control, and animal control.	*H*

* These acres represent the maximum total possible. Any decision on actual treatment would need to be field verified and meet all resource objectives. Many stands will not meet size or stocking level requirements for thinning.

Structural Stages in Riparian Reserves
Year 30 with No Silvicultural Treatment



Legend

- Stand Initiation
- Stand Exclusion
- Understory Reinitiation
- Old Growth
- Non Forest
- Detroit Reservoir

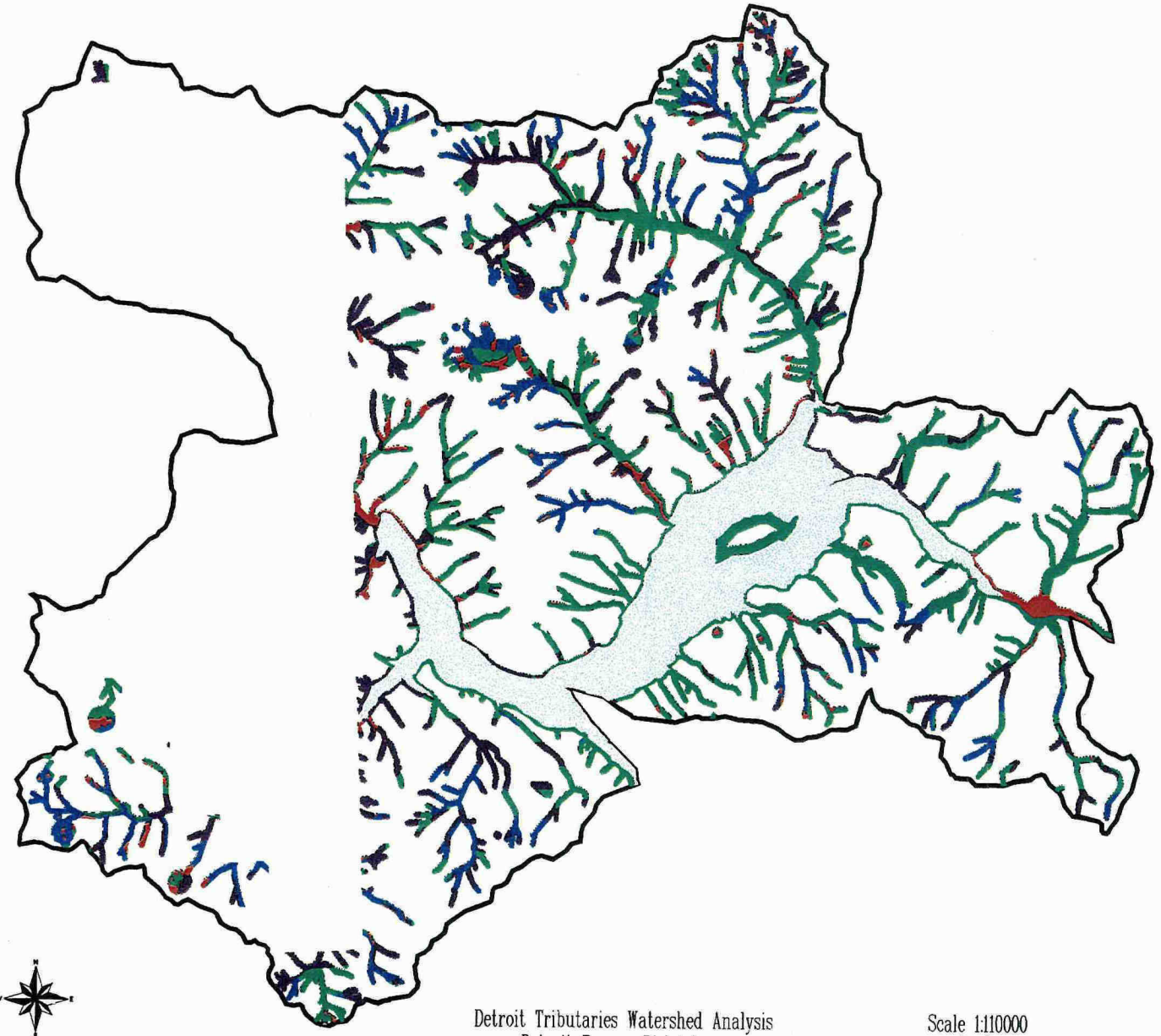
Detroit Tributaries Watershed Analysis
Detroit Ranger District

Scale 1:110000
10/06/97

MAP V-1a

Request #1538

Structural Stages in Riparian Reserves
Year 30 with Silvicultural Treatment



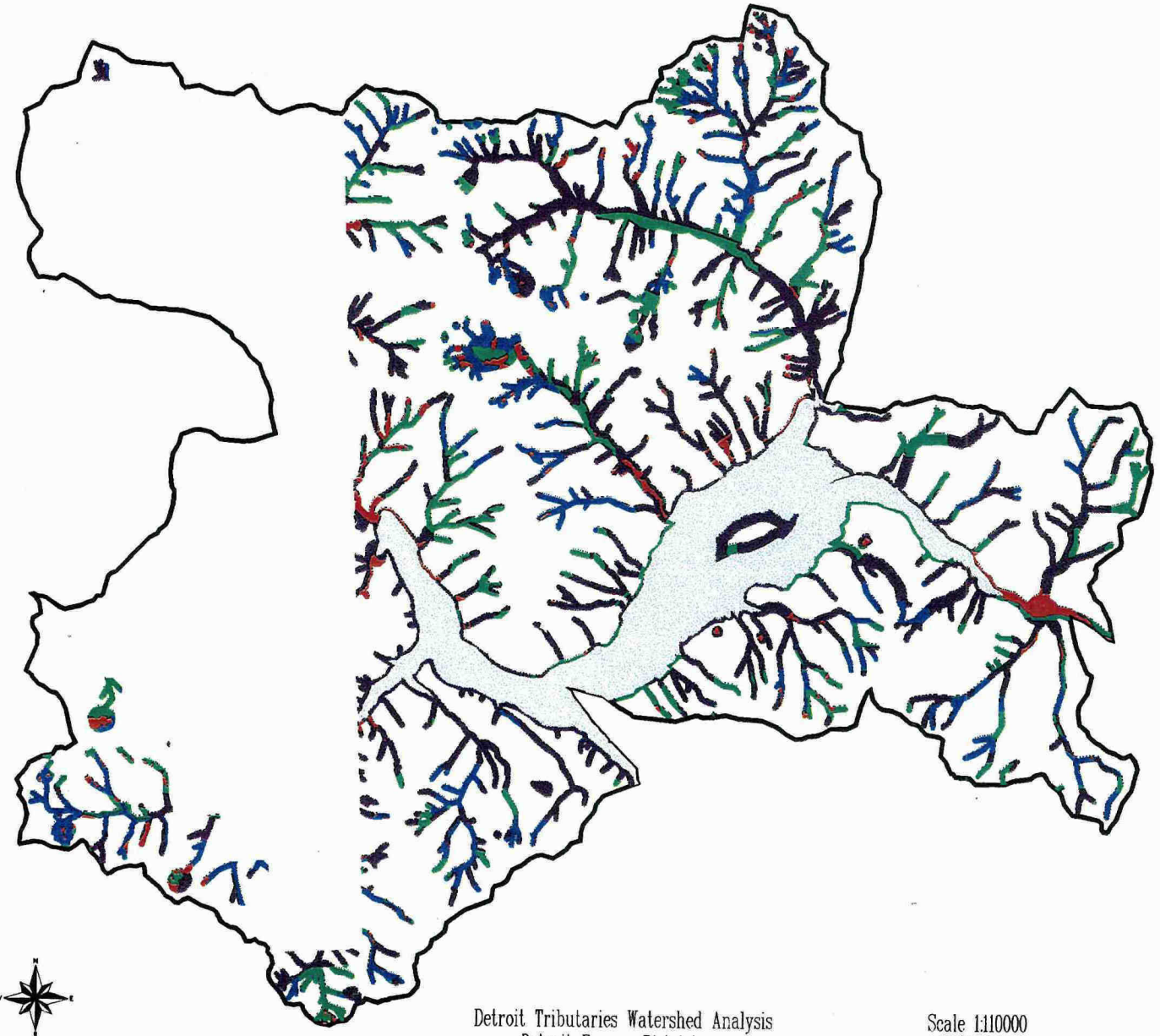
Detroit Tributaries Watershed Analysis
Detroit Ranger District

Scale 1:110000
10/06/97

MAP V-1b

Request #1538

Structural Stages in Riparian Reserves
Year 50 with No Silvicultural Treatment



Legend

- Stand Initiation
- Stand Exclusion
- Understory Reinitiation
- Old Growth
- Non Forest
- Detroit Reservoir

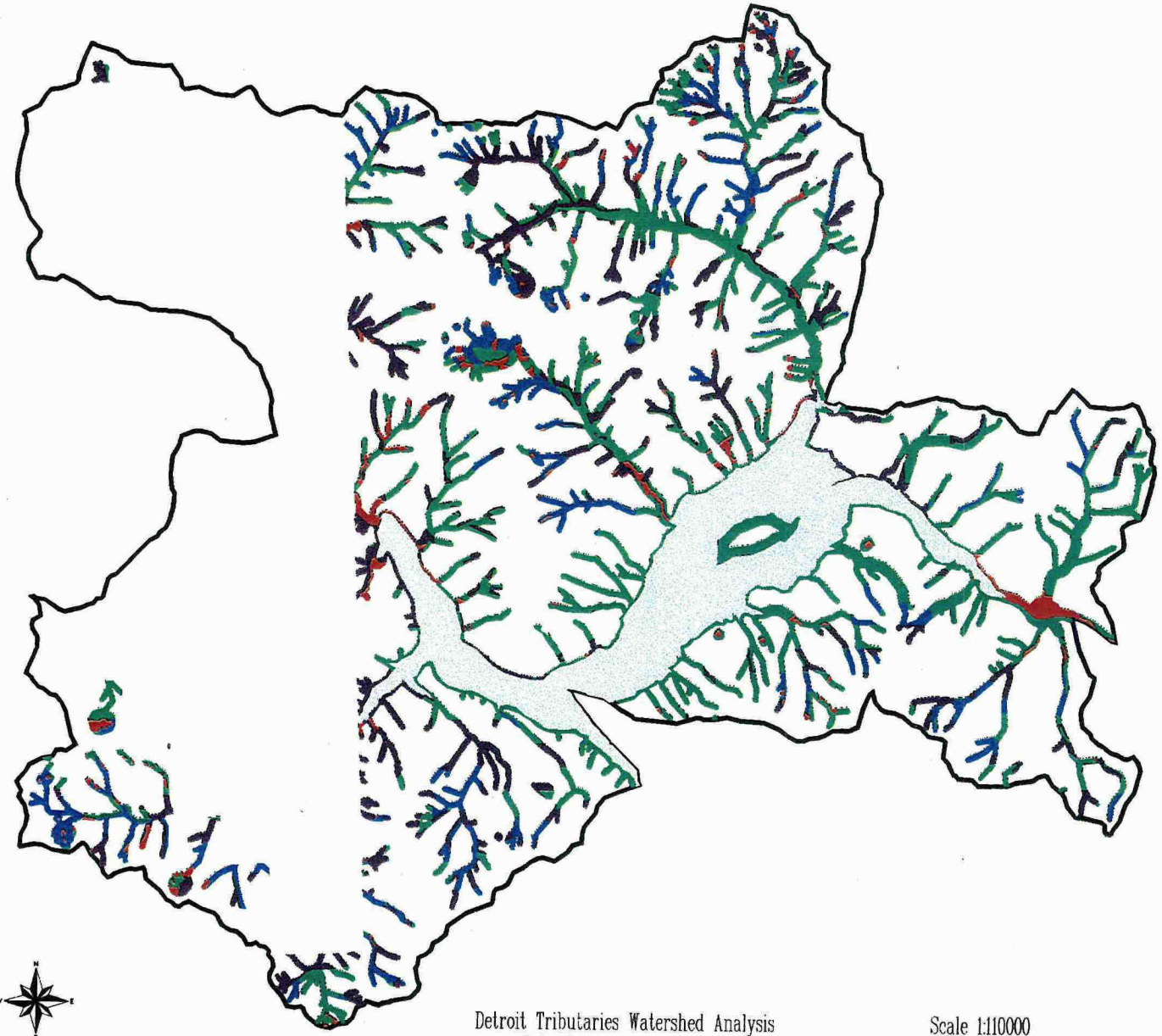
Detroit Tributaries Watershed Analysis
Detroit Ranger District

Scale 1:110000
10/06/97

MAP V-1c

Request #1538

Structural Stages in Riparian Reserves
Year 50 with Silvicultural Treatment



Detroit Tributaries Watershed Analysis
Detroit Ranger District

Scale 1:110000
10/06/97

MAP V-1d

Request #1538

Issue: Land Management Goals and dynamic natural systems (continued)		
Management Objectives	**Potential Treatments**	**Priority** *H, M, L*
Special Forest Products: • Stocking control of trees, thinning and post and pole harvest, which may increase tree growth, reduce canopy closure and stimulate understory vegetation. • Pruning which may reduce canopy closure and stimulate understory vegetation, increase future wood quality, reduce blister rust frequency on white pine and sugar pine • Clipping of plants may increase new shoot growth which may either reduce competition to other plants or provide available forage for animals. • Provides employment, economic diversity, and revenue to the Government. • 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. Since there is a wide variety of existing and potential products, it is difficult to generalize as to their specific effects. A potential list of products includes: boughs, Christmas trees, beargrass, sword ferns, salal, princes's pine, mosses, Oregon grape, clippings of various shrub species, huckleberries, mushrooms, tree cones, and posts and poles. Harvest is acceptable where compatible with Forest Plan Standards and Guides and with objectives for Riparian Reserves and LSR's. Specific harvesting and removal effects will be analyzed as part of the Environment Analysis process.	*M-H*

V-22. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Insects and Diseases**

Management Objectives	Potential Treatments	Priority *H, M, L*
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	*M*
Reduce dwarf mistletoe and root rot infected stands	Stand replacement harvest and replanting with non-host species can reduce dwarf mistletoe and root rot infected stands.	

V-23. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Noxious Weed Control**

Management Objectives	Potential Treatments	Priority *H, M, L*
Minimize the spread of noxious weeds	Highway 22 along both Detroit and Big Cliff reservoirs are good places to concentrate manual, biological, and minimal chemical control on knapweeds, scotch broom, tansy ragwort, and sweet clover.	*M*
Direct non-native plant control efforts to maximize effectiveness		
Re-establish vegetation in disturbed areas	Plant competitive species in areas where there is a risk of noxious weed spread.	*L*

v-24. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Plant Biodiversity**

Management Objectives	Potential Treatments	Priority *H, M, L*
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)	*H*
	Protect of within plant community diversity by precluding disturbance of species rich habitats. (e.g. maintain special habitat buffers)	*H*
	Maintain representation of all plant community types across the landscape (e.g.)	

Issue: Plant Biodiversity (continued)		
Management Objectives	**Potential Treatments**	**Priority H, M, L**
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.	*H*
Restore role of underburning	Understory removals and underburning Underburning in Dry Creek.	*M-H*

v-25. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Habitat Components necessary to sustain Native fish populations**

Management Objectives	**Treatment/Opportunity**	**Priority H, M, L**
Maintain or restore habitat complexity	Evaluate current habitat conditions and determine appropriate restoration projects, such as large woody material placement.	*M*
Maintain or reduce stream temperatures with regard to fish habitat	Manage riparian reserves on fish bearing streams to provide adequate shade to maintain streams temperatures appropriate for salmonid spawning and rearing.	*M-H*
Manage amount and timing of sediment as a result of management activities	Follow recommendations for timing of in stream work issued by the Oregon Department of Fish and Wildlife Continue to implement Forest Plan standards and guidelines	*H*
Issue: Reintroduction of Native Species		
Provide adequate habitat to sustain populations of migratory fish when access around migration barriers (dams) have been resolved	Evaluate current habitat conditions in relation to their ability to support historic fish populations and apply appropriate restoration projects where needed.	*L*

v-26. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Maintaining habitat components for native terrestrial wildlife species**
Issue: Conflicting Habitat Needs

Management Objectives	Potential Treatments	Priority *H, M, L*
Maintain habitat components for native terrestrial wildlife species by:		
Determining which species of concern exist in the watershed	Conduct surveys for species of concern within the Detroit Tributary watersheds	*M*
	Conduct surveys for species of concern in the watershed that have little or no known presence to determine abundance and distribution.	
Maintaining habitat components for mid and late successional Species Guilds	All Guilds: Enhance and maintain mid and late seral habitats. Most problems with these guilds deal with the lack of habitat or fragmentation of this habitat. Specific habitat requirements for species of concern should be concentrated on to provide adequate habitat. Refer to the following guilds for more information: TLC, TLGG, TLML, TMML, TMGG, TSPL, TSGG, TSGML, TSME, TSC, TSPE, LKRVARML, LKRVARG, LKRVRML, LKRVRG, LKRVA, AND SPCL.	*M*
	Survey riparian reserves to identify unique areas and treat accordingly. should not convert all hardwood areas to conifer	*H*
	Permanent meadows could be created, where appropriate, to provide for forage opportunities and provide habitat for special habitat guilds.	*L*
Maintaining habitat components for snag dependent species	Create snags in deficit areas by means of KV funding (e.g. adjacent to harvest units).	*H*
Maintaining habitat components for Peregrine Falcon	Enhance areas surrounding suitable habitat for peregrine falcons to attract a wide diversity of avian species. This may help in maintaining an ample food supply for an adult pair. An opportunity exists to maintain diverse riparian reserves near suitable habitat or enhance these areas to provide a more diverse mix of vegetation.	*L*

Management Objectives	Potential Treatments	Priority *H, M, L*
Maintaining habitat components for Peregrine Falcon (continued)	Surveys are needed in this watershed of suitable habitat before implementation of proposed projects. Consultation with U.S. Fish and Wildlife Service will be necessary if peregrines are found.	*H*
Maintaining habitat components within the Detroit Lake Bald Eagle Management Area (BEMA) for species associated with Detroit Lake	Further monitoring of the bald eagle management area to better identify actual habitat use patterns throughout the year	*H*
	Mark protect these all known Bald Eagle perch trees within the BEMA	*M*
	Design enhancement opportunities for the BEMA: • Installing and maintaining waterfowl nesting structures where suitable habitat conditions exist. The area around Detroit Flats would be a likely area for this type of project. Other Areas: Upper Arm campground, and the area near Hoover campground/ the wildlife viewing platforms. An inventory should be conducted on an identified pond on the north side of the lake near the dam to determine if this area is suitable for waterfowl enhancement.	*M*
	• Reservoir bank stabilization along Detroit Flats and other areas affected by the flood and protection of existing stumps would preserve natural fish cover and could protect current and potential fish population levels.	*L**
	• Planting of sedges and other aquatic vegetation in reservoir draw down areas could provide sites for aquatic insect breeding, as well as, cover for fish. Providing for fish food and cover will support increasing numbers of naturally reproducing fish stocks for eagle prey base and lessen the dependence on introduced fish supply.	*L**

* Assess effectiveness

Management Objectives	Potential Treatments	Priority *H, M, L*
Maintaining habitat components within the Detroit Lake Bald Eagle Management Area (BEMA) for species associated with Detroit Lake (continued)	• Much of the BEMA is not suitable for roosting or nesting. Commercial thinning, selective harvest, or other measures should be designed to increase structure within these stands. The potential nest zones may also benefit from thinning. Silvicultural treatments which encourage the development of large diameter conifers and will enhance the development of future nest, perch and roost trees. Such treatments include thinning, pruning, selective limbing, and eventually, snag creation. These treatments should be considered whenever timber harvest is planned within the BEMA Closing and decommissioning of roads in the immediate area of the nest site can prevent disturbance of breeding eagles.	*H*
Maintaining habitat components for northern spotted owl	Stand enhancement should be targeted for stands within known spotted owl pairs or resident singles that are deficient of habitat. Pre-commercial thin young plantations and commercial thin older stands to achieve late-successional characteristics sooner. Variable spacing should be looked at to create more diversity within these stands.	*H*
	Riparian: Stand enhancement should be focused on areas where dispersal is extremely limited, within known spotted owl home ranges, and probable dispersal corridors. Stand enhancement for stands not currently meeting 11-40 conditions should be a priority. 09054, 10043 and 10064 have riparian reserves that are significantly higher than the quarter township overall. There is a need to maintain these are due to the majority of the overstory may be present in these reserves.	
	Fire Management: Treat fuels in owl habitat stands that have a high fire danger especially in those areas where there are large patches of intact mature forest. Marten Basin and Dry Creek would be first priorities to treat. Fuel loading reductions may be necessary in some areas to prevent a large scale loss of habitat. Adequate amounts of down woody material should be left on site though.	*H*

Management Objectives	Potential Treatments	Priority H, M, L
Maintaining habitat components for northern spotted owl (continued)	Design enhancement projects for riparian reserves to achieve owl dispersal habitat at a faster rate. (see commercial thinning within riparian reserves)	*H*
	Retain pileated woodpecker/marten areas in Marten Basin, French Creek, Slate Creek, and Tumble areas ***(Table III-28)*** the short term until reserve allocations or surrounding areas recover to address connectivity issues for the area. . When owl dispersal conditions improve, they may be dropped.	*H*
Maintaining habitat components for big game	Improve forage, especially in winter range for big game. Forage enhancement could be captured along closed roads	*H*
	Reduce number of road miles in both winter and summer range.	*H*
	Due to lack of forage in the watershed, special habitats should be monitored to determine if big game are negatively affecting these areas.	*M*
	To achieve a higher quality of forage, fertilization and seeding with a big game forage mix should be added to future activities.	*H*
	In the BEMA: Forage is already limited within winter range, and where forage occurs, special notice should be given to increase the quality by burning, seeding, and fertilizing.	*M*
	Elk Management Emphasis Areas (MEAs)	*H*
	Convert hiding cover to forage MEAs: Slide, Log Tom, French	
	Enhance hiding cover to accelerate development into thermal cover MEAs: Log Tom	
	Additional recommendations by MEA	
	Slide Mea: Future treatments should choose to burn, seed, and fertilize to increase forage quality within the area. Hiding cover represents over 40% of the available cover present. Treating hiding cover could raise both forage and cover values thus resulting in an upward trend in habitat effectiveness.	

Management Objectives	Potential Treatments	Priority *H, M, L*
Maintaining habitat components for big game (continued)	Log Tom MEA: Hiding cover needs to be treated to increase both the forage and cover variables to convert hiding cover into more desirable habitat for big game. This in turn may increase the habitat effectiveness index for this MEA. There are several small spur roads that lie on private lands. Decommissioning may not be possible but they could be closed by a closure device if deemed necessary. This may increase the roads variable by decreasing road densities.	*H*
	French MEA: Treatment should occur in hiding cover stands.	
	Kinney MEA: Most of the existing forage is located in a lower valued category and even though this is managed at low emphasis, special attention should be given to upgrading the quality of forage in the future.	
Increase of awareness of wildlife needs and habitat characteristics.	Develop a wildlife interpretive plan	*M*

v-27. What and where are potential opportunities within the watershed that will contribute to sustainable communities, and assist with reaching economic development goals identified in the Canyon's strategic plan? **Issue: Timber Supply**

Management Objectives	Treatments/Opportunities	Priority H, M, L
Provide for a sustainable timber supply	Set appropriate harvest level within the management allocation requirements and the ecological limits of the watershed	*H*
	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	*H*
Issue: Community Economic Stability		
Provide a variety of forest products	Provide post and poles through pre-commercial thinning, beargrass, boughs, rocks, Christmas trees, etc.	*H*
	Work with local communities to help determine ways to diversify their economies	
Balance communities needs for increased tourism/recreational opportunities with other resource objectives	Work with local tourism organizations to analyze potential tourism opportunities on National Forest land and marketing strategies for these opportunities	
	Create partnerships with local communities and organizations to develop recreational opportunities that benefits local economies	
	Update the Detroit Lake Composite Area Management Guide and complete the interpretive plan.	*M*
Increase public understanding of resource management	Use current science and educate the public about resource management.	
Participate in the resolution of conflicts in Detroit Reservoir water level needs.	Work with other agencies and entities to resolve conflicts in Detroit Reservoir water level needs. (e.g. local recreation vs. downstream water quality and quantity needs)	
	Work with COE and other communities on COE's Willamette Basin Reservoir study.	
Participate in the improvement of infrastructure to achieve economic diversification goals	Support and provide technical assistance to local communities to help them implement a community sewer treatment facility proposal	*H*

Issue: Recreational Supply and Demand		
Management Objectives	**Treatments/Opportunities**	**Priority H, M, L**
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.	*H*
	Implement a carrying capacity study of the reservoir to help determine future development (eg. marina and launching expansion, parking, etc) and management strategies around Detroit Lake (eg. restrictions, designated use areas, etc.	*M*
	Develop a management and design guide for the Detroit Flats day use area	*H*
	Provide for existing demands where resource objectives can be met, For Example: • Improve parking around Detroit Lake; • Develop a bike path system that interconnects the lake area recreation facilities with Detroit and Idanha; • Improve and create accessible recreational opportunities, • Provide boat mooring at campgrounds, • Improve day use areas; etc.	*M/H*
	Convert the State Park administrative site to a recreational site.	*H*
	Develop an area interpretive plan	*L*
Maintain and enhance desirable recreation settings through various vegetation management practices	See Vegetation Recommendations	*M*
Decrease resource impacts and improve aesthetics at recreational areas	Restore and rehabilitate resource damage in high use campsite areas around the Detroit and Tumble Lakes, especially within Riparian Reserves. Provide sanitary facilities where feasible.	*M*
	Control access to damage sites	
	Eliminate or reduce dispersed camping in areas where resource objectives cannot be attained, eg. French Creek.	*H*
Reduce user conflicts	Increase administration, management, education and law enforcement in areas where conflicts area occurring.	*H*
	Eliminate or reduce dispersed camping in areas where user conflicts occur, eg. French Creek, Southshore.	*H*

Issue: Recreational Supply and Demand (continued)		
Management Objectives	**Treatments/Opportunities**	**Priority *H, M, L***
	Implement the carrying capacity study of the reservoir to help determine future development and management strategies around Detroit Lake. Strategies could include designating areas for particular activities.	***M***
Reduce user conflicts (continued)	Control launching and parking at Forest Service campgrounds to reduce impacts on campground visitors.	***H***
	Reduce boating/non-boating user conflicts at recreation facilities (day use boat launch) by designating areas for specific uses	***H***
Gather information that is currently lacking	Update all campsite inventories to monitor current campsite conditions.	***M***
Provide stable funding to achieve recreational goals	Find alternative funding sources and partnerships	***H***

v-28. What and where are the opportunities for management, restoration or improvement within the watershed? **Issue: Facility Maintenance**		
Management Objectives	**Potential Treatments**	**Priority** *H, M, L*
Maintain facility condition at or above acceptable standards, and meet current public needs.	Replace and maintain facilities reported in the Recreation Facilities Conditions Assessment.	*H*
	Upgrade sanitary facilities at campgrounds and day use areas to meet public expectation. Install sanitary facilities at dispersed areas that have sanitation problems, where feasible.	*H*
	Improve parking spaces in campgrounds to accommodate RV use.	*L*
	Improve parking around the reservoir to accommodate current demand.	*H*
	Develop Access Travel Management Plan. **031** Decommissioning Opportunities: Roads 2225-503, 2225-455, 2225-560, 2225-458-470, 2225-458-469, 2223-501-503, 2223-501-512, 2223-501-514, 2223-502, 2223-610, 2223-613, 2223-536, 2223-542, 2223-537, 2223-520, and 2223-541 **032** Decommissioning Opportunities: Roads 2212-634-037, 2212-634-637, 2212-634-635, 2212-545-544, 2212-545-546, 2212-545-547, 2212-545-528, 2212-625, 2212-640-642, 2212-640-645, 2212-640-646, 2202-718, 2202-726, 2202-738, and 202-770. **781** Decommissioning Opportunities: Roads 1003-404, 1003-305, and 1003-306 See facilities discussion for other road decommissioning criteria.	*H*
	Encourage and participate in plans to implement the proposed sewer treatment system that will meet demands of Detroit, Idanha, Detroit State Parks and Forest Service compound facilities	*H*
	Up grade forest road 10 to provide shoulders on both sides for pedestrian and bicycle traffic from State Highway 22 to the junction of forest road 1000-060.	*M*

Issue: Facility Maintenance (continued)		
Management Objectives	**Potential Treatments**	**Priority H, M, L**
Maintain facility condition at or above acceptable standards, and meet current public needs.	Minimize road failures and long-term resource impacts by decommissioning roads that cannot otherwise be maintained.	*M*
	Monument Peak road 2202-701(road going into the Monument peak SIA needs reconstruction to trail specs., and a possible gate.	*L*
	Concentrate on ERFO project revegetation.	*M*
Inventory and monitor facilities	Survey facilities for repair and maintenance needs.	*H*
Issue: Public Safety		
Provide for public safety	Remove hazards (e.g. hazard trees) within developed recreation and organization sites, popular dispersed camping sites (especially those with minimal developments) and within approximately 1 tree length from the prism of well traveled roads.	*H*
	Eliminate undersized pullouts or improve turnouts along Highway 22 to meet state standards. Define egress and ingress to improved turnouts. Develop Mt. Jefferson viewpoint among other viewpoint parking opportunities.	*L/M*
	Improve sight line at the Blowout Road/Highway 22 junction.	*H*
	Create pedestrian/bike access along Blowout Road and Highway 22 that connect recreation facilities with Detroit and Idanha.	*H*
	Improve entrance to Santiam Flats	*M*
	Improve parking around the reservoir to reduce congestion along highway and Blowout Road.	*M*
	Fire prevention and fuels management to reduce risk.	*M*
	Post warning signs of dangerous situations or facilities.	*H*
	Provide road maintenance on roads used by the public	*H*

Issue: Power Line Corridor and Dam		
Management Objectives	**Potential Treatments**	**Priority *H, M, L***
Provide direction for management of the power line corridor	Update Memorandum of Understanding with BPA and PGE for the powerline corridor	***H***
	Develop a management plan for the power line right of way corridor considering; noxious weeds, scenic resources, wildlife/forage habitat, recreation opportunities, heritage site protection, special forest products, etc.	***H***
	Inventory to determine condition of existing power line right of way access	***M***
	Participate in the Willamette Basin Reservoir Study and Environmental Assessment	***M***

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

Objectives	Treatments/Opportunities	Priority H, M, L
Maintain and enhance the inherent beauty and integrity of the watershed **Implement management actions to minimize adverse impacts to scenic quality (e.g. harvest unit design, facility placement on the landscape)**	Develop a North Santiam Viewshed Implementation Guide. The plan would provide a method for implementing principals set forth in the new Scenery Management Handbook and Forest Plan standards and guidelines. Due to the commitment of portions of land base for LSR's and Riparian Reserves there is increased demand for timber production from scenic corridors in matrix lands. This makes it essential to provide planners guidelines to optimize resource benefits as described in the Forest Plan.	*M*
	Implement the recommended guidelines defined in this watershed analysis for regeneration harvests. (e.g. spatially distribute timber harvest across the landscape rater than concentrating the disturbance within individual subdrainages)	*H*
	Develop a West Cascade Scenic Byway Management Plan.	*M*
	Update the power line corridor management plan addressing scenic concerns and guidelines for timber management	*H*
	Develop (scenic) standards and guidelines for Army Corps of Engineers lands that are managed by Forest Service	*M*
	Maintain and improve scenic overlooks of the reservoir along the highway and Blowout Road	*M*
	Amend Forest Plan to change existing land allocation in areas to a more appropriate scenic allocation (eg. middleground land visible from Detroit currently has a general forest allocation and meets all the criteria for scenic middleground management)	*H*