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April 22, 2005 PUD No. 20888

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Reference:

Wildlife Habitat Management Plan 2004 Annual Report Jackson Hydroelectric Project – FERC #2157 License Article 53

Dear Colleagues:

A copy of the 2004 Annual Report on the Jackson Hydroelectric Project Wildlife Habitat Management Plan is enclosed for your records.

If you have any questions or concerns, please contact Bernice Tannenbaum at 425-783-1746.

Sincerely,

Bruce

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2004 ANNUAL PROGRESS REPORT

WILDLIFE HABITAT MANAGEMENT PROGRAM

for the

HENRY M. JACKSON HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION Project Number 2157 - License Article 53

Submitted by

PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY

and

THE CITY OF EVERETT, WASHINGTON

April 2005

2004 ANNUAL PROGRESS REPORT WILDLIFE HABITAT MANAGEMENT PLAN

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2004 ANNUAL PROGRESS REPORT WILDLIFE HABITAT MANAGEMENT PLAN

1.0 SUMMARY

Accomplishments of the year 2004 on the Wildlife Habitat Management Plan (WHMP) 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 (WDW), and the Tulalip Tribes. The Washington Department of Natural Resources (DNR) was also consulted.

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 approved only if the modifications remain consistent with the WHMP's objectives.

As described in Sections 3 and 4 of this report and in previous years' reports, implementation of the WHMP over the past decade has already provided many of the intended wildlife habitat benefits. For example, snag and coarse woody debris creation has provided critical shelter and foraging substrate that was 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 2004

- Continued implementation of Lake Chaplain Tract RMAP
- Continued implementation of Spada Lake and Lost Lake Tract RMAPs
- Completed Phone Line Sale layout
- Sold Phone Line units
- Completed harvest on Units 1 and 2 on Phone Line Sale
- Completed road construction into Phone Line Sale
- Seeded road construction and harvested units
- Precommercial thinned Chaplain Sale Unit 3
- Began Crazy Bear Sale layout
- Snag creation on Spada Lake Tract
- Snag inventory on Spada Lake Tract
- Monitoring of revegetation and wetland sites (Lost Lake, Lake Chaplain Tract)
- Deer forage monitoring (Lake Chaplain Tract)
- Monitoring of vegetation coverage on power pipeline ROW (Project Facilities Tract)

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- Management of noxious weeds (Project Facilities Tract, Spada Lake Tract, Lost Lake Tract)
- Monitoring of nest structures (Lake Chaplain, Lost Lake and Spada Lake Tracts)
- Completed commercial thinning of selected units at Spada Lake Tract
- Preliminary evaluation of forest management options on additional Spada Lake Tract units
- Consultant report on forest management options on Spada Lake Tract
- Continued monitoring at Williamson Creek Tract
- Wetland descriptions/ratings on WHMP lands
- Initiation of informal relicensing activities

1.2 TASKS SCHEDULED FOR 2005

- Complete harvest Unit 3 of Phone Line Sale (Lake Chaplain Tract)
- Evaluate precommercial thinning on Spada Lake Tract (tentative)
- Plantation monitoring (Lake Chaplain Tract)
- Biosolids application on Lake Chaplain Tract (tentative)
- Snag monitoring (Lake Chaplain and Lost Lake Tracts)
- Snag creation on Spada Lake Tract
- Snag inventory on Lake Chaplain Tract
- Monitor nest structures
- Monitor revegetation sites
- Deer forage monitoring (Lake Chaplain Tract)
- Monitor buffer zones and green tree areas in harvested units (Lake Chaplain Tract)
- Implement RMAPs (Lake Chaplain, Spada Lake Tracts)
- Monitor Williamson Creek Tract
- Prepare revised Spada Lake Tract Supplemental Plan for 2006-2015
- Deer forage inventory in Line1-00 and Chap1-91
- Continue wetland descriptions/rating on WHMP lands
- Develop draft SOP to monitor and control noxious weeds
- Control noxious weeds as needed
- Reforest Phone Line sale
- Seed harvest units
- Complete Crazy Bear sale layout
- Water quality monitoring on Chaplain Creek

2.0 INTRODUCTION

The 2004Annual 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 co-licensees in the Project. The WHMP project area and management tracts are shown in Figure 1.

This annual report describes activities conducted during calendar year 2004 (see Section 3.0) and summarizes activities completed since the management program was initiated in 1988 (see Section 4.0). Activities anticipated for the calendar year 2005 are described (see Section 5.0).

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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.

3.0 WORK COMPLETED DURING 2004

3.1 FOREST VEGETATION MANAGEMENT ON THE LAKE CHAPLAIN TRACT

3.1.1 Phone Line Sale Layout and Harvest

Layout work for the Phone Line Sale was completed in 2004 (Figure 2) and the three units were sold in June 2004 to Miller Shingle Co. Road construction into Units 1 and 2 started in August, and logging started in September 2004. The harvest of Units 1 (10.5 ac.) and 2 (18.1 ac.) was completed in October, and about 4 acres of Unit 3 (18.3 ac. total) were also harvested.

Road rights-of-way and any disturbed soils on the harvest units were seeded with the grass/forb seed mix used on other Lake Chaplain harvest units in previous years.

3.1.2 Precommercial Thinning

Chap2-01 (15.5 ac.), which was harvested in 1991, was precommercially thinned in 2004 according to the following specifications:

- Leave Douglas fir at 12'x12'spacing
- Leave all Western red cedar
- Leave all cottonwoods (planted in swale in 1998)
- Leave hardwoods at 30'x 30' spacing,
- Prune maple stump sprouts to 2 to 3 stems

Large hardwoods (alder) were also retained in a swale in the unit that had previously (1998) been thinned (see 1998 Annual Report).

3.1.3 Monitoring of Plantations

Existing plantations were monitored in 2004, and most are in good condition. There are many cottonwood seedlings and big-leaf maple clumps in Tiki1-98, and the unit will be evaluated in 2005 for possible hardwood thinning. Divr2-95 will also be evaluated in 2005 for possible removal of hardwoods.

3.1.4 Blowdown Clean-Up and Salvage

Blowdown along some of the forest roads and harvest units led to a salvage sale in 2004. The roads most affected by windstorms early in the year included spurs off D-1000 into the Horseshoe Sale units, spurs off C-4000 into the Line Tree Sale units, the SP-1000 road serving the Donkey Damper Sale units, and the C-1900 road into Tiki1-98 and Phon3-05 (Figure 2).



3.1.5 Sale Layout for Crazy Bear Sale

Layout work began on two units of this sale (Figure 2). There may be a third unit, depending on the volume expected from the first two units. The work completed on Unit 1 includes property line location, marking of the unit boundary, GTA location and selection of logging method (ground based for both units). Some preliminary work was started on Unit 2 of this sale.

3.2 FOREST VEGETATION MANAGEMENT ON THE SPADA LAKE TRACT

Commercial thinning of 8 second growth timber stands (Units 9-111, 9-120, 9-121, 9-135, 9-142, 9-150, 9-183, 9-184) in the Spada Lake Tract began in October 2003 and was completed in May 2004 (Figure 3). A total of approximately 100 acres was thinned in these units with final target density of 150 trees per acre and basal areas in the range of 120-140 sq. ft per acre. A mixture of conifers and hardwoods was retained, and no trees with diameter greater than 18 inches were removed. Details of harvest setup were described in the 2002 and 2003 Annual Reports.

3.3 SNAG AND CWD MANAGEMENT

3.3.1 Snag Inventory and Creation

Snag management in 2004 consisted exclusively of work on the Spada Lake Tract (Figure 4). This was necessitated by the DNR's indication of a desire to abandon the south shore road system within 2 years. Planning for snag inventory and creation within all units accessed by this road will be conducted in 2005, to ensure that road abandonment, if it occurs, does not impede snag management.

It was determined that management within some stands would proceed more logically and efficiently by incorporating several small stands (typically mixed forest or deciduous forest pockets of an acre or two) into the larger surrounding conifer stands. These stand complexes will be re-typed during the upcoming revision to the Spada Supplement (see Section 3.14).

With regard to snag and canopy gap creation, sixteen stands (244 acres comprising 8 stand complexes) were evaluated for potential benefits from snag and gap creation (Table 1). One of these stands (9-90, 32 acres) had only a walk through exam performed, and was determined to be a good candidate for pre-commercial or commercial thinning in the foreseeable future with snag creation to follow a year or two after harvest. Five stands or stand complexes (stands 9-107, 9-110, 9-135 and surrounding small stands, 9-151 and surrounding small stands, and 9-184, totaling 117 acres) were inventoried, and snag/gap creation will occur in 2005. Stand 9-184 was commercially thinned in 2004. In this stand, one year will be allowed to elapse after management activities, prior to snag or gap creation, to allow for initial blowdown to occur. Snag and gap creation occurred in the remaining two stand complexes (stands 9-120, 9-121 and 9-183, totaling 95 acres).





Table 1. Summary of Snag Management Activities in 2004								
UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES		
Stand 9-90	31.8	0	n/a	n/a	n/a	walk thru exam; schedule for CT/PCT in 2005, then revisit for snag/gap		
Stand 9-107	28.5	0	n/a	n/a	n/a	spag/gap creation to occur in 2005		
	20.0	0	1/4	1//4	11/4	Natural snags only. Inventoried,		
Stand 9-110	8.4	0	0	0	0	snag/gap creation to occur in 2005		
Stand 9-120	41.0	146	13.9	59.8	4.2	v includes natural and created shags		
Stand 9-121/183	54.0	169	13.7	60.1	4.1	Includes natural and created snags; excludes commercially thinned portion		
Stand 9-135/						Natural snags only. Inventoried,		
140/141/145/148	41.0	0	n/a	n/a	n/a	snag/gap creation to occur in 2005		
Stand 9-151/		_				Natural snags only. Inventoried,		
152/154/155	27.8	0	n/a	n/a	n/a	snag/gap creation to occur in 2005		
Stand 9-184	11.0	0	n/a	n/a	n/a	waiting 1 year after CT for blowdown, snag/gap creation to occur in 2005; walk thru exam performed.		
TOTALS 244 the Totals for those 8 stands/complexes with snag ment in								
			, 0.0.0					

Within these stands, small openings (approximately 1/10th acre) were created by topping all trees greater than 11" dbh, as well as any smaller trees that could be reached from the larger tree being topped. In some cases, to enlarge the canopy opening further, trees around the periphery of these gaps were girdled at the base if they were less than 11" dbh. The initial goal was to obtain scattered ¹/₄ acre gaps throughout the stand, which would provide not only snags (most in the 11-15" category), but also to allow sunlight to reach the forest floor and encourage understory growth. Most of these canopy gaps were located in areas where understory shrubs were present but very sparse. Photo documentation stations will be established at selected gaps to record changes. At least three snags per acre now exist on these two stands, however, due to a lack of available larger trees; the two larger size class requirements of Table 2.2 of the WHMP were not met. These stands will be revisited in 10 years to create additional larger snags, if possible at that time. One of the stands complexes where snags were created was commercially thinned in 2003 (9-121/9-183). Snags were created only in areas outside of the anaty.

3.4 REVEGETATION AND WEED MANAGEMENT

3.4.1 Pipeline ROW

Management on the pipeline ROW consisted of annual mowing activities in the late fall, and increased vigilance for, and control of, noxious weeds. Locations of noxious weeds were noted using a GPS receiver, and a map will be produced to allow the tracking and control of infestations over time. The District's herbicide management policy was revised in 2004, allowing for the application of herbicides by a licensed technician where necessary. Several large infestations of Scotch broom, where repeated mowing and hand pulling had not been successful, were treated. Additionally, a few small patches of Tansy ragwort were treated as well.

Areas of native vegetation that are growing on the ROW were flagged and protected from mowing, where practicable, as were shrubs planted in previous years. Thimbleberry and spirea are the primary native species naturalizing on the ROW.

3.4.2 Spada Lake Tract

District biologists discovered small patches of noxious weed species growing along the South Shore Rd. and an adjacent wetland located between Recreation Sites 3 and 4. Weeds included thistle spp. and tansy ragwort. Weeds were hand pulled or seed heads were clipped off and bagged for removal from the site. Several scattered patches of tansy ragwort were also found on the back slope of Culmback Dam. Many plants showed signs of infestation by cinnabar mother caterpillars, which are also non-native, but have shown promise in helping to control tansy ragwort. Seed heads were clipped off and removed from the site for disposal.

3.4.3 Powerhouse Area

Patches of Scotch broom and thistle spp. established on the west side of the Sultan River at the Powerhouse following construction of the Sultan River Bridge in August 2002. The Scotch broom plants were hand-pulled or grubbed out and bagged for removal. The thistles closest to the river were chemically treated by a landscape contractor in spring 2004 and no new plants were found nearby during the following growing season. However, thistles were widely scattered elsewhere on the construction site. These small plants were hand pulled in the summer of 2004.

3.5 NEST STRUCTURES

3.5.1 Floating Nest Platforms

Monitoring of the two floating nest platforms on the Spada Lake Tract (Figure 8) occurred while District biologists were performing other tasks. No signs of use were noted for either platform. Similarly, neither of the two platforms at Lost Lake was used, but was monitored more frequently due to ease of access.

3.5.2 Nest Boxes

On the Lost Lake Tract, a total of 12 wooden nest boxes have been erected around the perimeter of the lake, the drainage to the southwest, and a small isolated wetland in the southwest corner of the tract (Figure 5). In 2004, 7 of those were used by cavity nesting waterfowl (4 hooded mergansers, 2 wood ducks and 1 bufflehead, Table 2). A nest box was considered successful if the contents of the box showed that at least one duckling had successfully fledged from the nest box, as evidenced by the presence of egg membranes, or the absence of duckling remains.

Six nest boxes were available at the beginning of the nesting season in 2004 near wetlands on the Lake Chaplain Tract, including Chaplain Marsh, (Figures 6 and 7). Two were used in 2004 (one each for hooded merganser and wood duck. All four of the unused boxes were damaged or torn off the tree by a black bear. No clear evidence of nesting was noted in any of these damaged boxes (such as down feathers, egg fragments, etc.). However, in three of these boxes, no nesting material whatsoever (wood chips provided in spring) was found in the vicinity. It is unlikely that empty, unused boxes would be disturbed, so it can be assumed that some stage of nesting attempt was likely in progress in these three boxes, and the status of the nesting female is unknown.

Of the eight nest boxes on the Spada Lake Tract none were used by waterfowl in 2004, but six had squirrel nests constructed, with some actively occupied at the time they were monitored (Figures 8 and 9).



1 7









Site	Boxes Available	Boxes with Duck Eggs	Number of Boxes with 1 Egg or More Hatching	Number of Ducks Fledged by Species	Other Use
Lost Lake Tract	12	7	7 (58%)	7 of 9 bufflehead; 32 of 34 hooded mergansers, with 2 nests having 1 bufflehead egg dumped in each nest that did not hatch; 10 of 10 wood ducks	1 box had a squirrel nest built inside
Lake Chaplain Tract	6	2	2 (33%)	4 of 4 bufflehead; 11 of 12 wood duck 4 nest boxes destroyed by bear, use unknown.	
Spada Lake Tract	8	0	0	0	6 boxes had squirrel nests built inside
TOTAL	26	9	9 (35%)	11 bufflehead;32 hooded mergansers;21 wood ducks	7 squirrel nests

TABLE 2. USE OF NEST BOXES ON WHMP LANDS IN 2004

3.5.3 Osprey Nest Platforms

District staff monitored the osprey nest platform at Lost Lake (Fig. 6) and the two platforms at Spada Lake (Fig. 9) at least once a month from April through July. No use was noted during that time, so additional monitoring visits were not necessary

3.5.4 Bald Eagle Nesting

The bald eagle nest established in 1997 on the Lake Chaplain Tract was occupied by nesting bald eagles in 2004. It appears that one chick was successfully fledged from the nest. Adult bald eagles were observed at the nest from mid–April until August. A chick/fledgling was observed on or near the nest in June, July and August.

3.6 OTHER WILDLIFE OBSERVATIONS

Some incidental observations of wildlife species on WHMP lands are listed in this section. 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.

- Black-tailed deer, numerous sightings Lake Chaplain, Spada Lake, Lost Lake
- Black bear, Spada Lake Tract
- Bobcat, powerhouse
- Garter snake sunning at Lost Lake
- Cedar waxwing pairs at Chaplain Marsh, wetland #2, S. Fork Sultan R.

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- Mountain beaver foraging along road to Lost Lake, also near Chaplain Marsh
- Beaver in Lake Chaplain wetland #3, Spada Lake Tract Rec. site 4, Williamson Creek wetland
- Ringneck duck pair feeding in S. Fork Sultan R.
- Harlequin female foraging in Williamson Creek mouth
- Canada geese (6) in Williamson Creek mouth, Lake Chaplain, Lost Lake
- Flying squirrel in nest box at Spada Lake
- Anna's hummingbird, Williamson Creek
- Bald eagle on Sultan R. at powerhouse, Lake Chaplain, Williamson Creek
- Band-tailed Pigeon
- Barred owl
- Barrows goldeneye
- Belted kingfisher
- Black-capped chickadee
- Blue heron
- Bufflehead
- Bushtit
- Cooper's hawk
- Double-crested cormorant
- Golden crowned kinglet
- Goldfinch
- Great horned owl feeding on pika, Spada Lake Rec. Site 5
- Hairy woodpecker
- Junco
- Lewis woodpecker
- Loon, Spada Lake, Lake Chaplain
- Merganser
- Merlin
- Mountain chickadee
- Northern flicker
- Northern harrier
- Northern shrike, Culmback Dam
- Pied-billed grebe
- Pileated woodpecker
- Pygmy owl
- Pine siskin
- Red tailed hawk
- Red winged blackbird
- Ruffed grouse, Spada Lake, Lost Lake
- American robin
- Short-eared grebe
- Song sparrow
- Stellar's jay
- Towhee
- Trumpeter swan
- Varied thrush
- Yellow-breasted chat

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• Winter wren

3.7 BIOSOLIDS APPLICATION AND MONITORING

The City of Everett monitored water quality in Chaplain Creek in relation to biosolids applications on units Hors1-93, Hors2-93 and Divr1-95 in 1996 and 2000 (Figure 2). The units and the application procedures were described in the 1996 Annual Report. Water quality data has been collected from August 1996 through December 2004. Results obtained in 2004 indicate the same patterns of seasonal variations for contaminants, all within the acceptable range, that have been found in previous years. These patterns were reported for fecal coliforms, nitrates and ammonia in the 2002 Annual Report, Section 3.10, Figure 12-14).

3.8 DEER FORAGE MONITORING

Deer forage availability was sampled in late June-early July 2004 on Hors 3, (harvested in 1993), and Donk2, (harvested in 2002) (Figures 10 and 11, respectively). Eleven years after harvest, Hors3 was increasingly dominated by conifers >6 ft., especially planted Douglas fir, although bracken fern and fireweed persisted in almost every sample point. Donk2 was harvested two years before monitoring in 2004 and has been populated by many early successional forbs, especially fireweed, and *Rubus* species. Prior to harvest, the stand had an understory of moss and sword fern, both of which were present post-harvest. Most of the unvegetated ground is covered by fine woody debris.

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 installation of two new culverts, brush cutting along roadsides, grading and shaping, as needed.

3.10 LAND MANAGEMENT ON DISTRICT PROPERTY

The District continued implementation of its RMAP, which includes the roads on the Spada Lake, Williamson Creek, Lost Lake and Project Facility Lands Tracts. Ditches, culverts and ROWs were inspected and maintained as needed. The District submitted the annual Road Maintenance and Abandonment Plan (RMAP) report to DNR as required, for roads on WHMP mitigation lands. Following timber harvest activities, spur road SL48 was abandoned according to Forest Practices standards. Acceptance and official abandonment status from DNR completed the planned road abandonment identified in the District's RMAP.

Detailed plans were developed for stabilizing the road from Olney Pass to Culmback Dam. A Forest Practices Application (FPA) was prepared and approved so that work can begin on schedule in the spring of 2005.





DNR informed the PUD that they want to abandon the South Shore Road, which leads to four of the District's Jackson Project Recreation Sites and wildlife mitigation lands. The District is working with DNR representatives and others to come up with an acceptable solution regarding DNR's concerns, license obligations, relicensing and project operations.

3.11 SECURITY MEASURES AT LAKE CHAPLAIN/JACKSON PROJECT FACILITIES

Heightened security measures at the City's water treatment facilities and the Jackson Project facilities were implemented following the events of September 11, 2001. The electric gate south of the filter plant at Lake Chaplain is kept closed at all times, and the south (Allen) gate is left open from 6am to 6pm, including weekends.

Public vehicle access to the Spada Lake Tract is controlled by gates at Olney Pass. The South Shore Road gate was opened to allow access to Recreation Sites 2, 3, 4 and 5 and the DNR trailheads during spring, summer and fall, but was temporarily closed in January 2004 due to icy conditions. Restrictions on access to the Culmback Dam area continued through 2004. The Olney Pass gate was locked, and additional gates were constructed in 2003. Members of the public who could demonstrate a legitimate right and need to have access to lands on the west-end of the reservoir obtained limited controlled access by inquiring at the powerhouse. Early in 2005 this access policy changed; the Olney Pass gate will normally be kept open and a gate closer to Culmback Dam will be locked to prevent public access to the dam.

3.12 JACKSON PROJECT RELICENSING

3.12.1 Organization

The Co-licensees for the Jackson Project will be using FERC's new Integrated Licensing Process (ILP) for relicensing. Several activities important to the informal relicensing process were conducted in 2004. A website has been created which 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. Go to the external snopud website (www.snopud.com), Water Resources, and relicensing to view this site. The Relicensing Team worked with Meridian Environmental to prepare Resource Summaries for Relicensing Consultation. This document gives us a head start on the Preliminary Application Document (PAD) that will be submitted with the Notice of Intent of file for relicense at the end of 2005.

The Relicensing Team met with various stakeholder groups beginning in late September to provide information on the Jackson Project and the relicensing process.

A project tour with FERC and agency representatives and with some NGOs was conducted on November 3, 2004. An open house was held in Everett on November 4, 2004. Members of the public and agencies attended.

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Table 3.	Wetland Rating Form Summa	ary				
		1	Washington Wetland Rating System		Cowardin System	
Wetland #	Name/Location	Wetland Size	Wetland Class	Functional Rating	Classification	
		(ac.)				
1	Rec. Site 3, west of boat launch	6	Lake fringe	111	lacustrine, littoral, aquatic bed (small portion) and emergent (majority of site), artificially flooded	
2	Lost Lake, edge of lake	30	Bog/Depressional	I and III	palustrine moss-lichen, emergent and broad- leaved evergreen shrub/scrub, and palustrine forested needle-leaved (minor part of site), saturated	
3	Lost Lake Tract, SW corner	7.4	Depressional	11	palustrine emergent persistent, and shrub- scrub broad-leaved deciduous, seasonally or semipermanently flooded	
4	Between Rec. Sites 3 & 4, on South Shore Rd.	6	Riverine	1	palustrine emergent, shrub-scrub broad- leaved deciduous and evergreen, and needle- leaved forested, permanently flooded (beaver dam)	
	Chaplain Creek Marsh	47.2	Riverine	1	palustrine aquatic bed, emergent persistent, and palustrine shrub-scrub broad-leaved deciduous, permanently flooded (beaver dam)	
6	Williamson Creek, east of road	3.7	Depressional	11	palustrine emergent, deciduous shrub-scrub, seasonally flooded, seasonally flowing stream	

3.12.2 Wetland Studies

Surveys were conducted of six wetlands on WHMP mitigation lands. Wetland information was collected using Department of Ecology's Washington State Wetlands Rating System for Western Washington (Table 3). The shoreline of Spada Lake was described and photographed to provide information for the PAD regarding the existing environment and impacts of project operation.

3.13 GIS DATABASES

GIS data bases in the Sultan Basin are being upgraded to meet the expected demands of project relicensing studies and documentation. Data bases in pc ArcInfo format were edited and exported into ArcGis geodatabases, and the geographic area included in the data bases was expanded to include a much wider region that will be discussed in relicensing documents.

3.14 SPADA LAKE TRACT SUPPLEMENTAL PLAN

The Wildlife Habitat Management Plan Supplement for the Spada Lake Tract (Spada Supplement) was approved by the FERC in 1997 for the period 1996-2005. Preparations for producing the next ten-year plan began in 2004, with an assessment of management actions that might be feasible and productive on Spada Lake timber stands. The assessment was prepared by a consulting forester and focused on silvicultural techniques and regulatory requirements (Hitchcock 2004). The consultant recommended that some of the stands be re-typed to reflect that most of the mixed forest stands are mosaics of deciduous and conifer stands rather than uniform mixtures of the two. The consultant's report and recommendations will be used to prepare the Spada Supplement for the period 2006-2015.

3.15 AGENCY TOUR OF WHMP LANDS

The District invited representatives of agencies that have an interest in the WHMP and the Jackson Project to tour mitigation sites on March 7, 2005, in order to introduce the mitigation program to newer agency staff that were unfamiliar with the program. The tour agenda and project summary handout are attached as Appendix 1.

4.0 CUMULATIVE SUMMARY

A summary of all activities completed under the WHMP, from the earliest implementation in 1988 through the end of December 2004, is presented in this section. Appendix 2 lists milestones of WHMP implementation to date, with a reference to the location in past annual reports of discussions of each activity. This Appendix is included in this Annual Report as a method of cross-referencing reports of past activities without repeating the complete details of information presented in previous reports. For complete discussion of a particular subject, the reader should refer to the referenced annual reports.

4.1 FOREST VEGETATION MANAGEMENT (LAKE CHAPLAIN TRACT)

4.1.1 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 2. 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.

4.1.2 Timber Harvest

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Harvest activity to date is depicted in Figure 2. The Phone Line Sale was sold in 2004 and partially logged. All of the unit boundaries have been reconfigured somewhat from the diagram in the WHMP to improve operational feasibility, reduce impacts to streams and wetlands, and reduce the length of access roads. As part of the process, boundaries of permanent mixed forest stands, stream and wetland buffer zones, and old growth management areas have been established. There have been some substitutions of final harvest units, as summarized below in Table 4. 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.

TABLE 4. MODIFICATIONS OF THE FINAL HARVEST (FH) SCHEDULE ON LAKE CHAPLAIN TRACT								
Unit Name	Scheduled FH	Reasons for Modification						
2005-5 ("Gold Camp"	1990	Existing wildlife habitat value is high. Unit						
unit)		Divr2-95 (portions of units originally						
		scheduled for FH in 2005 and 2030) was						
		harvested instead of 2005-5 in 1995						
2030-3	2005 (part) and	Units originally scheduled for FH in 2005 and						
	2030 (part)	2030 reconfigured into Divr2-95 and 2030-3						
Phon1	2000-3 (part) and	Portions of units originally scheduled for FH						
	2035-2 (part)	in 2000 and 2035 reconfigured into Phon1						
Phon2	2005-3 (part) and	Portions of units originally scheduled for FH						
	2035-2 (part)	in 2005 and 2035 reconfigured into Phon2						
		(see Section 3.1.3 of this annual report for						
		details.						

Commercial thinning scheduled 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 5. Two units that were not scheduled in the WHMP were thinned in 1993 (Table 5).

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TABLE 5. MODIFICATIONS OF THE COMMERCIAL THINNING (CT) SCHEDULEON LAKE CHAPLAIN TRACT							
Unit	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					
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					

4.1.3 Management of Roads and Post-harvest Units

All final harvest units were seeded with a grass/forb mix on bare areas, and replanted with Douglas fir and 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. 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 storms that caused blowdown described in Section 3.1.4.

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 is 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 thinned in 2004.

4.2 FOREST VEGETATION MANAGEMENT (LOST LAKE TRACT)

There was no management activity on the Lost Lake Tract in 2004. Stand 7-4 was precommercially thinned in 1991 and monitored annually through 2000. The slash has begun to decompose, and access through the stand has gradually improved over time. The shrub layer, especially salmonberry, has responded to the reduction in the tree canopy, and signs of deer browsing have been observed.

A feasibility study of timber harvest on the Lost Lake Tract was performed by a consultant in 2000; results were summarized in Section 3.1 of the 2000 Annual Report. A detailed timber cruise of the older stands (7-1, 7-1, 7-3) was performed in 2001, and several management options were prepared. The decision was made in 2002 not to harvest these stands, as described in Section 3.3 of the 2002 Annual Report.

4.3 FOREST VEGETATION MANAGEMENT (SPADA LAKE TRACT)

The Spada Supplement, a plan for lands surrounding Spada Lake that were acquired in 1991, was approved by the FERC in 1997. The Spada Supplement calls for commercial and precommercial thinning of some forest stands on the Tract. 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 12).

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 12). The road had become inaccessible east of Recreation Site 8 due to a massive landslide in 1997. Some of the planned forest management activities, including commercial thinning and precommercial thinning, in units formerly served by this road therefore were affected. With the loss of road access, the only option for future commercial harvest north of the lake will be helicopter logging.

A forestry contractor 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 reconstruction and new construction were eliminated from the plan. The modified units 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 3, Figure 12).

4.4 SNAG MANAGEMENT

All snag management conducted to date on the Lake Chaplain and Lost Lake Tracts is shown on Figure 13 and Table 6. A total of 60 units (1,288 acres) have been inventoried, with all but one having had all necessary snag creation. That remaining unit (a nine acre wetland buffer) is scheduled for completion in 2005. On those 60 units, 2,266 snags have been created.

For the Spada Lake and Williamson Creek Tracts, snag creation is shown in Figures 14 and 15 and Table 7. Numerous stands on both of these tracts are oldgrowth, and so have required only inventories. To date, a total of 846 acres have been inventoried, with 503 snags created on 36 stands. Approximately 117 acres on the Spada Lake Tract have already been inventoried and snag creation will occur in 2005.

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Table 6. Summary of Snag Management Through 2004 - Lake Chaplain & Lost Lake Tracts							
UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES	
2015-1	12.2	15	16.1	66.5	4.5	√ Includes natural and created snags	
2015-3	18.0	13	16.9	48.4	7.4	√ Includes 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	✓ Includes natural and created snags	
2015-6	19.0	45	17.5	55.4	4.0	✓ Includes natural and created snags	
2020-1	24.0	50	16.9	61.9	4.9	✓ Includes 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	\checkmark Includes 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	\checkmark Includes natural and created snags	
2025-3	31.7	86	17.4	65.0	3.9	\checkmark Includes natural and created snags	
2025-4	26.0	49	17.0	66.9	4.2	\checkmark Includes natural and created snags	
2030-2	22.1	60	17.0	50.3	3.1	\checkmark Includes natural and created snags	
2030-3	21.0	0	17.2	70.8	6.8	\checkmark Includes natural snags only	
2030-5	24.0	48	18.0	50.0	3.2	\checkmark Includes natural and created snags	
2035-3	18.5	30	18.0	55.0	4.9	$\sqrt{1}$ Includes natural and created snags	
2040-3	16.3	14	21.4	50.0	6.9	\checkmark Includes natural and created snags	
2045-6	14.0	15	17.8	70.1	3.8	\checkmark Includes natural and created snags	
Buffer Zone 1	2.3	15	16.4	63.8	9.8	\checkmark Includes natural and created snags	
Buffer Zone 2	1.4	7	15.9	46.6	5.0	\checkmark Includes natural and created snags	
Buffer Zone 3	8.7	23	16.6	46.6	4.5	$\sqrt{1}$ Includes natural and created snags	
OMA 10	8.6	4	20.0	56.3	18.4	$\sqrt{1}$ Includes natural and created snags	
OMA 3	11.8	27	16.2	63.6	6.3	Includes natural and created snags	
OMA 4	26.5	22	16.1	54.5	6.7	$\sqrt{1}$ Includes natural and created snags	
OMA 8	5.3	7	18.1	54.3	18.4	$\sqrt{1}$ Includes natural and created snags	
OMA1a	74.8	14	17.9	68.3	4.3	$\sqrt{1}$ Includes natural and created snags	
OMA1b	50.5	62	18.4	65.2	3.2	Includes natural and created snags	
OMA1c	30.7	68	18.1	64.4	4.0	Includes natural and created snags	
PMF 10	34.1	56	18.3	45.1	4.5	$\sqrt{1}$ Includes natural and created snags	
PMF 11	12.0	25	16.8	43.7	4.3	$\sqrt{1}$ Includes natural and created snags	
PMF 15	6.8	0	14.4	35.0	10.6	$\sqrt{1}$ Includes natural and created snags	
PMF 17	14.7	35	17.0	58.1	4.4	$\sqrt{1}$ Includes natural and created snags	
PMF 4	31.8	54	16.5	46.2	4.9	$\sqrt{1}$ 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	$\sqrt{1}$ Includes natural snags only	
PMF 7a ¹¹	15.5	20	17.8	58.5	2.5	Includes natural and created snags	
PMF 7b	15.8	38	18.1	66.0	4.6	Includes natural and created snags	
PMF 8	8.5	24	17.5	65.2	3.2	$\sqrt{1}$ Includes natural and created snags	

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES			
PMF 9	52.2	71	17.3	54.9	3.1	\checkmark Includes natural and created snags			
Stand 1-3 ¹²	4.4	0	n/a	n/a	3.1+	√ Natural snags only			
TIKI 1-98	21.0	54	17.5	55.6	3.1	✓ Includes natural and created snags			
TIKI 2-98	23.8	73	18.0	56.1	3.1	\checkmark Includes natural and created snags			
Wetland Buffer 1	8.7	12	19.0	47.9	1.4	Includes created snags only			
Wetland Buffer 2	35.5	65	17.2	56.4	3.1	\checkmark Includes natural and created snags			
CHAP1-91	26.0	75	16.6	33.5	3.1	$\sqrt{1}$ Includes natural and created snags			
CHAP2-91	15.0	46	16.1	27.4	3.1	✓ Includes created snags only			
CHAP3-91	24.0	55	18.0	31.0	3.6	\checkmark Includes natural and created snags			
DIVR1-95	15.6	42	16.8	50.3	3.1	\checkmark Includes natural and created snags			
DIVR2-95	19.7	59	18.3	47.9	3.1	\checkmark Includes natural and created snags			
DONK 1-01	23.5	67	17.1	65.3	3.1	\checkmark Includes natural and created snags			
DONK 2-01	21.4	58	18.0	67.6	3.0	$\sqrt{1}$ Includes natural and created snags			
HORS1-93	20.0	0	14.5	89.0	11.5	\checkmark Includes natural snags only			
HORS2-93	18.0	23	16.9	55.2	4.6	$\sqrt{1}$ Includes natural and created snags			
HORS3-93	13.7	37	16.0	33.8	3.1	\checkmark Includes natural and created snags			
LINE 1-00	14.8	42	18.0	65.4	3.0	\checkmark Includes natural and created snags			
LINE 2-00	22.0	62	17.4	66.4	3.1	\checkmark Includes natural and created snags			
Phone Line - 3	19.0	58	16.5	66.6	3.1	✓ Includes natural and created snags			
TOTALS	1148	1940	Totals for	r the 56 L	ake Cha	plain units which meet WHMP reqs.			
	1156	1952	Totals for all 57 Lk Chaplain units having snag mgmt activity to date.						
					1				
LOST LAKE TRACT									
Lost Lake 7-1	93.7	234	18.1	62.2	3.3	$\sqrt{1}$ Includes natural and created snags			
Lost Lake 7-2	34.0	80	17.3	61.7	3.2	$\sqrt{1}$ Includes natural and created snags			
Lost Lake 7-3	4.0	0	n/a	n/a	3.1+	✓ Natural snags only			
TOTALS	132	314	4 Totals for all 3 Lost Lake units having snag management activity to date, all of which meet WHMP requirements for snags.						
					<u></u>				
BOLD denotes those units where snag management activity occurred in 2004									
$\sqrt{1}$ Meets WHMP requirements for size class distribution and number per acre.									
1 Fewer than 3.07 snare/acre exist because fewer snars than required were created due to lack of overstory trees in this forested									

1 Fewer than 3.07 snags/acre exist because fewer snags than required were created due to lack of overstory trees in this forested wetland area. Unit will be revisited in 10 years for further snag opportunities. Unit is counted as meeting WHMP requirements.
 2 Remainder of stand, exclusive of already delineated units.

Table 7. Summary of Snag Management Through 2004 - Williamson Creek & Spada Lake Tracts						
					T	
UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
SPADA LAKE TRAC	СТ					
Stand 9-90	31.8	0	n/a	n/a	n/a	walk thru exam; schedule for CT/PCT in 2005, then revisit for snag/gap potential in 2006
Stand 9-107	28.5	0	n/a	n/a	n/a	snag/gap creation to occur in 2005
Stand 9-110	8.4	0	0.0	0.0	0.0	Natural snags only. Inventoried, snag/gap creation to occur in 2005
Stand 9-120	41.0	146	13.9	59.8	4.2	V Includes natural and created snags
Stand 9-121/100 Stand 9-135/	54.0	109	13.7	60.1	4.1	V Includes natural and created snays
140/141/145/148	41.0	n/a	n/a	n/a	n/a	snad/dap creation to occur in 2005
Stand 9-151/ 152/154/155	27.8	n/a	n/a	n/a	n/a	Natural snags only. Inventoried, snag/gap creation to occur in 2005
Stand 9-184	11.0	n/a	n/a	n/a	n/a	walk thru exam; waiting 1 year after CT for blowdown, snag/gap creation to occur in 2005
Stand 9-8	106.0	326	15.2	60.5	3.3	$\sqrt{1}$ Includes natural and created snags
Stand 9-24 ^{\1}	12.1	19	15.7	62.0	2.1	Includes natural and created snags
Stand 9-35	4.5	13	15.9	54.9	3.9	\checkmark Includes natural and created snags
Stand 9-47	4.3	10	15.7	64.0	3.0	$\sqrt{1}$ Includes natural and created snags
Stand 9-114 ^{\1}	53.0	0	n/a	n/a	n/a	Re-visit in 10 years
Stand 9-125 ^{\1}	33.0	0	n/a	n/a	n/a	Re-visit in 10 years
Stand 9-126 ^{\1}	23.7	0	16.3	44.5	0.4	Natural snags only, re-visit in 10 years
Stand 9-173	20.5	0	34.9	58.8	5.8	Natural snags only
Stand 9-180	7.4	14	21.4 65.0 4.2 √ Includes natural and created snags			$\sqrt{1}$ Includes natural and created snags
TOTALS	238 508	678 697	Totals for those 7 stands/complexes which meets WHMP requirements. Totals for all 17 stands/complexes having snag mgmt activity to date.			

		NUMBER	AVG. DBH	AVG. HT.	# PER	
UNIT	ACRES	CREATED	(in.)	(ft.)	ACRE	NOTES
WILLIAMSON CREI	EK TRACI	ſ				
Stand 10-1 ¹²	21.2	68	16.4	57.1	3.2	\checkmark Created snags only
Stand 10-2 ^{\1}	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	\checkmark Includes natural and created snags
Stand 10-5	15.1	12	22.7	37.0	3.5	\checkmark Includes natural and created snags
Stand 10-6	133.4	0	31.3	34.6	12.3	\checkmark 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 fo	r those 10) units wl	hich meets WHMP requirements.
	338	121	Totals fo	r all 11 ur	nits havin	g snag management activity to date.
BOLD denotes those	se units w	here snag	manage	ment ac	tivity o	ccurred in 2004
✓ Meets WHMP requ	irements f	for size clas	s distribu	ition and	l numbe	r per acre.
1 Trees not of adequate	size for sna	g creation, re-	evaluate in	10 years.		
\2 No natural snags foun	d during inve	entory.				

4.5 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 future 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.

4.6 **REVEGETATION**

4.6.1 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. Two sedge species became well 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.

4.6.2 Power Pipeline Right-of-Way

The pipeline ROW has been mowed on an annual basis to reduce the prevalence of tree seedlings, as well as to allow for visual inspection when necessary. Work to reduce ORV disturbance has occurred occasionally, including boulder and log placement along streams. Intrusion by ORVs still occurs intermittently, particularly during DNR logging operations, when gates are left open during the day.

Noxious weed control has stepped to the forefront of ROW management, and several techniques for control and eradication have been used; hand pulling of small infestations, repeated mowing/cutting during the growing cycle, and more recently, herbicide application. Weed infestations have been mapped and recorded for several years, and in 2005 they will be added to the GIS database.

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^{4.6.3} 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 over 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.

4.6.4 Powerhouse Site

Shrub and tree plantings were monitored at least twice each growing season between planting in 1993 and 1995, and once annually from 1996-1998. In 1997, we planted 5 cascara saplings and in 2003 we planted Oregon grape to test whether these species are suitable for the site. As of 2003, only one of the cascara saplings survived. Survival of the tree species has been greater than 90 percent, with variable growth: crabapples have performed better than ash and hawthorn. Of the shrubs, only Nootka rose has survived and grown well on this site. Some huckleberries and serviceberries have persisted, but have grown very slowly. Volunteer species that have done well on this site include non-native *Buddleia sp.* and native thimbleberry, red alder and salmonberry.

4.7 NEST STRUCTURES

Figures 5 through 7 of this report show locations of nest structures in existence in 2003, including several that were newly-placed in 2003. Locations of these nest structures and others that have been moved, or were destroyed, in the past are shown in Figures 9, 10 and 11 of the 2002 Annual Report.

4.7.1 Required 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.

4.7.2 Floating Nest Platforms

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In addition to the required nest structures, we placed two additional floating platforms (one of these in place of the third platform required at Lost Lake) in Lake Chaplain in 1990, in hopes of recruiting loons. In February 1996 the floating platforms at Lake Chaplain were moved to Spada Lake. One sank in late 1996 or early 1997 after a log became entangled in its anchor chain, and the other floated away from its anchor. The latter was placed at a different location on Spada Lake, in the Williamson Creek area in 1998. In 2002 the missing Spada Lake platform was found during low water levels, buried where it was anchored. It was repaired in 2003 and installed on the North Fork Sultan River.

The floating nest platforms have been used primarily for resting areas for waterfowl, and feeding platforms for otter. Only a few instances of nesting or nesting attempts have been noted since they were originally installed in the early nineties. As a result very little effort is extended to monitor or maintain them; typically this is done as during other routine activities.

4.7.3 Nest Boxes

In 2004 there was a total of 26 functional waterfowl nest boxes available on mitigation lands at the beginning of the nesting season. The nest boxes have been monitored every year since installation began with two boxes at Lost Lake in 1991. Waterfowl used over half of the boxes each year until 1998, when nest box success was 16%. Nest box success declined to a low of 10% in 1999, but has increased since then. These results include eight Spada Lake boxes, which go unused by waterfowl nearly every year, thereby reducing the average use. However, six of these boxes were used by squirrels in 2004.

TABLE 8. SUMMARY OF NEST BOX SUCCESS								
Year	1997	1998	1999	2000	2001	2002	2003	2004
Nesting	61	16	10	32	21	29	26	35
Success*								
*Percent of	*Percent of available boxes with ducklings fledging from them							

*Percent of available boxes with ducklings fledging from them.

General locations of the existing and removed nest structures are shown in Figures 6 through 7 of this report. Numerous nest boxes have been removed, typically due to the mount tree dying and becoming unstable for the nest box, to discourage starling use, or more recently, bear predation. New boxes are added only when an existing box is removed or damaged.

4.7.4 Osprey Nest Platforms

The osprey platform at Lost Lake produced one fledgling in 1994 and one in 1995. Nesting was attempted in 1996, 1997, 1998, and possibly in 1999, but was not successful. It appears the osprey moved to a nest site on DNR land in 1999. No osprey use of the platform at Lost Lake was observed in 2000 or 2001. Osprey used the platform in 2002, but nesting attempts did not appear to be successful. No osprey activity was observed in 2004. A nest was partially constructed at the osprey platform near the South Fork Sultan River at Spada Lake during 1994, and in 1995 osprey completed a nest and were observed setting prior to abandoning the nest in June. Nesting has not been observed on the osprey platforms at Spada Lake since then. A nest was actively used from 1996 through 1998 downstream from Culmback Dam. That nesting site was replaced by another nesting site on the same hillside, which was actively used by osprey in 1999. Results for this nest site are uncertain since 2000, as it is not on project lands and not easily observed.

4.7.5 Bald Eagle Nest

The natural bald eagle nest constructed along the east shore of Lake Chaplain in 1996 has fledged at least 9 eaglets since initiation. 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.

The nest has been monitored since 1996 with the following results:

- 1997 2 chicks observed in nest; at least 1 fledged
- 1998 1 chick observed in nest; fledged
- 1999 2 chicks observed in nest; both fledged
- 2000 2 chicks observed in nest; both fledged
- 2001 adults occupied nest through mid-May; not successful
- 2002 adults occupied nest through late April; not successful
- 2003 1 chick observed in nest; fledged
- 2004 1 chick observed in nest, fledged

4.8 **BIOSOLIDS APPLICATION**

The City of Everett applied 12.5 dry tons of biosolids per acre to units Hors2-93 (2035-6) and Hors1-93 (2040-5) in the Lake Chaplain Tract in August and September of 1996, as described fully in the 1996 Annual Report, Section 3.8. This application was one half of the prescribed amount of biosolids (based on measured nitrogen requirements). In the summer of 2000, the City applied a blended soil amendment consisting of 2 parts biosolids and 1 part wood ash to units Hors1-93, Hors2-93, Hors3-93, and Divr1-95. Units Hors1-93 and Hors2-93 received 37.5 dry tons per acre of soil amendment, and units Hors3-93 and Divr1-95 received 45 dry tons per acre.

Two water quality monitoring sites were established on Chaplain Creek. 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 coliform, ammonia, and chloride. Water quality monitoring has indicated no deleterious biosolids effect on the water quality parameters measured.

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. No monitoring has been conducted since then...

4.9 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 the following Lake Chaplain Tract units:

TABLE 9. SUM	TABLE 9. SUMMARY OF DEER FORAGE MONITORING SCHEDULE					
Unit Name	Harvest Year	Pre-Harvest Monitoring	Po	st-Harve	st Monito	oring
Chap1-91	1991	1997 (2010-3)	1997	1999	2002	2005
Hors3-93	1993		1998	2001	2004	2007
Divr1-95	1995	1997 (2015-5)	1997	2001	2003	2006
Tiki1-98	1998	1998	2000	2003	2006	2009
Tiki2-98	1998	1998	2000	2003	2006	2009
Line1-00	2000	1999	2002	2005	2008	2011
Donk2-02	2002	2001	2004	2007	2010	2013
Phon3-05	2005	2002	2007	2010	2013	2016

4.10 LAND ACQUISITION

In 1988 the District purchased the 205 acre Lost Lake Tract as part of the WHMP requirement. The District/USFS/DNR land exchange was completed in 1991. The District acquired 2,295 acres of upland and wetland habitat at Spada Lake and Williamson Creek. This included the entire Williamson Creek Tract identified in the WHMP. 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 Supplemental Plan was approved by the FERC on April 18, 1997 and will guide future forest vegetation management for that tract.

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.

4.11 WILLIAMSON CREEK TRACT

Monitoring of the Williamson Creek tract (Figure 15) 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 least every five years. Baseline inventory was completed in 2003. Monitoring activities will continue.

Field procedures beyond those described in the WHMP have been developed specifically for the Williamson Creek Tract, as described more fully in the Williamson Creek Standard Operating Procedures (PUD 1999). 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.

SUMMARY THROUGH 2003				
Stand #	% Complete	Type of Inventory	Year of Inventory	
10-1	100	Snags, CWD, photodoc.	2000	
10-2	100	Old growth	2000	
10-3	100	Snags, CWD, photodoc	2000	
10-4	100	Snags, CWD, photodoc	2000	
10-5	100	Snags, CWD, photodoc	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	Photodoc	1998	
10-14	100	Photodoc	1998,1999	
10-15	100	Photodoc	1999	

TABLE 10 WILLIAMSON CREEK BASELINE INVENTORY

Tables 11 and 12 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 11). 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 15) 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

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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 11). 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).

TABLE 11. WILLIAMSON CREEK TRACT NATURAL SNAGCUMULATIVE INVENTORY SUMMARY, COMPLETED 2003

Stand #	Cover Type	SNAGS/A C. (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 12. WILLIAMSON CREEK NATURAL CWD CUMULATIVEINVENTORY 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
10-12	Old Growth	36.0	24.9	54.7

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 11). The average number of CWD/acre was 3.9 and 2.1 on stands 10-3 and 10-5 respectively (Table 12). 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.

4.12 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 Upper 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 SL67 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 the dam. Plans were completed and appropriate permits were obtained so that work can be conducted in Spring 2005. 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. Also in 2001, a supplemental easement was obtained on a portion of road CD-147 (see District RMAP) owned by DNR.

5.0 WORK PLANNED FOR 2005

5.1 FOREST VEGETATION MANAGEMENT

5.1.1 Lake Chaplain Tract

Additional work is required to complete the layout for the Crazy Bear Sale. In 2005, we will identify trees to be made into snags and CWD, and we will mark hardwoods (big-

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leaf maple and alder) for retention. The GTA for unit 1 has been located, but the GTA for 2 needs to be defined. Unit 1 boundaries have been ribboned and traversed, but Unit 2 boundaries have not been marked or traversed yet.

Tree seedlings on all harvested units will be monitored for survival and vigor, and the density and distribution of hardwoods will be evaluated. In some units, including Divr2-95, it is possible that hardwood density in certain patches may be reduced; however, the target hardwood overstory composition will remain 5 to 10 percent.

5.1.2 Spada Lake Tract

The District may set up some stands for precommercial thinning: 9-90 and 9-133.

5.2 SNAG AND CWD MANAGEMENT

Snag management in 2005 will focus on Spada Lake Tract stands that were noted in the Spada Supplement as requiring activity by the end of 2005. Units are primarily located in the South Shore Management Unit and the Old Growth Management Unit along the Culmback Dam road. As explained in section 3.2 of this report, many of these stands are expected to consist of a wide range of diameters, and gap creation will be utilized where appropriate to create snags as well as openings in the canopy. It is likely that some units will not have trees of adequate size for snag creation. In this case, as many snags as are reasonable will be created, with the intention of returning in 10 years to create additional snags. At Spada Lake, snag creation will take place in stands along the South Shore road system where inventories occurred in 2004.

On the Lake Chaplain Tract, wetland BZ 1 will have snags created (Figure 13). Additionally, stands where snag creation was completed 10 years ago will be inventoried to determine the need for additional snags. Long-term snag monitoring will continue on selected Lake Chaplain and Lost Lake Tract units.

In 2005, snag management on the Lake Chaplain Tract will include revisiting units where snag creation occurred 10 years ago, to replace any snags that have fallen in the interim, and to record trees that have died in the past decade. Additionally, units where harvest activity is scheduled from 2025-2029 will be inventoried to allow a final entrance for snag creation prior to entering the 20-year period preceding harvest, when snags can not be created. Trees will be identified for snag and CWD creation on the Crazy Bear Sale, which is expected to be sold in 2005.

Created CWD will be monitored on selected Lake Chaplain harvest units.

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 are in the vicinity.

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5.3.2 Power Pipeline Right-of-Way

In 2005, shrub plantings will be monitored to note the condition of surviving plants and to determine if additional plantings are needed. The areas of natural in-growth will also be monitored to assess the value of utilizing this method of revegetation on the pipeline ROW.

Noxious weeds will be controlled as in previous years, with their locations and control efforts noted. A noxious weed monitoring and management plan will be drafted.

5.3.3 Lake Chaplain Tract and Powerhouse Site

Monitoring and routine maintenance will be conducted as in previous years. Some tree seedlings small shrubs will 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

Excessive vegetation growing on the floating nest platforms will be removed in February. The platform on the North Fork at Spada Lake will be repaired and a new anchor and additional vegetation will be added.

The floating nesting platforms and osprey platforms at Lost Lake and Spada Lake will be monitored when the biologists are on site to perform other activities during the breeding season (April-late June). Monitoring will be reinstated on a regular basis if any platform is used for nesting. At the end of the nesting season the floating platforms will be visited to look for signs of use by wildlife.

Nest boxes will be cleaned and repaired in February and checked for nesting success in June. Data from the three nest box designs that are used in this program will be evaluated to identify whether details such as roof or door design may be influencing nest box success.

5.4.1 Floating Nest Platforms

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.

5.4.2 Nest Boxes

Nest boxes will be cleaned and repaired as necessary by the end of February in preparation for the upcoming nesting season. 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 harvest units will be monitored in 2005: Chap1-91, Line1-00.

5.6 WILLIAMSON CREEK TRACT

Baseline inventories have been completed on the Williamson Creek Tract. Standard Operating Procedures call for monitoring of the wetlands, old growth and mixed forest stands on a continuing, but less intense basis. Monitoring of the wetlands will be conducted on the Williamson Creek Tract in 2005.

5.7 LAND MANAGEMENT

The District will continue implementation of the RMAP and will prepare and submit an annual report to DNR. District biologists will observe Culmback Dam Road repairs and stay apprised of activities to help assure that Forest Practices are followed. 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 Upper Sultan Basin, providing comments and suggestions on plans (habitat objectives, fire management, etc.) and coordinating land management in the basin.

5.8 **BIOSOLIDS APPLICATION**

Several harvest units on the Lake Chaplain Tract are possible candidates for biosolids applications in the summer of 2005. Line2-00 will very likely be treated, and two units that were treated in 2000 (Divr1-95 and Hors3-93) may received additional treatments. The previously-treated units did not receive the full amount of nitrogen recommended to bring soil quality up to the desired level, and the plan is to do so in 2005 if soil chemistry analysis currently under way supports the application. Water quality monitoring may continue in 2005 in Chaplain Creek.

5.9 JACKSON PROJECT RELICENSING

District biologists will participate in developing the preliminary application document and other associated relicensing activities such as study plan designs.

District biologists will study wetlands that were not studied in 2004. The Department of Ecology's Washington State Wetlands Rating System for Western Washington will be used. That information will be incorporated into the PAD if document preparation schedules permit.

5.10 SPADA LAKE TRACT SUPPLEMENTAL PLAN

The Spada Supplemental Plan for the period 2006-2015 will be completed by District staff and submitted to agency reviewers for comment.

Major Activities Location Quantity Road Construction TBD Lake Chaplain Tract Final Harvest Bear Timber Sale (Crazy Lake Chaplain Tract 2 units Sale) Timber Harvest (complete Lake Chaplain Tract Phone Line Sale Unit 3) Sale Layout (complete Crazy 2 units Lake Chaplain Tract Bear Sale) Commercial Thinning TBD Spada Lake Tract Timber Harvest layout 16 units Harvest Unit Stocking Lake Chaplain Tract, all previously harvest units Monitoring Precommercial Thinning setup Spada Lake Tract TBD Lake Chaplain Tract, Spada **Snag Creation** Lake Tract Lake Chaplain Tract, Spada TBD Snag Inventory Lake Tract CWD Creation Lake Chaplain Tract TBD Revegetation As needed to improve bare Pipeline ROW Grass seeding/fertilizer Shrub plantings spots Monitoring Monitoring of all **Revegetation Site** West side, Chaplain Marsh planted/seeded areas. North end, Lake Chaplain Monitoring/Maintenance Maintenance as needed: Powerhouse site Weeding, brush thinning, etc. Pipeline ROW 2 units Lake Chaplain Tract Deer Forage Lake Chaplain, Lost Lake Created snag trees Snags Tracts CWD Lake Chaplain Tract Lost Lake, Spada Lake, and Monitor all structures . Nesting Structures Chaplain Tract All wetlands designated in Wetland Monitoring Lost Lake, Williamson Creek SOPs Wetlands Williamson Creek monitoring Develop monitoring plan SOP Noxious weeds All WHMP lands and control weeds as needed None planned Lake Chaplain Tract **Biosolids Application** None planned Understory monitoring Water quality monitoring Chaplain Creek 2 stations Monitor and develop long-All established units GTA and BZ Management term management plans RMAP implementation. Spada Lake Tract Land Management **RMAP** implementation Lake Chaplain Tract

6.0 SCHEDULE OF ACTIVITIES FOR 2005

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Major Activities	Location	Quantity
Relicensing	All WHMP lands	Prepare pertinent sections of
		Prelim. Application
		Document, keep stakeholders
		informed.
Spada Lake Tract Supplemental	Spada Lake Tract	Prepare Plan for 2006-2015
Plan	-	

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APPENDIX 1 – AGENCY TOUR OF WHMP LANDS

Henry M. Jackson Hydroelectric Project Wildlife Habitat Management Plan March 7, 2005

Goal of the Tour: License articles of the Jackson Project include regular reviews of the project's fisheries and wildlife habitat management obligations by agency representatives, which has been accomplished by review of annual reports and periodic visits to management lands. Several agencies that have collaborated on the project have new staff members who will benefit from an on-site introduction to the Project's management program.

In attendance:	 Snohomish Co. PUD: Karen Bedrossian, Keith Binkley, Bruce Meaker, Bernice Tannenbaum. City of Everett: Don Farwell, Dan Mathias U.S. Fish and Wildlife Service: Tim Romanski Tulalip Tribes: Tom McKinsey, Michael Sevigny Washington Department of Fish and Wildlife: Gary Engman
9:30 am	Meet in Monroe along Hwy. 2 in parking lot between McDonald's and Safeway
9:30 - 10:20	Travel to Olney Pass/ Spada Lake Overview en route of Jackson Project, wildlife, fisheries and recreation programs.
10:30 – ll:15	Travel to Culmback Dam and Recreation Site 8 (Overlook) Overview of wildlife management on Spada Lake Tract, Williamson Creek Tract, discuss access.
11:15 – 12:30	Travel to Recreation Site 4 (Nighthawk) Wetlands, timber stand management
12:30 - 12:45	Travel to Recreation Site 3 (South Shore) Discuss management of drawdown zone, timber stand management, shoreline management, public use facilities. Eat Lunch.
12:45 – 2:15	Leave Spada Lake area, travel to Powerhouse and lower Pipeline right-of-way Wildlife habitat management on ROW, project facilities and operations
2:15 -3:15	Travel to Lake Chaplain Timber stand management, wildlife habitat management. Visit DIVR2-95 and TIKI1-98
3:15 - 4:00	Travel to Lost Lake Wildlife habitat management, public use
4:00 - 4:30	Return to Monroe

WILDLIFE HABITAT MANAGEMENT PROGRAM OVERVIEW Jackson Hydroelectric Project

BACKGROUND

- District was ordered by the FERC in 1984 to prepare a revised terrestrial wildlife mitigation plan to offset losses resulting from Project construction and operation.
- Most of the losses to wildlife resulted from inundation of approximately 1900 acres, which is now Spada Lake.
- The wildlife agencies requested:
 - 1. Priority be given to old-growth, wetland and riparian habitat.
 - 2. Mitigation be in the vicinity of lost habitat (in-basin).
 - 3. Habitat be similar to that which was lost (in-kind).
 - 4. Use of the U.S. Fish and Wildlife Service's Habitat Evaluation Procedures (HEP) to compare proposed mitigation to Project impacts.
- Preparation of the Wildlife Habitat Management Plan (WHMP) was a lengthy process of planning and negotiations with the agencies.
- The WHMP was approved by FERC in 1989.

The WHMP

- The WHMP addresses impacts resulting from the Project through the year 2060 and requires management activities on five tracts of land.
- The WHMP includes approximately 7000 acres (~ 4700 acres of land and ~ 2300 acres of reservoir and lake).
- The District owns approximately 4300 of those acres (~ 2400 acres of land and ~1900 acres of reservoir and lake).
- The City owns approximately 2700 acres (~2260 acres of land and ~440 acres of reservoir).

A. Management Techniques

1. Forest Vegetation Management:

- Major component of the WHMP.
- Ongoing, through the life of the WHMP.
- Preserve old-growth stands and create buffers around them.
- Maintain riparian habitat and forests of mixed coniferous and deciduous trees.
- Small timber harvests, reforestation, and other silvicultural activities on second growth forests to improve the growth of forest stands and understory vegetation for wildlife (e.g.: precommercial and commercial thinning, and gap creation).
- Space harvest units in location and time to create more edge and ensure forage and cover are always near-by.
- Provide green tree areas, snags and coarse woody debris.

2. <u>Snag Management:</u> snags provide habitat for many species and are used for nesting, hiding, foraging and food storage. The PUD inventories existing snag trees and creates additional snags as needed on all forest stands. Snags are monitored through 2060. The target is an average of three snags per acre.

3. <u>Coarse Woody Debris (CWD) Management:</u> logs are an integral part of maintaining a healthy forest ecosystem over time. They provide habitat for many species of animals, large and very small. Existing dead and down material is left on harvest units when possible and new material is provided during harvest.

4. <u>Wetland and Streamside Buffer Zones:</u> wetland, lake and stream habitat is protected and buffer zones are required around them. Wetland buffers vary from 200 to 500 feet and stream buffers vary from 50 to 200 feet in width.

5. <u>Revegetation and Right-Of-Way Management:</u> increase production of grasses, ground cover and shrubs on several ROWs. Increase vegetative screening and habitat value through planting of shrubs and trees in other areas. Management includes seeding, planting, maintenance and monitoring.

- 6. <u>Nest Structures:</u>
 - Waterfowl Nest Boxes provide nesting habitat for wood ducks and hooded mergansers. The WHMP calls for two nest boxes at Lost Lake. We currently have 12 boxes at Lost Lake, seven boxes on the Lake Chaplain tract and eight at Spada Lake.

- Artificial Nesting Islands offer waterfowl a predator-reduced environment. The WHMP calls for three floating nesting islands at Lost Lake. Working in consultation with the wildlife agencies, platforms have been placed and removed at Lake Chaplain and Spada Lake. We currently have two platforms at Lost Lake and two at Spada Lake.
- Osprey Nest Structures osprey commonly nest adjacent to lakes, rivers and reservoirs. They select trees, snags or artificial structures that have broad flat tops for nesting. Increased production can occur with larger, more stable nest structures. We have placed one nest structure at Lost Lake and two at Spada Reservoir by topping live trees and placing a platform upon them. Nesting has been successful on the platform at Lost Lake.
- B. WHMP Management Lands
 - 1. Lake Chaplain Tract (2657 acres).
 - Owned by City of Everett.
 - 1,360 acres of tract is second-growth coniferous forest. Forest management plan was developed to be more beneficial for wildlife than the original harvest plan developed by consultants for the City. Plan includes small harvest units <26 acres, snag and CWD management, and green tree areas.
 - 55 acres of old growth and 240 acres adjacent forest managed for old-growth characteristics.
 - Includes wetlands, riparian forest, deciduous and mixed forest management.
 - WHMP is now part of the City's Watershed Management Plan. Water quality was given the highest priority during WHMP development.
 - 2. Lost Lake Tract (205 acres)
 - District purchased tract in 1988 as part of WHMP implementation, to protect it from residential development.

- Preserve lake and wetland complex 200ft. permanent buffer plus additional 300 ft. buffer where some manipulation may occur to maintain it as mixed forest.
- WHMP calls for managing remaining forested areas to optimize value to species such as deer, grouse and chickadee as requested by the wildlife agencies. Maintain as mixed forest, which includes small harvest units and snag management. There has been wildlife agency approved variation in management from the WHMP, based on more detailed assessments of the units. Harvest has been deferred until conditions indicate that harvest activities will benefit wildlife. Factors influencing any harvest include the condition of the stands, the condition of adjacent stands, road access, and economic feasibility.
- Provide waterfowl nest boxes, floating nesting islands and osprey nest platforms.
- Hike in access only. Wetland areas sensitive to excess human use.
- Sportsman's club and WDFW stock with trout 2000 cutthroat and 500 rainbow trout in 2004.
- 3. Project Facility Lands (80 acres).
 - Includes the power pipeline ROW (40 acres), powerhouse site (27acres), a one-acre portion of the transmission ROW and 11 acres of adjacent land purchased during project construction.
 - WHMP calls for this tract to be managed to provide quality meadow, shrub and open woodland habitat.
 - Vehicular access has been restricted and seeding, planting and fertilizing has been conducted.
- 4. Spada Lake Tract (3683 acres).
 - District obtained this tract in 1991 as part of a land exchange with the U. S. Forest Service and Washington Department of Natural Resources.
 - Detailed plans for management through 2005 are in the "Wildlife Habitat Management Plan Supplement for the Spada Lake Tract", approved by FERC in 1997. The plan divides the tract into three

management units. It calls for preserving and enhancing old growth, riparian and mixed forest stands. In two of the management units the coniferous second growth forests will be managed for forest interior species by promoting a multi-storied canopy with snags, coarse woody debris and thinning. In one of the management units the coniferous second growth forests will be managed to produce habitat for species that use earlier forest successional stages. The plan prescribes precommercial thinning of 464 acres and commercial thinning of 140 acres to improve wildlife habitat. Snag and CWD management are a part of the plan.

- Currently there are two osprey nesting platforms, two floating waterfowl nesting platforms and eight nest boxes on the tract.
- WHMP required a test planting program to see if the shoreline drawdown zone can be revegetated.
- 5. Williamson Creek Tract (344 acres).
 - The District acquired this tract in the 1991 land exchange, as part of WHMP implementation.
 - The tract contains approximately 270 acres of old growth forest.
 - The WHMP calls for management to preserve existing habitat with an emphasis on late-successional wildlife species such as pine marten and pileated woodpecker.

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
Timber Harvest	Lake Chaplain	Chaplain Sale	1001(331 n 6) 1002(321 n 4)
	Lake Chaplain	Horseshoe Sale	1992(3.2.2, p.6), 1992(3.2.1, p.4)
	Lake Chaplain	Diversion Sale	1992 (3.2.2, p.0), 1993 (3.1.1, p.0)
	Lake Chaplain	Tiki Sale	1007(3.1.1, p.0)
· · · · · · · · · · · · · · · · · · ·	Lake Chaplain	Line Tree Sole	1997 (3.1.1, p.2), 1998 (3.1.1, p.2)
		Line free Sale	1999 (3.1.2, p.2), 1998 (3.1.2, p.3), 1999 (3.1.2, p.2), 2000 (3.1.1, p.4)
	Lake Chaplain	Donkey Damper Sale	1999 (3.1.4, p.5), 2000 (3.1.1, p.4), 2002 (3.1.3, p.4)
	Lake Chaplain	Donkey Damper Sale	1999 (3.1.4, p.5), 2000 (3.1.1, p.4), 2002 (3.1.3, p.4)
	Lake Chaplain	Phone Line Sale	2002 (3.1.3, p.4), 2004(3.1.1 p.9)
	Lake Chaplain	Crazy Bear Sale	2004 (3.1.5, p.11)
	Lake Chaplain	Salvage Sales	1993 (3.1.2, p.6), 1998 (3.1.1, p.2), 1999 (3.1.1, p.2), 2004 (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, p.5)
	Lake Chaplain	Diversion Sale	1996 (3.1.1, p.4)
	Lake Chaplain	Tiki Sale	1999 (3.1.1, p.2), 2000 (3.1.2, p.4)
	Lake Chaplain	Donkey Damper Sale	2002 (3.1.2, p.4)
	Lake Chaplain	Line Tree Sale	2000 (3.1.2, p.4)
Roads	Lake Chaplain	S1000 (Chaplain Sale)	1991 (3.3.1, p.6)
	Lake Chaplain	C1300 (Chaplain Sale)	1991 (3.3.1, p.6)
······	Lake Chaplain	C1900 (Tiki Sale)	1997 (3.1.2, p.5)
**************************************	Lake Chaplain	SP1500 (Tiki Sale)	1997 (3.1.2, p.5)
	Lake Chaplain	SP1000 (Tiki Sale)	1997 (3.1.2, p.5)
	Lake Chaplain	SP1300 (Tiki Sale)	1997 (3.1.2, p.5)
	Lake Chaplain	(Linetree Sale)	1999 (3.1.3, p.5)
	Spada Lake	North Shore Road	1997 (4.3, p.28), 1999 (3.8, p.26)
Forest Vegetation Management	Lake Chaplain	Precommercial Thinning, Hardwood Reduction	1999 (3.1.5, p.5), 2001 (3.1.4, p.4), 2002 (3.1.4, p. 7), 2004 (3.1.2, p.9)
	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)
	Spada Lake	Precommercial Thinning	1996 (3.1.5, p.6), 2000 (3.2.1, p.6)
	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)

APPENDIX 2 – WHMP IMPLEMENTATION MILESTONES

General Activity	Management Tract	Milestone	Annual Report Reference – (Section/page #)
Stream and Wetland Buffer Zone Management	Lake Chaplain	Snag creation and monitoring	
GTA Management	Lake Chaplain	Chaplain Sale Unit 1	1994 (3.1.3, p.5)
Snag Management	Lake Chaplain	Implementation Decisions	1990 (3.3, p.6), 1993 (3.2, p.8), 1996 (3.2, p.6)
	Lake Chaplain and Lost Lake	Snag Inventory Results	1991 (3.4, p.9), 1992 (3.3, p.6), 1995 (3.2, p.7), 1997 (3.2.2, p.7), 1998 (3.2.1, p.5), 1999 (3.2.1, p.5), 2000 (3.3.1, p.9)
	Lake Chaplain	Snag Creation	1990 (3.3, p.6), 1991 (3.4, 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)
	Lake Chaplain and Lost Lake	Snag Monitoring and Mapping	1998 (3.2.2., p.7), 1999 (3.2.2, p.9), 2002 (3.4.3, p.15), 2003 (3.3.1, p.9), 2003 (3.3.2, p.10)
	Williamson Creek	Snag Creation	2002 (3.4.1, p.10))
	Spada Lake	Snag Creation	2002 (3.4.1, p.10), 2003 (3.3.1, p.4), 2004 (3.3.1, p.11)
	Williamson Creek	Snag Inventory	2002 (3.10, p.33)
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)

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
B	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)
	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)
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)
	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)
	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)
· · · · · · · · · · · · · · · · · · ·	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.140
	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)
	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)

General	Management	Milestone	Annual Report Reference –
Activity	Tract		(Section/page #)
Category			
	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)
	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)
Bald Eagle Nest	Lake Chaplain	Monitoring	1997 (3.5.4, p.19), 1998 (3.5.4, p.18),
Zuita Lugio 1103t			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)
Biosolids	Lake Chaplain	Biosolids Application	1996 (3.8, n.18), 1998 (3.7, p.18), 2000
Application	Lune Chaptan	Diotonias rippintante-	(3.7. n.20)
1 Appiroution			(0.7, p.20)
	Lake Chaplain	Monitoring	1996 (3.8 n 18) 1997 (3.7 n 19), 2000
	Lake Chaptain	Wontoring	(3.7 n 20) 2002 (3.8 n 23) 2004 (3.7
			(3.7, p.20), 2002 (3.0, p.20), 2001 (0.1, p.20
Deer Feroge	I also Chaplain	Implementation	(1001 (2 10 1 - 21) 1006 (3 0 - 18))
Deer Forage	Lаке Спартані	Implementation	1991 (3.10.1, p.21), 1990 (3.7, p.10)
Monitoring		Decisions	1997 (3.8.1, p.19)
		& Methods	1001(2101-22)(1006(20-18))
		Forage Availability	1991 (3.10.1, p.22), 1990 (3.9, p.10)
		Results	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 (5.8, p.18)
	[p.24)
		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		1991 (3.1, p.3)
	Creek		
Management	Lake Chaplain	Chaplain Property	1995 (3.7, p.17)
Plans & Land		Comprehensive Plan	
Use Decisions			
	Lake Chaplain	Shoreline Zone	1995 (3.7, p.17)
······································	Marie Charge	development permit	
	Lake Chaplain	Zoning Code change	1996 (3.7. p.15)
	Dano Chaptain	Loning Cour mange	
	Lake Chanlain	Rold Foole Nest Site	1007 (Attachment 1)
	Lake Chaptani	Management Plan	1997 (Attachment 1)
	Τ	Management I fan	1001(2,2,n,2)
	Lost Lake	Concrete Ford	1991 (3.2, p.3)
	0 1 T 1	Installation	1007 (A + cohmont 2) 2004 (3.14 p.29)
	Spada Lake	Supplemental Plan	1997 (Attachment 2), 2004 (3.14, p.27)
	PUD Properties	Road Maintenance and	2002 (3.12, p.30), 2003 (3.11, p.24),
		Abandonment Plan	2004 (3.10, p.24)

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
Special Agency Consultation	Lake Chaplain All management tracts	Road Maintenance and Abandonment Plan Agency tour of WHMP Sites FERC Environmental Inspection	2002 (3.11, p.36) 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)
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)
Weed Monitoring and Management	All management tracts		2004 (3.4, p.15)
Relicensing	All	Follow ILP	2004 (3.12, p.27)