Management Plan
Skagit Wildlife Mitigation Lands

Seattle City Light 2006

Management Plan

Skagit
Wildlife Mitigation Lands

Project Manager
Beth Blattenberger
Environmental Affairs Division
Seattle City Light

with oversight provided by the
Wildlife Management Review Committee

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Acknowledgements

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Seattle City Light	Harris Martin

INTRODUCTION

This Management Plan supports Seattle City Light's (SCL's) obligation to address the long-term protection and management of lands purchased pursuant to its Federal Energy Regulatory Commission (FERC) license for operation of the Skagit River Hydroelectric Project (FERC Project No. 553). The *Settlement Agreement Concerning Wildlife* (hereinafter simply *Settlement Agreement*) laid out SCL's overall Skagit mitigation requirements for land acquisition and management, and incorporated a *Wildlife Habitat Protection and Management Plan (Wildlife Plan).* This Management Plan supplements but does not replace the *Wildlife Plan*. The *Wildlife Plan* was prepared before any land had actually been acquired. Since that time, management challenges have become more apparent and need to be addressed in light of new information and experience.

The *Settlement Agreement* was signed in 1991 after extensive negotiations between SCL and the Skagit license intervenors. It was intended to address the effects of the Skagit Project on wildlife resources, including effects of inundation of over 12,000 acres of land by reservoirs, especially Ross Lake, and the absence of flows in the Gorge bypass reach. It is one of a number of Settlement Agreements, another one of which addresses fisheries resources. The *Settlement Agreement* addresses primarily terrestrial wildlife. Nevertheless, the lands acquired under this program also provide benefits to plants and to fish. Potential measures to improve fish habitat were not included in the original *Wildlife Plan* but are included in this report.

The *Wildlife Plan* provides the following general guidance regarding management (page 4-1):

> The primary purpose for the acquisition and management of the wildlife habitat lands is to benefit wildlife. In general, management is intended to be minimal or low-intensity, and directed towards habitat acquisition and preservation. Furthermore, the management of these wildlife lands shall be consistent with tribal rights. . .
>
> Pursuant to the Settlement Agreement, lands were purchased in the South Fork Nooksack and Skagit River basins from 1991 to 2003. Additional lands may also be acquired in the future. All lands acquired under this program, whether currently in SCL's ownership or acquired in the future, are referred to in this document as 'Mitigation Lands.'

PURPOSE AND SCOPE

The purpose of this plan is to outline the process through which the lands will be managed and to provide for their long-term protection. The plan provides policy guidance on major issues, including:

- the quantity of funds to be kept in reserve during the 30-year term of the license for maintenance, security, enhancement, emergency response, and other contingencies;
- types of activities that will be allowed on the properties, consistent with adopted goals and objectives; and
- procedures to be followed to ensure that SCL meets the intent of the wildlife-mitigation component of the Skagit license.

The plan addresses all aspects of land management related to the Mitigation Lands, both administrative and habitat-related. Administrative activities include monitoring, public use (including hunting), road management and abandonment, fire management, cultural-resource protection, use of land for research, future data acquisition and reporting. Habitat management involves protection and enhancement of the natural features on the properties.

Supporting Documents

Two earlier phases of work led to the development of this plan.

A *Scoping Report* (Foster Wheeler Environmental Corporation 2000) stated the ensuing plan's goals and objectives, provided preliminary resource data on the Mitigation Lands and surrounding lands, identified data gaps, and identified issues and concerns.

A *Data Acquisition Report* (Foster Wheeler Environmental Corporation 2001) provided detailed information on the existing condition of SCL's lands and on the general condition of the surrounding lands. Habitat conditions such as vegetation, fragmentation, and connectivity are described, and species-specific analyses are presented. Both terrestrial and aquatic systems were assessed.

Since the *Data Acquisition Report* was prepared in 2001, it did not fully account for lands acquired in 2002 and 2003. Those later acquisitions are adjacent to previously acquired Mitigation Lands. Because the *Data Acquisition Report* included analysis of adjacent lands (although ground-truthing was not done for adjacent lands), it has been possible to incorporate habitat information on the 2002 and 2003 acquisitions into this plan. Information from the *Data Acquisition Report* has been further updated with 2004 data received from the Department of Fish and Wildlife on sensitive species and habitats.

LAND ACQUISTIONS

By the end of 2003, SCL acquired over 8,000 acres located in the South Fork Nooksack and Skagit River basins (Table 1 and Figure 1). The total is given as an approximate number for two reasons. First, property lines have not all be surveyed. Acreage is in many cases based on assessor records and may not be accurate. Second, some parcels boundaries are affected by changes in rivers and streams. The flooding in October 2003 altered many properties on the Skagit and Sauk rivers. Acreages given in tables elsewhere in this document may differ somewhat from those in Table 1 because those acreages are based on analysis done using Geographic Information Systems rather than assessor or other records used for Table 1.

Decisions regarding acquisition have been made by consensus of representatives of the license intervenors working together in the Land Acquisition Group (LAG). All parcels are situated within Skagit County, Washington, except the Dan Creek and Everett Creek parcels, both of which are located in Snohomish County, Washington. The properties are summarized in Table 1. Geographically isolated or unique parcels are discussed individually, while others with similar habitat features are organized into parcel groups.

SCL may purchase additional Mitigation Lands in the future or may be the recipient of land from the DNR pursuant to the state's Trust Land Transfer Program. SCL may accept DNR lands if the LAG agrees that these lands complement other Mitigation Lands and SCL can afford a higher level of protection to the land.

Management of any new parcels will be consistent with the approach laid out in this plan. Habitat conditions will be assessed, management opportunities will be identified, and management recommendations will be devised. Further, the programmatic goals and conditions presented in this plan will apply to all future acquisitions.

Table 1: Mitigation Lands

Parcel/Group	Acres	Township, Range	Section	Elevation (ft. above sea level)	Description
S. Fork Nooksack	**4,031**				
• S. Fork Nooksack	3,871	T36N R6E T36N R7E	12, 13, 14, 15, 22, 23 2, 8, 10, 11, 15, 16, 17, 18, 20, 21	800-3,400	• Land on both N and S sides of 8-mi-long section of river
• Bear Lake	160	T36N R7E	9	3,200-3,900	• Accessed by trail only
S. side of Skagit R.	**3,843**				
• Illabot South	2,513	T35N R10E T34N R10E	25, 26, 27, 34, 35 2, 3	300-4,000	• North-facing mountainside west of Marblemount, some recently clearcut
• Illabot North	745	T35N R10E	22, 23, 26, 27	260-300	• Many wetlands; partly on Skagit R; includes SCL transmission ROW
• Barnaby Slough	217	T35N R10E	29, 32	250	• Between Illabot Cr. and SR 530; WDFW fish-rearing facility
• Lucas Slough	207	T35N R10E T35N R9E	31 36	230	• Between Illabot Cr. and SR 530; small amt. on Skagit R.
• Napoleon Slough	61	T35N R9E	35	220	• Between SR 530 & Sauk R.; small amt. on Skagit R.
• McLeod Slough	100	T35N R9E	33, 34	210	• W. of Sauk R., small amt. on Skagit R.; some agricultural land (hay)
N. Side of Skagit R.					E. side of Bacon Creek on SR 20 between Marblemount and Newhalem; gravel pit
• Bacon Creek	**120**	T36N R11E	21	400-1,000	
Sauk River	**383**				
• Sauk Island	45	T33N R10E	32		Adjacent to Sauk R. between Darrington and confluence of Sauk and Suiattle R.
• N Sauk	50	T33N R10E	32	400-440	
• Everett Creek	250	T33N R10E T32N R10E	32 5		
• Dan Creek	38	T32N R10E	8		
TOTAL	**8,377**				

MANAGEMENT FRAMEWORK

Land management decisions are guided by a committee representing Skagit license intervenors and are constrained by a budget and by regulatory guidelines. This management framework is described in the following sections.

Management Responsibilities

The *Settlement Agreement* called for convening a Wildlife Management Review Committee (WMRC). Organizations represented on the committee are the Washington Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, the U.S. Forest Service, the North Cascades Conservation Council (non-voting member), the National Park Service (North Cascades), and the three Skagit tribes (Upper Skagit, Sauk-Suiattle and Swinomish). SCL chairs the committee. The *Wildlife Plan* describes WMRC responsibilities as follows (pages 2-1 and 2-2):

> "The WMRC will review the implementation of the Wildlife Plan (except for the initial acquisition of wildlife lands), assess its progress and the results of management activities and programs, and review and comment on the City's reports on the Wildlife Plan and its components and measures . . .
>
> "The WMRC will review and approve the habitat enhancement planning for the Nooksack area and elsewhere . . . The WMRC will also provide guidance and direction should problems arise . . . , or in response to advances in the theory and practice of wildlife management. The WMRC may direct that minor changes be made in the measures and activities of the Wildlife Plan in response to problems or to best meet the needs of the wildlife."

SCL will convene the committee annually at the beginning of each year (or more frequently if needed), either in person or by teleconference, to discuss potential or planned management actions for the upcoming year and their associated costs. SCL will maintain a written record of comments, assessments and recommendations of the WMRC and will report to the WMRC on any follow-up actions. At the end of each year, SCL will prepare a report for distribution to the WMRC outlining management actions taken over the course of the preceding year, including a budget status report (see discussion below in *'Set-Aside for Management'*).

Decisions of the WMRC are to be by majority vote of the voting members, unless there is a dispute regarding compliance with the *Settlement Agreement*, in which case a decision must be unanimous. If agreement cannot be reached by the WMRC, the committee may refer the matter to policy-level administrators in each organization. If the policy representatives cannot reach unanimous agreement, the next step is referral to the Federal Energy Regulatory Commission in accordance with *Settlement Agreement* provision 4.1.3.

SCL is fee-simple owner of all the Mitigation Lands and is ultimately responsible for their management. SCL will manage the lands in accordance with the guidance of this plan and of the WMRC. However, SCL is not obligated to take actions that could result in a financial liability

to SCL beyond the financial commitment of the *Settlement Agreement*; that would conflict with provisions of the *Settlement Agreement*; or that would otherwise be in conflict with applicable law or an official policy direction of the City.

In case of any uncertainty regarding management responsibilities and procedures, the provisions of the *Settlement Agreement* take precedence over this management plan.

Management Strategy

In consultation with the LAG and WMRC and in accordance with the stated intent of the *Wildlife Plan* (Section 4.2, page 4-1), SCL has adopted a low-intensity management strategy for the Mitigation Lands. The budget for the land acquisition/management program is combined for both activities (i.e., if funds are used for management, a lesser amount is available for acquisition), and the LAG decided to direct the majority of program funds toward acquisition. A major reason for this decision was the acknowledgement that, while grants and other funds are more often available for land purchases that benefit fisheries resources, funds are not often available for purchasing land for the benefit of terrestrial wildlife.

Under this plan only activities of an essential nature, such as site condition monitoring, trash removal, regulatory requirements, emergency response, etc., will be implemented using program funds. Management opportunities to enhance habitat may be undertaken with grant funds by other agencies, tribes, or conservation groups. SCL may also pursue grants to support implementation of selected habitat-enhancement projects.

In consideration of the foregoing, the parcel-specific section of this plan includes a discussion of management activities that SCL and the WMRC consider acceptable for the properties; however, such activities are considered optional and their implementation is not a binding obligation under this plan. An exception is management that would restore habitat from a currently degraded state or arrest conditions that are actively causing degradation.

Budget and Spending

In the *Settlement Agreement*, SCL committed to spend $17,000,000 in year 1990 dollars* for acquisition and management of land for the benefit of terrestrial wildlife. This is a capped amount and is roughly equal to $26.1 million in year 2005 dollars. Of the total commitment in 1990 dollars, roughly $15.9 million had been spent by the close of 2005, leaving $1.1 million available for future activities (roughly $1.7 million in 2005 dollars).

The *Settlement Agreement* also provided for spending of up to $20,000 in 1990 dollars (about $30,700 in 2005$) for cultural resource surveys on Mitigation Lands. This amount is in addition to the $17 million and is not to be spent if cultural resource surveys are not needed. Should cultural resources surveys exceed this cost, it would be necessary to use a portion of the $17 million. To date, no cultural resource surveys have been conducted on Mitigation Lands.

Set-Aside for Management

The FERC license period throughout which SCL must manage the Mitigation Lands extends until May 2025. To ensure that adequate funds will be available through this entire period, SCL and the LAG have agreed to set aside a portion of the program funds for future management. Exceptions may be made for very-low-cost acquisitions such as DNR land transfers. Conservative estimates for future management have been used to prevent SCL from exceeding the cap.

Every five years beginning in 2009 SCL will review progress on spending to evaluate whether a portion of the management set-aside should be released for acquisition purposes. This date was chosen because it is the regulatory deadline for decommissioning of forest roads, including possible removal of a large concrete bridge over the South Fork Nooksack River on SCL's property. Given the uncertainties related to bridge removal and the potential for high associated costs, SCL and the LAG will not be able to determine if releasing funds for further acquisitions is prudent until most obligations for road and bridge decommissioning have been met. Should that occur sooner than 2009, the schedule for assessing availability of funds for future acquisition may be adjusted accordingly.

Spending Priorities

As stated above, only those activities considered essential for land management, required by law, or those of a critical habitat nature will be implemented by SCL. Activities that fall into this category are shown in Table 2.

Many of the items listed in Table 2 involve uncertainty regarding their occurrence and their cost if they do occur. Therefore, it is not possible to estimate in advance the amount of funds that will be required for management. In order to keep the WMRC apprised of all spending requirements for this program, SCL will report all potential and planned land-management activities and their associated costs at the annual planning and reporting meeting.

* The amount in dollars of other years is recomputed to allow for inflation when the Consumer Price Index for that year is available.

Table 2: High-Priority Land-Management Activities

Activity	Justification	Timing	Approximate Cost
Site monitoring	To identify problems on properties	Regularly through 2025	$5,000 per year
Maintenance or replacement of gates	To prevent unauthorized activities	As needed	$5,000 per gate replacement
Trash removal (incl. abandoned cars)	Safety, environmental protection	As needed	$200 - $4,000 per event
Photo documentation of properties	To support grant requests for enhancement and/or restoration	As needed	$500 per project
Bacon Creek gravel pit closure	Repair disturbed site condition	2005-2007	Third-party obligation
Cultural resource inventory	Legal requirement to protect cultural resources	When ground-disturbing activities are planned	Separate funds available
Culvert replacement	Fish passage and protection of aquatic systems	As needed	$1,000 - $10,000 per replacement
Road abandonment	Required by WA Dept of Natural Resources (DNR)	By the end of 2008	$20,000
Road maintenance	Required by DNR	As needed	$1,000 per mile per year on average
Removal of S.F. Nooksack bridge	Required by DNR	By the end of 2008	Estimated at $350,000 or more
Hazardous or toxic waste disposal and/or remediation	In case of illegal dumping	As needed	Cost unknown
Fire response	Replanting or other habitat restoration	As needed	Cost unknown
Pest control		As needed	Cost unknown
Title insurance, documentation, resource habitat plans and other misc. costs	In case of Trust Land Transfer from DNR	Unknown	$10,000-$20,000 per parcel
Aerial photography	Document changed conditions	After major events or by 2015	$5,000 each time

Legal Requirements

SCL's ownership and management of the Mitigation Lands shall be consistent with all applicable law, including reserved tribal rights, the Endangered Species Act, the Clean Water Act, the National Historic Preservation Act, the Washington Forest Practices Act and their implementing regulations.

In particular, nothing in this Plan or in the plans, memoranda, procedures or other actions taken to further the purposes of this Plan shall reduce or otherwise impair access to and exercise of implied or explicit Indian rights, including hunting, fishing and gathering rights, reserved by the Treaty of Point Elliott. By signing onto this Plan and participating in the WMRC no tribe has, nor shall be deemed to have, made any admission or waived any contention of fact or law with respect to its treaty-reserved rights in any judicial, quasi-judicial or administrative proceeding. No party shall offer this Plan in any judicial, quasi-judicial or administrative proceeding as evidence of such. The City acknowledges the government-to-government relationship with the tribes. Therefore, in addition to the tribes' participation on the WMRC, the tribes may also deal directly with the City on issues of concern to the tribes.

The City and the tribes agree that exercise of the tribes' reserved rights will take place in a context of mutual respect and trust and will be based on a mutual concern for sustainable practices. The parties are committed to open communication, with the understanding that the expectation of communication is not intended to be burdensome to the tribes in the exercise of their rights or to the City in its land management responsibilities, and with the further acknowledgement of the confidential nature of many tribal cultural practices.

The *Wildlife Plan* (4.2.4) states that the City will not arbitrate differences between the regulatory agencies and tribes; any such differences will be resolved by the agencies and tribes themselves.

ADMINISTRATIVE MANAGEMENT

Administrative-management actions are designed to protect the values and goals of the Skagit Land Acquisition and Management Program as well as to minimize liability to SCL that could arise as a result of ownership of the Mitigation Lands.

Site Condition Monitoring

Regular visits to the Mitigation Lands are necessary to monitor conditions. Ownership of remote lands has risks of illegal activity associated with it including tree or wildlife poaching, squatters taking up residence, installation of drug labs, dumping of trash, etc. Habitat damage can be caused by fire, saturated soils associated with blocked culverts and other natural or human-induced events. At the outset of this plan, SCL will have most Mitigation Lands inspected twice yearly, at a minimum, and after all major storms. Parcels that are not accessible by road may be inspected annually. The WMRC may reassess the appropriate frequency of parcel visits in the future. Currently, an SCL employee is monitoring site conditions; this task may be contracted out in the future if the staffing burden exceeds SCL's obligation in the *Settlement Agreement*.

Site visits will include, as a minimum, driving all driveable roads on the parcel or on its perimeter to check the condition of roads and culverts and look for signs of illegal activity or habitat damage. After each inspection, there will be a brief written report. Appendix A includes a sample format for reporting site visits. If it appears that illegal activity has occurred, SCL will contact the appropriate regulatory authorities. If it appears that wildlife habitat has been harmed and/or there is a need for road repair, SCL will consult with the WMRC regarding appropriate action.

Road Maintenance and Abandonment

Washington Forest Practices Rules in effect since 2001 and administered by the DNR require landowners with more than 500 acres of forest land to develop and implement Road Maintenance and Abandonment Plans (RMAPs) for roads on their land. Roads must either be maintained or be abandoned (decommissioned). If roads are maintained, they must be brought up to standards that may involve replacement of undersized culverts. DNR standards apply to decommissioning and require roads to be made inaccessible to 4-wheel highway vehicles. Decommissioning also involves removing culverts, reopening stream channels and correcting drainage patterns that could result in harm to fish and/or damage to hillsides. Where roads are identified for abandonment, work is to be completed by 2008.

An RMAP was developed for the Mitigation Lands and approved by the DNR in 2002. Since maintenance involves long-term recurring expense and because the presence of roads is detrimental to wildlife, the only roads that will remain open are those for which other parties hold rights of access; most of the roads on the Mitigation Lands are planned for decommissioning.

Appendix B lists roads on SCL land and plans for decommissioning. Prior to implementing such plans, SCL shall consult with the tribes.

Public Use[1]

Public use of the Mitigation Lands is allowed as long as such use does not compromise habitat or species values and does not involve commercial gain. Removal of any naturally occurring material from the site is permitted only in minor amounts without habitat impact. Overnight camping, campfires, firewood gathering and Christmas tree cutting are not allowed. The WMRC may recommend revisions to this policy if problems arise with its implementation and/or it turns out to be inadequate to protect habitat.

Vehicle access will be restricted to the extent feasible. Motorized vehicles have adverse impacts to wildlife and water quality; in addition, vehicle access enables trash dumping and other undesired activity. On roads that have not been abandoned, access will, where possible, be controlled with gates.

Fishing and hunting are generally permitted on the Mitigation Lands, as regulated by WDFW and the Tribes. The WMRC may recommend exceptions to SCL. Reasons to restrict hunting by the public may include:

- Public safety, because of the proximity of housing or other human activity;
- Evidence that hunting has unacceptable adverse impacts on wildlife populations, including wildlife other than the species being hunted; and/or
- Conflicts with other uses (for example, hunting could scare away wildlife from an area intended for public viewing).

If the WMRC recommends a restriction on hunting, the reason will be clearly stated so that the recommendation may be reconsidered if conditions change. The WMRC will take into consideration the method and cost associated with any hunting restriction, such as posting or patrolling lands. SCL will notify the co-managers (WDFW and the tribes) of its concerns.

Easements and Special-Use Permits

Most of the Mitigation Land parcels are subject to third-party easements. These are legal agreements that must be honored through their full term. Most easements allow the easement holders to gain access to their properties across SCL's property. In some cases, SCL has easements over land owned by others in order to access Mitigation Lands. Easements may have associated provisions for allocation of maintenance responsibilities.

Some parcels were acquired under terms that allowed previously existing uses to continue, including haying, fish rearing and operation of a gravel pit. These agreements will be reevaluated near the time of their expiration, and activities that conflict with other purposes of the Mitigation Lands may be discontinued. SCL will not grant new easements or special-use permits for uses that are incompatible with this Management Plan.

[1] The word "public," as used in this plan, does not include the Tribes, which are sovereign entities in their own right, or their members.

Fire Management

Because lands adjacent to the Mitigation Lands are generally managed as commercial timberlands or used for private residences, SCL has chosen not to take a "wait-and-see" or "let-it-burn" fire-management approach. If a forest fire were to ignite or spread onto the Mitigation Lands, SCL would ask the DNR to respond to the fire, without waiting to first consult with the WMRC. SCL pays a mandatory fire assessment to the DNR for forest-fire response. This cost has not come from the budget for Mitigation Lands because of the administrative difficulty of allocating portions of the cost to various SCL lands. Increased patrols during periods of high fire danger may be warranted in certain locations.

Prescribed burns for habitat management may be undertaken after careful review by the WMRC. See the habitat-management section for further discussion.

Cultural Resource Protection

Habitat-management activities could inadvertently cause damage to cultural resources located above or below ground on Mitigation Lands. To prevent such damage, before any ground-disturbing activities will be allowed, SCL shall consult with the tribes. If the tribes identify the location as having potential cultural significance, or if there is any other reason to believe cultural resources may be present, SCL will arrange for a cultural-resource reconnaissance survey by a qualified professional. This may include records searches, consultation with affected tribes and/or assessments by a qualified archaeologist (selection of a researcher will be made in consultation with the affected tribes). If cultural resources are found or anticipated to be near a proposed activity, SCL, in consultation with any affected parties, will develop a plan to prevent or minimize impacts. If cultural resources and/or human remains are discovered in the course of ground-disturbing activities, SCL shall require work to be immediately halted and shall immediately contact the tribes and initiate consultation for determining subsequent actions.

Scientific Research

Scientific research may be conducted on Mitigation Lands provided the proposed activity does not compromise the habitat and wildlife values for which the property is being preserved, and after review and approval by both the WMRC and the Wildlife Research Advisory Committee. Further, the WMRC may recommend funding scientific research on the Mitigation Lands if it decides such research would provide a management benefit to the lands or the wildlife using those lands. Such research funds would come out of the program's capped acquisition/management budget.

Data Acquisition

From time to time it may be appropriate to update information on the Mitigation Lands. This could include some or all of the following activities:

- Request for new information on occurrence of sensitive species and habitats from the Washington Department of Fish and Wildlife (data received in August 2004), the Skagit River System Cooperative or the tribes

- Updates to information on ownership of adjacent lands
- Aerial photography (color photos of all Mitigation Lands taken under SCL contract in July 2000 at 1:8,000, and of Skagit lands in August 2001 at 1:4,620) to show changes in stream channels and vegetative cover, including on adjacent properties.
- Stream surveys for sediment, woody debris, macroinvertebrates.
- Forest surveys to count snags, downed logs, and species and age distribution
- Other special-purpose field work to identify habitat or presence of species of concern

Consideration should be given to updating Tables 3 and 4 in this Plan in the event of a major disturbance such as a forest fire, or at a minimum every 20 years.

Where possible, SCL will obtain photos and data collected by others using other funding sources.

Reporting

FERC considers the Mitigation Lands to be part of the FERC-licensed project, and requires SCL to update the maps in Exhibits J and K of the license when new lands are acquired. Since this was last done in September 2000, a new FERC submittal needs to be prepared in the near future and after any subsequent acquisitions. The Settlement Agreement requires SCL to submit reports to FERC after review and approval by the WMRC; these submittals are to be annual for the first 5 years of the license and at least every five years thereafter.

In additional to the FERC submittals, SCL will prepare an annual report for the WMRC on the previous year's activities and present a plan and budget for the following year.

HABITAT MANAGEMENT

As has already been discussed in the description of the overall management strategy (page 8), SCL will take a low-intensity approach to management and will direct most of the funds towards habitat acquisition rather than alteration. Where SCL Mitigation Lands funds are used for habitat improvement, priority will be given to actions that would restore habitats from a currently degraded state or would arrest conditions that are actively causing degradation. Many of the potential actions discussed below are included in this report only because they may be proposed by others using other funding sources. Conditions that must be met in order for other potential management actions to be considered include the following:

- Consistency with other management or recovery plans, such as species conservation plans;
- Protection of well-functioning habitats from degradation; and
- Management for diversity of habitat types and native species, taking into consideration the context of SCL's lands in the larger landscape.

The goal, conditions, management opportunities, and priorities incorporated in this plan are meant to be flexible and may change over time as more information on the properties is collected and as species' needs change.

The WMRC recognizes the importance of all native species to the balance of a well-functioning ecosystem. Consequently, habitat management is intended to take into account the needs of all species, especially those that may be threatened or endangered. The WMRC may choose to give special consideration to species in decline even if they have not yet received federal or state recognition as threatened or endangered. Projects that are primarily intended to benefit one or a few species may be undertaken as long as they do not adversely affect other species of concern.

Because SCL does not intend to implement many habitat projects itself, prioritization of possible activities is not a necessary element of this management plan. Other agencies, tribes, or conservation groups may propose to conduct habitat restoration or enhancement projects on the Mitigation Lands to improve conditions in either of the two river basins. Rather than prioritize which projects will be conducted, the role of this management plan is to specify the priority species and habitats for each parcel and to outline the range of actions that are considered acceptable in support of those priority species and habitats. When proposals for work on Mitigation Lands come before the WMRC, the WMRC will evaluate them based on their compatibility with the opportunities identified here.

While management for the greatest diversity of wildlife species is the goal (for species associated with a specific habitat type), a handful of "indicator" species were selected to guide terrestrial wildlife management regimes. They are: pileated woodpecker, elk, bald eagle, and red-legged frog. These species have been identified by various agencies as critical species or as species that are representative of key habitats or habitat features. If these species' life-history needs are satisfied, the same habitat elements will be provided for other important species.

Examples of the kinds of activities that might be undertaken or allowed are listed below.

Old-Growth Acceleration

The goal of habitat diversity in the context of the larger landscape is intended to recognize the increasing scarcity of old-growth habitat, which is important to many native species. A majority of the parcels acquired by SCL were formerly managed for resource-extraction purposes (including timber harvest and mineral extraction). These past practices have effectively set back the natural processes that would have occurred had there not been such intrusion. SCL would consider allowing actions to hasten the progress of the lands toward reaching a mature state, should opportunities be identified with little-to-no cost or other adverse impact. Long-term monitoring of results compared to control stands would be required.

At the same time, activities that interfere with the maturation of established conifer forests will be discouraged. The benefits of old-growth-acceleration measures are less clear for naturally regenerated stands and diminish for all stands as they grow older. The WMRC will evaluate any proposal on a case-by-case basis, taking into account the age and history of the stand.

Prescribed Burning

Fire has been used by native peoples in the Northwest for many years to maintain openings in the forest that provide good deer and elk habitat. Controlled burning has also been used to reduce the likelihood of future major fires and to promote certain plant species that need fire as part of their life cycle. Prescribed burning was recognized in the *Wildlife Plan* in the *Settlement Agreement* as a possible strategy for the Nooksack lands, in clearcuts less than 20 years old. The need for careful control is obvious, and intentional burning should not be used in areas with scarce mature habitat. SCL and the WMRC will evaluate proposals for prescribed burning on the Mitigation Lands in light of the other goals described in this document, and will require a burn plan with appropriate precautions and best management practices that complies with all applicable regulations, including permitting.

Pest Control

Periodic insect or disease outbreaks such as the hemlock looper outbreak in the Skagit Basin in the 1990s are a natural part of the ecosystem. Alterations to natural processes because of human activities can also contribute to insect and disease outbreaks. SCL will not take routine measures to control disease. If a serious outbreak occurs in the future, SCL will consult with a qualified forest entomologist and the WMRC to determine whether any treatment is warranted.

Noxious Weed Control

Non-native invasive plant species such as reed canarygrass, Himalayan blackberry and Scotch broom are common throughout the Northwest and occur on the Mitigation Lands. Japanese knotweed is common in the Skagit and Nooksack watersheds and may occur on the mitigation lands although at year-end 2005, no locations are known. Spread of these plants may choke out native plant species and be detrimental to wildlife food sources or other habitat requirements. Eradication and control are extremely difficult and require cooperation of adjacent landowners.

SCL is a party to the Memorandum of Understanding (MOU) for the Skagit River Cooperative

Weed Management Area, a multi-agency agreement to prioritize areas for weed control and exchange information on methods. SCL does not have plans for weed management on the Mitigation Lands at this time, but will observe non-native species as part of routine site monitoring. Any proposals for future weed management will be evaluated in consultation with the WMRC and, if in the Skagit watershed, in light of the priorities and methodology recommended by the parties to the MOU.

The Wildlife Plan (5.6.5) allows for limited use of herbicides by spot spraying under controlled circumstances. SCL has been cooperating with The Nature Conservancy and others in an effort to eradicate Japanese knotweed in the Skagit watershed through treatment with Rodeo (glyphosate). If Japanese knotweed is found on the Mitigation Lands, SCL will spray or allow spraying by others.

Snag and Downed-Log Creation

Snags are important habitat for cavity-nesting birds. On some of the Mitigation Lands, an increase in snag density could be beneficial. Snags can be created fairly easily by girdling and topping trees. These trees eventually fall over and add downed logs. Any proponent will be required to demonstrate the advisability of artificially induced snag/downed-log creation on a site-by-site basis.

Riparian Enhancement

Riparian habitat may be improved on some of the Mitigation Lands by conifer release and/or tree and shrub planting. Trees increase stream shading for temperature control, protect banks from erosion and create woody debris recruitment opportunities and wildlife cover and other fish and wildlife benefits. Riparian vegetation filters runoff from adjacent land before it enters streams.

Releasing conifers by cutting back adjacent vegetation can promote their growth and eventually increase recruitment of large woody debris (LWD).

Monitoring of Habitat Projects

Monitoring is essential for successful management. A detailed monitoring plan was not prepared as a part of this management plan because, unlike some types of management plans, it is not SCL's intent to implement all of the management opportunities. However, if SCL or another entity undertakes habitat management activities on the Mitigation Lands, the WMRC should ask to see a monitoring plan and evidence that funds are available to carry it out. It may be appropriate to require a performance bond. The following types of monitoring may be applicable:

Compliance/Implementation Monitoring

Compliance or implementation monitoring assesses whether a project was implemented according to design and implementation specifications. Protocols for monitoring would be developed as part of a given project plan.

Based on the types of management opportunities identified in this plan, the following types of compliance monitoring might apply. Several of these monitoring activities could be completed in conjunction with effectiveness monitoring:

- Surveys of stands that receive vegetative manipulation following treatment to determine if vegetation was treated as designed.
- Surveys of stands that received snag creation after project completion to determine if snags were created as specified.
- Surveys of roads that have been closed to ensure that the road closure techniques were implemented as planned and/or that erosion control structures were installed as designed.
- Surveys of forage units created for elk to determine if the treatments were implemented as planned.
- Riparian corridor surveys to determine if desired riparian widths have been created/maintained.

Effectiveness Monitoring

Effectiveness monitoring is used to determine whether a project was successful in achieving the desired objectives. Examples include:

- Monitoring created snags to see if cavity nesters are using them.
- Monitoring treated stands at years 1, 5, and 10 to determine whether treatments have been effective in creating the desired stand conditions.
- Assessing elk herds to reveal if projects are actually increasing elk numbers and allowing bull/cow ratios to reach desired goals.
- Conducting surveys to assess whether fish passage projects have successfully opened additional habitat for fish.
- Conducting stream sediment monitoring to determine if fine sediment levels have decreased after roads have been abandoned and revegetated or to determine whether erosion control measures on open roads are functioning as planned.
- Conducting temperature monitoring to determine the effectiveness of riparian corridors for providing shade.
- Conducting LWD counts to determine the effectiveness of riparian corridors in providing LWD.
- Conducting channel surveys (cross-sections) to determine if bridge removal has been effective in creating desired channel conditions.
- Conducting surveys of fish use and distribution and for aquatic macroinvertebrates to determine whether management actions and policies are improving the ecological health of the aquatic system.

It may not be necessary to undertake independent effectiveness monitoring if the level of certainty in effectiveness associated with a particular management action is high.

Validation Monitoring

Validation monitoring is the process of testing assumptions that underlie management decisions.

Similar to effectiveness monitoring, validation monitoring is usually completed as part of a research project; therefore, implementation of validation monitoring would be dependent on the type of project that is implemented.

For terrestrial species, validation monitoring would likely occur at the parcel or parcel-group scale. An example of this type of monitoring would be to gather data to determine the validity of the assumption that creating snags improves woodpecker habitat.

For aquatic species, validation monitoring would likely occur at the watershed scale, and would address limiting factors within the watershed as a whole. Current priorities (such as providing fish passage) may be restructured if other elements (such as estuary function) are identified as having a greater effect on salmon survival. This type of monitoring would require cooperation among many organizations.

Adaptive Management

Adaptive-management plans are designed to incorporate the results of monitoring of management activities back into the ongoing management planning process. These plans create a feedback loop in which the original goals of the management actions are compared with the monitoring results to determine if those goals are being met. Owing to the nature of this management plan (i.e., not all elements of the plan will likely be implemented), a traditional adaptive-management plan would not apply.

To address the ongoing need for feedback within the program, at the annual planning meeting, the WMRC will discuss the plan's progress and evaluate whether programmatic shifts need to occur. The discussion will focus on determining: if the goals are appropriate; if projects are being implemented as planned; and if these projects are effectively meeting the goals. Monitoring for this type of adaptive management may consist of yearly site visits by the WMRC, depending on the interest(s) of the group. Alternatively, the WMRC may choose to make its evaluation based on the results of SCL's regular site inspections.

PARCEL-SPECIFIC PLANS

This section summarizes existing conditions and presents management opportunities and recommendations for each of the parcels/parcel groups. The evaluation of conditions and recommendations were prepared primarily by Foster Wheeler based on work done in 2001-2003. These activities could be implemented by other parties or by SCL with the use of grant funds. Site conditions may change over time, and implementation of recommended actions would require further site evaluation and the development of detailed plans. With few exceptions, all of the Mitigation Lands are currently functioning at an acceptable or better level, thus providing benefits to the species they were intended to serve.

Appendix E includes maps of the parcels. Table 3 lists occurrence of various habitat types by parcel group, while Appendix C has a more detailed table including habitat on neighboring lands (within one mile of SCL lands). Table 4 summarizes elk habitat values for the various parcels, and Table 5 lists key species that are known to occur or may occur on the Mitigation Lands.

For detailed site-specific information on each parcel, see the *Data Acquisition Report*. This report also documents the methodology used for data acquisition.

Table 3: Habitat Occurrence by Parcel Group (Acres*)

Habitat Type		Bacon Cr.	Nooksack	Sauk	Skagit	Total
Upland Conifer Forest		**41**	**1,771**	**0**	**2,318**	**4,130**
	Clearcut	0	11	0	589	600
	Clearcut - partial	0	0	0	112	112
	Recent burn	0	0	0	27	27
	Early-seral seedlings	0	9	0	0	9
	Early seral	0	314	0	607	921
	Mid-seral	41	783	0	916	1,740
	Late-seral mature	0	10	0	0	10
	Late-seral old-growth	0	609	0	67	676
	Open mature parkland	0	35	0	0	35
Upland Hardwood Forest		**0**	**922**	**40**	**469**	**1,431**
	Early-seral	0	147	0	46	193
	Mid-seral	0	673	40	221	934
	Late-seral	0	102	0	202	304
Upland Mixed Forest		**0**	**1,064**	**34**	**540**	**1,638**
	Early-seral	0	68	0	276	344
	Mid-seral	0	996	34	264	1,294
Riparian Habitat		**49**	**25**	**215**	**298**	**462**
	Shrubland	0	8	3	0	11
	Hardwood forest	0	17	89	56	162
	Mixed forest	49	0	109	113	271
	Conifer forest	0	0	14	129	143
Wetland		**0**	**10**	**30**	**122**	**163**
	Emergent	0	1	3	45	49
	Scrub-shrub	0	10	21	77	108
	Broadleaf forested	0	0	6	0	6
Non-Forested Habitats		**26**	**177**	**48**	**129**	**380**
	Managed shrub/grassland	1	0	0	85	86
	Exposed rock	3	2	0	1	6
	Lake/pond	0	4	0	20	24
	River/creek/slough	11	171	36	14	232
	Disturbed	11	54	12	9	32
Total		**116**	**3,970**	**367**	**3,876**	**8,329**

*Numbers are based on GIS analysis and are not exact.

Table 4: Elk Habitat Quality Values*

Habitat Type	Quality	Nooksack		Skagit		Sauk		Total	
		Acres	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Hiding Cover	High	163	4	518	14	0	0	681	8
	Medium	753	17	891	21	0	0	1514	18
Total Hiding Cover		**916**	**21**	**1,409**	**35**	**0**	**0**	**2,195**	**27**
Thermal Cover	High	162	4	0	0	0	0	162	2
	Medium	244	6	0	0	0	0	244	3
	Low	0	0	17	<1	0	0	17	<1
Total Thermal Cover		**406**	**9**	**17**	**<1**	**0**	**0**	**423**	**5**
Hiding and Thermal Cover	High	184	4	12	<1	0	0	196	2
	Medium	641	15	136	4	0	0	777	9
Total Hiding and Thermal Cover		**825**	**19**	**148**	**4**	**0**	**0**	**973**	**12**
Optimal Cover	High	105	2	19	<1	0	0	124	1
	Medium	449	10	42	1	0	0	460	6
	No data	178	4	6	<1	0	0	184	2
Total Optimal Cover		**732**	**16**	**67**	**2**	**0**	**0**	**768**	**10**
Forage	High	347	8	840	22	0	0	1,66	14
	Medium	159	4	226	6	0	0	385	5
	Low	62	1	199	4	0	0	200	2
Total Forage		**568**	**13**	**1,265**	**32**	**0**	**0**	**1,751**	**21**
Non-habitat/No data		864	20	823	22	0	0	1,687	20

*Numbers are based on GIS analysis and are not exact. Columns and rows may not add exactly due to rounding.

Table 5: Status, Habitat Associations and Occurrence of Key Species

Species	Status[1]	Occurrence[2]	Habitat[3]	Acres of Habitat[6]			
				Bacon Creek	Sauk	Skagit	Nook-sack
Amphibians							
Tailed frog (*Ascaphus trueii*)	SC	S – All	Cold, rocky streams - forest	60	285	254	169
Red-Legged Frog (*Rana aurora aurora*)		S – All	WET, RIP in forests	49	239	273	1
Oregon Spotted Frog (*Rana pretiosa*)	FC, SE	S – All	WET, RIP	60	242	293	209
Birds							
Marbled Murrelet (*Brachyrampus marmoratus*)	FT, ST	D – Sa; S – N, Sk	LSH	0	0	67	582
Harlequin Duck (*Histrioniscus histrionicus*)		D – Sa, Sk; S – N	RIP, adjacent forests	0	210	278	194
Goshawk (*Accipiter gentilis*)	FSC, SC	S – All	LSH	0	0	67	582
Bald Eagle (*Haliaeetus leucocephalus*)	FT, ST	D – B, Sa, Sk; S – N	LSH near lakes, rivers & streams	0	0	254	681
Peregrine Falcon (*Falco peregrinus*)	FSC, SS	S - B, Sk	Cliff, WET, croplands, meadows	25	0	217	0
Spotted Owl (*Strix occidentalis*)	FT, SE	S – All	LSH	0	0	67	582
Yellow-Billed Cuckoo (*Coccyzus americanus*)	SC	S – Sa, Sk, N	RIP, WET, HD	0	242	735	766
Pileated Woodpecker[4] (*Dryocopus pileatus*)	SC	S – All	LSH, snags	0	0	67	582
Olive-Sided Flycatcher[4] (*Contopus borealis*)		S – All	All forested with abundant snags	90	138	2,553	2,789

Vaux's Swift (*Chaetura vauxi*)	SC	S – All	LSH	0	0	67	582
Mammals							
Long-Eared Myotis[4] (*Myotis evotis*)	FSC, SM	S – All	RIP, WET, conifer forest w/snags	90	242	1,443	2,467
Long-Legged Myotis[4] (*Myotis volans*)	FSC, SM	S – All	RIP, WET, conifers w/snags, shrub	90	242	1,508	2,484
Townsend's Big-Eared Bat (*Corynorhinus townsendii*)	FSC, SC	S – All	Cliffs/caves/building/conifer forest w/snags	44	0	886	1,414
Gray Wolf[5] (*Canus lupis*)	FE, SE	IO – B, Sk; S – N	Diverse alpine w/low human disturbance	106	0	3,666	3,918
Grizzly Bear[5] (*Ursus arctos*)	FT, SE	S – N	Diverse alpine w/low human disturbance	0	0	0	3,918
Fisher[5] (*Martes pennanti*)	FSC, SE	S – Sa, Sk, N	LSH, RIP, w/low human disturbance	0	0	71	582
Wolverine[5] (*Gulo gulo*)	FSC, SC	S - N, Sk	Remote alpine w/low human disturbance	0	0	0	3,918
Lynx[5] (*Lynx canadensis*)	FT, ST	S – N	Remote forest w/CCs, thickets	0	0	0	1,093
Elk[5] (*Cervus elaphus*)	Interest	D – Sa, Sk, N	Diverse forest, LSH, RIP, WET	0	316	2,311	2,203

1: FC = ESA Candidate; FSC = Federal Species of Concern; FE = ESA Endangered; FT = ESA Threatened; SE = State Endangered; SC = State Candidate; SS = State Sensitive; SM = State Monitor

2: D = Documented; S = Suspected; IO = isolated occurrence
Parcel codes: B = Bacon Creek; Sa = Sauk; Sk = Skagit; N = Nooksack

3: LSH = late-successional forest; WET = wetlands; RIP = riparian; HD = hardwoods; CC = clearcut

4: Species that need snags. Snag levels cannot be determined without a snag inventory; therefore, acreages are likely overestimates.

5: Species that need remote settings, similar to wilderness. Road density needs to be considered for habitat to be considered suitable. It is likely that acreages displayed are overestimates.

6: Acres of habitat are based on field surveys completed in 2002. Changes in the Sauk Parcel Group since 2002 invalidated 2002 field estimates. Therefore, the table shows potential habitat for the Sauk parcels rather than field-verified habitat. Estimated acres for the Sauk parcels are likely to be over-estimates.

South Fork Nooksack

SCL's Nooksack lands account for nearly half of the Skagit Mitigation Lands. The principal SCL Nooksack parcel is situated along both banks of 8 miles of the South Fork Nooksack River and includes both floodplain and hillsides. The land on the north side of the river, including the Bear Lake parcel, includes some higher elevation areas. The lands along the river are bordered primarily by industrial timberlands known as the Hamilton Tree Farm. The lands also border the Mt. Baker-Snoqualmie National Forest and Washington Department of Natural Resources (DNR) land partially managed as a Natural Area Preserve to the northeast of the parcel. Figure 2 in Appendix E shows the location of these lands.

Forest cover is primarily mid-seral-mixed-hardwood/conifer and mid-seral-conifer, with some late-seral-conifer old growth, early-seral-conifer, and mid-seral-hardwood. Smaller amounts of other habitat types, including riverine and shrub wetlands, are also found. These habitat types are important because they support more biodiversity than equivalent acreage in less diverse types such as mid-seral-conifer, as more species utilize these habitat types for foraging and nesting/denning. Figure 3 gives habitat types for SCL and surrounding lands.

The principal Nooksack parcel is accessed from the south, via a road that leaves State Route 20 near Hamilton and crosses Hamilton Tree Farm land. Access roads are gated. The SCL land is bordered along the south by a mainline road that is part of the Tree Farm and used for logging. There are three bridges over the South Fork on SCL land (see Figure 5): these are referred to as the upper, middle and lower bridges. The lower bridge is on the 200 Road, which accesses lands to the north of SCL lands and is used by logging trucks. The other two bridges are no longer used.

The Bear Lake parcel can be accessed by taking Baker Lake Road to FR 12, which heads west to Wanlick Creek. FR 1260 goes along the South Fork Nooksack above SCL lands. From there it is possible to hike about 3 miles to Bear Lake via Three Lakes.

Existing site conditions on the Nooksack lands can be summarized as follows:

- Moderate to high vegetative diversity
- Low to moderate amounts of snags and downed logs
- Low to moderate fragmentation
- High connectivity potential
- Moderate road density
- Dominant habitat class along mainstem: Large tributary with few side channels
- Priority wildlife species: Elk, pileated woodpecker
- Priority fish species: Chinook, coho, pink, and chum salmon; bull trout; summer and winter steelhead.

Wildlife

Priority Species – Elk: The Washington Department of Fish and Wildlife (WDFW) has prepared a management plan for the North Cascade (Nooksack) elk herd in collaboration with the tribes and Nooksack landowners. Because of a decline in the population of the herd, there

has been an emergency closure of the Nooksack area to elk hunting, and a herd-augmentation plan is being implemented with the intent of allowing hunting to resume in the future. WDFW has offered to include SCL and the WMRC in the review process for future revisions to the plan. The WMRC supports the collaborative approach and acknowledges the need for planning to take place on a scale larger than the individual SCL parcel.

The amount of elk forage habitat (13%) on the Nooksack lands is far below the 40% needed for western Washington elk herds (Holthausen et al. 1994). The *Wildlife Plan* stated an objective of "develop[ing] an enhancement program for the maintenance of elk forage areas on the South Fork of the Nooksack River lands that will meet agency concerns for long-term maintenance of habitat for the winter elk herd, conserve funds . . , and be practical to accomplish" (page 5-1). It described the following potential measures for elk habitat:

- Maintain or restore 5 to 20 percent of the total area as grass and forb plant communities.
- Provide distribution of forage areas throughout the riparian corridor in units no larger than 20 acres each and within 200 feet of forest cover.
- Provide for long-term retention of areas in early seral stages through prescribed burning, to be done only in clearcuts that are less than 20 years old and on slopes less than 50 percent.

The *Wildlife Plan* also suggested providing an area for public viewing of elk. This measure would provide a recreational opportunity for the public, but needs to be distinguished from measures to benefit elk habitat.

The Foster-Wheeler consultant study subsequent to the *Wildlife Plan* suggested creation of forage areas in small, well-spaced blocks (5 to 10 acres), surrounded by diverse multi-layered stands of optimal cover. Alternately, young stands could be thinned to create openings for forage growth.

Priority Species - Pileated Woodpecker: Naturally occurring late-seral stands would be expected to cover nearly 50 percent of any given land area, and late-seral stands are the only stands that are able to generate large enough snags for pileated woodpeckers. Overall, only 12 percent of the Nooksack lands has the recommended level of snags to be considered suitable pileated woodpecker habitat. Assuming that naturally occurring late-seral stands on the Nooksack lands have adequate amounts of snags (as the field data suggests), snag creation could be implemented in early and mid-seral stands where deficits exist. While pileated woodpeckers prefer snags over 20 inches dbh, they will forage in stands with smaller snags as well (WDFW 1991). Creation of snags and downed logs on some 1,500 acres of early and mid-seral stands would improve habitat for pileated woodpeckers and secondary cavity-nesters such as the hairy woodpecker and downy woodpecker.

Wildlife Management Opportunities: Creation of snags would also assist in diversifying the stand structure, thereby providing better habitat for resident and dispersing animals. There are an adequate number of downed logs presently, but replacement logs will be needed over time.

Fish

The most significant factors affecting fish habitat within the Nooksack lands boundaries are roads and the functional level of riparian vegetation.

Habitat requirements and management priorities are similar for chinook salmon, bull trout, and other salmonids that use the habitat in the Nooksack lands. All of these species need connected and fully functional aquatic habitats that are maintained through natural processes.

Although the majority of the riparian corridors in the Nooksack lands are functioning, there are areas with impaired riparian corridors. At many of the sites, LWD levels are low due to past land-use activities or upstream activities. Important fish habitat near the middle bridge is being degraded. The bridge abutments and associated fill interfere with natural channel migration. Restoration of natural processes in the section of river affected by the bridge would begin when the bridge is removed.

To improve habitat for fish in the Nooksack lands, the following management opportunities have been identified based on conditions in 2002 (locations refer to Figure 4):

- Remove or set back bridge supports from the river at the east end of the parcel (upper bridge).
- Evaluate right bank at N42 (near east end of parcel) regarding need for bank stabilization and/or woody-debris placement.
- Increase width of mature riparian vegetation at N67 (near the middle bridge).
- Remove the bridge and the fill on the south side of the middle bridge to allow the natural process of channel migration and flooding.
- Perform bank stabilization on side stream at N43B (east end of parcel, south side of river).

Road Management

Roads on the north side of the Nooksack, with the exception of the 200 Road, were decommissioned in 1997 with funding provided under the state's Jobs for the Environment Program. The 200 Road is not planned for decommissioning because it accesses land owned by others to the north. The 300 road that defines much of the south and east boundary of the parcel is not owned by SCL. The 330 spur leads to a large concrete bridge spanning the S.F. Nooksack River on SCL's property (the middle bridge); removal of this bridge is covered under the RMAP and is scheduled to occur by 2008. Once the bridge is removed, the half mile of road leading to the bridge can be abandoned as well.

Foster Wheeler evaluated the roads within the parcel boundary for stability and potential risk to downslope fish habitat. A spur road about one mile long, located west of the 200 road just north of the lower bridge, was identified as high risk. This road should be decommissioned.

The Nooksack Elk Herd Management Plan recommends seasonally limited vehicle access. A gate at the start of the 300 Road, while not on SCL land, limits access to SCL land on the south side of the Nooksack.

Skagit River Parcel Group

The Skagit parcel group contains six parcels, two of them contiguous with each other, on the south side of the Skagit River. All are intermingled with land owned by the Department of Natural Resources (DNR) and The Nature Conservancy (TNC), managed to protect the land's natural features. There is also Hamilton Tree Farm land adjacent to and in the vicinity of these parcels with timber production and harvest as the primary goal. Figure 6 in Appendix E shows the location of SCL and adjacent ownership. Figure 7 shows habitat types in the SCL parcel and surrounding land, and Figure 8 shows riparian condition as assessed in 2002.

Four small parcels are primarily wetland and riverine in nature with varying amounts of mixed hardwood and riparian hardwood forest. The primary objective for management of these parcels is to provide habitat for wetland- and riverine-dependent species:

The **Barnaby parcel** contains approximately 217 acres in the Barnaby Slough area, much of which is backwater slough habitat. It is easily accessed by a side road off the Martin Ranch Road. The WDFW operates a rearing facility on this parcel under permit from SCL. The permit also allows for a caretaker's residence. SCL inherited this use agreement at the time of purchase of the property. The current agreement terminates in 2019.

The **Lucas parcel** contains approximately 203 acres, primarily slough and wetland. It is accessed by way of a gated road across Hamilton Tree Farm land. There is substantial beaver activity on this parcel. The parcel is partially bordered by the Skagit River in the north.

The **Napoleon parcel** contains approximately 65 acres along Napoleon Slough between State Route 530 and the Sauk River. The Skagit River borders the northwest corner of the property. There is no road access to this parcel.

The **McLeod parcel** contains approximately 100 acres of agricultural land and slough habitat near McLeod Slough west of the confluence of the Sauk and Skagit Rivers. The Concrete-Sauk-Valley Road (a county road) forms the south boundary. The former owners retained a life estate to produce and cultivate hay on a portion of the property. Use of the property for this purpose extends until the end of the lives of the permit holders; it is not transferable or assignable. Deer and elk graze in the hay field and retreat to the forest cover near the slough.

With over 3,200 acres, the **Illabot-O'Brian parcels** account for approximately 40 percent of the total area of Mitigation Lands. The northwest and southeast lands are separated by the Rockport-Cascade Road and have differing character.

The **Illabot North** lands consist primarily of wetland/riverine habitats for dependent species such as bald eagle and red-legged frog. The SCL Skagit transmission line crosses the area, and there are a number of small residential neighboring parcels. A small portion of the land borders the Skagit River. The land is accessed by the transmission line right-of-way road.

The **Illabot South** lands are primarily upland habitat with some steep hillsides, utilized by a variety of species including bald eagles (winter-roost sites), deer, elk, bear, mountain lion, grouse and pileated woodpecker. A DNR Natural Area Preserve lies to the southeast. The 635 road, a gravel logging road, accesses the southwest portion of the parcel and forms part of the parcel boundary in the southwest. The 120 acres in Section 35 shown on Figure 7 as mid-seral-conifer have been reported by a WMRC member who visited the site as late-seral-conifer.

Existing site conditions on the Skagit parcels can be summarized as follows:

- High vegetative diversity
- Low amounts of snags and downed logs
- Moderate-to-high connectivity potential
- Varying road density
- Dominant habitat class along mainstem channels: Pool-riffle channels
- Priority wildlife species: Bald eagle, red-legged frog
- Priority fish species: Chinook, coho, pink and chum salmon; bull trout; summer and winter steelhead.

Wildlife

Priority Species - Bald Eagle: All of the lowland parcels in this group and some of the upland habitat types provide bald-eagle habitat, with varying degrees of quality. Nesting or day-roost habitat primarily consists of late-seral hardwoods, mostly cottonwoods, along side channels, sloughs, or the mainstem. A winter-roost site is located in the Illabot South parcel. This roost site is one of the few undisturbed old-growth stands near the Skagit River. Another winter roost is on DNR land southeast of the parcel (Section 36); it is managed primarily for bald eagles by the DNR.

There is little high-quality nesting habitat for eagles (late-seral, old-growth conifer stands) along this portion of the Skagit River. However, since bald eagles use this area primarily in winter, some WMRC members have questioned the need for additional nest sites. As trees mature and provide more structure, they may eventually be utilized as a winter roost. As old-growth stands suitable for nesting or roosting develop, existing old-growth stands that are farther away from the river may be less likely to be used. In addition to lack of habitat, high human presence is found along lands within the Skagit parcel group, accompanying the highway that parallels the river. Management opportunities that provide a combination of additional suitable winter-roost habitat as well as suitable conifers or cottonwoods for nesting close to the Skagit River could be considered.

Priority Species - Red-legged Frog: Wetland- and riparian-dependent species are a top management concern because the habitat types on which they depend are a relatively dominant landscape feature in the Skagit parcel group. The red-legged frog is used as a representative of wetland and riparian species because it is a species of concern and is known to utilize habitat found within this parcel group.

The Skagit parcel group supports 122 acres of wetlands, with most (77) of these acres in the shrub wetland type. All of these wetlands currently have water regimes that are slow-moving or

still, with sufficient roots and emergent grasses available to provide suitable egg-laying substrate for the red-legged frog. There are also 298 acres of riparian habitat types in the Skagit parcel group, mostly of the riparian mixed-forest type. An additional 20 acres of lakes and ponds and 14 acres of riverine habitat types are present. All lake and pond acres are considered suitable habitat for the red-legged frog, although the degree of suitability is unknown. Most of the riverine habitat would be too fast-flowing to be suitable for this species, although other important riparian-dependent species, such as red-breasted merganser, bufflehead, dipper, several species of salamanders, aquatic invertebrates and river otter find important habitat in riverine areas.

Overall, most of the streams, rivers and wetlands in this parcel group provide functional habitat features for species dependent on these habitat types. Vegetative diversity, cover, coniferous substrate, streambed substrate, water temperature and water quality all appear to be within normal parameters with few exceptions. Maintaining important wetland and riparian habitats in their current condition to provide suitable habitat for the associated species is a management priority for these lands.

Wildlife Management Opportunities: Management opportunities for the Skagit parcel group include:

- Structural diversification of the vegetative layers within upland stands would mimic natural processes for creating multi-layered canopies and provide a broader species mix. Such treatment would provide small openings (0.25 to 1 acre in size) and assist in allowing seedlings to encroach. This would provide diversity within even-aged stands and accelerate development of mature and old-growth characteristics. Bald-eagle use is high, and suitable winter-roost trees need to be available over the long term for this species. Future winter-roost sites on SCL lands would benefit this species over the long term, and achieving old-growth conditions as soon as possible on currently young and mid-seral stands is a management opportunity identified for this parcel. Approximately 1,060 acres (primarily in Sections 23 and 27, T35N, R10E), in combination with stands in the other smaller parcels within the Skagit parcel group, could be treated to increase structural diversity. If implemented, approximately 10 percent should be treated in the next decade, which would amount to between 27 and 106 acres of clearing. Cut trees should be left on the ground.

- Snags and downed logs could be created on approximately 1,100 acres of mid-seral-mixed and mid-seral-conifer forest stands (primarily in Sections 23 and 27, T35N, R10E). Creation of snags would assist in diversifying the stand structure, thereby providing better habitat for resident and dispersing animals. If implemented, approximately 3 snags should be created per acre over at least 10 percent of these stands in the next decade, 90 percent by girdling and the rest by topping. These snags would eventually fall over and should be retained on site to add more downed logs. This parcel is currently low in numbers of downed logs, and replacement logs will be needed over time.

- Monitoring of the various ponds and oxbows is suggested to determine which ones are functioning effectively. As water levels change, some ponds become isolated, while others provide water connections to the mainstem of the Skagit River. It is important to offer both types of wetland habitats to maximize the diversity of species that utilize these areas. In

addition, recruitment of various age classes of cottonwoods is important for future roost and nest trees along the Skagit River for bald eagles.

Fish

The Skagit River provides habitat for chinook salmon, coho salmon, chum salmon, pink salmon, sockeye salmon, winter and summer steelhead, and bull trout. Parcels owned by SCL in the Skagit Basin have high-quality existing and potential fish habitat, and should be managed to protect listed salmonids and other aquatic species.

Illabot-North

The Illabot-North parcel provides valuable spawning and rearing habitat for salmonids. SCL, in cooperation with the tribes, has already undertaken several fisheries enhancement projects on this parcel. These projects were paid for in full or in part with funds available through the Settlement Agreement on Fisheries:

- Illabot Creek flows into an old oxbow channel of the Skagit River known as Illabot Ponds; the ponds are in turn connected to the Skagit River. The ponds have good rearing habitat but lack appropriate gravel substrate and flow velocity for spawning. In 1997, a channel approximately 1,000 feet long was constructed as an extension of the Illabot Ponds. Natural groundwater upwelling in this area is attracting many fish to spawn there. Because of the good response, another 1,400 feet of channel was added in 2001. This channel runs under the SCL transmission lines and turns north to parallel the lines.
- An SCL transmission-line-maintenance road crosses a branch of O'Brian Creek about one hundred yards south of the channel described above. The creek flows through a culvert under the road. In 1998, accumulated fine sediment was removed and replaced with clean spawning gravel on the downstream (west) side of the road.
- Just south of Corkindale Creek crossing (where the SCL transmission line crosses the Skagit River), an isolated natural slough was reconnected to the river and extended north and clean, mixed-size gravels were added in the fall of 2003. Unfortunately, the October 2003 floods deposited sediment at this restoration site immediately after it was created. Much of the sediment was removed in 2004. Fish are responding well to the new habitat.

Additional enhancement opportunities include:

- Placement of LWD in the lower stretch of Illabot Creek. The area has large substrate and limited complexity as fish habitat and could benefit from placement of large-diameter logs.
- Replacement of the culvert where O'Brian Creek flows under the transmission right-of-way road with a bridge. This would allow juvenile coho and other species to access several miles of sloughs that include more than 100,000 square meters of juvenile rearing habitat.

Illabot-South
The Illabot-South parcel includes a roughly 2-mile section of Illabot Creek with important spawning habitat for pink, coho and chinook salmon. It also provides habitat for chum salmon, bull trout and steelhead. Various parties are interested in obtaining federal designation of Illabot Creek as a Wild and Scenic River. SCL has agreed to support these efforts.

McLeod, Napoleon, Lucas, and Barnaby Parcels

- **McLeod:** Widen and protect the riparian corridors to ensure that shade and LWD are provided to the system.
- **Napoleon:** There are no specific concerns for this parcel at this time. Management should focus on protecting the existing habitat.
- **Lucas:** Reed canarygrass is abundant in the wetlands and sloughs in the parcel, but because the reed canarygrass is not close to road access and is intermingled with desirable native species, its removal may not be feasible. Native species may grow and shade out reed canarygrass over time.

  A long narrow dike crosses the slough. Consideration may be given to breaching this dike. If done, lowering the entire dike is preferable to creating small breaches, since beaver would quickly dam small openings. Breaching the dike might reduce the size of the wetland area and may not be desirable.
- **Barnaby:** A high road density significantly affects riparian function. These roads are needed for access to the WDFW rearing facility and adjacent property. Other management opportunities (see Figure 8 for locations) include:

  (1) releasing the existing conifers at B8 to promote their growth and eventually increase the conifer recruitment for LWD;

  (2) reconnecting a small slough (B80) along the west end of the property to the main slough (B) by reconstructing culverts that pass under the road and also connecting it to Slough B3 by removing a berm (this may involve some work outside the SCL property line);

  (3) adding LWD as an additional cover element in some locations.

Road Management

Illabot-South: 17 miles of former logging roads to the southeast of the Rockport-Cascade Road were abandoned, and DNR approval received, in 2005. Three short spurs at the eastern edge of the parcel are to be abandoned by Hamilton Tree Farm owners under a reciprocal agreement. The 635 road (gravel) is not wholly on SCL land and must remain open.

Illabot-North: Most roads to the northwest of the Rockport-Cascade Road are needed for access to SCL transmission right-of-way and/or to private residences. A short road spur off Illabot Creek Road was abandoned in 2005. No additional abandonment is feasible at this time. However, culverts may need maintenance or replacement.

The **McLeod** and **Napoleon** parcels contain no roads.

Roads on the **Barnaby** parcel are needed for access to WDFW facilities and adjacent lands.

Lucas: The 641 road terminates on SCL land in the south portion of the Lucas parcel. In one location, the road blocks a small slough, and there is no culvert. This blockage should be removed. The rest of the road does not present problems but could be scarified (on SCL land) to accelerate its return to a natural condition.

Bacon Creek Parcel

The Bacon Creek parcel is approximately 120 acres in size. Predominant habitat types include mid-seral conifer forest and riparian forest. Riverine habitat, disturbed sites, managed shrub/grassland (underneath the powerline), and rock outcrops occurring in smaller percentages make up the remainder of this parcel. Figure 9 in Appendix E shows the Bacon Creek parcel and adjacent land; Figure 10 shows habitat types in the SCL parcel and surrounding land, and Figure 11 shows riparian condition as assessed in 2002.

This parcel extends north from State Route 20 near the confluence of the Skagit River and Bacon Creek. The parcel borders the Mt. Baker-Snoqualmie National Forest to the north, east, and west. The Ross Lake National Recreation Areas (part of the North Cascades National Park Complex) begins just to the east. The southern portion of the property includes a gravel pit that was in operation prior to the SCL purchase. It continued operation under permits issued by SCL and DNR. Permission to extract materials expired in 2004, and restoration activities are currently under way. An SCL transmission line crosses the parcel at its southern edge.

The site is accessed by a Forest Service road running north from State Route 20 and continuing past the SCL property line to access land further up Bacon Creek.

Existing site conditions on the Bacon Creek parcel can be summarized as follows:

- Low vegetative diversity
- Very low amounts of snags
- Low fragmentation
- High connectivity potential
- High road density
- Dominant habitat class along mainstem channels: Pool-riffle/Forced Pool/Riffle
- Priority wildlife species: No representative habitat for any of the 4 indicator species
- Priority fish species: Spawning habitat of pink and coho salmon and bull trout; chinook and chum salmon may also use habitat.

Wildlife

No priority terrestrial wildlife species currently occur in any significant numbers on the Bacon Creek parcel. Elk generally do not range as far east as Bacon Creek. Bald eagles are rarely seen where Bacon Creek and the Skagit River join, and suitable foraging and nesting/roosting habitat is generally unavailable. No suitable habitat for wetland-dependent species needing slow-moving streams or ponds occurs on this parcel. Pileated woodpeckers are unlikely to occur on this parcel due to the lack of mature and late-seral forest where large snags are found.

Although no priority wildlife species have been identified, habitat management could still benefit many species of wildlife. The following management opportunities have potential to improve habitat. Evaluation of specific proposals should take into account the condition of the stand at the time of the proposed action and weigh the benefits of habitat manipulation against those of allowing a natural progression to occur:

- Create snags and downed logs on approximately 41 acres of mid-seral conifer forest and on 49 acres of riparian mixed forest. Repeated wildfires created the even-aged seral condition with few snags, although some downed logs remain. Creation of snags would assist in diversifying the stand structure in this small parcel, thereby providing better habitat for dispersing animals. If implemented, approximately 3 snags per acre should be created on at least 10 percent of these acres over the next 10 years, approximately 90 percent by girdling and the rest by topping. The created snags will eventually fall over and add downed logs. There is an adequate number of downed logs presently, but replacement logs will be needed over time.
- Structural diversification of the vegetative layers within stands would mimic natural processes for creating multi-layered canopies and provide a broader species mix. Such treatment would provide small openings (0.25 to 1 acre in size) and assist in allowing seedlings to encroach. This type of improvement would meet goals for providing diversity within even-aged stands, and eventually reach mature and old-growth characteristics sooner than if left alone. Approximately 41 acres of mid-seral conifer forest could be treated in this fashion; approximately 4 acres of openings could be created over ten years.

Fish

Bacon Creek provides spawning habitat for large numbers of pink and coho salmon. Cub Creek, a tributary that enters Bacon Creek from the east on SCL land, provides spawning and rearing habitat for chum salmon as well. Bull trout spawn in upper Bacon Creek, including the forks in the creek located upstream of the National Forest boundary. Bacon Creek also provides habitat for chinook and chum salmon.

The fall 2003 flooding brought significant new woody debris into Bacon Creek and caused channel changes to Bacon Creek and Cub Creek. No management actions to improve fish habitat are recommended at this time.

Road Management

A Forest Service road passes through SCL land and continues farther up Bacon Creek. Earlier efforts by the Forest Service to protect the road included placement of riprap along the creek banks. Riprap prevents the channel from meandering and also reduces the recruitment of LWD. After the fall 2003 floods caused additional damage to the road, an agreement was reached among SCL, the Forest Service and the Skagit River Systems Cooperative (Co-op) for a portion of the road on SCL land to be relocated further away from the creek, with work taking place in the summer of 2004. No funds for Mitigation Lands were used. Work required removal of trees in the new roadway and has increased the number of downed logs on the parcel. Bank riprap was removed. After the new road was completed, the Co-op planted trees in a large clearing between the gravel pit and the creek.

Sauk River Parcel Group

The Sauk parcel group is comprised of several parcels situated along the Sauk River between Darrington and the confluence with the Suiattle River. The landscapes of all parcels are similar in terrain and habitat types, primarily flat, wetland- and riparian-dominated habitat types interspersed with conifers. Figure 12 in Appendix E shows the location of the parcels and ownership of adjacent lands, Figure 13 shows habitat types in the SCL parcels and surrounding land, and Figure 14 shows riparian conditions.

The **Dan Creek parcel** includes approximately 38 acres in Snohomish County near Dan Creek on the east side of the Sauk River. The land area is approximately 32 acres; the remainder is creek and slough, which was heavily used by winter steelhead until the channel change in the fall of 2003. There is no road access.

The **Everett Creek parcel** includes approximately 160 acres in Snohomish County just south of the Skagit County line. **North Everett Creek** has 90 adjacent acres in Skagit County. Most of the land is east of the river, but a portion of the parcel is on the west side. The southeast corner of the property is in a very active area of the river channel and is susceptible to being washed away. The road into the parcel is across other ownership from the Crawford Loop Road; SCL holds an easement for access to its property.

North Sauk, 50 acres on the east side of the river, was purchased in the same transaction as North Everett Creek, but the landowner chose to retain an inholding as a vacation property, separating this parcel from other SCL land to the south. There is no road access.

The **Sauk Island parcel** contains approximately 45 acres surrounded by sloughs on the west side of the river in Skagit County. The land is accessed from State Route 530. There is no road access for highway vehicles.

Existing site conditions on the Sauk parcel group can be summarized as follows:

- High vegetative diversity
- Very low amounts of snags and downed logs
- Moderate fragmentation
- Moderate connectivity potential
- Moderate road density
- Dominant habitat class along mainstem channels: Pool-riffle; Forced pool/riffle
- Priority wildlife species: Bald eagle; red-legged frog
- Priority fish species: Coho and chum salmon (spawning and rearing); spring chinook salmon and sea-run cutthroat trout. Possible additional use by pink and sockeye salmon; winter and summer steelhead. Bull trout pass by on their way to spawning habitat upstream.

The Sauk River dispersal corridor is important because the terrain in the Sauk watershed is very steep, making upland dispersal without the aid of riparian corridors energy inefficient for large mammals (USDA Forest Service 1985). Maintenance of the relatively natural conditions of this critical connective corridor for the movement of animals should be an important component of managing these parcels.

Because of the dominance of riverine and wetland habitats, bald eagles and red-legged frogs are the priority species for the Sauk parcel group.

Wildlife

Priority Species - Bald Eagle: No high-quality, late-seral old-growth conifer habitat exists on SCL lands along the Sauk River. Eagles either nest in conifer stands on adjacent lands or use large cottonwoods for nesting. Only 246 acres of moderate-quality habitat (mixed hardwood and riparian hardwood mixed stands) is available for eagles on SCL lands along this river, primarily in Section 5. In addition to lack of high-quality suitable habitat, there is a high human presence associated with the highway paralleling the river. Thus, management opportunities that provide a combination of additional suitable winter-roost habitat as well as suitable conifers or cottonwoods for nesting close to the Sauk River could be beneficial.

Priority Species - Red-legged Frog: There are currently 27 acres of wetlands in the shrub and broadleaf wetland types in the Sauk parcel group. All of these wetlands currently have water regimes that are slow-moving or still, with sufficient roots and emergent grasses available to provide suitable egg-laying substrate for the red-legged frog. There are 215 acres of riparian habitat types found in the Sauk parcel group. Most of the riparian types are within the riparian mixed-forest type. Most of the riverine habitat would be too fast-flowing to be suitable for the red-legged frog, but may provide suitable habitat for other important riparian-dependent species.

Overall, most of the streams, rivers and wetlands provide functional habitat features for species dependent on wetlands and riparian areas. Vegetative diversity, cover, coniferous substrate, streambed substrate, water temperature and water quality all appear to be within normal parameters. Many wetland- and riparian-dependent species were observed during field surveys, including beaver, great blue heron, several species of frogs, coots, mergansers, belted kingfishers, dippers, grebes, buffleheads, bald eagles, and others. Thus, managing lands within the Sauk parcel group to maintain important wetland and riparian habitats in their current condition is another important priority.

Wildlife Management Opportunities: Management opportunities for the Sauk parcel group relative to the priority wildlife species are identified below. Because most of the land lies in the channel migration zone of the Sauk and the river is undammed and exceptionally dynamic, serious attention should be given to the long-term viability (or lack thereof) of any proposed habitat manipulation.

- Snags and downed logs could be created on approximately 150 acres of mid-seral-mixed, riparian-forest-mixed and riparian-forest-conifer stands, primarily in the Everett Creek parcel. If implemented, approximately 3 snags should be created per acre over at least 10 percent of these stands in the next decade, 90 percent by girdling and the rest by topping. Creation of snags will assist in diversifying the stand structure in this parcel group, thereby providing better habitat for resident and dispersing animals. These trees eventually fall over and should be retained on site to add more downed logs. This parcel group is currently low in numbers of downed logs, and replacement logs will be needed over time.

- Structural diversification of the vegetative layers within stands would mimic natural processes for creating multi-layered canopies and provide a broader species mix. Such treatment would provide small openings (0.25 to 1 acre in size) and assist in allowing seedlings to encroach. This type of improvement would meet goals for providing diversity within even-aged stands, and eventually reach mature and old-growth characteristics sooner than if left alone. Acceleration of the mid-seral-mixed forest stands to provide old growth as soon as possible is an important objective for this small parcel as bald-eagle use is relatively high, and suitable roost and nesting trees need to be available over the long term for this species. Currently, nesting and roosting trees are being provided by large cottonwoods on other private lands, and recruitment of such trees might be managed on SCL lands, with the goal of providing additional trees in the future. Approximately 70 acres of mid-seral forest, mostly in the Everett Creek parcel, could be treated in this fashion. If implemented, approximately 7 acres of small openings should be created in the next 10 years.
- Monitoring of the various ponds and oxbows scattered throughout these small parcels is suggested to determine which ones are functioning effectively. As water levels change, some ponds become isolated, while others provide water connections to the mainstem of the Sauk River. It is important to offer both types of wetland habitats to maximize the diversity of species that utilize the area. In addition, recruitment of various ages of cottonwoods is important for future roost and nest trees along the Sauk River for bald eagles.

Fish

Streams and sloughs within the Sauk parcel group are heavily used by coho and chum for spawning and rearing. Chinook and sea-run cutthroat also use the habitat on the parcels. Pink salmon, sockeye salmon, and winter and summer steelhead are in the Sauk River and may also use the habitat.

The highest management priority for aquatic habitat on the Sauk River is to maintain or improve the riparian corridors and instream LWD. However, the system is not severely constrained in most areas, and natural channel migration is contributing some wood to the river. The natural channel migration in this area should be allowed to continue.

Road Management

On **Sauk Island**, there are several wide dirt trails/ATV tracks that adversely affect riparian vegetation and, in some cases, may interfere with direct LWD delivery to the river. The lack of tree growth in the bare area of the trail reduces the overall amount of wood that will be available for future LWD recruitment to the river. Also, trees that fall across the trails/ATV tracks are generally cut by trail users. Separating the upper end of the tree from the lower stem and rootwad reduces the size of the LWD and is likely to reduce the stability of the log as well, reducing the amount of time that it stays in the system. While decommissioning these roads would be beneficial to habitat, it may not be feasible to prevent trail maintenance by local residents. It is necessary to ford a slough to reach the trails, and they are not accessible to highway vehicles, so SCL does not have a legal obligation to do anything further about these trails.

The **Dan Creek** parcel has no road access. A former road has many downed trees across it. There are no culverts, and the road surface is covered with flood deposits of sand. No action is needed.

A road crosses the **Everett Creek/North Everett Creek** parcel to access private property to the north. Two sections of this road were washed out in the high water of October 2003. The private property owners may desire to rebuild access to their land, and SCL has notified them that they may do so as long as they obtain all required permits. SCL should remove a culvert at the top of the second washout, although access to this point is difficult.

The **North Sauk** parcel has no roads.

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FIGURE 1
Wildlife Mitigation Lands

Nooksack Parcels

Bacon Creek Parcel

Skagit River Parcels

Sauk River Parcels

S.F. Nooksack River

Lake Shannon

Skagit River

Cascade River

Sauk River

Suiattle River

Concrete - Sauk Valley Rd

Rockport-Cascade Rd

Newhalem

Concrete

Hamilton

Sedro-Woolley

Marblemount

Rockport

Darrington

WHATCOM COUNTY

SKAGIT COUNTY

SNOHOMISH COUNTY

9

20

530

T37R08E T37R09E T37R10E T37R11E T37R12E

T36R05E T36R07E T36R08E T36R09E T36R10E T36R11E T36R12E

T35R05E T35R06E T35R07E T35R08E T35R09E T35R10E T35R11E T35R12E

T34R05E T34R06E T34R07E T34R08E T34R09E T34R10E T34R11E

T33R05E T33R06E T33R07E T33R08E T33R09E T33R10E T33R11E

T32R05E T32R06E T32R07E T32R08E T32R09E T32R10E T32R11E

Legend

DNR Stream Class*
- 1
- 2
- 3

State Highway

Other Road

County Boundary

Township Boundary

Section Boundary

DNR Land

Mitigation Lands

National Park Service Land

Forest Service Land

State Park

Waterbody

* Layer updated for display, not field verified.

N W E S

0 0.5 1 2 3 4 5

Miles

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FIGURE 2
South Fork Nooksack River Parcels

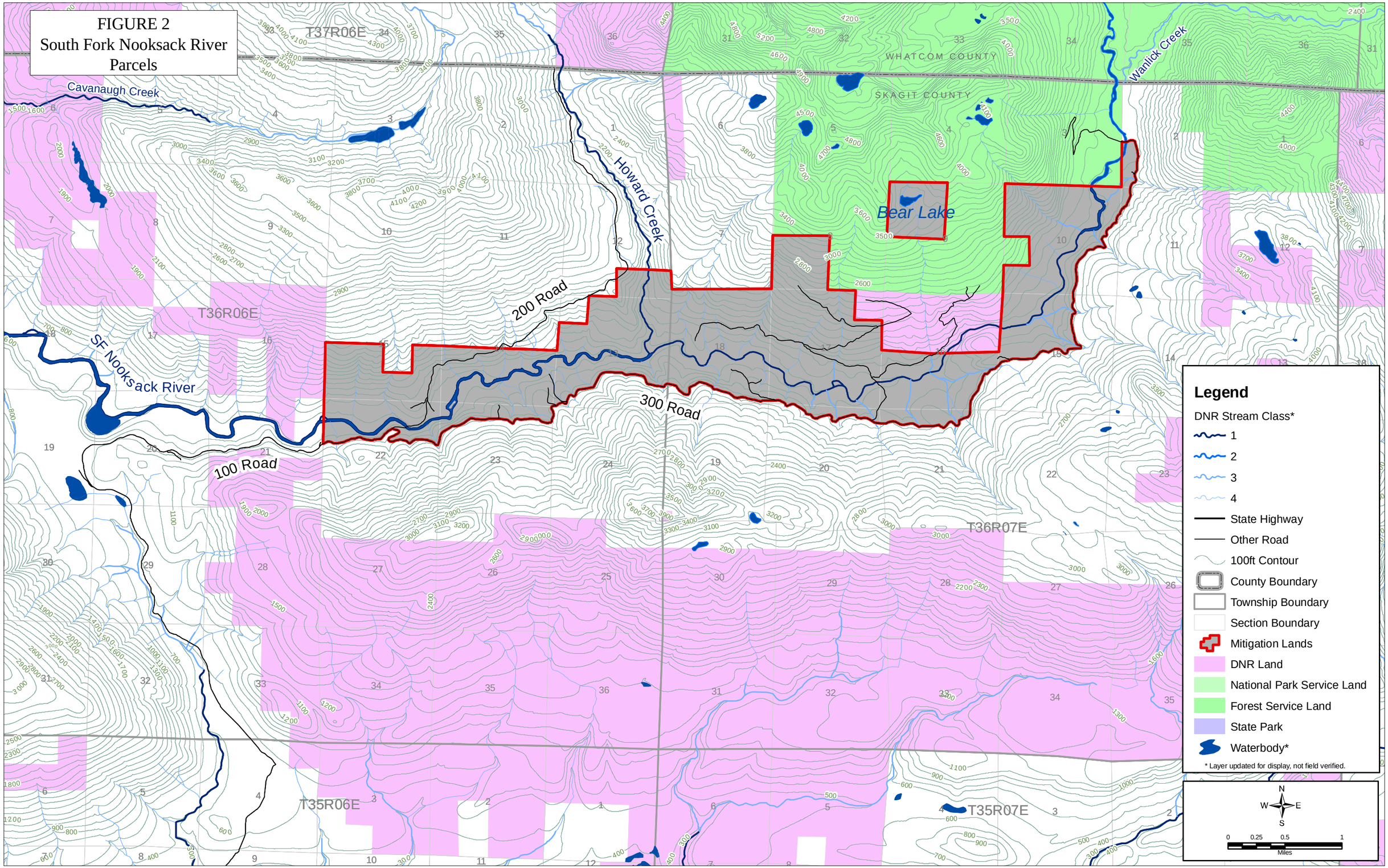

FIGURE 3
Upland Habitat
South Fork Nooksack River Parcels

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WHATCOM COUNTY

SKAGIT COUNTY

T37R06E

T37R07E

T36R06E

T36R07E

T35R06E

Howard Creek

Bear Lake

SF Nooksack River

Legend

Streams*
- Class 1
- Class 2
- Class 3
- Class 4

- Mitigation Lands
- County Boundary
- Township Boundary
- Section Boundary
- Waterbody*

UPLAND HABITAT

- Clearcut
- Clearcut (partial)
- Early seral grass/forb
- Early seral conifer
- Early seral hardwood
- Early seral mixed
- Mid seral conifer
- Mid seral hardwood
- Mid seral mixed
- Late seral conifer mature
- Late seral conifer old-growth
- Late seral hardwood
- Late seral mixed
- Open mature
- Parkland
- Riparian shrubland
- Riparian forest hardwood
- Riparian forest mixed
- Riparian forest conifer
- Wet meadow
- Emergent wetland
- Shrub wetland
- Broadleaf wetland
- Conifer wetland
- Grass/forb
- Shrubfields
- Exposed rock
- Lacustrine open water
- Riverine
- Disturbed sites
- Recent burn
- Managed shrub/grassland
- Landslide

* Layer updated for display, not field verified.

N W E S

0 0.25 0.5 1 Miles

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FIGURE 4
Riparian Function
South Fork Nooksack River Parcels

N45
N46
N44
N42
N43/43A
N43
N43B
N38/39
N43C
N29B
N38B
N30/39
N34
N30
N66C
N67A
N64
N66B
N66A
N14
N56
N54
N63A
N63B
N63D
N63C
N67B
N67
N29A
N29
N68
N61 &58
N60
N5C
N5B
N5A
N10

T36R06E
T36R07E

Legend

Riparian Function Call
- Functioning
- Moderately Impaired
- Impaired
- Unknown
- Hydro-modification\(e.g., dikes, rip rap)

Township Boundary
Section Boundary
Mitigation Lands

Stand-id

N
W
E
S

0 0.25 0.5 1
Miles

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FIGURE 5
Road Inventory
South Fork Nooksack River Parcels

Howard Creek

South Fork Nooksack River

100

200

300

T36R06E

T36R07E

Upper Bridge

Middle Bridge

Lower Bridge

South Fork Nooksack River

Legend

- Mitigation Lands
- Township Boundary
- Sections Boundary
- Gravel Road
- South Fork Nooksack River
- Rivers/Streams
- Bridge Location

Road Risk

- High
- Medium
- Low
- Not rated

Road Blocks

- Blocks LWD recruitment
- Blocks surface flow
- Blocks surface flow, LWD

N
W E
S

0 0.25 0.5 1
Miles

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FIGURE 6
Skagit River Parcel Group

Marblemount

Cascade River

Rockport Cascade Rd

Illabot North

T35R09E

T35R10E

T35R11E

Rockport State Park

Rockport

Skagit River

O'Brian Creek

Martin Ranch Rd

Martin Rd

Concrete Sauk Valley Rd

McLeod

Barnaby

Lucas

Napoleon

Illabot South

Sauk River

Illabot Creek

T34R10E

T34R11E

20

530

Legend

DNR Stream Class*

- 1
- 2
- 3
- 4

- State Highway
- Other Road
- 100ft Contour
- Township Boundary
- Section Boundary
- Mitigation Lands
- DNR Land
- National Park Service Land
- Forest Service Land
- State Park
- Waterbody*

*Layer updated for display, not field verified.

N W E S

0 0.25 0.5 1 Miles

FIGURE 7
Upland Habitat
Skagit RIver Parcel Group

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Marblemount
Cascade River
Illabot North
Barnaby
McLeod
Rockport
Skagit River
O'Brien Creek
Sauk River
Napoleon
Lucas
Illabot Creek
Illabot South
T35R09E
T35R10E
T35R11E
T34R09E
T34R10E
T34R11E

Legend

Streams*
- Class 1
- Class 2
- Class 3
- Class 4

Mitigation Lands
Township Boundary
Section Boundary
Waterbody*

UPLAND HABITAT

- Clearcut
- Clearcut (partial)
- Early seral grass/forb
- Early seral conifer
- Early seral hardwood
- Early seral mixed
- Mid seral conifer
- Mid seral hardwood
- Mid seral mixed
- Late seral conifer mature
- Late seral conifer old-growth
- Late seral hardwood
- Late seral mixed
- Open mature
- Parkland
- Riparian shrubland
- Riparian forest hardwood
- Riparian forest mixed
- Riparian forest conifer
- Wet meadow
- Emergent wetland
- Shrub wetland
- Broadleaf wetland
- Conifer wetland
- Grass/forb
- Shrubfields
- Exposed rock
- Lacustrine open water
- Riverine
- Disturbed sites
- Recent burn
- Managed shrub/grassland
- Landslide

*Layer updated for display, not field verified.

N W E S

0 0.25 0.5 1
Miles

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FIGURE 8
Riparian Function
Skagit River Parcel Group

T35R09E

T35R10E

Illabot North

Illabot South

Barnaby

Lucas

Napoleon

McLeod

BSlough

B8

B11

B(80)

B3

L7

L8

L3

N8

N5

M2

M4

I3A

I13

I4

I12

I8

I21

I44a

I10

I35

I14

I59

I69

I55

Legend

Riparian Function Call

- Functioning
- Moderately Impaired
- Impaired
- Unknown
- Hydro-modification\(e.g., dikes, rip rap)

- Township Boundary
- Section Boundary
- Mitigation Lands

Stand-id

N
W
E
S

0 0.25 0.5 1
Miles

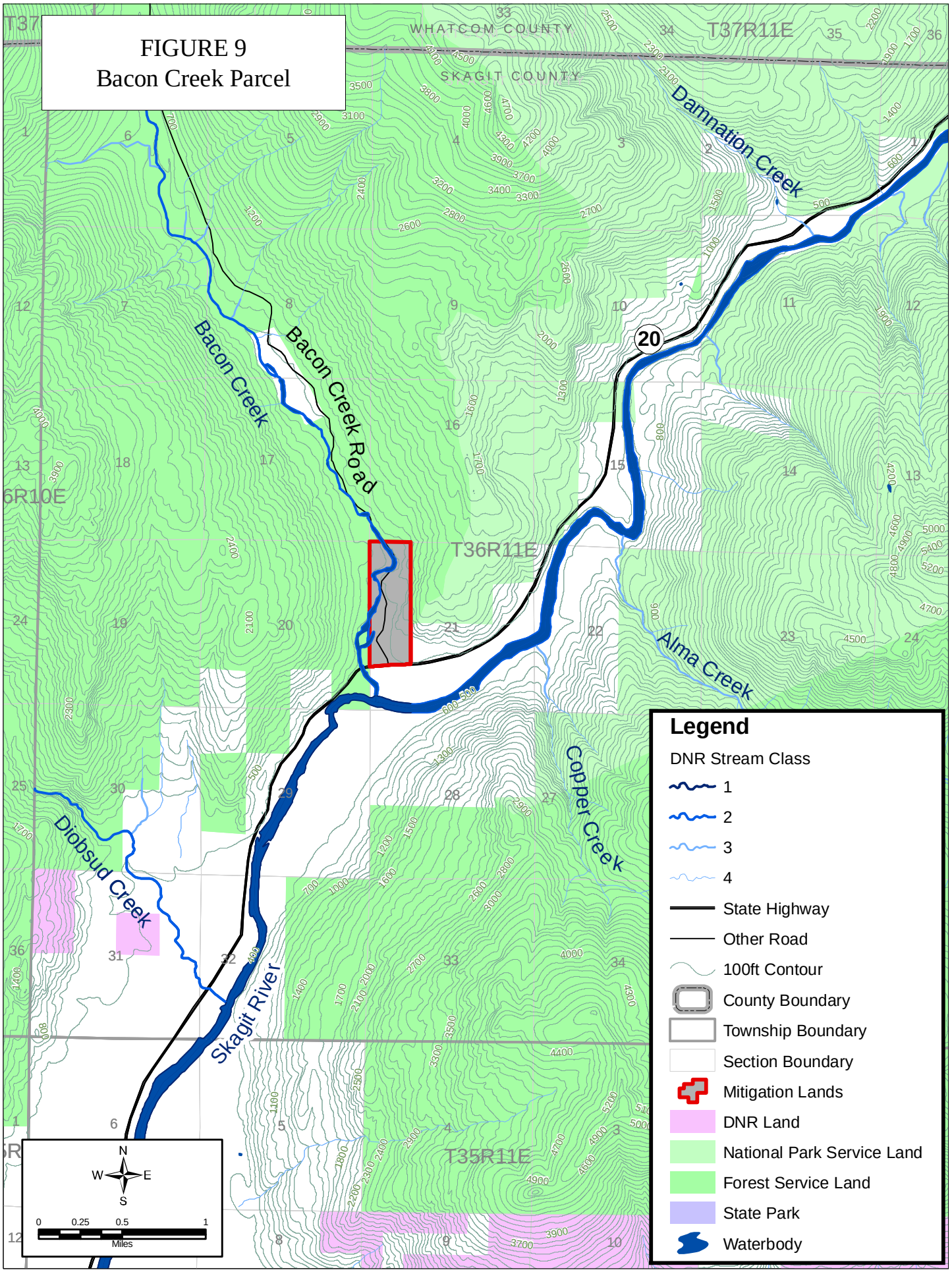
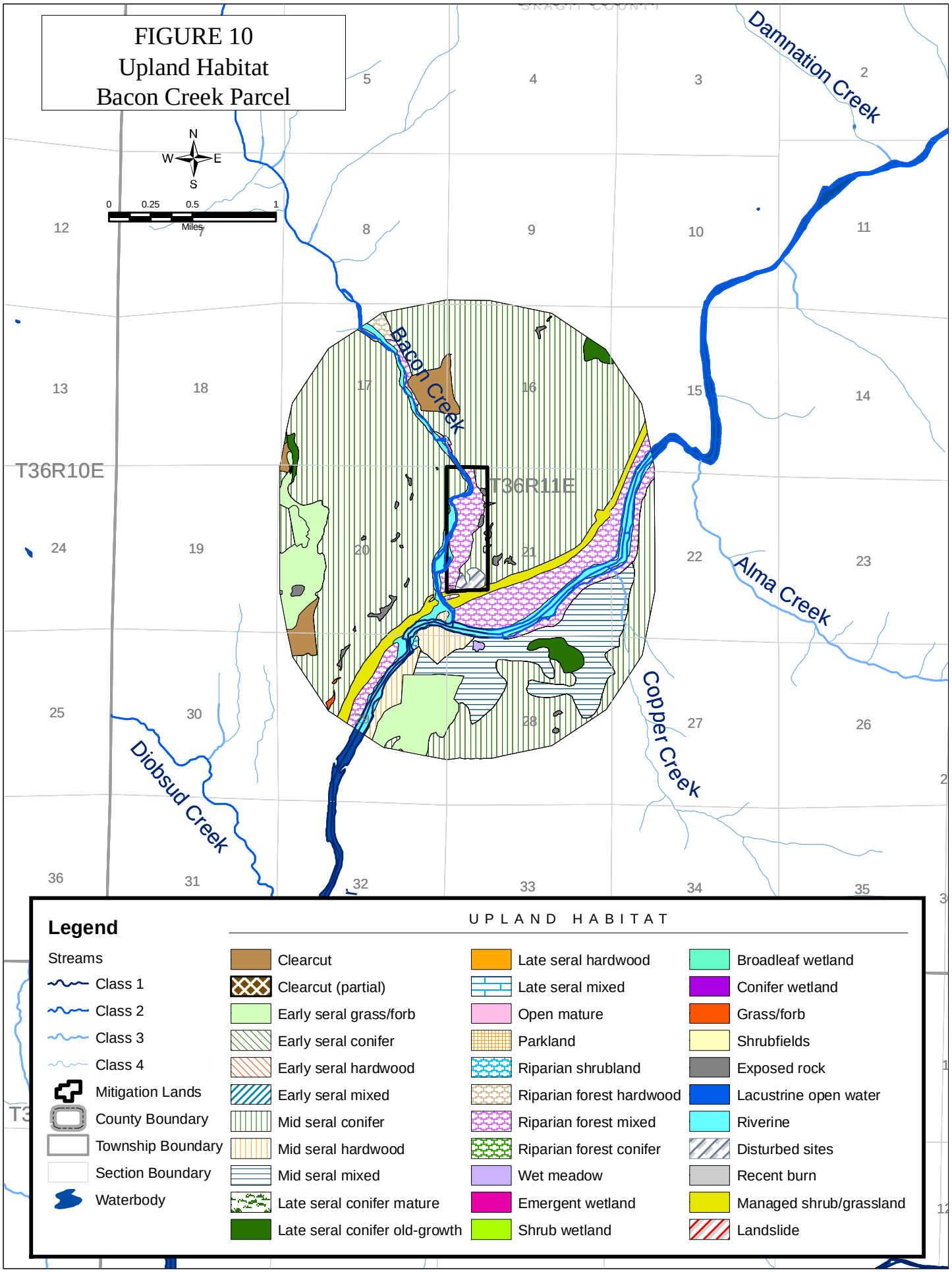


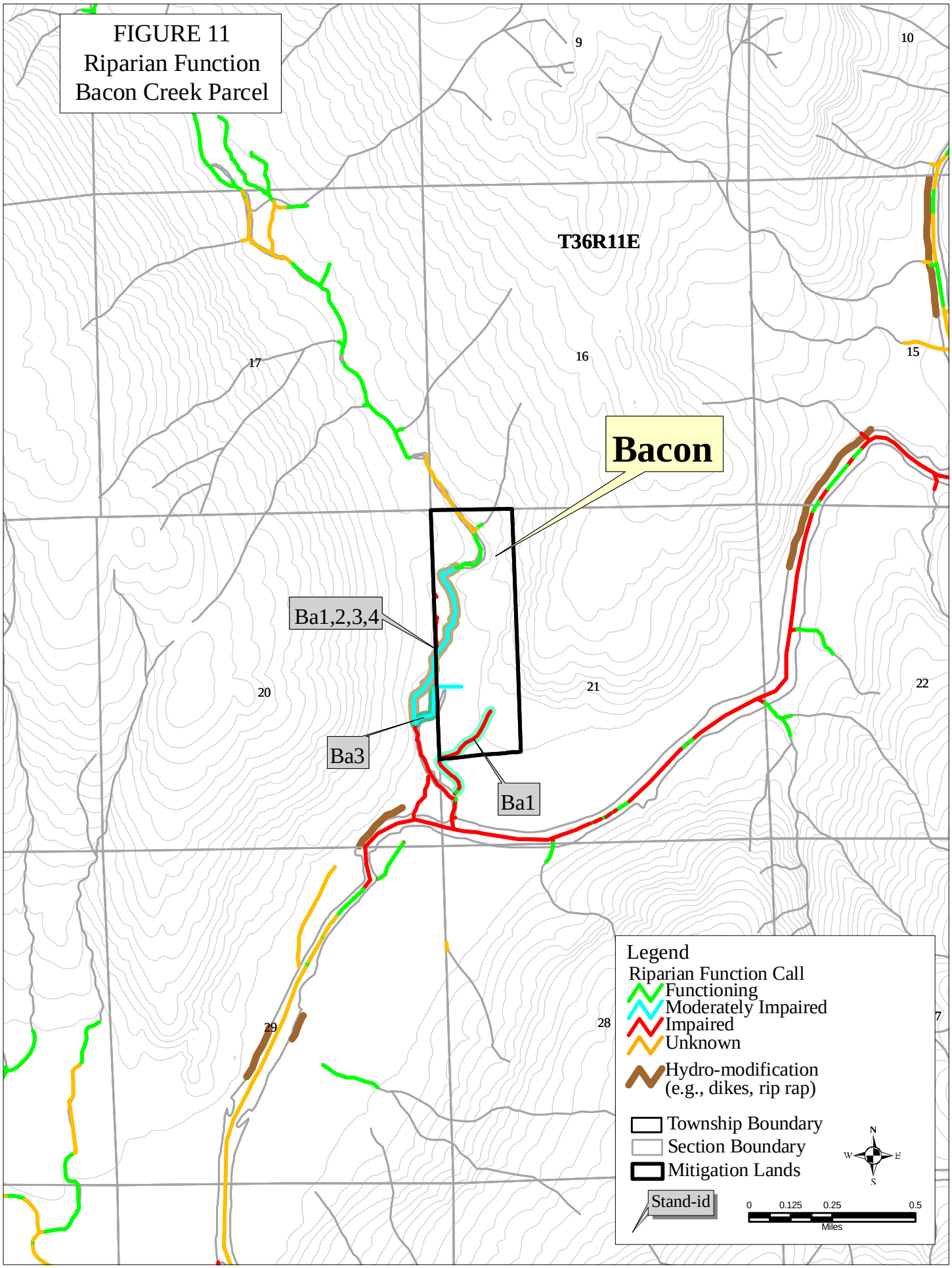
FIGURE 9
Bacon Creek Parcel
/projects_2005/seattle_city_light/maps/figure9.mxd July 2005
WHATCOM COUNTY
SKAGIT COUNTY
T37R11E
T36R11E
T35R11E
T36R10E
Damnation Creek
Bacon Creek
Bacon Creek Road
Alma Creek
Copper Creek
Diobsud Creek
Skagit River
20
N
W
E
S
0 0.25 0.5 1
Miles
Legend
DNR Stream Class
1
2
3
4
State Highway
Other Road
100ft Contour
County Boundary
Township Boundary
Section Boundary
Mitigation Lands
DNR Land
National Park Service Land
Forest Service Land
State Park
Waterbody



/projects_2005/seattle_city_light/maps/figure10.mxd July 2005

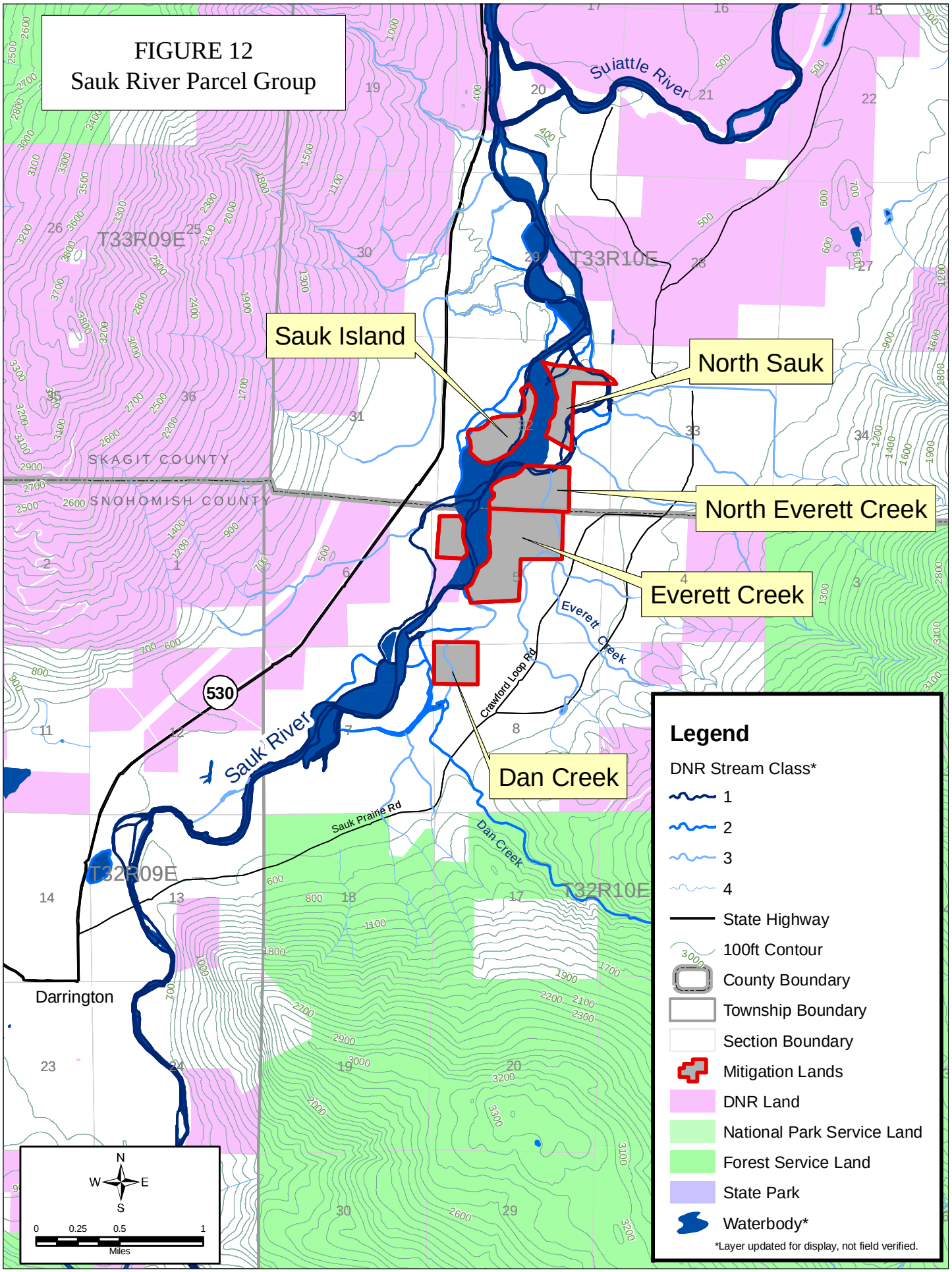
/projects_2005/seattle_city_light/maps/figure11.mxd July 2005

FIGURE 11
Riparian Function
Bacon Creek Parcel



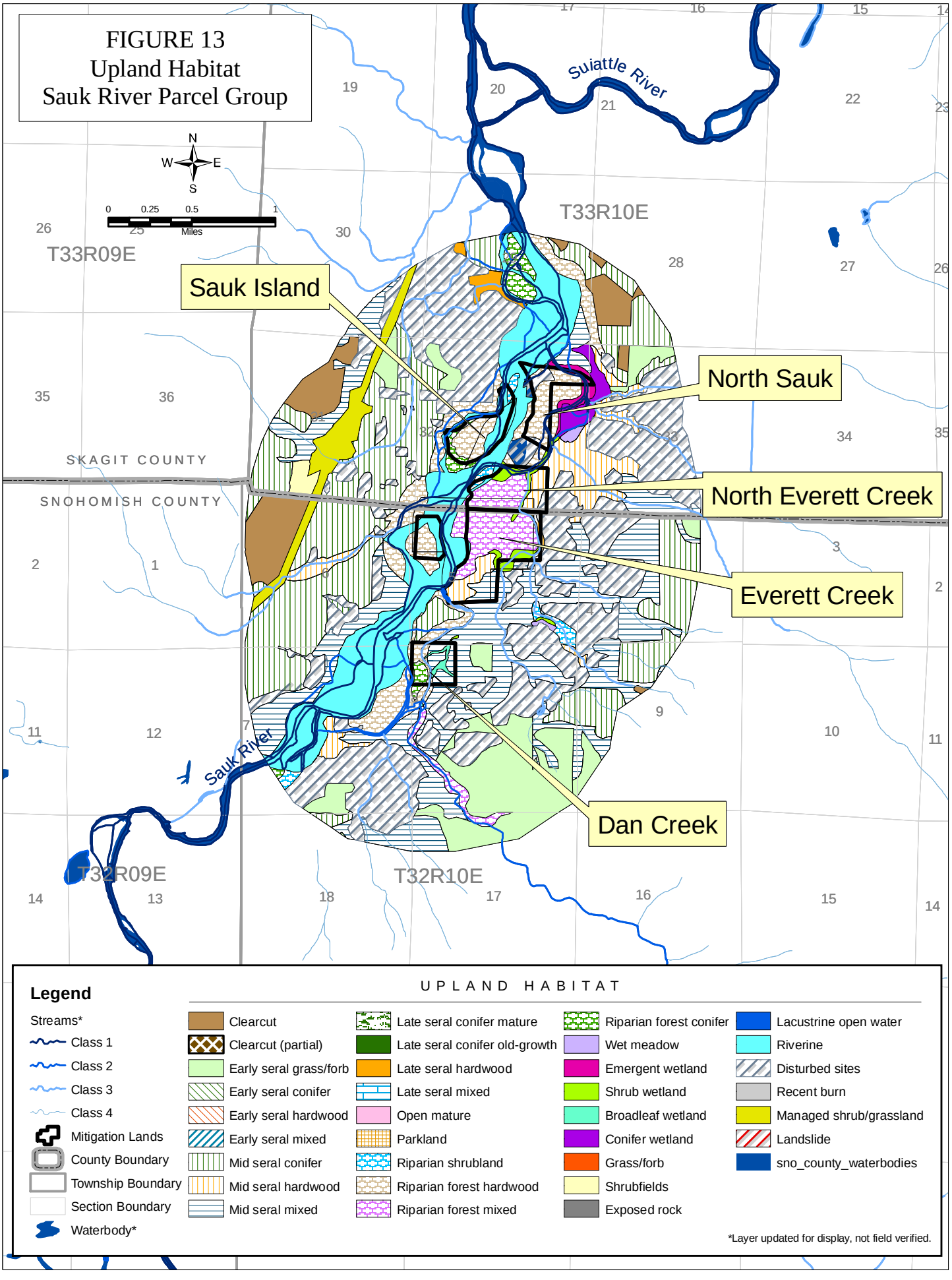
/projects_2005/seattle_city_light/maps/figure12.mxd July 2005

FIGURE 12
Sauk River Parcel Group



/projects_2005/seattle_city_light/maps/figure13.mxd July 2005

FIGURE 13
Upland Habitat
Sauk River Parcel Group



Legend

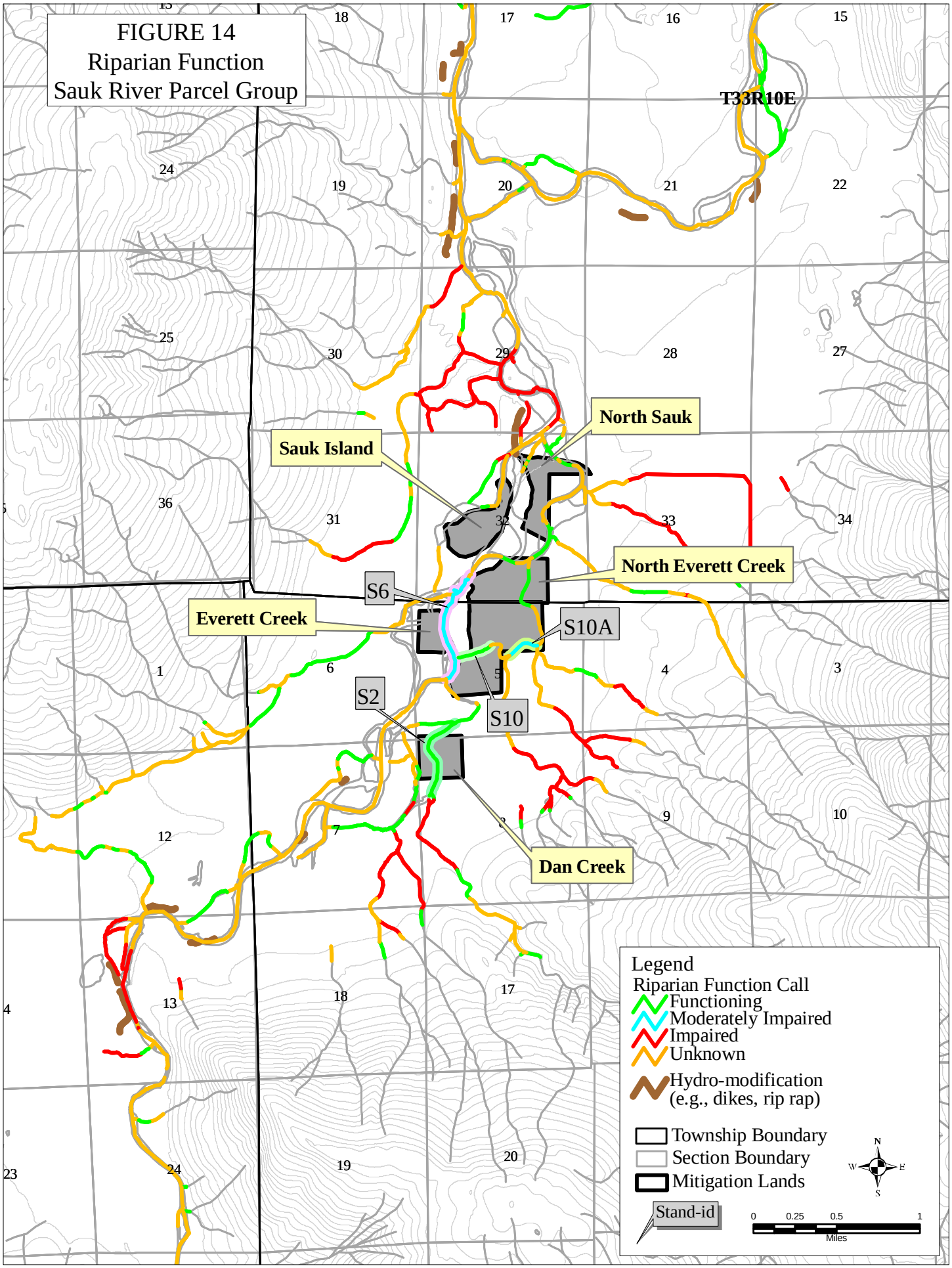
Streams*
- Class 1
- Class 2
- Class 3
- Class 4

Mitigation Lands
County Boundary
Township Boundary
Section Boundary
Waterbody*

UPLAND HABITAT

- Clearcut
- Clearcut (partial)
- Early seral grass/forb
- Early seral conifer
- Early seral hardwood
- Early seral mixed
- Mid seral conifer
- Mid seral hardwood
- Mid seral mixed
- Late seral conifer mature
- Late seral conifer old-growth
- Late seral hardwood
- Late seral mixed
- Open mature
- Parkland
- Riparian shrubland
- Riparian forest hardwood
- Riparian forest mixed
- Riparian forest conifer
- Wet meadow
- Emergent wetland
- Shrub wetland
- Broadleaf wetland
- Conifer wetland
- Grass/forb
- Shrubfields
- Exposed rock
- Lacustrine open water
- Riverine
- Disturbed sites
- Recent burn
- Managed shrub/grassland
- Landslide
- sno_county_waterbodies

*Layer updated for display, not field verified.



/projects_2005/seattle_city_light/maps/figure14.mxd July 2005

Appendix A

Site visit report form

Skagit Mitigation Lands: Record of Site Visit

Name of parcel: _____
Date of inspection: _____
Persons present: _____
Road(s) driven: _____
_____
_____

Area walked: _____
_____
_____

Observations:

Road condition:

Trash:

People camping/other evidence of use:

Noxious weeds/nonnative invasives:

Gate condition (found open or closed? Lock condition?)

Evidence of fish or wildlife:

Recent habitat damage:

Change in channel of river or stream:

Conversation with neighbors or interested public:

Action taken or recommended:

Appendix B

Road inventory

Appendix C

Habitat occurrence by parcel and within one mile of Mitigation Lands

Appendix D

Definitions of habitat types

Definitions of Habitat Types

Habitat type	Abbrevi-ation	Description
Upland Coniferous Forest		
Clearcut	CC	Recently harvested area typically less than 5 years old; logging debris usually still visible.
Clearcut (partial)	CCP	Complete harvest of standing timber is underway, or partial harvest (green-tree retention) typically less than 5 years old; logging debris usually still visible.
Recent burn	RB	Stands that have burned within the past 5 years.
Early seral	ES	Regenerating forested areas dominated by small trees or shrubs; usually less than 20 years old; planting pattern sometimes still visible.
Early seral coniferous	ESC	Regenerating forested areas with more than 70% small conifer trees; may include shrubs; usually less than 20 years old; planting pattern sometimes still visible.
Mid-seral coniferous	MSC	Forested areas with more than 70% conifers; medium-sized trees; generally more than 20 years old but not demonstrating late seral structure or size.
Late seral coniferous mature	LSCM	Forested areas dominated by large trees that have had no apparent harvest; crown closure usually in exce4ss of 60%; may have multiple canopies; some snags and downed logs.
Late seral coniferous old-growth	LSCO	Forested areas dominated by large trees that have had no apparent harvest; crown closure usually in excess of 60%; multiple canopies; significant numbers of snags and downed logs.
Open mature	OMAT	Forested areas dominated by smaller mature trees; usually less than 60% crown closure; one or two canopies; only found in higher elevations, low productivity class sites.
Parkland	PRKLND	High-elevation, usually subalpine, forest; scattered mature trees, often dominated by subalpine fir; often interspersed with exposed rock.
Upland Hardwood Forest		
Early seral hardwood	ESH	Regenerating forested areas with more than 70% small hardwood trees and shrubs; usually less than 20 years old; planting pattern sometimes still visible.
Mid-seral hardwood	MSH	Forested areas dominated by deciduous species such as black cottonwood, red alder, bigleaf maple, paper birch or some combination of these; community expected to eventually be replaced by conifers; usually less than 30 years old where stand is regenerating from disturbance.

Late seral hardwood	LSH	Low-elevation stands mostly along the Skagit River; more than 70% hardwoods, usually dominated by large, mature black cottonwood or bigleaf maple; these stands will not likely be replaced by conifers; usually high canopy closure.
Early seral mixed hardwood/conifer	ESHC	Regenerating forested areas dominated by small trees, 50-70% hardwood and shrubs; usually less than 20 years old; planting pattern sometimes still visible.
Mid-seral mixed hardwood/conifer	MSHC	A transitional habitat type, similar to hardwood forest, except species composition is more evenly divided, 50-70%, between deciduous and conifer species.
Riparian types		
Riparian shrubland	RS	Areas within or adjacent to riverine or riparian areas that are dominated by shrub species; includes scrub tree species such as willow; usually in areas of very frequent disturbance.
Riparian forest hardwood	RFH	Areas adjacent to riverine or riparian areas that are greater than 70% deciduous tree species, such as alder; usually in areas of frequent disturbance.
Riparian forest mixed hardwood/conifer	RFHC	Same as previous category but species composition more evenly divided, 50-70%, between deciduous and conifer species; usually in areas of frequent disturbance.
Riparian forest conifer	RFC	Same as previous category but greater than 70% conifer; this type is difficult to distinguish from other conifer-dominated upland types; disturbance cycle less frequent than other riparian types.
Wetland types		
Wet meadow	WM	Herb-dominated, seasonally inundated area.
Emergent wetland	EW	Herb-dominated wetlands where plants are rooted in the soil, but extend to and above the water's surface; community includes sedges, rushes, cattails and usually a component of open water.
Shrub wetland	SW	Wetlands commonly transitioning from open water areas to upland, such as at the edge of oxbow lakes; community dominated by species such as dogwood, *Spirea* sp., and willow.
Hardwood wetland	HW	Seasonally inundated wetlands dominated by deciduous tree species; occurs infrequently in the data because canopy cover usually prevents differentiation from other habitat types.
Conifer wetland	CW	Same as previous category, but dominated by conifer species; this wetland type often characterized by numerous snags.

Non-Forest Types		
Grass/forb	GF	Naturally occurring openings dominated by grasses and forbs (usually less than 10% tree cover); usually found on south-facing slopes.
Shrubfields	SH	Naturally occurring openings dominated by shrub species (usually less than 25% tree or grass cover); does not include clearcuts with dense shrub cover.
Managed shrub/grassland	MSG	Openings (powerline right-of-way, pastures) maintained to perpetuate a dominance of grasses, forbs or shrubs (usually less than 25% tree cover)
Exposed rock	ER	Areas with exposed rock including talus, cliffs, rock outcrops or bedrock; sparse plant cover.
Lacustrine open water	OW	Open water not associated with riverine systems (i.e., lakes, ponds, oxbows, etc.)
Riverine	RIV	Includes mainstem river and major stream systems, including gravel and sandbars.
Landslide	LS	Areas of active or recent slope failure as evidenced by exposed soil/bedrock or vegetated slumps.
Disturbed sites	D	Includes areas that have been cleared for some purpose other than timber harvest, such as grazing, crop production, transmission lines, residential or commercial development, pasture or mining.

Appendix E

Parcel maps

Disclaimer: Seattle City Light does not guarantee the accuracy of the maps contained herein. Information on roads and property ownership was obtained from other sources. SCL did not check the accuracy of all information, and some information may be out of date by the time of finalization of this report. Rivers and streams may change their course. Vegetative cover, property ownership and road locations may change over time. Some vegetative cover was inferred from aerial photos and was not ground-truthed. Maps should not be relied upon for current detailed information.

Skagit Mitigation Lands road inventory

Parcel	Road name	Type	In/border/cross	Easement from	Easement to
McLeod	Concrete Sauk Valley Rd		Border		
Napoleon	None			ORM	
Lucas	641	Gravel	Ends in SCL	ORM	WDFW
Lucas	642	Gravel	Ends in SCL	ORM	
Barnaby	Entrance	Gravel	SCL		WDFW, TNC (Martin?)
Barnaby	North spur	Gravel	Cross to Martin		WDFW (Martin horse ranch?)
Barnaby	West spur	Gravel	Cross to TNC		WDFW, TNC
Illabot - SE	680/681 spurs	Former logging	End in SCL land	ORM	ORM???
Illabot - SE	676	Former logging	SCL-ORM-SCL	ORM	None
Illabot - SE	675 (O'Brian)	Former logging	Cross to DNR		DNR
Illabot - SE	674 (Illabot)	Former logging	SCL		None known
Illabot - SE	635 spur	Former logging	SCL		None known
Illabot - SE	635	Former logging	Cross/S border/to ORM	ORM	ORM
Illabot - SE	Railroad grade	Dirt, former RR	SCL		None
Illabot - NW	Illabot Cr Lane	Gravel, potholes	SCL & ROW easement		
Illabot - NW	W spur Illabot Cr La	Gravel, potholes	SCL & private		Access fish habitat, powerlines, homes
Illabot - NW	Pandora Circle Road	Gravel	border	Carefree Acres	
Nooksack	100	Logging, gravel	S. border	ORM	
Nooksack	200	Logging, gravel	Cross to ORM	ORM	ORM
Nooksack	200 spur	Dirt, overgrown	SCL only		none known
Nooksack	300	Logging, gravel	S. border	ORM	
Nooksack	330 S of bridge	Former logging	SCL only		
Nooksack	330 N of bridge	Former logging	SCL only		
Bear Lake	None				
Bacon Cr	USFS 1060	Gravel	Cross to Nat'l Forest		USFS
Bacon Cr	Gravel pit access	Gravel	SCL only		Randy Martin
Sauk Island	Informal	Dirt	SCL only	Doty	
Dan Cr	Overgrown	Dirt	SCL only	Rankin/TNC	
Everett Cr	Private	Dirt	Cross to Guse	Rankin/TNC	Guse family
N Sauk					

Use/Access	Length (mi) on SCL land	Culverts (SCL)	Status Year End 2005
	0	0	County road
on foot	0	0	
ORM gate	0.3	0	Need to remove blockage
ORM gate	0	0	
Public; Gate at 0.15 mi.	0.25	1	WDFW controls flow
Gated, usually open	0.12	0	
Gate at end of SCL land	0.5	1	WDFW controls flow
ORM gate	0.5	1	ORM agreed to abandon in 2005
None; gate removed	1.3 + ORM spur	0	Abandoned in 2005
None, gated	10.5 (incl spurs)	0	Abandoned in 2005
None, gated	3.0 (incl spurs)	0	Abandoned in 2005
None	0.2	0	Abandoned in 2005
ORM gate	1	?	Needed for access to other land
Rock barrier by SCL ROW	0.6 past ROW	0	No action needed
No gate	1	2	Need ROW access
No gate	0.15	0	SCL portion abandoned in 2005
Gated; card key	0	0	Accesses resort subdivision
Logging; ORM gate	0	0	ORM owns and maintains
Logging; ORM gate	3	?	ORM uses and maintains
Not used	1	1	Needs abandonment work
Logging; ORM gate	0	0	ORM owns and maintains
River access	0.5	?	Poor condition
None - decomm.	8.1	0	Abandoned in 1997
Trail & abandoned jeep trail	0	0	
Public access	1.1	3?	Relocated in 2004
Gated	0.1	0	
Ford channel	0	0	Maintained by locals
Gate on Rankin property	0	0	No need for work
Gate on Rankin property	0.5	1	Partly washed out in 2003 flood
Walk via Everett Cr parcel	0	0	

Appendix C: Habitat Occurrence by Parcel and Within One Mile of Mitigation Lands

Habitat Type	Nooksack Parcel Group				Bacon	
	Bear Lake	Nooksack	Total Nooksack	1 Mile Buffer	Bacon	Buffer
Upland Conifer Forest	**153.0**	**1,617.2**	**1,770**	**12,821**	**40.6**	**2,430.3**
Clearcut		10.6	**11**	1,018		69.4
Clearcut (partial)				16		
Recent burn						
Early seral (seedlings)		8.5	**9**	2,616		207.2
Early seral conifer		314.2	**314**	110		
Mid seral conifer		783.3	**783**	5,530	40.6	2,114.6
Late seral conifer mature		10.2	**10**			
Late seral conifer old-growth	153.0	455.8	**609**	3,035		39.1
Open mature		34.6	**35**	114		
Parkland				382		
Upland Hardwood Forest	**0.0**	**922.4**	**922**	**1,428**	**0.0**	**62.2**
Early seral hardwood		147.1	**147**	7		
Mid seral hardwood		673.1	**673**	1,382		62.2
Late seral hardwood		102.2	**102**	39		
Upland Mixed Forest	**0.0**	**1,064.4**	**1,064**	**154**	**0.0**	**270.0**
Early seral mixed hardwood/conifer		68.4	**68**	2		
Mid seral mixed hardwood/conifer		996.0	**996**	151		270.0
Riparian Habitat Types	**0.0**	**24.9**	**25**	**42**	**49.3**	**229.5**
Riparian shrub		8.2	**8**	4		1.6
Riparian forest hardwood		16.7	**17**			10.4
Riparian forest mixed hardwood/conifer					49.3	217.5
Riparian forest conifer				38		
Wetland Types	**0.0**	**11.5**	**11**	**13**	**0.0**	**2.1**
Wet meadow				9		2.0
Emergent wetland		1.4	**1**			
Shrub wetland		10.1	**10**	1		
Broadleaf wetland				0		
Conifer wetland				2		0.1
Non-Forested Habitats	**4.2**	**182.8**	**187**	**407**	**26.3**	**236.0**
Grass/Forb				3		1.6
Shrubfields		0.1	**0**	15		
Managed shrub/grassland					0.9	85.9
Exposed rock		2.0	**2**	208	2.6	17.0
Lake/Pond	4.2		**4**	26		
Riverine		170.9	**171**	65	11.4	130.2
Landslide		9.9	**10**	0		
Disturbed site		0.0		89	11.4	1.3
Unknown		0.0				
Grand Total	**157.3**	**3,823.2**	**3,980**	**14,863**	**116.1**	**3,230.1**

Habitat Type	Sauk Parcel Group						
	Dan Creek	Everett Creek	North Everett Creek	North Sauk	Sauk Island	Total Sauk	1 Mile Buffer
Upland Conifer Forest	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**1,522**
Clearcut							199
Clearcut (partial)							
Recent burn							
Early seral (seedlings)							393
Early seral conifer							
Mid seral conifer	0.1					**0**	930
Late seral conifer mature							
Late seral conifer old-growth							
Open mature							
Parkland							
Upland Hardwood Forest	**0.0**	**25.6**	**14.8**	**0.0**	**0.0**	**40**	**178**
Early seral hardwood							
Mid seral hardwood		25.6	14.8			**40**	158
Late seral hardwood							20
Upland Mixed Forest	**18.8**	**15.5**	**0.0**	**0.0**	**0.0**	**34**	**793**
Early seral mixed hardwood/conifer							
Mid seral mixed hardwood/conifer	18.8	15.5				**34**	793
Riparian Habitat Types	**15.9**	**86.4**	**39.8**	**36.7**	**35.8**	**215**	**336**
Riparian shrub			1.7		1.4	**3**	26
Riparian forest hardwood	9.3	14.3	1.2	36.7	27.4	**89**	228
Riparian forest mixed hardwood/conifer		72.1	36.9			**109**	40
Riparian forest conifer	6.6				7.0	**14**	43
Wetland Types	**5.5**	**10.3**	**10.2**	**2.8**	**0.0**	**29**	**68**
Wet meadow							7
Emergent wetland				2.6		**3**	16
Shrub wetland		10.3	10.2	0.2		**21**	10
Broadleaf wetland	5.5					**6**	0
Conifer wetland							35
Non-Forested Habitats	**1.2**	**13.7**	**5.2**	**10.5**	**17.8**	**48**	**1,815**
Grass/Forb							
Shrubfields							18
Managed shrub/grassland							106
Exposed rock							
Lake/Pond							
Riverine	1.2	11.9	1.9	3.2	17.8	**36**	510
Landslide							
Disturbed site		1.8	3.3	7.3		**12**	1,180
Unknown							
Grand Total	**41.6**	**151.4**	**70.0**	**50.0**	**53.5**	**366**	**4,712**

Habitat Type	Skagit Parcel Group							
	Barnaby	Illabot North	Illabot South	Lucas	McLeod	Napoleon	Total Skagit	1 Mile Buffer
Upland Conifer Forest	**46.1**	**360.9**	**1,899.9**	**4.7**	**0.8**	**0.0**	**2,312**	**10,808**
Clearcut	0.0		575.7	4.7	0.8		**581**	1,774
Clearcut (partial)			112.0				**112**	13
Recent burn			27.0				**27**	86
Early seral (seedlings)	3.3	0.0	0.0	0.0		0.0	**3**	3,579
Early seral conifer	17.9		588.8				**607**	306
Mid seral conifer	24.8	360.8	529.7	0.0			**915**	3,734
Late seral conifer mature								
Late seral conifer old-growth			66.7				**67**	1,315
Open mature								
Parkland								
Upland Hardwood Forest	**0.4**	**147.8**	**151.7**	**148.1**	**16.3**	**5.4**	**470**	**2,163**
Early seral hardwood		14.1	32.3				**46**	4
Mid seral hardwood	0.4	14.5	90.7	112.6	2.9		**221**	831
Late seral hardwood		119.2	28.7	35.4	13.3	5.4	**202**	1,328
Upland Mixed Forest	**99.8**	**147.7**	**273.5**	**0.0**	**0.2**	**17.1**	**538**	**1,346**
Early seral mixed hardwood/conifer		73.7	199.7			2.4	**276**	3
Mid seral mixed hardwood/conifer	99.8	74.0	73.8	0.0	0.2	14.7	**262**	1,343
Riparian Habitat Types	**25.9**	**20.7**	**169.0**	**0.0**	**45.3**	**37.6**	**299**	**1,050**
Riparian shrub								139
Riparian forest hardwood	0.0			0.0	45.3	10.6	**56**	606
Riparian forest mixed hardwood/conifer	25.9	20.7	40.3			27.0	**114**	239
Riparian forest conifer			128.7				**129**	65
Wetland Types	**26.0**	**35.2**	**0.2**	**49.2**	**8.7**	**3.2**	**122**	**143**
Wet meadow								
Emergent wetland	26.0	3.8		15.2			**45**	23
Shrub wetland		31.4		34.0	8.7	3.2	**77**	103
Broadleaf wetland			0.2				**0**	13
Conifer wetland	0.0							4
Non-Forested Habitats	**23.5**	**31.6**	**19.7**	**0.3**	**55.1**	**0.4**	**131**	**2,679**
Grass/Forb								6
Shrubfields								
Managed shrub/grassland		25.3	4.6		54.3		**84**	216
Exposed rock			0.6				**1**	16
Lake/Pond	22.0	1.0					**23**	33
Riverine			13.0		0.8	0.4	**14**	1,025
Landslide								
Disturbed site	1.5	5.3	1.4	0.3	0.0		**9**	1,384
Unknown	0.0							
Grand Total	**221.8**	**743.7**	**2,514.1**	**202.2**	**126.3**	**63.8**	**3,872**	**18,188**

Habitat Type	Total Parcels	Total Parcels and Buffers
Upland Conifer Forest	**4,123**	**31,705**
Clearcut	**592**	3,653
Clearcut (partial)	**112**	141
Recent burn	**27**	113
Early seral (seedlings)	11.9	6,807
Early seral conifer	920.9	1,337
Mid seral conifer	1,739.3	14,048
Late seral conifer mature	10.2	10
Late seral conifer old-growth	675.4	5,065
Open mature	34.6	148
Parkland	0.0	382
Upland Hardwood Forest	**1,432**	**5,263**
Early seral hardwood	**193**	204
Mid seral hardwood	**935**	3,368
Late seral hardwood	**304**	1,691
Upland Mixed Forest	**1,637**	**4,199**
Early seral mixed hardwood/conifer	**344**	349
Mid seral mixed hardwood/conifer	**1,293**	3,850
Riparian Habitat Types	**587**	**2,244**
Riparian shrub	**11**	181
Riparian forest hardwood	**161**	1,006
Riparian forest mixed hardwood/conifer	**272**	769
Riparian forest conifer	**142**	288
Wetland Types	**163**	**388**
Wet meadow	**0**	19
Emergent wetland	**49**	88
Shrub wetland	**108**	222
Broadleaf wetland	**6**	19
Conifer wetland	**0**	41
Non-Forested Habitats	**392**	**5,530**
Grass/Forb	**0**	11
Shrubfields	**0**	33
Managed shrub/grassland	**85**	493
Exposed rock	**5**	246
Lake/Pond	**27**	86
Riverine	**233**	1,964
Landslide	**10**	10
Disturbed site	**32**	2,687
Unknown	**0**	0
Grand Total	**8,335**	**49,329**