Henry M. Jackson Hydroelectric Project FERC No. 2157



2008 ANNUAL PROGRESS REPORT WILDLIFE HABITAT MANAGEMENT PLAN

May 5, 2009



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1.0 SUMMARY

Accomplishments during 2008 on the Wildlife Habitat Management Plan (WHMP) lands for the Henry M. Jackson Hydroelectric Project are presented in this report. A cumulative summary of tasks accomplished since the initiation of the WHMP in 1988 is also presented in this report. Problems or changes needed during implementation of the WHMP are discussed, and updated schedules are presented. A draft of this report was submitted for comments to the U.S. Fish and Wildlife Service (USFWS), the Washington Department of Fish and Wildlife (WDFW), and the Tulalip Tribes (Tribes). The Washington Department of Natural Resources (DNR) was also consulted. A meeting has been offered by the District to discuss the results of 2008 work.

The basic habitat enhancements, monitoring programs, and reports required by the WHMP to date have been implemented consistent with the WHMP's objectives (Section 3, WHMP, by management tract) and implementation schedule (Section 5.0, WHMP). In some cases, procedures described in the WHMP have been modified or refined to improve the usefulness and reliability of results. Similarly, the details of timber stand boundaries and harvest schedules have been modified to improve operations and reduce impacts, but all such modifications have been within the allowances provided by the WHMP. All significant modifications in procedures have been evaluated relative to the WHMP's management objectives, in consultation with agency reviewers, and have been implemented only if the modifications remain consistent with the WHMP's objectives. Significant modifications are documented in the WHMP annual reports.

As described in Sections 3 and 4 of this report and in previous years' reports, implementation of the WHMP over the past 20 years has already provided many of the intended wildlife habitat benefits. For example, snag and coarse woody debris creation have provided critical shelter and foraging substrates that were scarce in second growth forest stands, while small-scale timber harvest has created new foraging opportunities for several species. Revegetation of areas disturbed during project construction has provided cover and forage.

1.1 MAJOR TASKS ACCOMPLISHED DURING 2008

- Management of noxious and invasive weeds (all WHMP tracts)
- Created snags and gaps (Spada Lake)
- Monitored nest structures (Lake Chaplain, Lost Lake and Spada Lake Tracts)
- Monitored water quality in Chaplain Creek
- Monitored deer forage (Lake Chaplain Tract)
- Completed studies for Jackson Project Relicensing, conducted stakeholder meetings, prepared protection, mitigation and enhancement measures for the new license period, prepared the Updated Study Report and the Preliminary License Proposal and submitted them to the FERC.
- Continued implementation of Lake Chaplain Tract RMAP
- Crazy Bear Timber Sale harvest unit replanted (Lake Chaplain Tract)
- Initiated timber inventory update (Lake Chaplain Tract)
- Monitored plantations (Lake Chaplain Tract)
- Continued layout of future harvest units (Lake Chaplain Tract)

- Continued implementation of Spada Lake Tract RMAP and associated road repairs
- Continued wetland descriptions/rating on WHMP lands and land adjacent to the lower Sultan River that could be affected by changes to the instream flow regime as part of relicensing studies.

1.2 TASKS SCHEDULED FOR 2009

- Monitor snags to determine levels of use & preference (all tracts)
- Create snags and/or gaps (Spada & Lake Chaplain Tracts)
- Monitor nest structures (all tracts)
- Monitor water quality of Chaplain Creek
- Monitor deer forage (Lake Chaplain Tract)
- Continue implementation of RMAPs (Lake Chaplain, Spada Lake Tracts)
- Continue layout of future harvest units (Lake Chaplain Tract)
- Continue timber inventory update (Lake Chaplain Tract)
- Monitor plantations (Lake Chaplain Tract)
- Monitor thinned stands on Spada Lake Tract
- Monitor revegetation sites
- Monitor Williamson Creek Tract
- Manage noxious and invasive weeds (all WHMP tracts)

2.0 INTRODUCTION

The 2008 Annual Progress Report on the Wildlife Habitat Management Plan (WHMP) for the Henry M. Jackson Hydroelectric Project was prepared by Public Utility District No. 1 of Snohomish County (District) and the City of Everett (City), who are currently colicensees in the Project. The WHMP project area and management tracts are shown in Figure 1.

The WHMP guides management of the five tracts of land totaling approximately 7,070 acres of land and water. Refer to the WHMP, Wildlife Habitat Management Plan Supplement for the Spada Lake Tract (January 1997 & January 2008), and the Pre-Application Document (PAD) for the Jackson Hydroelectric Project, Section 5.4 (December 2005) for details on management goals and objectives, schedules and updated information. These documents are available on the District's web site at http://www.snopud.com/water/relicensing.ashx?p=2334

This annual report describes activities conducted during calendar year 2008 (Section 3.0) and summarizes activities completed since the management program was initiated in 1988 (Section 4.0). Activities anticipated for the calendar year 2009 are also described (Section 5.0). Activities, procedures and schedules described in this report are based on the WHMP approved by the Federal Energy Regulatory Commission on May 19, 1989, in compliance with Project License Article 53 and subsequent related orders from the Commission.

Activities completed prior to 2008 (from 1990 – 2007) are documented in a series of Annual Progress Reports prepared by the District and City, and may be found at the District's web site:

http://www.snopud.com/water/relicensing/history/existing/terrestrial.ashx?p=2348



FIGURE 1. WHMP MANAGEMENT TRACTS

3.0 WORK COMPLETED DURING 2008

3.1 SNAG MANAGEMENT

3.1.1 Lake Chaplain Tract

Discussions are currently underway with the DNR regarding the future of the South Shore Road at Spada Lake, which provides road access to over 400 acres of land. Given that the future of the road is uncertain, snag creation in that area and others on the Spada Lake Tract were given the highest priority, therefore, snag creation did not occur on the Lake Chaplain Tract in 2008.

3.1.2 Spada Lake Tract

In 2008, a total of 263 snags were created (Table 1) in groups of typically 10-15 trees, on nearly 80 acres (2 stand complexes), along both the South Shore Road and Culmback Dam Road, including one stand where snag and gap creation began in 2006 (Figure 2). Of these, approximately 150 trees had cat-faces or cavities carved in the tree with a chain saw to expedite decay and nest cavity creation and about 170 were topped but left alive in an attempt to create live decadent trees for future nest cavity creation. Typical diameters for created snags range from 11-17 inches, with an average of about 14 inches. Approximately 340 additional small trees (< 11" dbh) were either topped or base girdled within these gaps to increase light input to the forest floor. WHMP requirements for a minimum of 3 snags/acre are met on these stands, but due to small average tree diameter, size class distribution requirements cannot be met at this time.

Photo-documentation stations were established at the center of each gap to allow changes over time to be noted. Qualitative assessments of each species of understory plant were also made within selected gaps. A subset of these gaps will be monitored over time to determine the effects of canopy removal on the forage plants, and whether decadent features are created by live-topping a percentage of the snags. This information will allow for refinement in snag and gap creation procedures.

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Table 1. Summary of Snag Management Activities in 2008									
UNIT	ACRES	NUMBER CREATED	AVG DBH (in.)	AVG HT. (ft.)	# PER ACRE	NOTES ^{\1}			
9-97	2.3	148	14.5	40.1	4.55	, √ Includes created snags only			
9-142/ 150 comple x	34.0	115	14.4	57.1	3.44	$\sqrt{1}$ Includes created snags only			
9-125	76.9	263	14.55	48.4	4.0	Includes created snags only (work will continue in 2008)			
√ Meets available	Meets WHMP requirements for number per acre, but larger size classes not available in this stand								

3.2 REVEGETATION AND WEED MANAGEMENT

During noxious weed surveys as well as during other field work, locations of weeds were recorded to document occurrence and effectiveness of control measures. GPS coordinates were recorded for each infestation; the District has this information in their GIS database and can use it for management purposes. Surveyors pulled individual weeds or small infestations and this information is contained within the GIS database as well.

3.2.1 Lake Chaplain Tract

Over five thousand individual noxious and/or invasive non-native weeds (thistles, butterfly bush, tansy ragwort, and scotch broom) were uprooted along roadsides on the Lake Chaplain Tract during 2008. Nearly 85% of uprooted weeds were situated within the hydrographic boundary of Lake Chaplain, where herbicide application is not permitted. Flower or seed-head cutting and hand pulling are the typical means used to control these plants.

Two patches of Japanese knotweed were identified outside of the hydrographic boundary of Lake Chaplain in 2006. The patches were slashed in early summer of 2008 and subsequent sprouts were treated with herbicide in early fall of 2007. One patch was again slashed in the early summer of 2008 and treated with herbicide in early fall of 2008. Additional treatment may be necessary in 2009.

English Holly planted in 1993 to provide a vegetated screen along Chaplain Marsh was removed in the spring based upon a request by the Forest Service to manage this potentially invasive species. Adequate native vegetation, some planted in 1993 and some volunteer, provides an adequate screed along the marsh without the holly present.



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FIGURE 2. SNAG MANAGEMENT IN THE SPADA LAKE TRACT – 2008

3.2.2 Pipeline ROW

The pipeline Right-of-Way (ROW) was searched for noxious weeds with a licensed contract sprayer applying herbicide to any found outside of riparian buffer areas and the City of Sultan's watershed area. Typical weeds found were Canada thistle, hawkweed, scotch broom, Himalayan blackberry, and tansy ragwort. Use of small portions of the ROW by off-road vehicles has been persistent, particularly with the gate at the end of 116th street being left open around the clock for recreational access. A new gate was installed at the entrance to the City of Sultan's watershed, with concrete blocks lined across part of the ROW, preventing most off-road vehicles from gaining access to that area of the ROW that historically received the most abuse.

Treated biosolids from the City of Everett wastewater treatment plant were applied to approximately ½ mile of the ROW in two areas. Both areas were publicly posted as required by the SEPA permit. Near the microwave tower at the southeast end of the ROW approximately 0.15 miles of ROW was covered, and in the Marsh Creek area, near manholes P4-P6, biosolids were applied to approximately 0.3 miles. Biosolids were applied approximately 3 inches deep then over seeded with grass/forb mixes typical for use on the ROW. Photodocumentation will allow comparison over time to untreated areas to determine if this is an appropriate and cost-effective means of amending the soil, while re-seeding with a lower growing grass/forb mix to reduce the need for vegetation maintenance, and still providing hiding cover for small mammals and forage for deer.

3.2.3 Transmission Line ROW

Noxious weeds were pulled or sprayed several times during the growing season, with the primary species found here being English Holly, and thistle and blackberry species.

3.2.4 Spada Lake Tract

Roads in the Spada Lake area as well as Culmback Dam itself were patrolled for weeds several times during the growing season. Typical weeds found along roads were thistle species. Weeds found on the back side of the dam included scotch broom, tansy ragwort and hawkweeds. Scotch broom and tansy ragwort were pulled, bagged and removed from site, while hawkweed was mowed to prevent flower and seed production in the short term. An effective means of removing the hawkweed without use of herbicides in the watershed will continue to be explored in 2009.

3.2.5 Williamson Creek Tract

Areas identified by consultants during noxious weed inventories were visited once during the growing season to pull and grub-out weeds. These were found primarily along the abandoned road grade running north through the Tract. Weeds found and pulled include hawkweeds, thistles and reed canary grass.

3.3 NEST STRUCTURES

3.3.1 Floating Nest Platforms

None of the 4 floating nest platforms was observed to have use in 2008 (Figures 3 and 4). The platform anchored in the North Fork was again dislodged from its anchorage and apparently either buried in sediment or washed down the lake, and has not yet been found. Given the low rate of use of these platforms, there is no plan to replace it. However, if it is recovered, an attempt will be made to find a new, more sheltered location.

No use was observed on either of the platforms at Lost Lake, but occasional use by feeding otters and possibly loafing by water birds is typical, evidence of which is commonly noted during end of breeding season visits.

3.3.2 Nest Boxes

On the Spada Lake Tract none of the eight boxes installed had been used by cavity nesting waterfowl, although some were being used by squirrels when checked in the fall (Figures 3 and 4, Table 2). Boxes on this tract have not been subjected to as much predation by bears as have boxes on the other tracts.

On the Lake Chaplain and Lost Lake Tracts, nest boxes installed on trees wrapped with 3-4' high aluminum bands survived much better in 2008 than in prior years, although overall use of boxes by nesting waterfowl was quite low (Figures 5 and 6, Table 2). Six of the seven boxes available for use in 2008 had predator guards on the mounting tree, and none of the seven boxes were damaged by bears. Nest box use was again low, possibly due in part to lower than normal average temperatures and slightly higher precipitation from February through March, both factors that have been linked to decreased nesting success. Additionally, many species of cavity nesting waterfowl show a strong affinity for their natal lake or wetland, so given the low nesting success over the past few years, increasing the local population and thereby nest box usage may take some time.

Location	Boxes Available	Boxes Used	Box Success (# boxes that fledged >/= 1 egg)	Number fledged by species
Lost Lake Tract	7	2 (29%)	2 (29%)	6 hooded mergansers & 5 wood ducks fledged; 4 others used by squirrels
Lake Chaplain Tract	0	n/a	n/a	n/a
Spada Lake Tract	8	0 (0%)	n/a	0
TOTAL	15	2 (13%)	2 (13%)	11 total

Table 2.	Nest Box U	se on JHP	Lands in 2008

3.3.3 Osprey Nest Platforms

District staff monitored the osprey nest platform at Lost Lake (Figure 6) and the two platforms at Spada Lake (Figure 4) while conducting other business in the area. No use was noted on any of the three structures.

An additional osprey nest platform installed in 2007 north of the Powerhouse between the Sultan River and the District's microwave tower, to provide additional nesting habitat and help keep the osprey from attempting to nest on the new microwave tower. Osprey were occasionally seen in the area, but no nesting attempts were made.

3.3.4 Bald Eagle Nest

The bald eagle nest established in 1997 on the Lake Chaplain Tract was monitored occasionally by District biologists, and more frequently by City watershed patrolmen. The nest was occupied by nesting bald eagles, with 2 eaglets observed in mid-June, and 1 chick successfully fledged.



FIGURE 3. NEST STRUCTURES AT EAST END SPADA LAKE



FIGURE 4. NEST STRUCTURES AT WEST END SPADA LAKE



FIGURE 5. NEST STRUCTURES AT CHAPLAIN MARSH



FIGURE 6. NEST STRUCTURES AT LOST LAKE

3.4 FOREST VEGETATION MANAGEMENT ON THE LAKE CHAPLAIN TRACT

3.4.1 Crazy Bear Timber Sale Harvest

The Crazy Bear Timber Sale was sold and harvest completed in 2008 (Figure 7). Both units were planted in 2008 with 250 Douglas fir seedlings per acre. A total of 41 acres were harvested in the two units, with 126 trees marked for retention as either natural snags or trees to be made into snags prior to harvest. Trees designated as coarse woody debris were left standing on-site where possible, and those near roads were felled after harvest was complete.

3.4.2 Layout of Future Harvest Units

Field reconnaissance and inventory of three final harvest units (2000-1, 2005-1, and 2005-2) and two thinning units (2025-5 and 2035-1) was completed. The final harvest units will be reconfigured to account for mapping inaccuracies and to minimize road construction. Scheduled thinning is deemed unnecessary because understory forage production has been increasing as overstory trees succumb to a variety of pathogens and leave gaps in the canopy. A consequence of the ongoing overstory mortality is that the number of snags present in these stands has increased five-fold since 2005.

3.4.3 Monitoring of Plantations

Older plantations were monitored for bear damage and hardwood competition was evaluated. Bear damage is evident in all of the plantations that were thinned (Chap1-91, Chap2-91,

and Chap3-91). Bears strip bark from conifer trees during spring sap flow to feed on the cambium and prefer the vigorously growing trees retained in thinned plantations.

The WHMP standard calling for hardwoods to comprise 5 to 10 percent of total stem count has been exceeded in Divr2-95. Monitoring of conifer growth suppression will continue; a decision to slash excessive hardwood trees will consider the potential for subsequent bear damage on conifer trees. Bear damage may increase in 2009 due to poor berry production in 2008.

3.5 FOREST VEGETATION MANAGEMENT ON THE SPADA LAKE TRACT

All forest units where commercial harvest or pre-commercial thinning could occur without new road construction or slope de-stabilizing re-construction have been completed. No harvest is planned for the Tract, and units will be revisited in approximately 10 years to re-evaluate the potential and need for timber management activities.



FIGURE 7. HARVEST ACTIVITY IN THE LAKE CHAPLAIN TRACT - 1991-2008

3.6 OTHER WILDLIFE OBSERVATIONS

Some incidental observations of wildlife species on WHMP lands are listed below in Table 3. These observations are not the result of systematic surveys for wildlife, but are included in the report to document the presence of these species on management lands.

Table 3.	Incidental Wildlife
	Observations

DESCRIPTION	LOCATION	DATE
Western Grebes – 7 chicks	Williamson Creek mouth	Summer 2008
Wood Ducks – 2 pair in beaver pond	NE corner L. Chaplain Tract	3/6/08
Tree Swallows	N end L. Chaplain	3/6/08
Canada geese	N end L. Chaplain	4/2/08
Common merganser - pair	Lost Lake	4/16/08
Wood duck - female	Lost Lake	4/16/08
Barn swallows	L. Chaplain filter plant	4/30/08
Black-headed Grosbeak – 2 pair	NW corner L. Chaplain Tract	5/28/08
Goldfinch	Powerhouse	6/4/08
Black bear	Culmback Dam	6/21/08
White-crowned sparrow	Culmback Dam	6/26/08
Garter snake	Culmback Dam	6/26/08
Doe and fawn	Culmback Dam Road	6/26/08
Black bear	Diversion Dam Road near	6/28/08
	Chaplain Creek	
Weasel – dark color phase	L. Chaplain N. dam	7/5/08
Bullfrog – numerous tadpoles	Lost Lake	7/11/08
Band-tailed pigeons - immature	Culmback Dam	7/12/08
Long-tailed weasel	Spada L South shore	10/9/08
Kestrel	Spada Lake	10/11/08

3.7 BIOSOLIDS APPLICATION AND MONITORING

Biosolids were not applied in the Lake Chaplain Tract during 2008, and there are no plans to apply biosolids in 2009.

Water quality in Chaplain Creek, both upstream and downstream from previous biosolids application sites, was monitored quarterly. Results obtained in 2008 indicate the same patterns of seasonal variations for several contaminants, all within the acceptable range, that have been found in previous years.

3.8 DEER FORAGE MONITORING

Deer forage availability was sampled in late June 2009 on the Line1-00 final harvest unit on the Lake Chaplain Tract, and on the Chap1-01 final harvest unit in early July 2009. Chap1-00 was harvested in 1991 and precommercially thinned in 2001 to reduce the density of sapling Douglas firs. Eighteen years after harvest of the unit, planted and naturally-recruited Douglas fir dominated the sapling/pole tree layer (trees greater than 6 feet in height) (Figure 8). Ninety-one percent of sample quadrats had a tree present that was greater than 6 feet in height. Other tree species were present in this layer, including hardwood species (red alder, Pacific willow, cherry (Prunus), black cottonwood and bigleaf maple) and western hemlock, but their frequencies were so low that very few were recorded in sample quadrats. While there were a few small patches of red alder and bigleaf maple present off-transect, in general, hardwoods are not a significant component of this unit. Conifer and hardwood species under 6 feet in height were also present in very low frequencies.

The understory layer of Chap1-91 was dominated by sword fern, moss, Oregon grape, huckleberry and salal prior to harvest (Figure 9). In the years following harvest, forb species, especially fireweed, grasses and bracken fern were recorded frequently in surveys. Some species, including fireweed and most forbs and grasses, had largely dropped out of the understory layer by the 2008 survey, probably in response to shading by the growing tree canopy. Also in response to shading, bare ground increased in frequency in the 2008 survey, relative to earlier successional stages in which forbs and Rubus species covered the ground. The 2008 survey reported increased frequency of sword fern, huckleberry and moss relative to earlier post-harvest surveys. Some shrub species, including salal and Oregon grape, have been present in relatively unchanged frequencies throughout the surveys, indicating that these species respond to shade as well as light. Rubus species such as thimbleberry, trailing blackberry and other species responded to removal of the tree canopy after harvest, but only trailing blackberry remained widespread in the 2008 survey.

Line1-00 was harvested in 2000, and thus was sampled eight years after harvest in the 2008 survey. Douglas fir dominated trees greater than 6 feet in height, but western hemlock and black cottonwood were also relatively widespread (Figure 10). Trees under 6 feet in height were recorded in the 2008 survey, in particular hemlock and cherry.

The understory layer of Line1-00 prior to harvest was dominated by sword fern, moss and Oregon grape Figure 11). Following harvest, the understory was diverse, and included forb species, grass species, ferns and shrub species. Several shade-intolerant species characteristic of disturbed areas, including bracken fern and fireweed, were frequently recorded in surveys. Moss and forb frequency peaked two years after harvest and then declined. A large number of shrub species were recorded, with thimbleberry, salmonberry and huckleberry showing relatively high frequency of occurrence five to eight years after harvest. Coarse woody debris on the unit consisted primarily of Douglas fir and western hemlock logs that were retained after harvest in 2000 to enhance wildlife habitat values of the unit.



Figure 8. Chap1-91. Tree Species Frequency of Occurrence



Figure 9. Chap1-91 Understory Species Frequency of Occurrence



Figure 10. Line1-00 Tree Species Frequency of Occurrence



Figure 11. Line1-00 Understory Layer Species Frequency of Occurrence

3.9 LAND MANAGEMENT AT LAKE CHAPLAIN

The City of Everett continued implementation of its Road Maintenance and Abandonment Plan (RMAP) in the Lake Chaplain Tract. RMAP activities included brush cutting along roadsides and cleaning of culverts and ditches, as needed. A protocol fish survey confirmed the absence of fish above the waterfalls in Straight Creek. An official water type change was submitted and accepted, thereby eliminating the need to replace three culverts on the Swamp Road that were previously considered to be barriers to fish passage. Outside of the hydrographic boundary of Lake Chaplain, nearly one mile of unnecessary road was abandoned by removing culverts and constructing waterbars to control erosion.

3.10 LAND MANAGEMENT ON DISTRICT PROPERTY

The District continued implementation of its RMAP. Routine road maintenance was conducted as needed on all District roads in 2008. Culverts and ditches were inspected and cleaned or brushed as needed. The District submitted the annual Road Maintenance and Abandonment Plan (RMAP) report to DNR as required, for roads on WHMP mitigation lands.

Consultations with Jackson Project stakeholders as part of the Project relicensing effort, included discussion of potential road abandonment of DNR's (SL-ML South Shore Road), and Forest Service 6122 Road (District CD14 Road) in the Sultan Basin adjacent to Spada Lake. Options for use of those roads were considered. As part of relicensing there will be a decision regarding whether the 6122 Road (CD14 Road) will become a trail or remain as a road.

The District continued to stay in contact with DNR representatives regarding DNR's proposal to abandon the South Shore Road, which leads to four of the District's Jackson Project Recreation Sites and wildlife mitigation lands. Issues that continue to be discussed include maintenance of the road through the current license period (through May 2011) and long term solutions and plans through the next licensing period. Relicensing studies including the Recreation Needs Analysis and consultations with stakeholders during the relicensing process will result in a decision on the future of the South Shore Road. The approach included in the Preliminary License Proposal (PLP) is for the District to upgrade the South Shore road to Recreation Site 3 and for DNR to convert the road to a pedestrian trail with administrative quad access from Site 3 to the Greider trailhead. Discussions with stakeholders are ongoing.

3.11 SECURITY MEASURES AT LAKE CHAPLAIN/JACKSON PROJECT FACILITIES

Restrictions on access to and across Culmback Dam continued as approved by FERC "Order Modifying and Amending Recreation Plan (Issued June 28, 2006)."

The District continues to use the installed security systems on the Culmback Dam Road in the vicinity of Culmback Dam. These systems include motion-activated alarms, lights and cameras.

3.12 JACKSON PROJECT RELICENSING

Activities important to the formal relicensing process in 2008 included:

- Completion of Terrestrial Studies and Final Technical Reports for:
 - Study Plan 7: Special Status Plant Surveys,
 - Study Plan 8: Noxious Weed Inventory,
 - Study Plan 9: Wetland Surveys
 - Study Plan 10: Amphibian Survey,
 - Study Plan 11: Marbled Murrelet Surveys, and
 - Study Plan 12: Northern Spotted Owl Surveys.
- Updated Study Reports and stakeholder meetings,
- Development of PM&Es,
- Development and Filing of the PLP

All final technical reports, the Updated Study Report and the PLP are all posted to the District's relicensing web site, which is continually updated. It provides the agencies and public with information about relicensing of the Jackson Project and displays many of the documents compiled over the past 20+ years of Project history. The web site is: http://www.snopud.com/water/relicensing.ashx?p=2334.

3.13 SPADA LAKE TRACT SUPPLEMENTAL PLAN

The management techniques and prescriptions of the second Supplemental Plan, approved August 21, 2008 continue to be implemented as required, including evaluation of timber management options, snag tree creation, wetland assessment and nest structure maintenance.

3.14 AGENCY AND TULALIP TRIBES CONSULTATION

A meeting between the co-licensees and the wildlife agencies was held on April 16, 2008 to review past implementation activities and to provide time for a site visit to the Lake Chaplain and Lost Lake Tracts. Road conditions precluded access to the Spada Lake Tract. The agencies, Tribes and stakeholders have been kept apprised of relicensing progress and activities throughout 2008. No comments were received on the Annual Report. Consult the relicensing web site for additional information: http://www.snopud.com/WaterResources/relicensing.ashx?p=2334.

4.0 CUMULATIVE SUMMARY

Section 4.0 provides a cumulative summary of WHMP related activities conducted since the beginning of implementation through 2008.

4.1 SNAG MANAGEMENT

Since implementation of the Wildlife Mitigation Plan began in 1989, a total of 2,768 snags have been created on 74 units (1,558 acres) across the Lake Chaplain and Lost Lake Tracts (Figure 12 & Tables 4 & 5). Of these, 72 units (1,534 acres) currently meet the WHMP guidelines for snag size distribution and density.

On the Spada Lake and Williamson Creek Tracts, 2,913 snags have been created on 55 stands or stand complexes (1,275 acres), as shown in Figures 13 and 14, and Tables 6 and 7, respectively. Thirty of these stands/complexes (1,004 acres) have at least 3 snags/acre, but of a smaller average diameter than called for in the WHMP, due to the younger age of the stands. Snag creation now occurs almost exclusively in clumps to create gaps in the forest canopy, thereby increasing light input to the forest floor with the goal of improving shrub growth. As a result, groups of typically 12-15 trees greater than 11" dbh are topped, with most trees less than 11" dbh either topped or base girdled as well. Approximately two thirds of the trees greater than 11" dbh were live topped, with the intention of allowing them to continue growing, but also creating favorable conditions for wildlife use in the future, such as a cathedral top or hollow top. Small cavities were also created in approximately half of the trees, but only in live-topped trees.

Across all Project lands, a total of 5,681 snags have been created, with 102 units or stands (2,537 acres) now meeting WHMP requirements for a minimum of three snags/acre. As noted in section 3.1.2, size class distribution on most stands at Spada Lake is impossible to attain at this time, due to extremely overstocked stands and associated small average diameters.

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
CRAZ 1	17.8	57	17.5	66.3	3.2	√ Natural and created snags
CRAZ 2	23.2	69	17.4	75.7	3.0	√ Natural and created snags
2025-2	17.3	42	18.2	75.5	4.5	√ Natural and created snags
2025-5	22.3	52	17.4	64.0	3.4	√ Natural and created snags
2025-6	15.9	30	18.5	68.3	3.6	√ Natural and created snags
2035-1	23.4	64	17.6	64.7	3.1	√ Natural and created snags

Table 4. Summary of Snag Management Through 2008 - Lake Chaplain

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
2035-2	5.0	11	18.0	77.3	4.1	√ Natural and created snags
2035-4	12.7	9	17.8	78.9	4.7	√ Natural and created snags
2035-5	20.0	42	17.9	75.9	4.7	√ Natural and created snags
2045-1	22.3	41	17.1	65.1	3.2	√ Natural and created snags
2045-2	27.3	0	30.9	62.2	7.7	Includes natural snags only
2045-3	11.0	6	17.7	83.3	3.6	√ Natural and created snags
2045-4	20.0	7	17.4	69.3	4.9	√ Natural and created snags
2045-5	17.8	68	18.3	68.1	3.8	√ Natural and created snags
2045-6	27.6	19	18.0	71.2	4.0	√ Natural and created snags
2015-1	12.2	15	16.1	66.5	4.5	√ Natural and created snags
2015-3	18.0	13	16.9	48.4	7.4	√ Natural and created snags
2015-4	18.8	0	20.6	46.1	4.7	Includes natural snags only
2015-5	17.7	26	16.0	44.1	5.4	√ Natural and created snags
2015-6	19.0	45	17.5	55.4	4.0	√ Natural and created snags
2020-1	24.0	50	16.9	61.9	4.9	√ Natural and created snags
2020-4	15.3	36	17.0	49.3	4.4	√Includes created snags only
2020-5	19.1	15	19.1	61.4	9.8	√ Natural and created snags
2020-6	12.0	26	17.7	50.5	6.3	√Includes created snags only
2025-1	28.0	24	16.5	65.4	4.1	√ Natural and created snags
2025-3	31.7	86	17.4	65.0	3.9	√ Natural and created snags
2025-4	26.0	49	17.0	66.9	4.2	√ Natural and created snags

 Table 4. Summary of Snag Management Through 2008 - Lake Chaplain

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
2030-2	22.1	60	17.0	50.3	3.1	√ Natural and created snags
2030-3	21.0	0	17.2	70.8	6.8	√ Includes natural snags only
2030-5	24.0	48	18.0	50.0	3.2	√ Natural and created snags
2035-3	18.5	30	18.0	55.0	4.9	√ Natural and created snags
2040-3	16.3	14	21.4	50.0	6.9	√ Natural and created snags
Buffer Zone 1	2.3	15	16.4	63.8	9.8	√ Natural and created snags
Buffer Zone 2	1.4	7	15.9	46.6	5.0	√ Natural and created snags
Buffer Zone 3	8.7	23	16.6	46.6	4.5	√ Natural and created snags
OMA1 a	74.8	14	17.9	68.3	4.3	√ Natural and created snags
OMA1 b	50.5	62	18.4	65.2	3.2	√ Natural and created snags
OMA1 c	30.7	68	18.1	64.4	4.0	√ Natural and created snags
OMA 3	11.8	27	16.2	63.6	6.3	√ Natural and created snags
OMA 4	26.5	22	16.1	54.5	6.7	√ Natural and created snags
OMA 8	5.3	7	18.1	54.3	18.4	√ Natural and created snags
OMA 10	8.6	4	20.0	56.3	18.4	√ Natural and created snags
PMF 4	31.8	54	16.5	46.2	4.9	√ Includes created snags only
PMF 5	27.4	0	23.5	47.3	5.3	$\sqrt{1}$ Includes natural snags only
PMF 6	13.3	0	23.9	64.3	6.0	Includes natural snags only
PMF 7a ^{∖1}	15.5	20	17.8	58.5	2.5	Includes natural and created snags

 Table 4. Summary of Snag Management Through 2008 - Lake Chaplain

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
PMF	15.0	20	10.1	66.0	1.0	√ Natural and created
70	15.8	38	10.1	00.0	4.0	$\sqrt{Natural and created}$
PMF 8	8.5	24	17.5	65.2	3.2	snags
PMF 9	52.2	71	17.3	54.9	3.1	√ Natural and created snags
PMF 10	34.1	56	18.3	45.1	4.5	√ Natural and created snags
PMF 11	12.0	25	16.8	43.7	4.3	√ Natural and created snags
PMF 15	6.8	14	14.4	35.0	10.6	√ Natural and created snags, from danger tree removal along transmission lines
PMF 17	14.7	35	17.0	58.1	4.4	√ Natural and created snags
Stand 1-3 ^{\2}	4.4	0	n/a	n/a	3.1+	√ Natural snags only
TIKI 1- 98	21.0	54	17.5	55.6	3.1	√ Natural and created snags
TIKI 2- 98	23.8	73	18.0	56.1	3.1	$\sqrt{1}$ Natural and created snags
Wetlan d Buffer 1	8.7	12	19.0	47.9	1.4	Includes created snags only
Wetlan d Buffer 2	35 5	65	17.2	56.4	3.1	√ Natural and created snags
- CHAP 1-91	26.0	75	16.6	33.5	3.1	√ Natural and created snags
CHAP 2-91	15.0	46	16.1	27.4	3.1	$\sqrt{1}$ Includes created snags only
CHAP 3-91	24.0	55	18.0	31.0	3.6	√ Natural and created snags
				1		

 Table 4. Summary of Snag Management Through 2008 - Lake Chaplain

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
DIVR1 -95	15.6	42	16.8	50.3	3.1	√ Natural and created snags
DIVR2 -95	19.7	59	18.3	47.9	3.1	√ Natural and created snags
DONK 1-01	23.5	67	17.1	65.3	3.1	√ Natural and created snags
DONK 2-01	21.4	58	18.0	67.6	3.0	√ Natural and created snags
HORS 1-93	20.0	0	14.5	89.0	11.5	$\sqrt{1}$ Includes natural snags only
HORS 2-93	18.0	23	16.9	55.2	4.6	√ Natural and created snags
HORS 3-93	13.7	37	16.0	33.8	3.1	√ Natural and created snags
LINE 1-00	14.8	42	18.0	65.4	3.0	√ Natural and created snags
LINE 2-00	22.0	62	17.4	66.4	3.1	√ Natural and created snags
Phone Line -	19.0	58	16.5	66.6	3 1	√ Natural and created snags
TOTAL	1,402	2,422	Totals for the 69 Lake Chaplain units which meet			
TOTAL	1,426	2,454	Totals for all 71 Lake Chaplain units having snag mgmt activity to date.			

 Table 4. Summary of Snag Management Through 2008 - Lake Chaplain

Table 5. S	Table 5. Summary of Snag Management Through 2008 –Lost Lake					
Lost Lake						$\sqrt{10}$ Natural and created snags
7-1	93.7	234	18.1	62.2	3.3	
Lost Lake						ightarrow Natural and created snags
7-2	34.0	80	17.3	61.7	3.2	
Lost Lake						
7-3	4.0	0	n/a	n/a	3.1	$ m \sqrt{Natural snags only}$
TOTAL	132	314	Totals for all 3 Lost Lake units having snag mgmt activity to date, all of which meet WHMP requirements for snags.			

 $\sqrt{}$ Meets WHMP requirements for size class distribution and number per acre.

\1 Fewer than 3.07 snags/acre exist due to lack of overstory trees in this forested wetland area.

Unit will be revisited in 10 years for further snag opportunities. \2 Remainder of stand, exclusive of already delineated units.

		0				
UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
9-125	32.9	167	14.5	40.1	5.1	√ Includes created snags only, from 2007 & 2008
9-142/ 150 complex	34.0	115	14.4	57.1	3.4	√ Includes created snags only
9-8	106.0	326	15.2	60.5	3.3	$\sqrt{1}$ Includes natural and created snags
9-24 ^{\2}	12.1	19	15.7	62.0	2.1	Includes natural and created snags
9-35	4.5	13	15.9	54.9	3.9	√ Includes natural and created snags
9-47	4.3	10	15.7	64.0	3.0	√ Includes natural and created snags
9-90	32.0	143	13.0	45.8	4.5	√ Includes created snags only
9-97	2.3	10	13.2	54.0	4.3	Includes created snags only
9-107 complex	33.4	121	14.5	48.7	6.4	√ Includes natural and created snags
9-108 complex	73.0	280	13.7	47.5	3.8	√ Includes created snags only
9-110	8.4	34	13.0	51.6	4.0	√ Includes natural and created snags
9-114	53.0	178	13.5	53 7	33	√ Includes created snags only

Table 6.	Summary of	f Snag	Management	Through	2008	- Spada	Lake	Tract
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UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
			()	(,		$\sqrt{Created snads only}$
9-120	41.0	234	14.11	55.9	5.7	from 2004 & 2006
9-121 complex	116.0	566	13.6	51.8	4.9	√ Natural and created snags from 2004 & 2006
9-126	23.7	126	14.2	56.7	5.6	√ Includes natural and created snags
9-133	46.0	00	n/a	n/a	n/a	no trees of adequate size; re-visit in 10 years
9-135 complex	41.0	161	13.7	52.4	3.8	√ Includes created snags only, from 2006 & 2008
9-144	20.4	129	12.8	59.2	6.2	✓ Includes created snags only
9-151 complex	28.7	86	13.9	47.3	3.9	√ Includes natural and created snags
9-165	9.2	58	14.2	49.7	3.6	√ includes created snags only
9-173	20.5	00	34.9	58.8	5.8	√ Natural snags only
9-180	7.4	14	21.4	65.0	4.2	√ Includes natural and created snags
9-184	11.0	2	13.1	45.0	3.2	√ Includes created snags only, from 2006 & 2008
The following uni density and smal	ts were ex l average	camined for a diameter, no	snag cre o creatio	eation p on poter	otential, ntial exits	but due to high tree s at this time. Units will
be revisited to ye			2007	walk thr	<u></u>	" dense conifers: trees
9-86	6.3	0	too sm	all, wai	t 10 vea	rs
9-87	3.2	0	2007.	non-veo	retated	
9-93	3.1	0	2007. :	slide ar	ea	
9-96	5.2	0	2007. 1	riparian	forest	
9-102	0.4	0	2007. (deciduc	ous fores	t; too narrow/ close to
0 102	0.1		2007.	earlv su	iccessio	nal. 3-9" alders: revisit in
9-137	9.1	0	10 yea	rs		, -,
9-153	7.6	0	2007.	early su	iccessio	nal
9-158	6.2	0	2007.	recreati	on site 2	
9-160	31	0	2007.1	trees to	o small;	wait 10 years.
9-161	31.8	0	2007.	non-veg	getated/o	draw down zone
9-162	22.6	0	2007. I on SW	mostly i side of	mixed fo South F	rest; some remnant OG Fork arm. revisit in 10

 Table 6.
 Summary of Snag Management Through 2008
 - Spada Lake Tract

	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
		-	vears		_	
			2007.	avg +/-	6" dbh; v	very few >11", mostly
9-164	17.5	0	hardwo	oods; re	visit in 1	l0 years
9-166	0.35	0	2007.	grass m	ieadow,	< 1 ac
			2007.	deciduo	ous fores	it; 3-8" alders, very
9-168	5.3	0	dense	salmon	berry ur	iderstory.
			2007.	mixed for	orest; 6-	10" conifers & alders,
9-169	2.33	0	very fe	w > 11'	'; revisit	in 10 years
			2007.	deciduo	ous fores	t; 6-10" alders, revisit 10
9-170	8.6	0	years			
			2007.	too sma	all to trea	at individually; wait 10
9-171	2.4	0	years a	and lool	k at com	bining with 9-162
9-172	2.1	0	2007.	shrub-b	rush	
9-178	3.8	0	2007.	early su	iccessio	nal
			2007.	mixed for	orest; to	o close to lake and
9-181	3.2	0	wetlan	d.		
9-182	3.8	0	2007.	wetland		
			Totals f	or those	20 stand	ds/complexes which meet
TOTALS	670	2,606	WHMP	requirer	ments for	number/acre.
	937	2,792	Totals f mgmt a	or all 44	stands/o date.	complexes having snag

Table 6.	Summary of	Snag Management	Through 2008	- Spada Lake Tract
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BOLD denotes those units where snag management activity occurred in 2008

 $\sqrt{\rm Meets}$ WHMP requirements for number per acre, but due to lack of large trees, size class distribution cannot be met.

1 A stand complex is a collection of stands, typically one larger stand with several small stands (less than 2 acres) scattered within its boundaries, which for the purpose of management, are combined and treated largely as a single unit.

\2 Trees not of adequate size for snag creation, re-evaluate in 10 years.

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
Stand 10-1 ^{\1}	21.2	68	16.4	57.1	3.2	√ Created snags only
Stand 10-2 ^{\2}	4.2	0	15.1	12.0	1.3	Natural snags only
Stand 10-3	18.7	28	19.3	32.9	3.0	$\sqrt{1}$ Includes natural and created snags
Stand 10-4	7.5	13	16.8	40.1	3.5	$\sqrt{1}$ Includes natural and created snags
Stand 10-5	15.1	12	22.7	37.0	3.5	√ Includes natural and created snags
Stand 10-6	133.4	0	31.3	34.6	12.3	√ Natural snags only
Stand 10-7	68.8	0	29.3	38.5	11.1	√ Natural snags only
Stand 10-8	8.5	0	31.0	43.8	9.0	√ Natural snags only
Stand 10-9	3.7	0	24.2	45.0	9.5	√ Natural snags only
Stand 10-11	50.5	0	32.3	46.0	6.0	√ Natural snags only
Stand 10-12	6.3	0	30.7	38.3	6.0	√ Natural snags only
TOTALS	334	121	Totals for those 10 units which meets WHMP requirements.			which meets WHMP
	338	121	activity to date.			

Table 7. Summary of Snag Management Through 2008 - Williamson Creek Tract

\2 Trees not of adequate size for snag creation, re-evaluate in 10 years.



FIGURE 12. SNAG MANAGEMENT IN THE LAKE CHAPLAIN AND LOST LAKE TRACTS THROUGH 2008



FIGURE 13. SNAG MANAGEMENT IN THE SPADA LAKE TRACT THROUGH 2008



FIGURE 14. SNAG MANAGEMENT IN THE WILLIAMSON CREEK TRACT THROUGH 2008

4.2 COARSE WOODY DEBRIS MANAGEMENT

The 1995 Annual Report described the first inventories of CWD on the Lake Chaplain Tract, and the subsequent development of the CWD management procedure to ensure compliance with WHMP targets. The procedure was implemented on the 1995 Diversion Sale and the 1998 Tiki Sale. The 1995 and 1996 Annual Reports describe more fully the earlier inventories and consultations with the agencies regarding standards for compliance. In 1996, the inventory/monitoring methods were revised following a consultant's review of the procedures, as described in the 1996 Annual Report. The methods were finalized in 1997; field tested, and implemented on the units of the 1998 Tiki Sale, the Linetree Sale, and all subsequent harvest units. CWD management procedures specific to the Williamson Creek Tract were developed in 1999. Created CWD on two units of the 1995 Diversion Sale was monitored in 1999 per the CWD management methods. Table 8 lists CWD logs created on harvest units from 1995 to date.

4.3 REVEGETATION AND NOXIOUS WEED CONTROL

A Noxious Weed Inventory (Study Plan 8) was conducted in 2007 and the Final Technical Report was filed with FERC in January 2008, as part of the relicensing studies for the Jackson Project, to document the occurrence of species of noxious weeds and invasive non-native plants. The study area included WHMP lands where Project operations or Project-related maintenance, land use practices, or human activities could promote noxious weeds. National Forest System lands within the riparian corridor between Culmback Dam and the Diversion Dam were also inventoried. Approximately 1,089 acres of land were inventoried. Nineteen species of weeds were recorded. See the District's relicensing web site for the entire report (Jackson Hydroelectric Project Study Plan 8: Noxious Weed Inventory; 2008 Technical Report):

http://www.snopud.com/Content/External/Documents/relicensing/Study%20Report s/Jackson2157_SP8_FTR_Jan2008.pdf

4.3.1 Spada Lake Drawdown Zone

Test plots of five wetland emergent species were planted at two sites in October/November 1994 and monitored annually through 2000. One sedge species became somewhat established and spread vegetatively at Williamson Creek. Most plantings at the North Fork Sultan river site were damaged by wave action and floating debris.

Slough sedge (*Carex obnupta*) recruitment on the sites may be the result of the 1994 plantings since most of these plants are in or among the planted rows (1998 Annual Report, Section 3.4.1). However, natural in-seeding of wetland plants on both sites, especially small fruited bulrush and other herbaceous species, has been far more successful in covering the ground than the test plantings so far. The 1997 Annual Report (Section 4.6.1) describes the response of wetland plantings and natural recruitment on these sites with respect to the management of lake elevation. Subsequent monitoring visits (1999 and 2002) document the condition of the planting sites.

UNIT	ACRE S	NUMBER LOGS CREATED	# LIVE TREES	# SNAGS AND EXISTING LOGS	AVG. DIAMETER OF TREE	# LOGS/ACR E
Divr1- 95	15.6	120	34 Douglas fir	0	25.4	7.7
Divr2- 95	19.7	160	30 Douglas fir	18 Douglas fir	23.7	8
Tiki1- 98	21	166	32 Douglas fir	5 Douglas fir, 2 Hemlock	29.9	7.9
Tiki2- 98	23.8	189	42 Douglas fir	5 Douglas fir, 9 Hemlock	27.9	7.9
Line1- 00	14.8	124	29 Douglas fir	5 Douglas fir, 1 Hemlock	26	8.4
Line2- 00	22	176	44 Douglas fir	3 Hemlock	25.3	8
Donk1- 02	23.5	190	42 Douglas fir	9 Douglas fir, 11 Hemlock	24.2	8.1
Donk2- 02	14.3	115	22 Douglas fir, 3 Cedar, 4 Hemlock	2 Hemlock	26.4	8
Donk3- 02	7.1	61	13 Douglas fir	1 Douglas fir, 1 Hemlock	25.4	8.6
Phon1- 04	10.5	21	*	19 Hemlock, 2 Cedar	17	tbd**
Phon2- 04	18.1	30	*	30 Hemlock	18	tbd**
Phon3- 05	18.3	153	33 Douglas fir	9 Douglas fir, 6 Hemlock	24.2	8.4
Craz1- 07	17.8	153	22 Douglas fir	2 Douglas fir, 1 Hemlock	26.9	8.6
Craz2- 07	23.2	196	23 Douglas fir	2 Douglas fir, 4 Hemlock	26.8	8.4
Sum	193.1	1505	327			

Table 8.	Summary of	Created CWD	on Lake (Chaplain	Harvest Units
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* Snags and CWD were not created in Phon1-04 and Phon2-04, as described in the 2002 Annual Report, Sec. 3.1.3, p.4

** See previous footnote and discussion in 2002 Annual Report. Edge of unit and adjacent GTA provide sufficient logs/acre.

4.3.2 Power Pipeline ROW

Annual maintenance on the Pipeline ROW includes mowing to reduce tree growth and to keep the tall grasses from impeding visual inspection of the pipeline corridor. Off-road vehicle intrusion has been reduced greatly compared to the early 1990's, and now

occurs primarily when gates are left open during logging operations or to allow recreational access. Noxious weed control is conducted several times each year, as different species are more noticeable at different times of the growing season. Mowing helps to reduce some of the noxious weed infestations and prevent seed production in some cases, but herbicide applications outside of riparian buffers and the City of Sultan's watershed are the most effective and efficient means of control. Mapping with GPS has helped to promote repeated visits to sites that in previous years were infested, enabling closer monitoring and control of weeds.

4.3.3 Lake Chaplain Tract

The required plantings at the north end of Lake Chaplain were monitored twice annually from the time of planting in 1992 through 1995, and once in the following years. Survival of western red cedar at the north end of the lake from the time of planting to 1998 was 80 percent. Douglas fir saplings have had excellent growth, with overall survival greater than 90 percent. Excess alders were removed in 1998 and 2001 to release planted conifers and delay conversion of grass/shrub habitat to hardwood thickets. The area was reseeded in 2001 following alder removal.

Species planted in 1993 adjacent to Chaplain Marsh included western red cedar, English holly, huckleberry, serviceberry, red-osier dogwood, nootka rose and red-flowering current. Many volunteer shrubs have grown on the margin of the marsh as well, including Pacific willow, western hemlock, Douglas fir, big-leaf maple, twinberry, spirea, salmonberry, thimbleberry, vine maple and trailing blackberry. The required plantings were monitored twice annually from the time of planting in 1993 through 1995, and once in the following years. Alders growing among the plantings were cut down in 1998 to release the planted shrubs from competition. As a result, the density of the vegetative screen between the Lake Chaplain Road and the marsh decreased temporarily, but the desired species composition was retained. Holly was removed in 2008, as requested by the Forest Service. At the time of this annual report, the planted and volunteers shrub layer is sufficiently dense to screen the marsh from view from the road.

4.3.4 Powerhouse Site

Shrub and tree plantings were monitored at least twice each year as have volunteer native thimbleberry, red alder and salmonberry. Volunteer *Buddleia* have been removed annually since 2004. They have proven to be very resilient, and will continue to be removed wherever they appear. Alder trees that encroach on the shrub/tree clusters have been removed, and will continue to be removed as well.

4.4 NEST STRUCTURES

All of the nest structures that were required by the WHMP have been installed and monitored annually thereafter. In 1990, two floating nest platforms and two duck nest boxes were installed at Lost Lake. One osprey platform was installed at Lost Lake in 1990 and two at Spada Lake in 1992. The additional nest boxes, floating platforms and osprey platform at Lost Lake, Chaplain Marsh, Powerhouse and Spada Lake were installed by the District and provide nesting opportunities beyond what is required in the WHMP.

4.4.1 Floating Nest Platforms

The floating nest platforms provided by the co-licensees have primarily been used for resting and loafing by otters, and occasionally by waterfowl. On only a few occasions have nesting or nesting attempts been noted, and as a result, monitoring is conducted infrequently, while performing other duties at each location.

4.4.2 Nest Boxes

From a high of 53% use to a low of 4.5%, nest box success over the past 19 years has varied greatly. For the past five or six years, black bear predation has been the greatest cause of nest box damage and associated reduction in availability to nesting waterfowl. Typically, little evidence exists to determine with any certainty whether nesting had occurred prior to the box being damaged, but studies show that empty boxes are typically not targeted. Numerous studies have shown that cold and/or wet spring weather can result in reduced nesting attempts and lower success rates. Temperature and precipitation records for February, March and April (the peak nesting period) show slightly higher than average daily temperatures but slightly higher precipitation during those critical months.

4.4.3 Osprey Nest Platforms

Since the osprey platform was installed at Lost Lake in 1990, there have been 5 or 6 years with nesting attempts, with 2 fledglings produced in at least 2 of those years. The osprey returned to the platform only one year since abandoning it, but that attempt was unsuccessful.

The two platforms at Spada Lake have never been successfully used to fledge young. The platform near the South Fork Sultan River was partially built up in 1994, and adults were observed setting on the nest early in the 1995 nesting season, but apparently the nesting attempt failed. In 1996, a natural nest was constructed in the Sultan River gorge about a quarter mile downstream of Culmback Dam. That nest was used for 3 years, when the top of the snag broke, resulting in the osprey constructing another nest on the same hillside in 1999. This nest site has been only casually observed, since it is not on Project lands and is not easily viewed, therefore, results are uncertain.

Four osprey were frequently seen on or near the additional osprey nest platform installed in 2007 north of the Powerhouse between the Sultan river and the District's microwave tower. No activity was noted in 2008.

4.4.4 Bald Eagle Nest

The natural bald eagle nest constructed along the east shore of Lake Chaplain in 1996 has fledged at least 10 eaglets since initiation, plus an additional chick that left the nest prematurely in 2006. In conjunction with the Washington Department of Fish and Wildlife, the City of Everett created a nest site management plan that restricts timber harvest within 800' of the nest site from February 1 through August 15.

4.5 FOREST VEGETATION MANAGEMENT - LAKE CHAPLAIN TRACT

4.5.1 Road System Layout and Construction

The main road systems for the northeast side of the Tract, the area south of the Diversion Dam Road, and portions of the west side of the tract have been constructed, as shown in Figure 7. Spur roads were constructed to provide access to individual units as needed for harvest. The RMAP for the Lake Chaplain Tract was completed in 2002, and implementation is underway.

4.5.2 Timber Harvest

Harvest activity and sale layout to date are depicted in Figure 7.

There have been some substitutions of final harvest units, as summarized below in Table 9. However, the final harvest program complies with the WHMP's schedule to date, as well as requirements such as the restriction on harvest unit size. To date, a total of 18 units (approximately 336 acres) have been clearcut. The WHMP's 15-year green-up period between adjacent harvest units has been followed within the Tract, but some units adjacent to clear cuts on State land did not allow the full 15-years. The WHMP allows some flexibility in scheduling harvests (i.e. harvest may occur 5 years before or after the target year) on the Lake Chaplain Tract, and the co-licensees attempt to provide as much green-up time as possible within the WHMP's schedule.

The commercial thinning schedule in the WHMP from 1990 to 2005 was modified for several reasons, including potential problems related to access, soil type and timber type. These issues were discussed more fully in the 1996 Annual Report (Section 4.1.3). After on-site evaluation, it was determined that several units would be eliminated from the commercial thinning schedule. The units, and the reasons for not thinning them, are listed in Table 10. Two units (38 acres) that were not scheduled in the WHMP were thinned in 1993 (Table 10).

4.5.3 Management of Roads and Post-Harvest Units

All final harvest units at Lake Chaplain were seeded with a grass/forb mix on bare areas, and planted with Douglas fir seedlings; most were also planted with red cedar seedlings. Road ROW's were also seeded, and access roads outside the closed watershed have been gated to prevent vehicular access by the public.

Seedling survival plots have been established in all harvested units after planting, and the results are monitored for at least two years. One unit, Tiki1-98, was replanted one year after initial replanting due to excessive mountain beaver damage.

Small timber salvage sales were held associated with final harvest of some units:

- 1) adjacent to a 1991 harvest unit following a major storm in January 1993 and,
- 2) adjacent to two 1998 harvest units and access roads in 1998 and 1999.

Other timber salvage work took place in 2004 following severe winter storm blowdown.

Monitoring of stocking levels in post-harvest units was started in 1997. Results that year in unit Chap2-91 showed excessive conifers, adequate overall density of hardwoods, but distribution of hardwood species was clumped. In 1998 some hardwood removal and replanting was done in this harvest unit. In 2001 some hardwood removal was done in Divr2-95, and Chap1-91 was precommercially thinned. Chap3-91 was precommercially thinned in 2002 and Chap2-91 was precommercially thinned in 2004.

Unit Name	Scheduled FH	Reasons for Modification
2005-5 ("Gold Camp")	1990	Existing wildlife habitat value is high. Unit Divr2-95 (portions of units originally scheduled for FH in 2005 and 2030) was harvested instead of 1990-5 in 1995
2020-7 ("Gold Camp")	2005	Recent clearcut on adjoining ownership. Harvest will be delayed until 2020 to allow 15 years of green-up. Unit 2000-1 will be harvested instead of 2005-5
2030-3	2005 (part) and 2030 (part)	Units originally scheduled for FH in 2005 and 2030 reconfigured into Divr2-95 and 2030-3
Phon1	2000-3 (part) and 2035-2 (part)	Portions of units originally scheduled for FH in 2000 and 2035 reconfigured into Phon1
Phon2	2005-3 (part) and 2035-2 (part)	Portions of units originally scheduled for FH in 2005 and 2035 reconfigured into Phon2 (see Section 3.1.3 of this annual report for details)
2015-4	2045-6	Rescheduled to avoid future green-up conflicts
2015-6	2000-5	
2025-2	2045-5	
2045-5	2025-2	
2045-6	2015-6	
2045-7	2015-4	

 Table 9. Modifications of the Final Harvest (FH) Schedule on Lake Chaplain Tract

 Table 10. Modifications of the Commercial Thinning (CT) Schedule on Lake Chaplain

 Tract

Unit	Scheduled CT	Reasons for Modification
2010-1	1990	Wet soil; timber type (hemlock) not suited to CT
2010-2	1990	Wet soil; timber type (hemlock) not suited to CT
2015-2	1995	Wet soil
2020-1	1990	Wet soil
2030-2	2005	Steep slope
2030-3	1990	High potential for blowdown; no benefit expected from CT

Table 10. Modifications of the Commercial Thinning (CT) Schedule on Lake Chaplain Tract			
2025-5	2005	Wet soil; timber type (hemlock) not suited to CT; forage production increasing due to ongoing overstory mortality	
2035-1	2005	Wet soil; timber type (hemlock) not suited to CT; forage production increasing due to ongoing overstory mortality	
Hors1- 93*	Not scheduled	Opportunity to improve understory vegetation; CT operationally feasible; FH scheduled in 2040	
Hors2- 93*	Not scheduled	Opportunity to improve understory vegetation; CT operationally feasible; FH scheduled in 2035	

4.6 FOREST MANAGEMENT - SPADA LAKE TRACT

4.6.1 Spada Lake Tract Supplemental Plan

The first Supplemental Plan for the Spada Lake Tract for approximately 1,745 acres of land surrounding Spada Lake that were acquired in 1991, was approved by the FERC in 1997. The Spada Supplement called for commercial and precommercial thinning of some forest stands on the Tract. The first Supplement originally called for thinning treatments on as much as 600 acres, depending on feasibility, during the period 1996-2005. After the Supplement was approved, however, the DNR completed abandonment of the North Shore Road and its tributary roads from a point east of Recreation Site 8 during the summer 1999 (Figure 15). The road had become inaccessible east of Recreation Site 8 due to a massive landslide in 1997, and the DNR chose to perform the work needed to properly abandon the road, and not to maintain it for vehicular use. Therefore, some of the planned forest management activities, including commercial thinning and precommercial thinning, in units formerly served by this road were affected. With the loss of road access, the only option for future commercial harvest north of the lake would be helicopter logging. The second Supplemental Plan, approved by the FERC in 2008, reflects new management techniques and limitations on road access to the Tract.

4.6.2 Silvicultural Treatments

Three young second growth stands (totaling about 30 acres) on the south shore of Spada Lake were precommercially thinned in September 1996. Two second growth stands totaling about 38 acres on the south fork were precommercially thinned in 2000 and two stands totaling about 38 acres in the northeast corner of the property were precommercially thinned in 2002 (Figure 15).

4.6.3 Timber Harvest

A forestry consultant performed a feasibility study of timber harvest on second growth stands at the Spada Lake Tract that can be accessed by road (see Section 3.1.5 of the 2000 Annual Report). Eight stands were set up for commercial thinning, and Forest

Practices applications were approved by the DNR in 2002. Harvest unit boundaries were modified in 2003, following a detailed timber cruise and cost/benefit analysis, and areas requiring road construction or reconstruction were eliminated from the plan. The modified units (approximately 104 acres) were sold in 2003. Logging began adjacent to unit 9-135 in October 2003 and was completed on the remaining units in May 2004 (Figure 15). Currently, no other units with harvestable timber exist on the Tract where roads would not need to be built or reconstructed on unstable soils.

4.7 BIOSOLIDS APPLICATION

The City of Everett applied biosolids on various occasions to harvested units on the Lake Chaplain Tract, as summarized in Table 11.

Unit	Year	Product	Application Rate
Hors1-93	1996	biosolids	12.5 dry tons/ac.
Hors2-93	1996	biosolids	12.5 dry tons/ac
Hors1-93,	2000	2:1::biosolids:wood ash	37.5 dry tons/ac.
Hors2-93	2000	2:1::biosolids:wood ash	37.5 dry tons/ac.
Hors3-98	2000	2:1::biosolids:wood ash	45 dry tons/ac.
Divr1-95	2000	2:1::biosolids:wood ash	45 dry tons/ac.
Hors3-93	2005	Biosolids	24 dry tons/ac.
Divr1-93	2005	Biosolids	26 dry tons/ac.
Line2-00	2005	Biosolids	39 dry tons/ac.
Line2-00	2006	Biosolids	8.6 dry tons/ac.

Table 11. Summary of Biosolids Applications to WHMP Lands

Vegetation monitoring was conducted from 1996 to 1999 and again in 2001 in accordance with the vegetation monitoring plan described in the 1996 Annual Report. No vegetation monitoring was conducted in 2000 because biosolids application at the sample sites disturbed the vegetation.

Two water quality monitoring sites were established on Chaplain Creek to identify possible contamination of the stream from biosolids applied to adjacent harvest units (Hors 1, and 2, and Divr1). Creek waters were sampled monthly beginning in August 1996 through the end of 2001, and at least quarterly afterward. Parameters examined were nitrates, phosphorus, fecal coliforms, ammonia, and chloride. Water quality monitoring has indicated no deleterious effect on the water quality parameters measured resulting from the biosolids application..

Figure 16 compares results from 2004, prior to the most recent biosolids application in the Chaplain Creek drainage, with results from 2005 through 2007. Earlier patterns were reported for fecal coliforms, nitrates and ammonia in the 2002 Annual Report, Section 3.10, and Figures 12-14. Chaplain Creek normally exhibits increases in fecal coliforms during the summer, and nitrates during the winter. The August 2005 spike in



ammonia downstream from the biosolids application sites is within the normal range of variation for this contaminant in Chaplain Creek.

FIGURE 15. FOREST VEGETATION MANAGEMENT IN THE SPADA LAKE TRACT THROUGH 2008



FIGURE 16. WATER QUALITY MONITORING 2004-2008

4.8 DEER FORAGE MONITORING

A revised sampling procedure was finalized in 1997, after several other procedures proved unsatisfactory in previous years. The 1997 procedure has been used in monitoring Lake Chaplain Tract harvest units, as listed in the 2004 Annual Report, Table 9.

4.9 LAND ACQUISITION

In 1988 the District purchased the Lost Lake Tract (205 acres) as part of the WHMP requirement. This tract contains a high quality lake and wetland complex and other high quality wetlands.

The District/USFS/DNR land exchange was completed in 1991. The District acquired over 4,000 acres at Spada Lake and Williamson Creek. This included the entire Williamson Creek Tract identified for acquisition in the WHMP. The 376-acre tract includes 268 acres of old growth, 28 acres of mixed forest, 34 acres of riparian forest and at least 6 acres of wetland, all of which will be preserved and protected.

With the exception of existing recreation sites and areas used for hydroelectric operations, the land in the Spada Lake Tract has been incorporated into the wildlife habitat management program as prescribed by the WHMP and the Spada Lake Tract Supplemental Plan. The WHMP called for at least 700 acres from the land exchange be added to the original Spada Tract of 1,938 acres. An additional 1,059 acres was obtained in the exchange and incorporated into the WHMP for a current tract of 3,697 acres. The Supplemental Plan was approved by the FERC on April 18, 1997 and will guide future forest vegetation management for that tract. The Spada Tract includes 214 acres of old growth forest, 26 acres of wetlands and over 11 acres of riparian forest.

The City/DNR land exchange was completed in late 1991. All of the land specified in the WHMP in the Lake Chaplain Tract was acquired by the City and dedicated to management under the WHMP.

4.10 WILLIAMSON CREEK TRACT

Monitoring of the Williamson Creek tract has focused on baseline inventories of the stands for snags, CWD, understory vegetation, wetlands and photo-documentation. The status of inventorying on each stand is summarized in Table 12. Note that old growth inventory includes snags, CWD, understory vegetation inventory and photo-documentation. Wetland monitoring will be conducted at approximately five year intervals. Baseline inventory was completed in 2003. Monitoring activities will continue in the future.

Field procedures beyond those described in the WHMP have been developed specifically for the Williamson Creek Tract. Baseline surveys were conducted in old growth stands to descriptively characterize snags, CWD and understory vegetation. Baseline surveys began in 1998 and were completed in 2003. Snags and CWD were inventoried following the standards for sampling these elements on the Lake Chaplain and Lost Lake Tracts. The minimum size for snags was 10' tall and 11" DBH, for CWD it was 10' long and 11" diameter at the large end. On the Williamson Creek Tract,

transects were located along reasonably accessible walking routes determined in the field. The goal was to sample enough transects within each stand to provide at least 5 percent coverage. Each transect was 330' x 66' (0.5 acres). Understory vegetation on old growth stands was inventoried by sampling 1/100th-acre circular plots at each end of the snag and CWD transects. Species occurrence was noted and notes were taken describing the biologist's overall characterization of the stand. During the surveys, photos were taken to illustrate stand characteristics that the biologists consider representative of these stands and descriptive notes were taken.

Stand #	% Complete	Type of Inventory	Year of Inventory
10-1	100	Snags, CWD, photo-doc.	2000
10-2	100	Old growth	2000
10-3	100	Snags, CWD, photo-doc	2000
10-4	100	Snags, CWD, photo-doc	2000
10-5	100	Snags, CWD, photo-doc	2000
10-6	100	Old growth	2000,2002,2003
10-7	100	Old growth	1999,2000,2003
10-8	100	Old growth	2003
10-9	100	Old growth	1999
10-10	100	Wetlands	1998
10-11	100	Old growth	2001,2002
10-12	100	Old growth	2001
10-13	100	Photo-doc	1998
10-14	100	Photo-doc	1998,1999
10-15	100	Photo-doc	1999

 Table 12. Williamson Creek Baseline Inventory Summary, Completed 2003

Tables 13 and 14 summarize baseline inventory data for natural snags and CWD collected to date. Additional snags have been created in stands 10-1, 10-3, 10-4 and 10-5 (Table 7). The number of snags on the old growth stands ranges from 1.3 to 12.3 per acre. The amount of CWD on old growth stands ranges from 12.0 to 52.4 per acre.

The second growth and riparian forested stands (10-1, 10-3, 10-4, and 10-5) adjacent to Williamson Creek (Figure 14) were inventoried in 2000. The WHMP calls for retaining stands 10-1 and 10-4 as riparian forest without harvesting through the life of the plan. These stands were cover-typed as riparian, mixed, and small saw timber coniferous forest in the WHMP, which requires snag management, maintenance and monitoring in these stands. No snags were found within the transects in stand 10-1 and an average of 1.8 natural snags/acre were found within the transects in stand 10-4 (Table 13). Snags were created in 2001 in stand 10-1 and were completed in 2002 (Table 7). This stand is primarily composed of small (10-15") conifers and alders. As a result, snag creation

potential is limited at this time. Snag creation in stand 10-4 was completed in winter 2001, with 13 snags created (Table 7).

Stand #	Cover Type	Snags/ac (all decay classes)	Avg. Diameter (in.)	Avg. Height (ft.)
10-1	Small Saw/Riparian	0.0	0.0	0.0
10-2	Old Growth	1.3	15.1	12.0
10-3	Riparian/Mixed	0.4	21.8	14.0
10-4	Riparian/Mixed	1.8	17.0	32.6
10-5	Large Saw/Riparian	2.8	24.3	31.3
10-6	Old Growth	12.3	31.3	34.6
10-7	Old Growth	11.1	29.3	38.5
10-8	Old Growth	9.0	31.0	43.8
10-9	Old Growth	9.5	24.2	45.0
10-11	Old Growth	5.6	29.9	43.6
10-12	Old Growth	6.0	30.7	38.3

 Table 13. Williamson Creek Tract Natural Snag Cumulative Inventory Summary, Completed 2003

Table 14. Williamson Creek Natural CWD Cumulative Inventory Summary, Completed 2003

Stand #	Cover Type	CWD/ac. (all decay classes)	Avg. Diameter (in.)	Avg. Length (ft.)
10-1	Small Saw/Riparian	3.0	24.3	25.7
10-2	Old Growth	12.9	19.8	63.6
10-3	Riparian/Mixed	4.0	18.8	24.7
10-4	Riparian/Mixed	1.5	27.3	50.8
10-5	Large Saw/Riparian	2.1	19.7	56.5
10-6	Old Growth	38.0	22.8	40.6
10-7	Old Growth	21.1	29.0	49.2
10-8	Old Growth	12.0	29.5	54.7
10-9	Old Growth	52.4	24.0	43.9
10-11	Old Growth	37.6	25.7	41.8

Stand #	Cover Type	CWD/ac. (all decay classes)	Avg. Diameter (in.)	Avg. Length (ft.)
10-12	Old Growth	36.0	24.9	54.7

Table 14. Williamson Creek Natural CWD Cumulative Inventory Summary, Completed 2003

The WHMP calls for retaining stands 10-3 and 10-5 for late successional stage species. These stands were cover-typed as mixed, deciduous, riparian, and large saw timber coniferous forests in the WHMP, which requires ensuring adequate snags and CWD on these two stands. Snag management and monitoring is required for the life of the plan. The baseline snag and CWD inventories were completed in these two stands in 2000. The average number of snags/acre was 0.4 and 2.8 on stands 10-3 and 10-5 respectively (Table 13). The average number of CWD/acre was 3.9 and 2.1 on stands 10-3 and 10-5 respectively (Table 14). Snag creation was completed for both stands during the fall/winter of 2001. Twenty-eight snags were created in stand 10-3 and 12 snags were created in stand 10-5 (Table 7). Stand 10-3 had several irregularly distributed pockets of natural snags which were found, and thereby reduced the number of created snags required.

4.11 LAND MANAGEMENT

The co-licensees have worked with landowners in the Sultan Basin since the WHMP was initiated in an effort to coordinate land use activities so that they are consistent with, or at least do not interfere with management of the WHMP. Activities on adjacent property have included recreational pursuits, timber harvest, surveying, and road maintenance and abandonment.

The DNR is in the process of preparing a Natural Resource Conservation Area (NRCA) plan for the NRCA lands in the Sultan Basin and the co-licensees have been following that process and providing input since 1999. The co-licensees have provided comments to DNR during the planning process and on working drafts of the plan.

In compliance with Washington Forest Practice Rules (WAC 222-24-050 through 052), the District prepared and submitted in 2001, a Road Maintenance and Abandonment Plan (RMAP) Inventory Scheduling Proposal and an RMAP covering all of the District owned wildlife mitigation lands. Implementation of the RMAP began in 2002. Spur roads SL-22, SL-61, SL-48 and SL-67 were officially abandoned in the Sultan Basin under WAC 222-24-052(3). The District hired a geotechnical engineer in 2003 to prepare plans for maintaining the road from Olney Pass to Culmback Dam, and the work was completed in spring 2005. Coordination has continued as new road repairs are needed. The City completed its RMAP for the Lake Chaplain Tract in 2002 and obtained DNR approval.

The District and the DNR negotiated a Routine Road Maintenance Agreement in 2001 for roads associated with project mitigation lands in the Sultan Basin. Annual meetings are held between the co-licensees and DNR to discuss road and land management activities. Also in 2001, a supplemental easement was obtained on a portion of road

CD-147 (see District RMAP) owned by DNR. Discussion between the District and DNR regarding the status of the South Shore road continue.

4.12 JACKSON PROJECT RELICENSING

The District and City filed the Notice of Intent and Pre-Application Document with FERC in December 2005. Scoping meetings were held by FERC in February 2006. A Proposed Study Plan was submitted in May 2006 and a Revised Study Plan was filed in September 2006. The first study season was conducted in 2007 and the Initial Study Report was filed in October of 2007. An Interim Comment Period was provided to the stakeholders by FERC and the District prepared and filed an Updated Study Report in 2008. All terrestrial studies and Final Technical Reports were completed and filed with FERC in 2008. A Preliminary License Proposal was filed with FERC in December 2008. All documents filed with FERC are on the District's website at http://www.snopud.com/water/relicensing.ashx?p=2334.

5.0 WORK PLANNED FOR 2009

5.1 FOREST VEGETATION MANAGEMENT

The density and distribution of hardwoods will be evaluated on selected older units. The older plantations will be monitored for bear damage. In some units, including Divr2-95 and Tiki1-98, it is possible that hardwood density in certain patches may be reduced; however, the target hardwood overstory composition will remain at least 5 to 10 percent of total stem count.

5.2 SNAG MANAGEMENT

In 2009, snag management will focus on units at the Lake Chaplain Tract where 10 years has elapsed since initial snag creation began. These units will be re-inventoried and created snags will be revisited to verify their status and characterize use by wildlife. Any deficiencies in snag quotas will be remedied at that time. Also, stands along both the South and North Shores at Spada Lake will be inventoried, with creation to follow.

5.3 **REVEGETATION**

5.3.1 Spada Lake Drawdown Zone

Annual monitoring of wetland plantings and natural recruitment of vegetation was completed in 2002, but the sites may be informally monitored when District staff is in the vicinity.

5.3.2 Power Pipeline Right-of-Way

Weed survey data from Study Plan 8: Noxious Weed Inventory 2007 Technical Report will be used to target control efforts, with new locations and control efforts added to the GIS database.

5.3.3 Lake Chaplain Tract and Powerhouse Site

Monitoring and routine maintenance will be conducted as in previous years. Some tree seedlings and small shrubs may be added to plantings in the Sultan Bridge area to compensate for ground cover plantings that did not survive in 2004.

5.4 NEST STRUCTURES

Floating nest platforms will be monitored when other activities are conducted at Lost Lake and Spada Lake, and will be checked at the end of the nesting season to record any signs of use.

Nest boxes will be cleaned and repaired as necessary by the end of February in preparation for the upcoming nesting season. Due to the increasing problem of predation, when reinstalled, boxes will be placed further apart and each tree will be wrapped with three to four vertical feet of flashing, in an attempt to deter bears from climbing the trees. Until the success of these measures can be determined, boxes that

have been damaged may not be replaced. Boxes will be checked in early summer to record species use and nesting success rates.

The osprey platforms at Spada and Lost Lakes, and the bald eagle nest at Lake Chaplain will be monitored in conjunction with other activities, but typically at least once per month, to record nesting use.

5.5 DEER FORAGE MONITORING

The following Lake Chaplain Tract harvest units will be monitored in 2009: Tiki1-98, Tiki2-98, and Hors3-93.

5.6 WILLIAMSON CREEK TRACT

Baseline inventories have been completed on the Williamson Creek Tract. Monitoring will occur on the wetlands, old growth and mixed forest stands on a continuing, but less intense basis.

5.7 LAND MANAGEMENT

The District will continue implementation of the RMAP and will prepare and submit an annual report to DNR. The City will implement its RMAP on the Lake Chaplain Tract.

The co-licensees will continue to work with DNR on their NRCA plan for the Sultan Basin, providing comments and suggestions on plans (habitat objectives, fire management, etc.) as needed and will continue coordination of land management in the basin.

5.8 JACKSON PROJECT RELICENSING

The District will continue working with the stakeholders regarding protection, mitigation and enhancement measures, the Noxious Weed Plan, Marbled Murrelet Protection Plan and the Terrestrial Resources Management Plan as part of the relicensing process. Stakeholder comments on the Preliminary Licensing Proposal were due 31 March 2009. The Final License Application will be filed with FERC by 30 May 2009. Stakeholder comments and agency recommendations are due 27 September 2009. Reply comments are due from the District 11 November 2009.

5.9 SPADA LAKE TRACT SUPPLEMENTAL PLAN

The Spada Supplemental Plan for the period 2006-2015 will continue to be implemented.

5.10 SECURITY MEASURES AT LAKE CHAPLAIN/JACKSON PROJECT FACILITIES

The District will continue existing security measures at Lake Chaplain and at Jackson Project Facilities.

6.0 PLANNED ACTIVITIES FOR 2009

Major Activities	Location	Quantity
Monitor Thinning Units	Spada Lake Tract	All commercial thinning units
Final harvest unit monitoring	Lake Chaplain Tract, Crazy Bear, older plantations	2 units, others TBD
Snag Inventory	Spada Lake Tract & Lake Chaplain	4+ units at Spada Lake; 10+ units due for 10-year re-inventory at Lake Chaplain
Snag Creation	Spada Lake Tract & Lake Chaplain	4+ units at Spada Lake; as required by 10-year re-inventory at Lake Chaplain
Nest Structures	Lost Lake, Spada Lake, Project Facility Lands Tract and Chaplain Tract	Clean and repair existing structures as needed
CWD Creation	n/a	No units slated for harvest in 2009.
Revegetation:		
Grass seeding/fertilizer Shrub plantings	Pipeline ROW	As needed to improve bare spots
Monitoring:		
Revegetation Site Monitoring/ Maintenance	West side, Chaplain Marsh North end, Lake Chaplain Powerhouse site Pipeline ROW	Monitoring of all planted/seeded areas as time allows. Maintenance as needed: Weeding, brush thinning, etc.
Deer Forage	Lake Chaplain Tract	3 units
Snags	Lake Chaplain, Lost Lake Tracts	Subset of created snag trees to document use and longevity
Nesting Structures	Lost Lake, Spada Lake, Project Facility Lands, and Chaplain Tract	Monitor & maintain all structures
Williamson Creek monitoring	Williamson Creek Tract	Wetlands

Major Activities	Location	Quantity
Noxious weeds	All WHMP lands	Develop monitoring plan SOP and control weeds as needed
Understory monitoring		None planned
Water quality monitoring	Chaplain Creek	2 stations
GTA and BZ Management	All established units	Set up in conjunction with harvest unit boundary placement.
Land Management	Spada Lake Tract	RMAP implementation.
	Lake Chaplain Tract	RMAP implementation
Relicensing	All WHMP lands	Finalize Weed, Marbled Murrelet and Terrestrial Resource Management Plans; submit Final Licensing application.
Spada Lake Tract Supplemental Plan	Spada Lake Tract	Focus actions on South Shore Road area

APPENDIX 1 – WHMP IMPLEMENTATION MILESTONES & PAST REPORT CROSS-REFERENCE TABLE

General	Management	Milestone	Annual Report Reference –
	Traci		(Section/page #)
Timber	Lake Chaplain	Chaplain Sale	1991 (3.3.1. р.6), 1992 (3.2.1.
Harvest		Onaplain call	p.4)
	Lake Chaplain	Horseshoe Sale	1992 (3.2.2, p.6), 1993 (3.1.1,
	-		p.6)
	Lake Chaplain	Diversion Sale	1995 (3.1.1, p.6)
	Lake Chaplain	Tiki Sale	1997 (3.1.1, p.2), 1998 (3.1.1,
			p.2)
	Lake Chaplain	Line Tree Sale	1997 (3.1.1, p.2), 1998 (3.1.2,
			p.5), 1999 (3.1.2, p.2), 2000
	Laka Chanlain	Dankay Dompor	(3.1.1, p.4)
	Lake Chaplain		1999 (3.1.4, $p.3$), 2000 (3.1.1, $p.4$) 2002 (3.1.3, $p.4$)
	Lake Chaplain	Phone Line Sale	2002(313 n 4) 2004(311)
	Luite onapian.		n 9). 2005 (3.1.1, p.7).
			2006(3.1.1 p.4)
	Lake Chaplain	Crazy Bear Sale	2004 (3.1.5, p.11), 2005
			(3.1.2, p.7), 2006 (3.1.2, p.4),
			2007 (3.4.1, p. 14)
	Lake Chaplain	Salvage Sales	1993 (3.1.2, p.6), 1998 (3.1.1,
			p.2), 1999 (3.1.1, p.2), 2004
Deferretation	Lata Ohanlain		(3.1.4, p.9)
Reforestation	Lake Chaplain	Chaplain Sale	1992 (3.2.1, p.4)
	Lake Chaplain	Horseshoe Sale	1993 (3.1.1, p.6), 1994 (3.1.3,
	Lake Chanlain	Diversion Sale	(3.1.1 p.)
	Lake Chaplain	Tiki Sale	1990(3.1.1, p.4) 1990(3.1.1, p.4) 1990(3.1.1, p.4)
	Lanc Onaplain		n 4)
	Lake Chaplain	Donkev Damper	2002 (3.1.2. p.4)
		Sale	
	Lake Chaplain	Line Tree Sale	2000 (3.1.2, p.4)
	Lake Chaplain	Crazy Bear Sale	2007 (3.4.1, p. 14)
Roads	Lake Chaplain	S1000 (Chaplain	1991 (3.3.1, p.6)
		Sale)	
	Lake Chaplain	C1300 (Chaplain	1991 (3.3.1, p.6)
	Laka Chanlain		4007 (0.4.0 5)
	Lake Chaplain	C1900 (Tiki Sale)	1997 (3.1.2, p.5)
	Lake Chaplain	SP 1300 (Tiki Sale) SP1000 (Tiki Sale)	1997 (3.1.2, p.3) 1007 (3.1.2, p.5)
	Lake Chaplain	SP1300 (Tiki Sale)	1997 (3.1.2, p.5) 1007 (3.1.2, p.5)
		(Linetree Sale)	1997 (3.1.2, p.3) 1999 (3.1.3, p.5)
	Spada Lake	North Shore Road	1997 (4 3 n 28), 1999 (3.8.
	Opudu Lano	North Onore Load	p.26)

General Activity	Management Tract	Milestone	Annual Report Reference – (Section/page #)
Category			
Forest	Lake Chaplain	Precommercial	1999 (3.1.5, p.5), 2001 (3.1.4,
Vegetation		Thinning, Hardwood	p.4), 2002 (3.1.4, p. 7), 2004
Management		Reduction	(3.1.2, p.9), 2006 (3.1.3, p.4)
	Lost Lake	Precommercial Thinning	1991 (3.3.2, p.9)
	Spada Lake	Precommercial Thinning	1996 (3.1.5, p.6), 2000 (3.2.1, p.6), 2002 (3.2.2, p.7)
	Lost Lake	Harvest Planning	2000 (3.2.2, p.6), 2002 (3.3, p.7)
	Spada Lake	Harvest Planning	2000 (3.2.3, p.7), 2002 (3.2.2, p. 7), 2003 (3.2, p.2),
	Spada Lake	Commercial Thinning	2004 (3.2, p.11), 2006 (3.2, p. 4)
GTA Management	Lake Chaplain	Chaplain Sale Unit 1	1994 (3.1.3, p.5)
Snag	Lake Chaplain	Implementation	1990 (3.3, p.6), 1993 (3.2,
Management		Decisions	p.8), 1996 (3.2, p.6)
	Lake Chaplain	Snag Inventory	1991 (3.4, p.9), 1992 (3.3,
	and Lost Lake	Results	(2,2,2, p,7), 1008 (2,2,1, p,5)
			(3.2.2, p.7), 1996 (3.2.1, p.3), 1998 (3.2.1, p.3), 1999 (3.2.1, p.5), 2000 (3.3.1)
			p 9) 2005 (3.3 p 11)
	Lake Chaplain	Snag Creation	1990 (3.3, p.6), 1991 (3.4,
		5	p.12), 1992 (3.3, p.6), 1993
			(3.2, p.8), 1994 (3.2, p.6),
			1995 (3.2, p.7), 1996 (3.2,
			p.6), 1997 (3.2.2, p.7), 1998
			(3.2.1, p.7), 1999 (3.2.1, p.5),
			2000 (3.3.1, p.9), 2006 (3.3.1,
	Laka Ohanlain	Or an Maniferinan	p.4)
	Lake Chapiain	Snag Monitoring	1998 (3.2.2., p.7), 1999 (3.2.2,
	and LOST Lake	and Mapping	(3.3.1 n 9), 2002 (3.4.3, p. 15), 2003
	Williamson	Snag Creation	2002 (3.4.1 p.10)
	Creek	Chag Creation	2002 (0.4.1, p.10))
	Spada Lake	Snag Creation	2002 (3.4.1, p.10), 2003
		5	(3.3.1, p.4), 2004 (3.3.1, p.11),
			2006 (3.3.2, p.6), 2007 (3.1.2,
			p.5)
	Williamson Creek	Snag Inventory	2002 (3.10, p.33)

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
CWD Management	Lake Chaplain	Implementation Decisions	1991 (3.10.2, p. 27), 1992 (3.9.2, p.12), 1993 (4.5, p.22), 1994 (3.6.6, p.10), 1995 (3.3.2, p.11), 1995 (Appendix A-Exhibits 1-3), 1996 (3.3, p.10)
	Lake Chaplain	CWD Inventory Results	1991 (3.10.2, p.27), 1993 (3.7.2, p.14), 1995 (Appendix A-Exhibit 4)
	Lake Chaplain	CWD Creation	1994 (4.7.6, p.18), 1995 (3.3.1, p.7), 1995 (Appendix A- Exhibit 4), 1998 (3.3, p.9)
	Lake Chaplain	CWD Monitoring	1998 (3.3, p.9), 1999 (3.3, p.5), 2000 (3.3.2, p.9)
	Williamson Creek	CWD Inventory Results	2002 (3.10, p.33)
Revegetation	Spada Lake	Drawdown Zone Test Plantings and Monitoring	1994 (3.3.1, p.6), 1995 (3.4.1, p.12), 1996 (3.4.1, p.10), 1997 (3.4.1, p.10, Fig.4), 1998 (3.4.1, p. 10), 1999 (3.4.1, p.11), 2002 (3.5.1, p.15)
	Pipeline ROW	Revegetation Design	1991 (3.5, p.19)
	Pipeline ROW	Seeding and Monitoring	1992 (3.4, p.10), 1993 (3.3, p.11), 1994 (3.3.2, p.7), 1996 (3.4.2, p.11), 1997 (3.4.2, p.11), 1998 (3.4.2, p. 10), 1999 (3.4.2, p.11), 2000 (3.4.1, p.13), 2001 (3.5.1, p.14), 2002 (3.5.2, p.16), 2003 (3.4.2, p.11)
	Pipeline ROW	Plant shrubs and trees	1997 (3.4.2, p.11), 1998 (3.4.2, p.10), 1999 (3.4.2, p.12), 2002 (3.5.2, p.15)
	Pipeline ROW	Place tree root wads	1989 (3.3, p.3), 1995 (3.4.2, p.13)
	Lake Chaplain	Revegetation Design	1991 (3.5, p.19)
	Lake Chaplain	Plantings at north end of lake and monitoring	1992 (3.4, p.10), 1998 (3.4.5, p.12), 1999 (3.4.5, p.12), 2000 (3.4.2, p.13), 2001 (3.5.2, p.15)

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
	Lake Chaplain	Plantings along Chaplain Marsh and monitoring	1993 (3.3, p.11), 1998 (3.4.3, p.12), 1999 (3.4.3, p.12)
	Powerhouse	Revegetation Design	1991 (3.5, p.19)
	Powerhouse	Plant shrubs and trees and monitoring	1993 (3.3, p.11). 1997(3.4.4, p.13), 1999 (3.4.3, p.12), 2003 (3.4.1, p.10)
Noxious Weed Control	Pipeline ROW	Mapping and control	2004 (3.4, p. 15), 2005 (3.4.2, p.11), 2006 (3.4.2, p. 10)
	Lake Chaplain	Mapping and control	2004 (3.4, p. 15), 2005 (3.4.1, p.11), 2006 (3.4.1, p. 10)
	Spada Lake	Mapping and control	2004 (3.4, p. 15), 2006 (3.4.3, p. 10)
	Lost Lake	Mapping and control	2004 (3.4, p. 15), 2005 (3.4.3, p.11)
	Project Lands	Inventory & Mapping	2007 (3.2 p. 8)
Nest Structures	Lost Lake	Floating platforms	1991 (3.6, p.20), 1992 (3.5, p.10), 1993 (3.4, p.11), 1998 (3.5.1, p.13), 1999 (3.5.1, p.14), 2000 (3.5.1, p.13), 2002 (3.62, p.18), 2003 (3.5.1, p.11), 2004 (3.5.1, p.16), 2005 (3.5.1, p.13), 2006 (3.5.1, p. 10), 2007 (3.3.1, p. 9)
	Lost Lake	Duck nest boxes	1990 (3.7, p.8), 1995 (3.5.2, p.16), 1996 (3.5.2, p.13), 1999 (3.5.2, p.14), 2000 (3.5.2, p.13), 2002 (3.6.2, P.18), 2003 (3.5.2, p.11), 2004 (3.5.2, p.16), 2005 (3.5.2, p. 13), 2006 (3.5.2, p. 11), 2007 (3.3.2, p. 9)
	Lost Lake	Osprey Platform	1990 (3.8, p.8), 1999 (3.5.3, p.19), 2000 (3.5.3, p.19), 2002 (3.6.3, P.22), 2003 (3.5.3, p.16), 2004 (3.5.3, p.22), 2005 (3.5.3, p. 18), 2006 (3.5.3, p. 11), 2007 (3.3.3, p. 14)
	Lake Chaplain	Floating platforms	1991 (3.6, p.20), 1992 (3.5, p.10), 1993 (3.4, p.11), 1994 (3.4, p.7), 1999 (3.5.1, p.14).

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
	Lake Chaplain	Duck Nest Boxes	1993 (3.5, p.11), 1995 (3.5.2, p.16), 1996 (3.5.2, p.13), 1997 (3.5.1, p.16), 1999 (3.5.2, p.14), 2000 (3.5.2, p.13), 2002 (3.6.2, p.18), 2003 (3.5.2, p.11), 2004 (3.5.2, p.16), 2005 (3.5.2, p. 13), 2006 (3.5.2, p. 11), 2007 (3.3.2, p. 9)
	Spada Lake	Floating Platforms	1996 (3.5.1, p.13), 1997 (3.5.1, p.16), 1999 (3.5.1, p.14), 2000 (3.5.1, p.13), 2002 (3.6.1, p. 18), 2003 (3.5.1, p. 11), 2004 (3.5.1, p.16), 2005 (3.5.1, p. 13), 2006 (3.5.1, p. 10), 2007 (3.3.1, p. 9)
	Spada Lake	Duck Nest Boxes	1996 (3.5.2, p.13), 1998 (3.7, p.18, 1999 (3.5.2, p.14), 2000 (3.5.2, p.13), 2002 (3.6.2, p.18), 2003 (3.5.2, p.11, 2004 (3.5.2, p.16), 2005 (3.5.2, p. 13), 2006 (3.5.2, p.11), 2007 (3.3.2, p. 9)
	Spada Lake	Osprey Platforms	1992 (3.7, p.11), 1999 (3.5.3, p.19), 2000 (3.5.3, p.19),2002 (3.6.3, p.22), 2003 (3.5.3, p.16), 2004 (3.5.3, p.22), 2005 (3.5.3, p. 18), 2006 (3.5.3, p. 11), 2007 (3.3.3, p. 14)
Bald Eagle Nest	Lake Chaplain	Monitoring	1997 (3.5.4, p.19), 1998 (3.5.4, p.18), 1999 (3.5.4, p.20), 2000 (3.5.4, p.20), 2002 (3.6.4, p.22), 2003 (3.5.4, p.16), 2004 (3.5.4, p.22), 2005 (3.5.4, p.18), 2006 (3.5.4, p.11), 2007 (3.3.4, p. 14)
Biosolids Application	Lake Chaplain	Biosolids Application	1996 (3.8, p.18), 1998 (3.7, p.18), 2000 (3.7, p.20), 2005 (3.7, p.20), 2006 (3.7, p. 17)
	Lake Chaplain	Monitoring	1996 (3.8, p.18), 1997 (3.7, p.19), 2000 (3.7, p.20), 2002 (3.8, p.23), 2004 (3.7, p.24), 2005 (3.7, p. 23), 2006 (3.7, p. 19)

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
Deer Forage Monitoring	Lake Chaplain	Implementation Decisions & Methods	1991 (3.10.1, p.21), 1996 (3.9, p.18) 1997 (3.8.1, p.19)
		Forage Availability Results	1991 (3.10.1, p.22), 1996 (3.9, p.18) 1997 (3.8.2, p.22), 1998 (3.8, p.18), 1999 (3.7, p.20), 2000 (3.8, p.24), 2002 (3.9, p.23), 2003 (3.8, p.18). 2004 (3.8, p.24), 2005 (3.8, p. 23), 2006 (3.8, p.19), 2007 (3.8, p. 17)
		Utilization Results	1991 (3.10.1, p.22)
Land Acquisition	Lost Lake		1989 (3.1, p.2)
	Lake Chaplain		1991 (3.1, p.3)
	Spada Lake		1990 (3.1, p.2)
	Williamson Creek		1991 (3.1, p.3)
Management Plans & Land Use Decisions	Lake Chaplain	Chaplain Property Comprehensive Plan	1995 (3.7, p.17)
	Lake Chaplain	Shoreline Zone development permit	1995 (3.7, p.17)
	Lake Chaplain	Zoning Code change	1996 (3.7, p.15)
	Lake Chaplain	Bald Eagle Nest Site Management Plan	1997 (Attachment 1)
	Lost Lake	Concrete Ford Installation	1991 (3.2, p.3)
	Spada Lake	Supplemental Plan	1997 (Attachment 2), 2004 (3.14, p.29)
	PUD Properties	Road Maintenance and Abandonment Plan	2002 (3.12, p.36), 2003 (3.11, p.24), 2004 (3.10, p.24), 2005 (3.10 p.23), 2006 (3.10, p.19)
	Lake Chaplain	Road Maintenance and Abandonment Plan	2002 (3.11, p.36), 2005 (3.9, p. 23), 2006 (3.9, p.19)

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
Special Agency Consultation	All management tracts	Agency tour of WHMP Sites FERC Environmental Inspection	1997 (3.9, p.22), 2004 (Appendix 1) 1999 (3.9, p.31), 2003 (3.13, p.27)
Security Measures	Lake Chaplain and JHP Facilities	Heightened security measures	1994 (3.3.2, p.7), 2002 (3.13, p.36), 2003 (3.12, p.27, 2004 (3.11, p.27), 2005 (3.11, p. 26), 2006 (3.10, p. 26)
Other Monitoring	Williamson Creek	Monitoring	1999 (3.8, p.26), 2000 (3.9, p.24), 2002 (3.10, p.24), 2003 (3.0, p.18)
Relicensing	All All	Follow ILP Conduct Studies	2004 (3.12, p.27) 2005 (3.12, p. 26), 2006 (3.12, p. 26)

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