

## **Chapter 3 Findings and Recommendations**

### **Synthesis**

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Synthesis is the process the watershed analysis team used to identify and evaluate links between the physical and biological functions, processes and uses in the analysis area. Synthesis considers all domains (aquatic, wildlife, vegetation, and recreation) and identifies where overlaps and conflicts occur so that the analysis team can discover opportunities and resource constraints in the watershed.

Synthesis was conducted by having each resource area identify areas of concern and findings discovered through the assessment. These concerns and findings were then displayed on a working map so that overlaps, interactions, and potential conflicts could be identified and discussed as a group. This chapter lists the major findings by resource area and then presents the recommendations developed by assessing opportunities and needs in light of resource constraints and management goals for the analysis area.

### ***Hillslope Processes and Hydrology Findings and Recommendations***

#### **Sediment Inputs from Roads Findings**

Decreased timber harvest has removed the need for new road construction and heavy vehicle traffic, but also reduced the available money to maintain roads. Without proper maintenance, roads deteriorate and increase the risk of failure and sediment delivery to streams. In response to this, the Forest has pursued both internal and external funding to treat roads in the Middle and South Forks of the Nooksack River watersheds. In both cases, the Middle Fork and South Fork backlog of road drainage deficiencies has been corrected on most of the system roads. Of the original road mileage in these basins, over half have been closed. The remaining roads serve as recreation access and receive routine maintenance. Reducing road densities has reduced the impacts to watershed conditions which occurs from collecting and concentrating of water by high road densities. There are exceptions to the recently improved conditions, and several sites are known to have deficiencies that need corrected as identified in the following recommendations.

#### **Sediment Inputs from Roads Recommendations**

- Condition of the transportation network will need to be monitored.
- Road 12 will require additional attention between Mileposts (MP) 7 - 9 to correct remaining drainage and stability problems.
- Road 1260 will require periodic maintenance from MP 0.8-2.2 brushing as well as ditch line cleaning due to raveling cut banks.

- The South Fork Road 12 crossing of Bell Creek is a partial bedload barrier and complete fish barrier which fragments an isolated population of genetically-identified, native Dolly Varden, and it will require removal or replacement.

### Large Wood Findings

Large wood augmentation would provide channel roughness and complexity, which is essential for channel development.

In the Middle Fork, tributary streams such as Rankin Creek and other right bank tributaries had their riparian areas logged and the channels were cleaned of wood.

In the South Fork, D-8 cats pushed the log jams and LWD to the channel edges between its confluence with Bell Creek and the 1260 bridge crossing.

### Large Wood Recommendations

- Although stream surveys indicate that pool frequencies are good throughout most of the Middle Fork Nooksack Watershed, all streams should be evaluated for large wood augmentation, and large wood placement projects undertaken if necessary.
- In the South Fork, and its tributary Wanlick Creek, may need additional inputs of wood to act as key pieces to provide collection points for smaller recruited debris. In Wanlick Creek this may be needed in addition to the cooperative channel project that was conducted between 1990-1996 and increased large wood content to 300 pieces per mile (flooding since then has reduced large wood to less than 154 pieces per mile (Table 5).

### SnoTel Site Access Findings

The early flood warning system for Whatcom County and Sumas area of Canada has depended on a network of SnoTel sites. The Elbow Lake SnoTel site was added to the network along with the Wells Creek site in 1995 and significantly improved predictability of the early flood warning model which uses the network (pers comm Paula Cooper, Whatcom County Flood and River Engineer).. This system's success for the last decade has provided river and flood engineers, and Whatcom County emergency managers a tool to increase the warning time to floodplain residents downstream. This early warning system has been an important factor in the reduction of property damage and the threat to life in Whatcom County.

### SnoTel Site Access Recommendations

- The Forest strongly supports the need for the network of SnoTel sites for continued public safety of Whatcom residences. The Elbow Lake SnoTel Site is located near the end of Road 12. From milepost 13.85 to 18.3, the Baker Lake and South Fork Nooksack Access and Travel Management Environmental Assessment has proposed to offer Whatcom County the option to take over maintenance of this section of road for the administrative use of maintaining the SnoTel site. Otherwise, the proposal is to decommission this road segment after allowing time for an alternative SnoTel site to be calibrated with the existing one.

## ***Aquatic Habitat and Fisheries Findings and Recommendations***

### **Fish Habitat Findings**

In the Middle Fork Nooksack Watershed, the Ridley Creek Trail crossing on the upper mainstem was washed away during high flows. The trail east of this crossing is in need of repair for approximately 0.5 mile of its length due to significant water erosion. In some areas, the "trail" is an eroded trench 2 – 3 feet deep, and much of the trail is located in the riparian zone. Fine sediment from the erosion is degrading spawning habitat conditions to an unknown degree.

In the Middle Fork, tributary streams such as Rankin Creek and other right bank tributaries had their riparian areas logged and the channels were cleaned of wood.

### **Fish Habitat Recommendations**

- At a minimum, place structures to divert water off of the Ridley Creek Trail. Through appropriate NEPA analysis, relocate, reconstruct, or decommission this trail.
- Although stream surveys indicate that pool frequencies are good throughout most of the Middle Fork Nooksack Watershed, all streams should be evaluated for large wood augmentation, and large wood placement projects undertaken if necessary.

### **Fish Passage Findings**

In the Middle Fork Nooksack River, the City of Bellingham's water supply diversion dam is blocking upstream passage by anadromous fish. With the expected removal of this blockage, anadromous fish will have access to the streams on the National Forest. Clare Fogelsong, representing the City of Bellingham at the Nooksack Salmon Summit in 2005, stated that the removal of the dam would likely occur in 2007 (pers. comm. Ned Currence, Nooksack Tribe, 1/2006).

In the South Fork Nooksack River, a culvert at the crossing of Bell Creek along Forest Service Road 12 is a complete barrier to upstream migration and fragments the population of Dolly Varden isolated above a natural barrier one mile lower in the stream.

### **Fish Passage Recommendations**

- Support the need for fish passage at the City of Bellingham's water supply diversion dam.
- The South Fork Road 12 crossing of Bell Creek requires removal or replacement to increase the viability of the isolated Dolly Varden population that is fragmented by this crossing.

### **Riparian Reserve Findings**

No information exists to suggest that riparian reserve widths should be altered by this watershed analysis. Historic harvests in parts of the analysis areas cut trees down to the stream, and has resulted in densely-stocked young stands that may benefit from silvicultural treatment to encourage development of large conifers. Site specific information will be required to identify sites which may benefit from this treatment and to identify which streams are capable of utilizing

or transporting them. Hypothetically, landslide prone areas could benefit from silvicultural treatment to reduce the risk of landslides following rain-on-snow events (See Appendix B).

### **Riparian Reserve Recommendations**

- Conduct stand exams along streams with densely-stocked riparian stands to determine if silvicultural treatment would encourage faster development of large diameter conifers, and implement those treatments. Any treatment must maintain or improve stream temperatures in the South Fork Nooksack River.
- Research is needed to determine if thinning can be used to reduce landslide risk (see Appendix B for rationale and hypothesis). Implement if appropriate.

### ***Wildlife Findings and Recommendations***

#### **Late Successional Reserves Findings**

Habitat in the Late Successional Reserves in the South and Middle Forks is nearly sufficient for the reserves to be fully functioning. Some opportunities may exist for non-commercial and commercial thinnings that would facilitate the development of late successional and old-growth forest structure, and in the case of non-commercial thinning, could accelerate the development of old-growth trees.

At very high stocking levels, diameter and height growth of trees is reduced due to competition for limited available resources (USDA 2001). For 30 year-old stands, stocking levels greater than 500 trees per acre (TPA) reduce height and diameter growth. For a 90 year-old stand, stocking levels in excess of 400 TPA would have similar effects on growth. Where high stocking levels are reducing height and diameter growth, vegetation management (thinning) would improve future habitat conditions for LOS species. These thinning treatments would have additional short-term benefits of increasing ground vegetation biomass and plant species diversity.

Stands less than 30-years-old do not have wood products that can be harvested commercially. Vegetation management in these stands would fell small trees and leave them on site. A 71-acre stand in the western hemlock zone that was harvested in 1982 has stem densities of approximately 2,300 trees per acres that would benefit from this treatment. There are no stands in the Pacific silver fir forest zone in the Middle Fork Nooksack young enough to benefit from this treatment. In the South Fork Nooksack, there are nearly 200 acres in the Pacific silver fir zone with stocking densities ranging from 1,750 to 2,575 trees per acre that would benefit from vegetation management.

Although thinning young trees in the Pacific silver fir vegetation zone increases diameter growth of all species, height growth of Pacific silver fir and noble fir is reduced at wide spacing (Curtis et al. 2000). Vegetation management of young stands in the Pacific silver fir zone should maintain 10 to 12 feet between residual trees (300 to 435 trees per acre) to avoid reducing height growth of these trees.

Stands between 35 and 80-years-old could be commercially thinned. In the main stem of the Middle Fork Nooksack there are approximately 773 acres in two stands that are 37-years-old. In the Clearwater subwatershed, there is one isolated stand of 75 acres and a group of three stands totaling 102 acres that are of this age, or nearing this age. In this age range in the South Fork Nooksack, there are approximately 647 acres in 13 stands that range from 38 to 104 acres in size. Ten of the stands are separated from one another by even younger aged stands that form contiguous areas of 275-310 acres of relatively young stands.

Stocking levels for these stands are unknown, but should be determined. If stocking levels are in excess of roughly 450 trees per acre, variable density thinnings should occur to improve LSR characteristics (USDA 2001 pp 68-73). If stocking levels are less than 450 trees per acre, this large homogeneous area could be improved by creating openings similar to gaps that occur in late seral and old-growth stands (USDA 2001 p. 65). These openings will allow sunlight to reach the forest floor increasing vegetative diversity (Beggs 2004, McKenzie et al. 2000, Bailey and Tappiener 1998). Re-establishment of understory vegetation is a characteristic of the forest maturation stage of forest development, which generally begins 80-100 years after stand development (Franklin et al. 2002). Created openings would emulate several characteristics of late-successional forests including higher understory diversity and gap formation. Greater diversity in understory vegetation is expected to result in greater diversity in small mammals (Carey and Johnson 1995) and songbirds (Hagar et al. 1996).

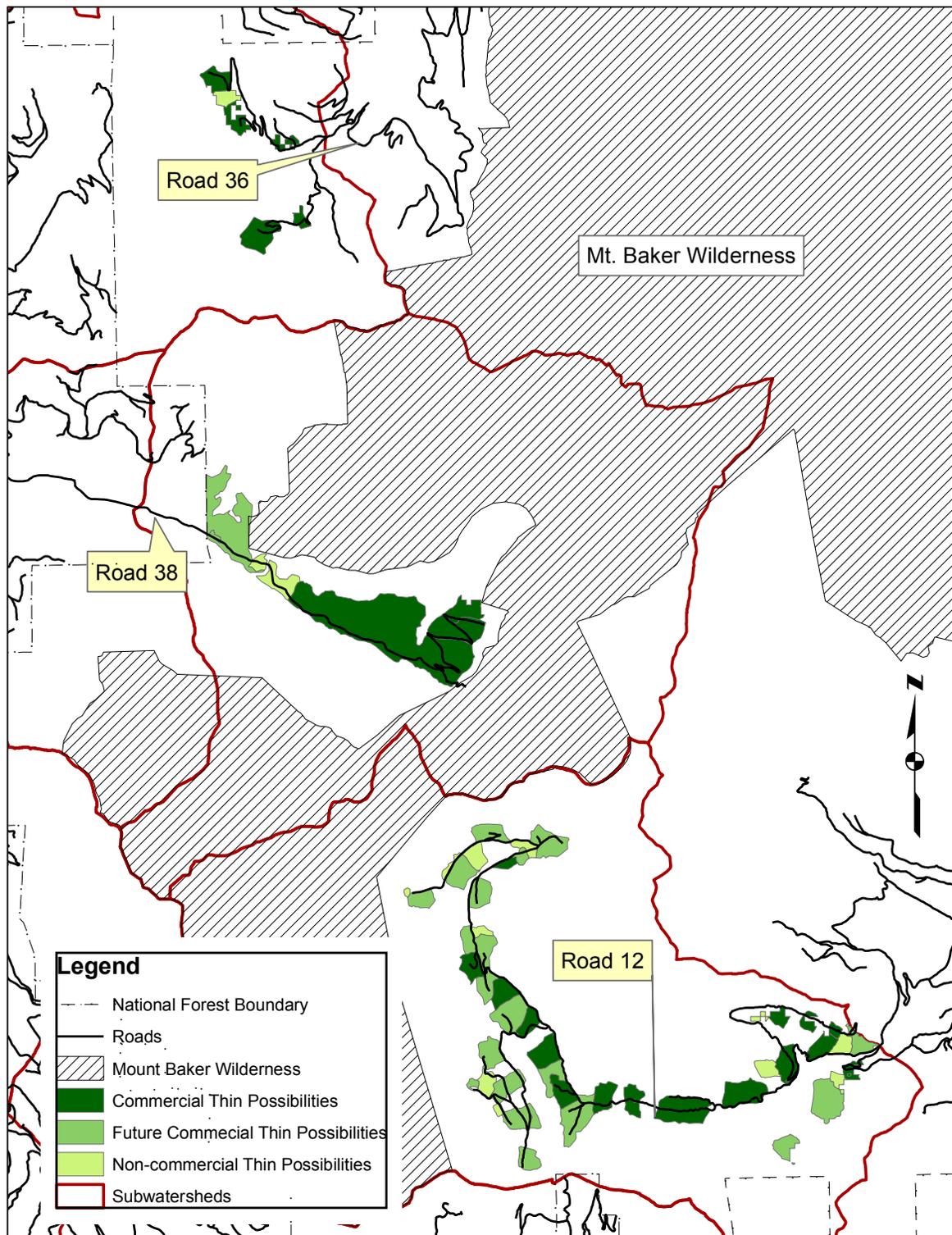
#### Late Successional Reserve Recommendations

- Non-commercially thin approximately 200 acres of stands 30-years-old and younger in the western hemlock and Pacific silver fir zone where stocking levels exceed 500 trees per acre. In the Pacific silver fir zone, post-thinning spacing between trees should not exceed 12 feet to maintain height growth.
- Conduct stand exams in mid-seral stands from 40 -70 years-old to determine if stem densities recommendations is the Late Successional Reserve Assessment. Perform commercial thins in stand found to have excessive stem densities.
- In mid-seral stands that exceed 40 acres (by themselves, or including adjacent mid- and early-seral stands), create small gaps in areas where understory vegetation is sparse. Gaps will increase plant and animal species diversity and result in greater horizontal diversity in the landscape. The size and number of gaps would be determined by silvicultural objectives and site characteristics analyzed and documented through the NEPA process.

#### Elk Findings

Due to limited forage, attaining the goal of 1,450 elk in the North Cascades herd will likely only occur through the creation of considerable areas of good foraging habitat on non-federal lands in areas that currently provide poor foraging habitat.

Figure 23 Possible stands for thinnings to promote LSH characteristics



The value of current habitat (20 percent of good forage habitat and 17 percent of marginal forage habitat) modeled by Tressler and Davis (2003) is negatively influenced by reduced use of habitats near roads and trails.

### Elk Recommendations

- Improvements to elk foraging habitat are expected to occur through road closures in the South Fork Nooksack watershed. A small amount of marginal habitat in the Middle Fork Nooksack could be improved if the road was closed at the Elbow Lake trailhead, but considering the small amount of improvement that would result from this action, it should only be implemented if no other resources were benefiting from the presence of the road.
- Develop comprehensive fire management plans to include evaluation of impacts and benefits to all resource areas that would allow some wildfires to burn within prescription to create additional elk forage on National Forest System Land.
- Provide technical assistance to partners pursuing elk forage enhancements on mitigation lands acquired by Seattle City Light and Puget Sound Energy.

### Mountain Goat Findings

Fire suppression, displacement due to recreational activities, predation, and other factors have undoubtedly had some impact on mountain goat populations, but over-hunting appears to have had the largest role in the area-wide declines. Declines of 60-90% are predicted to have occurred in the two largest populations in the area due to the impact of hunting. The Mount Baker population appears to be rapidly growing since hunting ceased in 1996, further suggesting that mountain goat numbers were decreasing due to that factor. Because repeated surveys have not occurred in the Goat Mountain area, the trend of the population size during and after hunting is not known. It is possible that goat harvest was also a factor contributing to the disappearance of goats from Washington Monument and Twin Sisters Mountain.

### Mountain Goat Recommendations

- Provided that mountain goat population declines are largely a result of hunting, augmenting goat populations that are too small to recover, or re-introducing mountain goat to areas where they no longer exist, could be the most effective method to improve mountain goat populations in western Washington. With its rapidly growing population, Mount Baker could provide the source animals for transplants provided that the number of transplanted individuals does not result in population declines.
- Until there is greater certainty about the degree of impact resulting from recreational activities, trail construction and reconstruction activities should be designed to minimize potential displacement of mountain goats.
- Develop comprehensive fire management plans to include evaluation of impacts and benefits to all resource areas that would allow some wildfires to burn within prescription to improve

mountain goat habitat on National Forest System Land. If prescribed burns to improve goat habitat in the Baker River Watershed are successful, evaluate the potential for similar prescribed burns between Loomis Mountain and the South side of Mount Baker.

## ***Sensitive Plants and Noxious Weeds Findings and Recommendations***

### **Sensitive Plant Findings**

There is a general lack of information on Sensitive plants in the two watersheds, due to the infrequency of projects in the area requiring botanical review.

It is likely many more Sensitive plants occur in the two watersheds due to abundant suitable habitat. A particularly noteworthy habitat type is the ultramafic rock which makes up Twin Sisters Mountain.

Generally, the seral stages are within the Range of Natural Variability and reflect the typical pattern of harvest in earlier decades, fire occurrence, and differing ownerships. Stands are outside the range in the late successional multi-story seral stage in the Middle Fork Nooksack reflecting primarily harvest history on both NF and private lands.

Connectivity for late-successional species between the Middle and South Forks is good.

Connectivity for late-successional species between the South Fork and the Baker Lake basin is currently poor due to past clearcutting at Wanlick Pass. Connectivity will improve over time, as these stands mature, and may be helped with stand treatments. Stand treatment direction comes largely from the Forest-Wide Late Successional Reserve Assessment (USDA 2001). Treatments should be pursued only if they are expected to accelerate the development of late successional stand characteristics more rapidly than without treatment. The stands in these two watersheds are considered a medium priority for treatment, on a Forest-wide basis.

Connectivity between the Middle Fork and North Fork is also poor due to past clearcutting in the Grouse Butte area. This will also improve over time, and may be helped with stand treatments. The Forest Wide LSR Assessment specifically mentioned treatment of mid successional stands in the Middle Fork Nooksack.

### **Sensitive Plant Recommendations**

- Conduct systematic surveys for sensitive plants.
- Harvest timber using the Forest-wide Late Successional Reserve Assessment objectives to improve connectivity for late-successional species.
- Noxious Weed Findings
- There is a general lack of information on noxious weeds in the two watersheds, due to the infrequency of projects in the area requiring botanical review.

### Noxious Weed Recommendations

- Conduct systematic surveys for noxious weeds.

### ***Fire History and Occurrence Findings and Recommendations***

With the exception of harvest units and high elevation stands, stand condition and fuel type within the analysis area are the result of several very large historic fire episodes. The last of these large fires occurred in about 1701. Given an absence of large scale fire or other disturbance in recent history, fuel conditions within the analysis area will increasingly trend toward those represented by FM 10 (Mature Timber). Lacking large scale disturbance, the proportion of the mature timber fuel type will continue to increase throughout the analysis area. This trend will increase the potential for large scale stand replacement fire.

### Recommendations

- Develop comprehensive fire management plans to include evaluation of impacts and benefits to all resource areas that would allow some wildfires to burn within prescription. Subsequently, implement Wild Land Fire Use for lightning caused fires in selected locations within the analysis area.
- If prescribed burns to improve goat habitat in the Baker River Watershed are successful, evaluate the potential for similar prescribed burns between Loomis Mountain and the South side of Mount Baker.

### ***Air Quality Management Recommendations***

- Visibility monitoring should be continued at Ross Lake and Snoqualmie Pass to track this important and sensitive AQRV, and to identify sources of visibility impairing pollutants near Mt. Baker wilderness and Nooksack Forks watershed.
- The Forest should also continue to work proactively with the Washington Department of Ecology to protect visibility in and near Mt. Baker wilderness through their pollution permit program.
- Lakes within the watershed should be sampled for chemistry although the Nooksack Forks watershed is probably a lower priority than other more sensitive areas of the Forest.
- Ozone concentrations in and around Mt. Baker wilderness should be monitored through installation of appropriate monitoring equipment at the Mt. Baker ski area. This site is as close as possible to wilderness conditions while still providing access to electrical power. Partnering with the National Park Service is recommended.
- Fire planning should include analysis of potential visibility impacts, especially in the case of utilization of fire for something other than ecosystem management in natural stands. Smoke from fires can cause significant human health impacts and any plans to use prescribed fire or

allow for natural fires should include analysis of smoke impacts in local communities. An action plan should be developed for use in the case of significant smoke impacts so we are prepared to adequately inform the public of events and modify our decisions at the time of a smoke episode. This could include a monitoring plan, coordination with other agencies (Department of Ecology, local health districts, Department of Emergency Management, etc.), public information packets, etc.

## ***Human Uses Findings and Recommendations***

### **Timber Management and Special Forest Products Findings**

The Matrix lands in the analysis area are not particularly suitable for timber management purposes due to the road access problem, the low value of existing timber, and relatively poor tree growing sites. Economically, it would be difficult to justify a timber sale in those areas.

- The amount of commercial timber sales has been dramatically reduced in the past decade.
- Timber harvesting practices have changed from the past clearcutting to intermediate harvesting now - usually a commercial thin.
- There have been approximately 4,760 acres of timber harvesting over the past nine decades which have created stands of variable ages and conditions.
- Many acres of densely stocked stands exist within these two watersheds due to past harvesting.
- Treatment of stands less than 80 years old may help meet some Late Successional Reserve (LSR) objectives sooner than if left untreated.
- There are opportunities for stand treatments in LSR in these watersheds, both for commercial thinning and non-commercial thinning. Such opportunities exist in stands less than 80 years of age. There are about 4,160 acres within these two watersheds under 80 years old.
- We do not know the quantities of potential SFPs (such as transplants, medicinal, or fungi) that could be available to the public.

### **Timber Management and Special Forest Products Recommendations**

- To meet future LSR objectives, non-commercially thin approximately 200 acres of stands 30-years-old and younger in the western hemlock and Pacific silver fir zone where stocking levels exceed 500 trees per acre. In the Pacific silver fir zone, post-thinning spacing between trees should not exceed 12 foot to maintain height growth.
- Conduct stand exams in mid-seral stands from 40 -70 years-old to determine if stem densities recommendations is the Late Successional Reserve Assessment. Perform commercial thins in stand found to have excessive stem densities.

- Where stand exams indicate an opportunity for future vegetation management, consider placing roads in storage rather than decommissioning roads.
- Conduct SFP surveys to determine the potential level of available forest products for the public.
- Conduct stand exams to determine if stocking conditions are predisposing stands to large-scale mortality due to insects and disease.
- Continue to monitor the watersheds for possible outbreaks of insect populations.

### Minerals Findings

Olivine production is economically viable in the Twin Sisters olivine formation, and olivine from this formation is of high quality and steady demand exists.

Geothermal energy resources exist in this area and have potential for development.

### Minerals Recommendations

- Provide for the continued mining of olivine while mitigating for impacts to other resources.
- Evaluate proposals for geothermal development outside of the Mt. Baker Wilderness while mitigating for impacts to other resources within the limitations of the Forest Plan. In 1990, evaluation of proposed geothermal development found potential conflicts with the Forest Plan in nearly all portions of these two watersheds.

### Road Infrastructure Findings

As road maintenance budgets continue to decline, it is necessary to reduce the length of the road system that is maintained. By decommissioning or placing roads in storage, maintenance costs are reduced. Some open roads in the analysis area are already brushed-in and undrivable due to lack of funding for road maintenance.

### Road Infrastructure Recommendations

- Alternatives for road management have been developed over the last two years by an interdisciplinary team and recently published in the Baker Lake and South Fork Nooksack River Access and Travel Management Environmental Assessment.
- One mitigation measure and possible alternative is for Whatcom County to take over maintenance of Road 12 from milepost 13.85 to 18.3 for the administrative use of maintaining the SnoTel site. Otherwise, the proposal is to decommission this road segment after allowing a period for an alternative SnoTel site to be calibrated with the existing one.

### Heritage Resources Findings

Heritage resources such as Park Butte Lookout contribute fundamentally to the delivery of quality recreation experiences and services to the public. There are other heritage resources in the

Nooksack Forks watershed that are not adequately inventoried and preserved due to the infrequency of projects in the area invoking Section 106 review.

### Heritage Recommendations

- Conduct systematic surveys for heritage resources.
- Continue to consult with Tribes and interested persons regarding the identification, evaluation and preservation of significant heritage resources.
- Consult with Tribes regarding their interests, resources and uses of the area, as well as physical characteristics that are relevant to traditional beliefs or practices.
- Pursue funding and partnership agreements that address the long-term preservation of the Park Butte Lookout.

### Wilderness Findings

Wilderness use is growing within the Mt. Baker Wilderness. However, the portion of wilderness within the analysis area, with the exception of the Elbow Lake area, does not receive high levels of visitation because of the lack of trail development and the overriding popularity of other areas within the wilderness. Human impacts on wilderness resources are minimal as a result. Elbow Lake sites have the greatest impacts, with 25 percent of the sites exceeding Forest Plan standards. The wilderness within the analysis area is patrolled by Forest Service employees infrequently due to budget constraints and higher priorities for patrolling other areas.

### Wilderness Recommendations

- Pursue funding or volunteers for wilderness patrol, monitoring and education.
- Support the proposed changes in the road system with the Baker Lake and South Fork Nooksack River Access and Travel Management Environmental Assessment, which would alter access from the end of Road 12 to the Pioneer Camp Trailhead. This change should reduce use, and therefore impacts, occurring at Elbow Lake.

### Trails Findings

Due to lack of funds, many trails are not maintained to standard.

The Elbow Lake Trail is the major stock trail within the analysis area. Approximately \$260,000 has been spent on capital improvements on this trail and the Bell Pass Trail since 1989. In October 2003, a major flood destroyed the stock bridge over the Middle Fork. The changes in stream channel conditions would require a 300-foot suspension bridge to span the river with an estimated cost of \$300,000 to \$400,000.

With the proposed changes in the road system with the Baker Lake and South Fork Nooksack River Access and Travel Management Environmental Assessment, access from the South Fork (Road 12) would be altered from the end of Road 12 to the Pioneer Camp Trailhead.

The Ridley Creek Trail is a stock trail in the analysis area that had been planned for reconstruction and relocation in the mid 1990s. Reconstruction of this trail was postponed until a future date. The natural log crossing over the Middle Fork was washed away in the 2003 flood, requiring fording of the river. A permanent bridge location for the Ridley Creek trail was identified during the initial trail reconnaissance. The cost of bridge construction is likely to equal or exceed \$200,000 to \$300,000.

The proposed relocation of Ridley Creek trail, the improved Elbow Lake Trail and the Bell Pass Trail would complete a 20-mile stock loop trail originating on Road 38.

### Trails Recommendations

- System trails should meet the primary objective and difficulty level assigned to them in the Forest Plan and complement the objectives of the management areas and ROS designation in which they occur. All system trails should meet assigned trail standards. In general, maintenance and reconstruction of existing trails should be emphasized over new construction unless new construction would fulfill an identified need.
- Trail reconstruction and maintenance priorities should address resource impacts, i.e. soil erosion/trenching, sub-alpine vegetation damage, and riparian vegetation damage around lakes, tarns, and streams. Projects that address impacts should be considered restoration opportunities.
- Evaluate trail bridge reconstruction or trail relocation opportunities for the Elbow Lake and Ridley Creek Trails in the Middle Fork Nooksack River, and propose improvements if warranted and funding is available.
- Evaluate the need for the Nooksack Flat Trail, the Three Lakes Trail, and the Ridley Creek Trail in the next Forest Plan.
- Continue annual trail maintenance on Elbow Lake, Blue Lake/Dock Butte, and Bell Pass trails. Continue semi-annual trail maintenance on Ridley Creek Trail following evaluation of its need. Trail maintenance activities will be based on funding and volunteer/partner opportunities.
- Continue to allow for snowmobile use on FS Roads 39, 36, 3610, 3620, 3630.
- Look for opportunities to construct loop trails within the analysis area to meet future demand, as called for in the Forest Plan.

### Dispersed Recreation Use Findings

Recreational uses in the analysis area include lake fishing, hunting, berry picking, mushrooming, cross-country skiing, scenic driving, camping, hiking, climbing, backpacking, snowmobiling and horseback riding.

Dispersed campers use spur roads and old skid trails along the valley bottom of the South Fork Nooksack River, designated camps within the NRA, and various trail end lakes and viewpoints within the analysis area. Approximately 31 dispersed camp sites have been inventoried at 13 locations. Two climber camps with approximately 54 campsites are found on the slopes of Mt Baker.

#### Dispersed Recreation Recommendations

- Consider an inventory of dispersed sites and general recreation use. Consider developing a plan to control dispersed site impacts as needed.

#### Developed Recreation Findings

There are currently five developed trailheads and the historic Park Butte Lookout within the analysis area. One, the Elbow Lake Trailhead, will be removed with the proposed closure of the end of Road 12 with primary access to the Elbow Lake Trail from the South Fork side relocated to the Pioneer Camp Trailhead. The two trailheads in the Middle Fork will likely have reduced use due to the loss of bridges during the floods of 2003.

#### Developed Recreation Recommendations

- Upgrade and maintain Pioneer Camp Trailhead. This would likely include some or all of the following: brushing, gravel placement, signs, hitching posts, traffic control barriers, bulletin board, and trailhead register.
- Consider providing sufficient amenities at Pioneer Camp Trailhead to include it in the Northwest Forest Pass Program. Add Ridley Creek and Elbow Lake Trailheads in the Middle Fork area back into the program if the trails and bridges are reconstructed in the future. This could include garbage collection, toilets, picnic tables, and law enforcement patrols.

### **Mitigation of potentially conflicting recommendations**

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- There is a potential conflict between the need to decommission spur roads and continuing to provide for dispersed camping opportunities. Decommissioning of spur roads should leave a small portion of the road intact to allow sufficient area for dispersed camping off of the main road.
- Geothermal development has the potential for impacts to plant and wildlife habitat, water quality, and fisheries. Mitigation would be identified on a site specific basis through the appropriate environmental analysis and documentation process.
- Evaluate trail bridge reconstruction or trail relocation opportunities for the Elbow Lake and Ridley Creek Trails in the Middle Fork Nooksack River. At the Ridley Creek Trail crossing, the channel is wide, with coarse bedload (cobble to small boulder). The channel is subject to periodic flooding and outburst flows from glacier upstream. Recommend minimum elevated span 15 feet above the channel bed or use unimproved stream crossing. At the Elbow Lake

Trail Crossing, the channel is wide, with coarse bedload (cobble to small boulder) and alder trees. The channel is subject to periodic flooding and outburst flows from glacier upstream. In October 2003, debris dams formed and then broke creating surge flows, which isolated the recently built trail bridge. The crossing is now over 250–300 feet wide and would require an elevated bridge to be above the debris jam formation.

**Figure 24 Middle Fork Nooksack - Ridley Creek Trail Crossing**



## **Projects benefiting multiple resources**

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- Conduct stand exams to identify areas for commercial and non-commercial thinning to benefit plant and animal habitat and watershed conditions.
- Develop a fire use plan to benefit goat and elk habitat and reduce the probability of large, stand-replacing fires.
- Controlling water and erosion on the degraded portions of the Ridley Creek trail would benefit trail quality, wilderness experience, and aquatic resources. Alternatives could include reconstruction, relocation, or decommissioning of the trail, but in all cases some structures are needed to control water and prevent further erosion.
- Evaluate instream large wood in the analysis area to identify where augmentation projects would benefit stream channel conditions and fish habitat.