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April 29, 2002  
PUD No. 20705

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Gentlemen:

RE: Jackson Hydroelectric Project -FERC #2157  
Wildlife Habitat Management Plan  
2001 Annual Report

A copy of the 2001 Annual Report on the Jackson Project Wildlife Habitat Management Plan is enclosed for your records.

If you have any questions or comments, please contact me at 425-783-1746.

Sincerely,

A handwritten signature in cursive script that reads "Bernice Tannenbaum".

Bernice Tannenbaum  
Environmental Coordinator

Enclosure

Cc: Bruce Meaker, E2  
Don Farwell, City of Everett  
Dan Mathias, City of Everett

**2001 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 2002**

**2001 ANNUAL PROGRESS REPORT  
WILDLIFE HABITAT MANAGEMENT PLAN**

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# **2001 ANNUAL PROGRESS REPORT WILDLIFE HABITAT MANAGEMENT PLAN**

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## **1.0 SUMMARY**

Accomplishments of the year 2001 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 1989 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 2001**

- Completed planting of Linetree Sale unit 1 (Lake Chaplain Tract)
- Completed precommercial thinning of Chaplain Sale unit 1 (Lake Chaplain Tract)
- Completed hardwood slashing of Diversion Sale unit 2 (Lake Chaplain Tract)
- Completed Lake Chaplain Road drainage upgrade (Lake Chaplain Tract)
- Sold Donkey Damper timber sale (Lake Chaplain Tract)
- Started logging Donkey Damper Sale units (Lake Chaplain Tract)
- Plantation monitoring (Lake Chaplain Tract)
- Biosolids monitoring (Lake Chaplain Tract)
- Snag inventory and creation (Spada Lake Tract and Williamson Creek Tract)
- Deer forage monitoring (Lake Chaplain Tract)
- Seeding of power pipeline ROW (Project Facilities Tract)
- Monitoring of vegetation coverage on power pipeline ROW (Project Facilities Tract)
- Monitoring of nest structures (Lake Chaplain, Lost Lake and Spada Lake Tracts)
- Monitoring of revegetation and wetland sites (Lost Lake Tract, Lake Chaplain Tract)
- Long-term snag monitoring (Lake Chaplain Tract)

- Monitoring of Williamson Creek Tract
- Monitoring of biosolids application sites (Lake Chaplain Tract)
- Layout of timber harvest units (Spada Lake Tract)
- Continued feasibility study of timber harvest options (Lost Lake Tract)
- Complete Road Maintenance and Abandonment Plan for Lost Lake, Spada Lake, Williamson Creek and Project Facilities Tracts
- Continued collection of baseline data at Williamson Creek Tract

## **1.2 TASKS SCHEDULED FOR 2002**

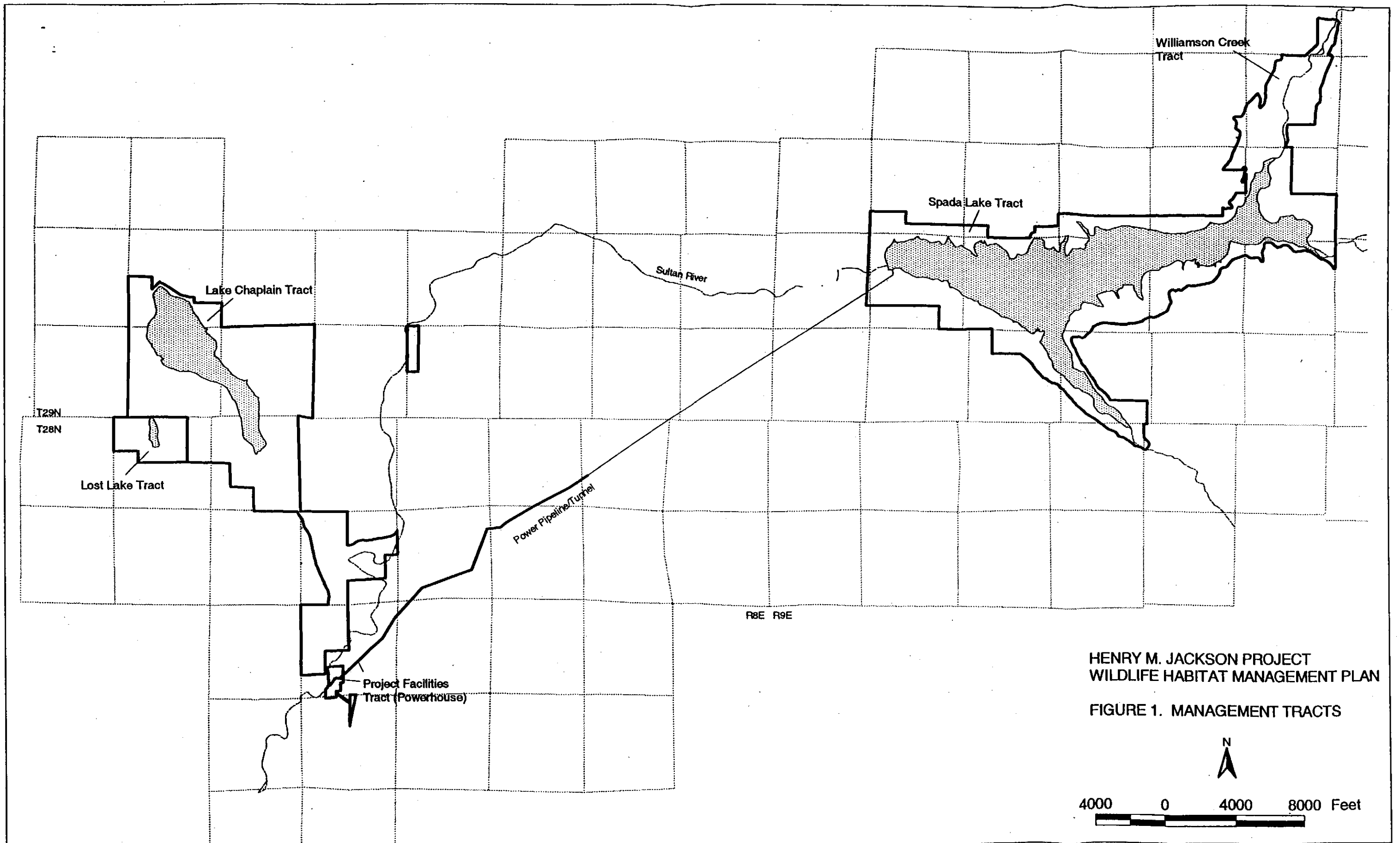
- Complete road construction on Donkey Damper Sale (Lake Chaplain Tract)
- Complete logging Donkey Damper Sale units (Lake Chaplain)
- Planting of Donkey Damper Sale units (Lake Chaplain)
- Complete layout of next sale (Lake Chaplain)
- Complete precommercial thinning on Chaplain Sale unit 2 (Lake Chaplain Tract)
- Plantation monitoring (Lake Chaplain)
- Biosolids monitoring (Lake Chaplain)
- Hemlock looper infestation monitoring (Lake Chaplain)
- Complete Road Maintenance and Abandonment Plan for Lake Chaplain Tract
- Implement Road Maintenance and Abandonment Plan at Spada Lake Tract
- Snag monitoring (Lake Chaplain and Lost Lake Tracts)
- Snag inventory on Spada Lake Tract and Williamson Creek Tract
- Monitor Williamson Creek Tract
- Monitor nest structures
- Monitor revegetation sites
- Deer forage monitoring (Lake Chaplain Tract)
- Coarse woody debris monitoring on Lake Chaplain harvest units
- Monitor buffer zones and green tree areas in harvested units (Lake Chaplain Tract)
- Monitor precommercial thinning units (Spada Lake Tract, Lost Lake Tract)

## **2.0 INTRODUCTION**

The 2001 Annual Progress Report on the Wildlife Habitat Management Plan (WHMP) for the Henry M. Jackson Hydroelectric Project was prepared by Public Utility District No. 1 of Snohomish County (District) and the City of Everett (City), who are 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 2001 (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 2002 are herein described. (see Section 5.0). Activities, procedures and schedules described in this report are based on the WHMP approved by the Federal Energy Regulatory Commission on May 19, 1989, in compliance with Project License Article 53 and subsequent related orders from the Commission.





HENRY M. JACKSON PROJECT  
WILDLIFE HABITAT MANAGEMENT PLAN

FIGURE 1. MANAGEMENT TRACTS

### **3.0 WORK COMPLETED DURING 2001**

#### **3.1 FOREST VEGETATION MANAGEMENT ON THE LAKE CHAPLAIN TRACT**

##### **3.1.1 Timber Harvest**

The Donkey Damper sale, as described in the 2000 annual report, was sold in October 2001 (Figure 2). Harvest and road construction activities began in November 2001 and will be completed by the spring of 2002.

##### **3.1.2 Reforestation**

In the spring of 2001 the 9 acres of the Linetree unit one (Linetree1-00) that were not planted after harvest in 2000 were planted to Douglas fir at 300 trees per acre. Red-cedar was not available for purchase, therefore were not planted, but they will be planted in 2002.

##### **3.1.3 Harvest Unit Layout**

Preliminary layout work for the next sale began; however no final proposal has been developed.

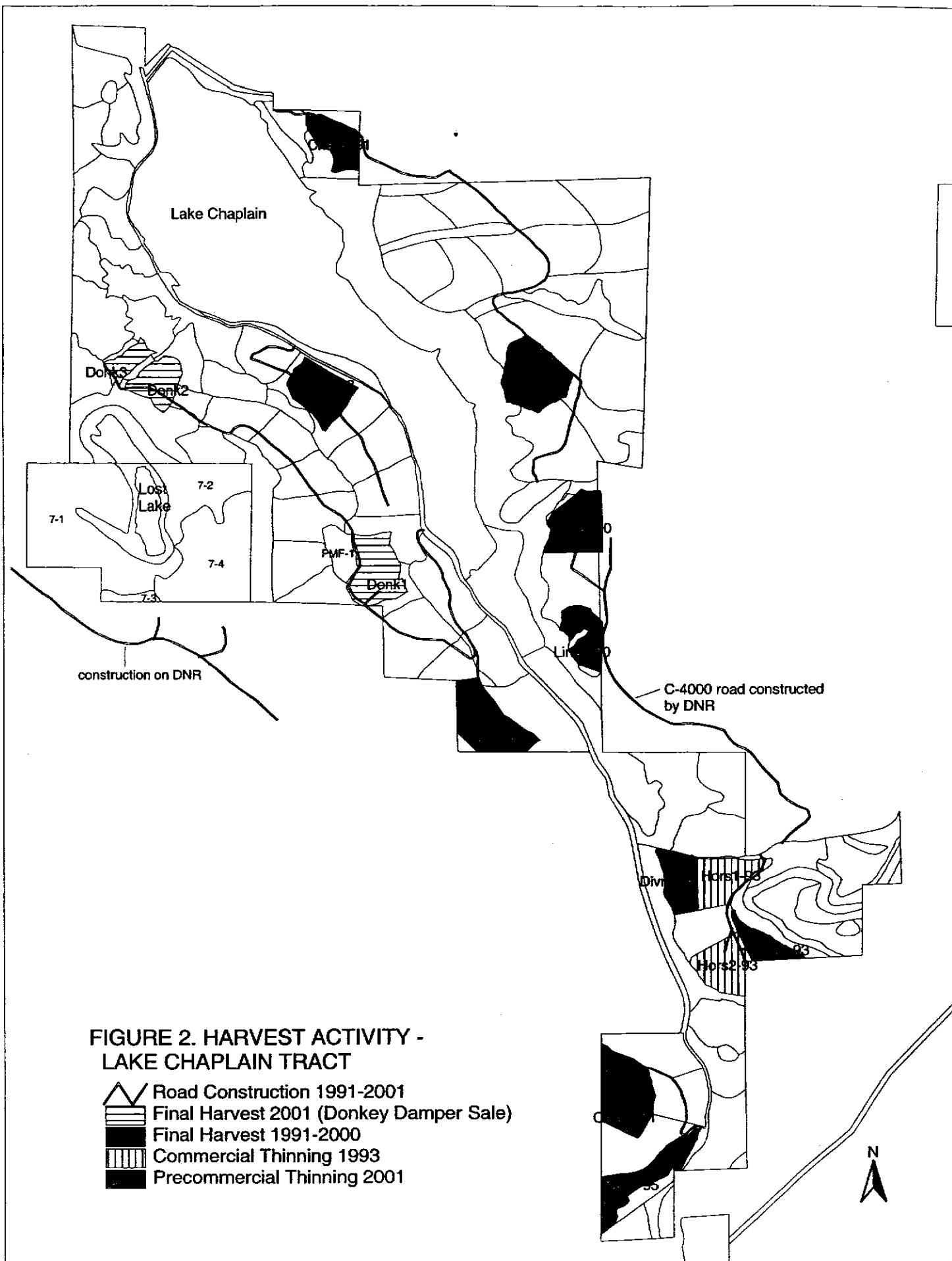
##### **3.1.4 Stand Management**

Chaplain sale unit one (Chap1-91), which was logged in 1991 and planted in 1992, was precommercially thinned in 2001 (Fig.2) . The prescription for this thinning was to thin the Douglas fir to a spacing of 12' x 12', leave all red-cedar and hardwoods but cut the Big-leaf maple clumps back to three to five stems per clump.






During the summer of 2001 conifer release slashing was completed on the Diversion sale unit two (Divr2-95). The prescription for this slashing was to cut all hardwoods to a spacing of 30 to 40 feet and cut maple clumps back to three to five stems per clump. This slashing released the overtopped conifer seedlings and retained adequate hardwood stems to provide the five to ten percent hardwood component in the overstory as required in the WHMP.

##### **3.1.5 Insect Outbreak**

During September 2001 it became obvious that there was an insect population increase that was having an impact on the Western hemlock on the Lake Chaplain Tract. The DNR had also noticed the outbreak during routine aerial forest monitoring. After several meetings DNR determined that there was a significant population increase in both the Hemlock looper and the Phantom looper. Follow-up flights and ground assessments indicated that about 11,000 acres have suffered defoliation, including 1,000 acres in the Lake Chaplain Tract and 100 acres in the Lost Lake Tract. The northeast and northwest corners of the Lake Chaplain Tract appear to have experienced the most defoliation to



**FIGURE 2. HARVEST ACTIVITY -  
LAKE CHAPLAIN TRACT**

-  Road Construction 1991-2001
-  Final Harvest 2001 (Donkey Damper Sale)
-  Final Harvest 1991-2000
-  Commercial Thinning 1993
-  Precommercial Thinning 2001

date. The extent of mortality due to defoliation has not yet been determined. Hemlocks are more likely to succumb to defoliation than Douglas fir.

Additional survey work will follow in 2002 to determine whether the insect population is increasing or decreasing. With this information, we will be meeting again to discuss management strategies, if any, that we may use to deal with the problem. One possible response to significant and widespread die-off of affected trees would be to revise the scheduled harvest dates of certain units. Commercial thinning of affected units is a possibility. No specific proposal for action has been developed yet.

### **3.2 FOREST VEGETATION MANAGEMENT ON THE SPADA LAKE TRACT**

The District's consultant, who reported on timber harvest feasibility in late 2000, continued to advise the District on management options on its small-wood stands ( $\leq 40$  yrs. old). He evaluated nine Spada Lake Tract stands totaling 167 acres, and reported costs and expected revenues from commercial thinning (Fig.3). Depressed hemlock prices continued to influence decision-making in 2001 in the Spada Lake Tract, although the primary criterion will be the habitat benefits of each option. Management decisions for these stands were based on several considerations:

- Wildlife habitat values on the Spada Lake stands, if left unmanaged, will not improve for many years.
- Prompt thinning of the Spada Lake stands will not result in a large increase in the future value of residual timber within the next 20 years due to poor soil productivity, compared to taking no action now.
- Stands 9-36, 37 and 38 have never been thinned, whereas the remaining stands in this analysis have been precommercially thinned in the past.
- Stands 9-36, 37, 38, 120, and portions of 121 and 183 require road reconstruction or new construction, adding significantly to harvest costs

The decision was made to manage Spada Lake stands 9-36, 37 and 38 through precommercial thinning in the near future, rather than the alternatives of commercial thinning or taking no action. The highly overstocked stands would require extensive road reconstruction to make commercial harvest possible, and the size and value of the timber present does not warrant this effort. With precommercial thinning, the stands can be improved in a more cost-effective manner with no road work required, and they could be commercially harvested in the future.

The remaining stands under consideration in the consultant's report, (9-120, 9-121, 9-183, 9-142, 9-150 and 9-184), can be commercially thinned more cost-effectively than 9-36, 37 and 38. These stands were marked for future commercial thinning, including boundary tags, road alignments, and required buffer zones. Forest practices applications were prepared for submittal to the Department of Natural Resources. The stands have not been advertised for sale yet, however, due to depressed market conditions.

### 3.3 FOREST VEGETATION MANAGEMENT ON THE LOST LAKE TRACT

The District's consultant reported on timber harvest feasibility on five Lost Lake Stands late in 2000, and continued to advise the District on management options in 2001. Management of these stands is based on several considerations:

- Habitat values on portions of the stands, especially 7-1, are currently good (Figure 4).
- Since the development of the WHMP forest cover on adjacent property has been greatly reduced by timber harvest and additional harvests are planned. The habitat needs of Lost Lake's target species, black-tailed deer, ruffed grouse and black-capped chickadee, would not be served by creating additional clearcuts, as prescribe by the WHMP.<sup>1</sup>
- The WHMP schedule for small scattered clearcuts would require an excessive amount of road construction and long-term maintenance

An alternative concept was developed to reduce road construction requirements and clear-cutting, while still improving forage and maintaining cover for target species (Figure 4). Management options include variable density commercial thinning or no action, on the three stands that contain merchantable timber (85 acres, Stands 7-1, 7-2, and 7-3)<sup>2</sup>. The consultant evaluated two variable density selective harvest options, as follows:

- Low-intensity option: 10% of the stand would be one-acre openings, corresponding to swales dominated by large alders, 45% of the stand would be thinned to 70% canopy closure, and 45% would be thinned to 50% canopy closure. This option favors the preservation of thermal/hiding cover, with limited increase in forage.
- Medium-intensity option: 10% of the stand would be one-acre openings, and the remainder would be thinned to 50% canopy closure. This option favors production of forage while reducing cover.

As in the Sultan Basin, depressed hemlock prices continued to influence decision-making on the Lost Lake Tract, with the additional concerns over the reduction in forested habitat on adjacent properties. The co-licensees discussed the management options, including a no-action alternative, with agency representatives on April 5, 2002 (see Agency Meeting Minutes, Appendix A). The low-intensity thinning option will be re-evaluated several years in the future, and may be implemented after adjacent clearcuts on neighboring properties have developed adequate hiding cover for wildlife.

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<sup>1</sup> The WHMP designated 96 acres of mixed forest outside the 500-ft. wetland buffer zone to be managed on a 60-year final harvest rotation. The 80-acre buffer zone was designated as permanent mixed forest, with 1-acre patch cuttings allowed in the outer 300 feet of the buffer zone. (For details, see WHMP, Section 2.1.4 and Section 3.2).

<sup>2</sup> Stand 7-4 is a younger stand that was precommercially thinned in 1991.  
2001Anrpt;Version 2

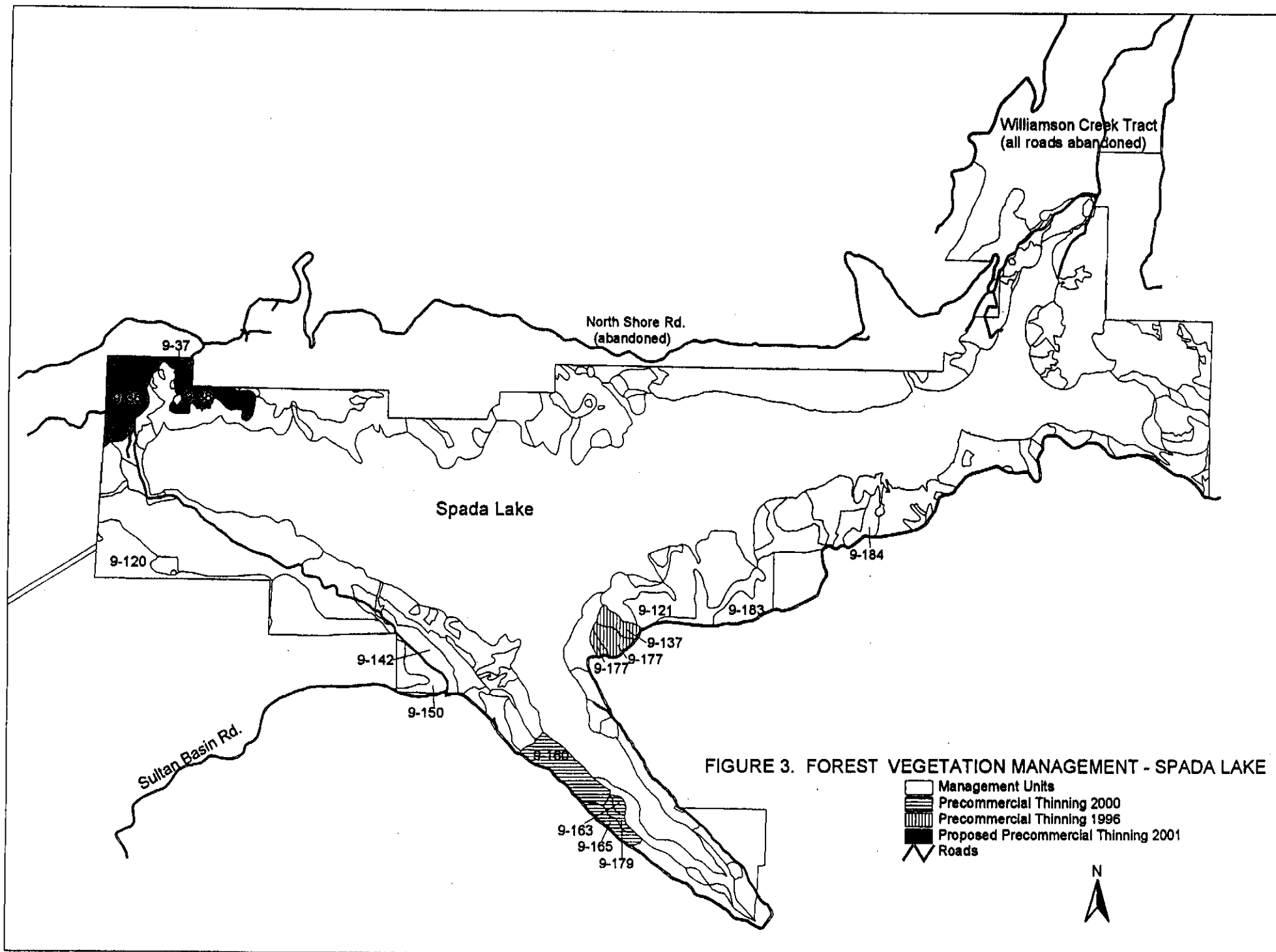
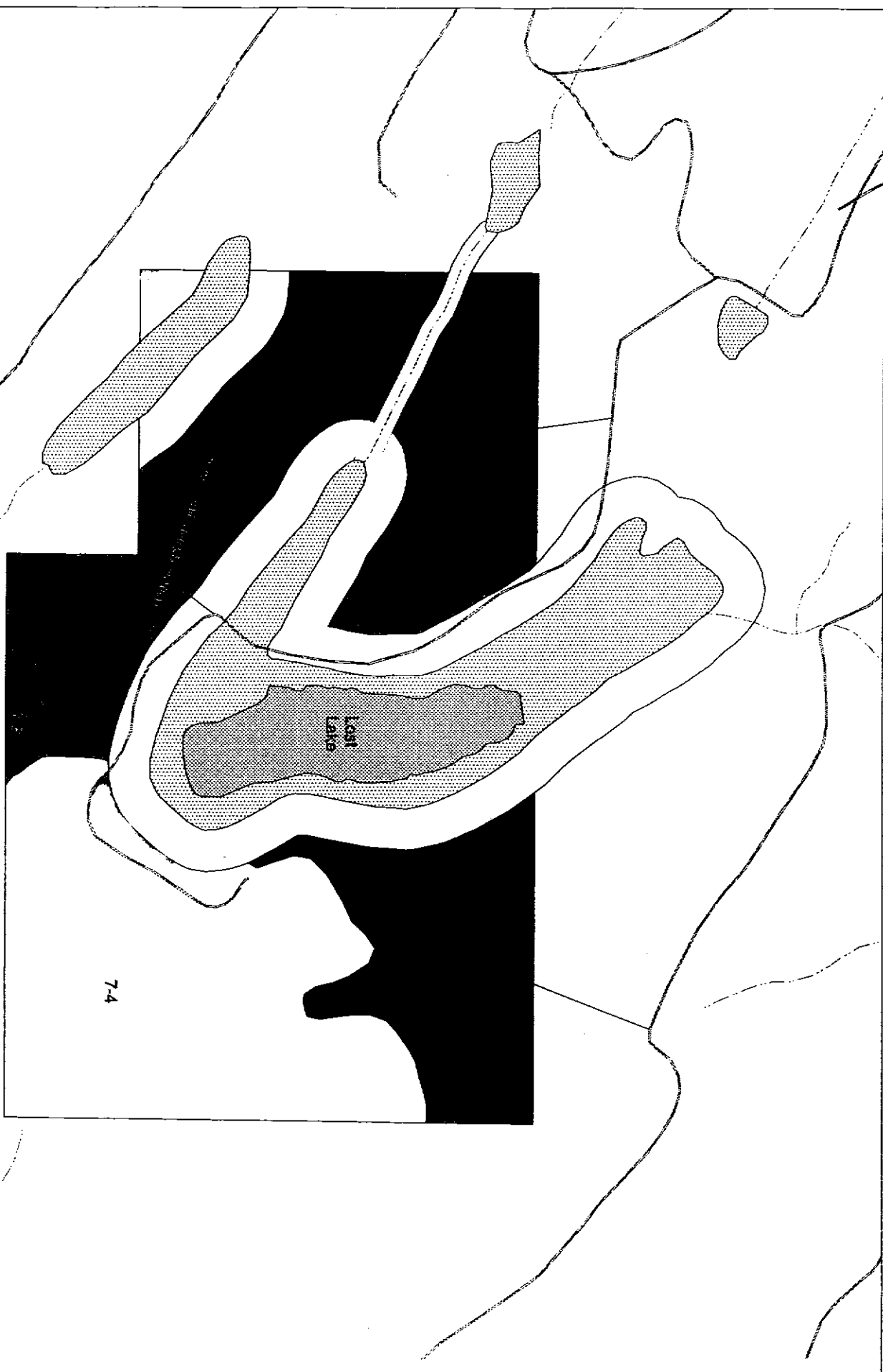


Figure 4. Lost Lake Management Stands

- Streams
- Roads
- Open Water
- Lake
- Wetland
- Buffer Zones
- Proposed Commercial Thinning



### 3.4 SNAG AND CWD MANAGEMENT

#### 3.4.1 Snag Inventory and Creation

Snag management in the year 2001 consisted of 5 units inventoried (52 acres) on the Spada Lake Tract (Fig 5) and creation of 108 snags on 7 units from the Spada Lake and Williamson Creek Tracts (Figs 5 & 6, and Table 1). Snags were created on the four Williamson Creek non-old growth units inventoried in 2000. Additional snags will be created on one of these units and snag creation will be evaluated in 2002 on Stand 10-2, a small old growth stand. The remoteness of the work locations significantly influenced the numbers of acres inventoried and snags created. Additionally, some of the units (e.g. 9-126) scheduled for snag inventories in the Spada Supplement have very little potential for snag creation at this time. Several stands are overstocked and average stand diameters range from 11-16". These units may be revisited in 10 years to evaluate the potential for snag creation at that time. Snags were created using a chain saw to remove the top and make several vertical cuts in the top to facilitate decay. All created snags are marked with paint and a numbered metal tag, and their location is recorded for future monitoring.

Snag inventory and creation on the Lake Chaplain Tract were deferred in 2001, pending possible changes in the harvest schedule in units affected by the hemlock looper outbreak (see Section 3.1.5)

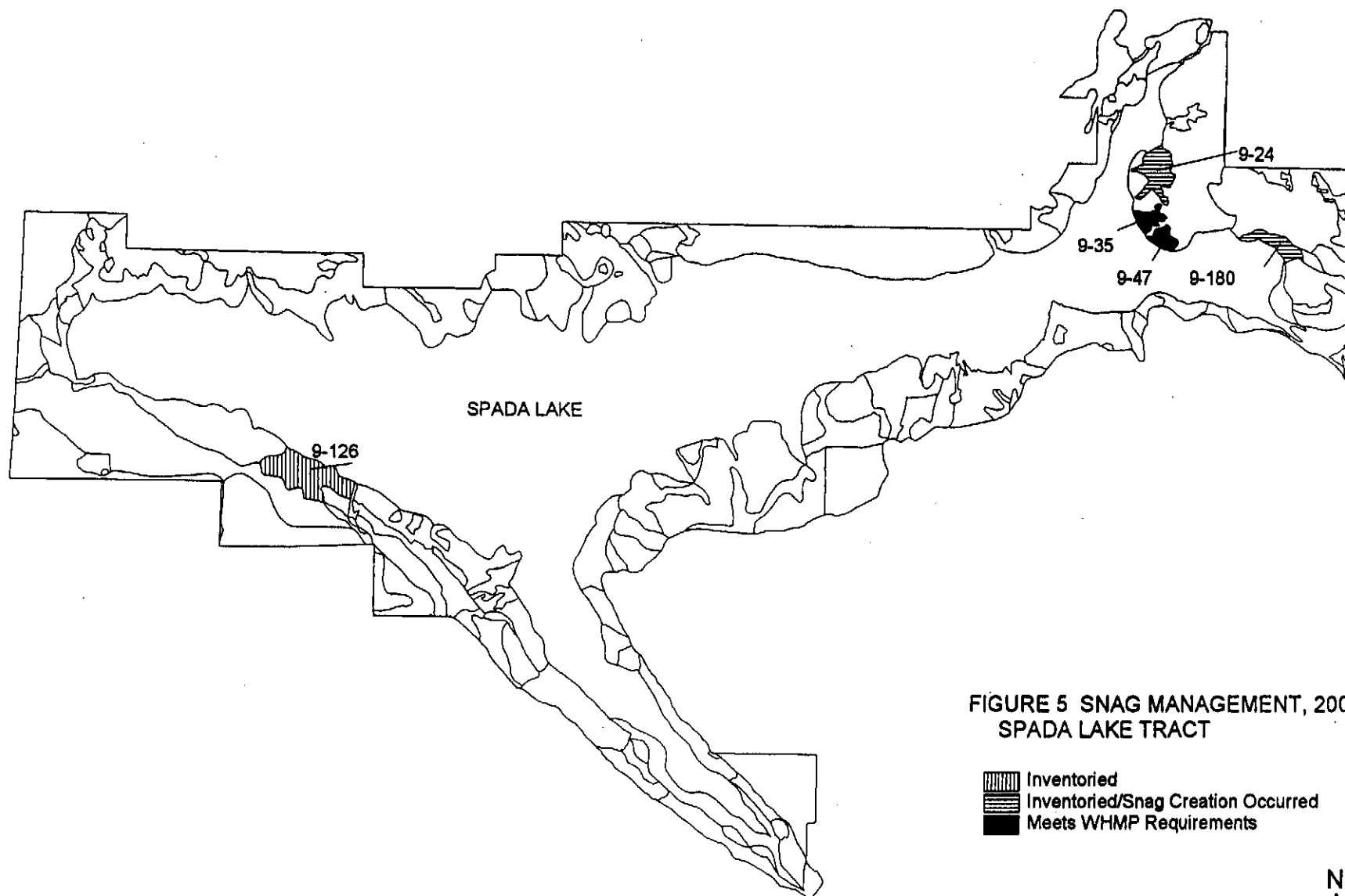
#### 3.4.2 Mapping of Snags and CWD

Snags and CWD on previously harvested Lake Chaplain units were mapped using GPS equipment to facilitate long-term monitoring (Fig. 7). The following units were mapped in 2001: Chap 1-91, Chap 2-91, Chap 3-91, and Divr 2-95 (Figure 4). The objective is to map at least the subset of snags and CWD that are selected for long-term monitoring, but if time allows all tagged snags and CWD will be mapped on harvest units. GPS mapping was not very successful under the tree canopy, and we will continue to map snags and CWD in forested units with compass and tape.

#### 3.4.3 CWD Monitoring

Two large class 4 fir logs were marked and mapped prior to harvest in Line Tree Unit 1 (Line1-00), and five class 3 and 4 fir logs were marked in Unit 2 (Line2-00), for the purpose of monitoring the effects of timber harvest on existing CWD (Fig. 7). All but one of the logs was readily located in 2001 after the unit was harvested. The effects of harvest included damage to loose bark and surface wood, scraping off moss and other vegetation, and a moderate reduction in length due to breakage. All of the logs had large amounts of slash piled against them. In one log, which had a burrow beneath it before the unit was harvested, the slash filled the entrance.





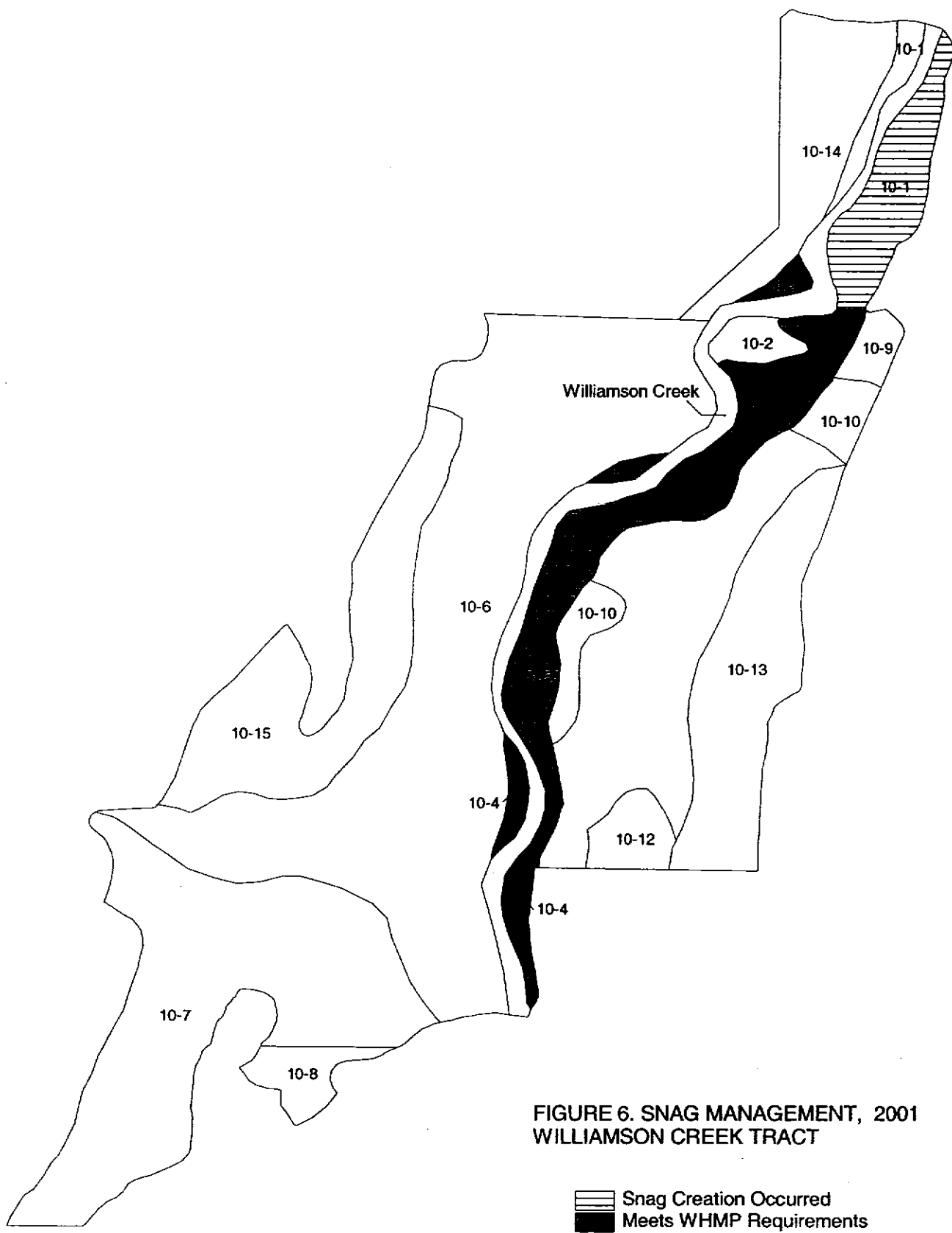


FIGURE 6. SNAG MANAGEMENT, 2001  
WILLIAMSON CREEK TRACT

Snag Creation Occurred  
Meets WHMP Requirements

**Table 1. Summary of Snag Management in 2001**

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
Stand 9-24 <sup>1</sup>	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	√ Includes natural and created snags
Stand 9-47	4.3	10	15.7	64.0	3.0	√ Includes natural and created snags
Stand 9-126 <sup>2</sup>	23.7	0	16.3	44.5	0.4	Natural snags only
Stand 9-180 <sup>3</sup>	7.4	0	21.4	65.0	1.2	Natural snags only
Stand 10-1 <sup>3,4</sup>	21.2	13	16.1	52.5	0.6	Created snags only
Stand 10-3	18.7	28	19.3	32.9	3.0	√ Includes natural and created snags
Stand 10-4	7.5	13	16.8	40.1	3.5	√ Includes natural and created snags
Stand 10-5	15.1	12	22.7	37.0	3.5	√ Includes natural and created snags
Stand 10-11 <sup>5</sup>	50.5	0	32.3	46.0	6.0	Natural snags only
Stand 10-12 <sup>5</sup>	6.3	0	30.7	38.3	6.0	Natural snags only
TOTALS	171	108	Totals for those 11 units with snag management in 2001			
<sup>1</sup> Too few snag creation opportunities exist, re-evaluate in 10 years.						
<sup>2</sup> Trees not of adequate size for snag creation, re-evaluate in 10 years.						
<sup>3</sup> Snag creation incomplete, to be completed in 2002.						
<sup>4</sup> No natural snags found during inventories.						
<sup>5</sup> Old-growth stand; will not have pro-active snag management.						

### 3.4.4 Long-Term Snag Monitoring

Created snags were monitored to track decay processes and use by wildlife on harvest units and forested stands at Lake Chaplain. Snags in the following units were revisited in 2001: 2015-5, 2030-2, OMA-1 (part), BZ2, PMF-11, Chap 1-91, Chap 2-91, Chap 3-91 (Fig. 7). Results are in preparation.

## 3.5 REVEGETATION

### 3.5.1 Power Pipeline Right-of-Way

Small areas of the ROW, which have not yet become successfully revegetated, were seeded with a mixture of annual and perennial ryes, fescues and clovers. This was the fourth year of vegetation monitoring, and most areas are showing an increase in grass/forb coverage. The lower portion of the ROW (from P10 to P15) was inadvertently mowed prior to vegetation monitoring being conducted. This undoubtedly reduced the percent coverage of most species within those plots, which comprise 1/3 of the total number of ROW sampling points. The remainder of the ROW was mowed later in the summer. The most commonly occurring plant or cover types were grasses, miscellaneous asteraceae and bare soil (91.2%, 63.2% and 63.2% frequency, respectively, Table 2) Other palatable plants found include clover (19.3%), trefoils (10.5%), trailing blackberry (10.5%), and wild strawberry (5.3%). The cover types and species that were most abundant within the plots were bare soil, grasses and conifer seedlings (49.9%, 39.1% and 37.5% coverage, respectively, see Table 2). Recall that early mowing had occurred on 1/3 of the sample areas. While this would not likely reduce the percent frequency of plant species, one would expect the percent cover to decrease greatly after mowing for all cover types except bare soil, which would likely increase as a result.

The relative abundance of cover types and plant species is based on multiplying the percent frequency and percent cover. Those with the highest relative abundance are: grass, bare soil, and miscellaneous asteraceae (see Table 2). The largest changes from the previous year are: trefoils decreased by 80%, and mosses by 52%. It would be expected that trefoils would decrease greatly after an early summer mowing, particularly since the areas they predominate are on the portion of the ROW that was mowed early. Large increases in relative abundance were made by willow (+350%), wild strawberry (+117%), and trailing blackberry (+113%).

**TABLE 2. 2001 ROW Vegetation Monitoring Results**

<b>PLANT GROUP or SPECIES</b>	<b>PERCENT FREQUENCY</b>	<b>AVERAGE % COVER</b>	<b>RELATIVE ABUNDANCE (% Freq. x % Cover)</b>
Grass	91.2	39.1	3565.9
Bare soil	63.2	49.9	3153.7
Misc. asteraceae	63.2	20.8	1314.6
Clover	19.3	26.4	509.5
Moss	12.3	35.0	430.5
Trefoil	10.5	26.7	280.4
Misc. forb	33.3	8.3	276.4
Tr. blackberry	10.5	20.7	217.4
Strawberry	5.3	34.2	181.3
Cottonwood seedlings	7.0	20.6	144.2
Willow	3.5	26.3	92.1
Conifer seedlings	1.8	37.5	67.5
Alder seedlings	7.0	2.5	17.5

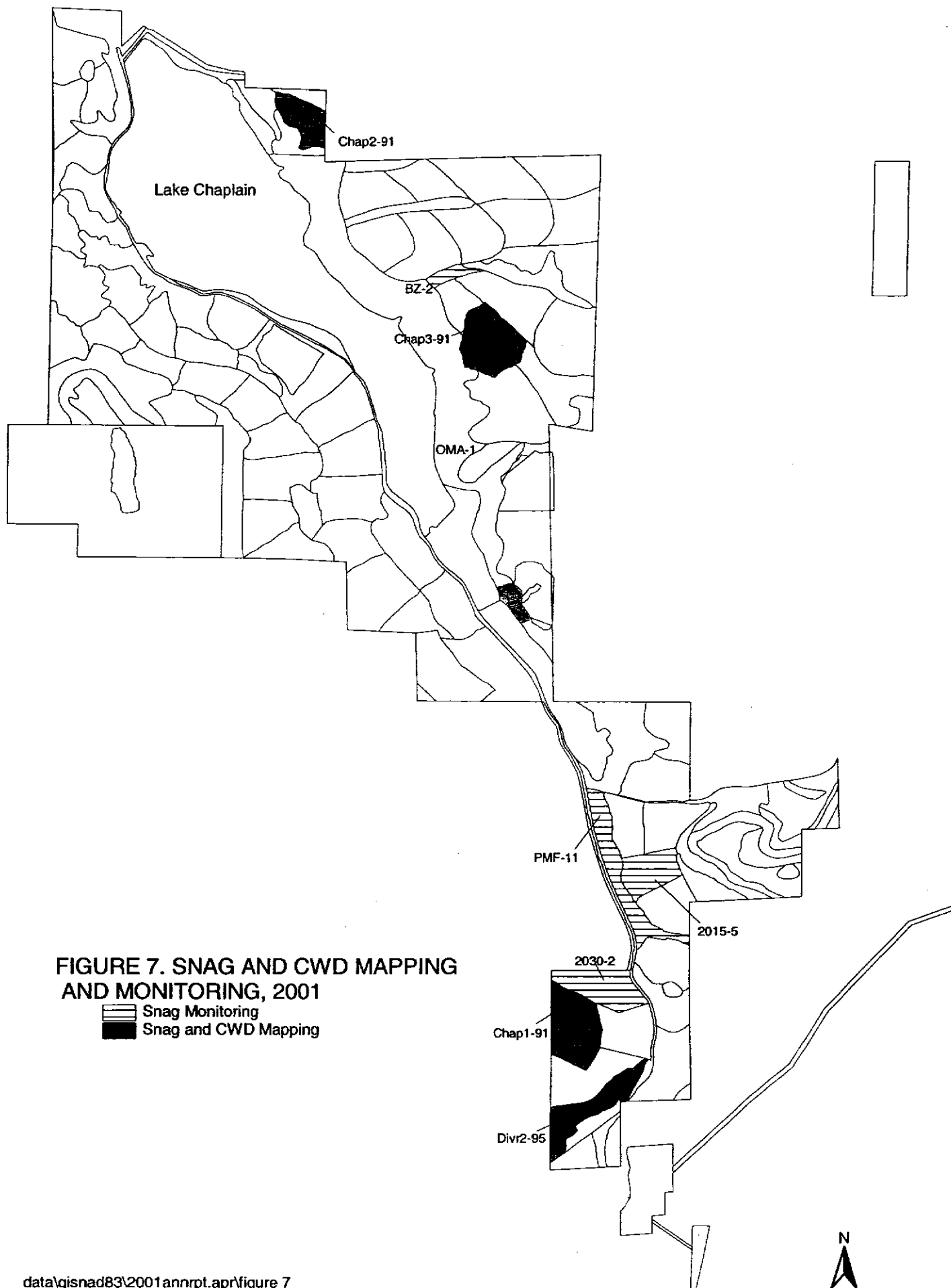
### 3.5.2 North End of Lake Chaplain

The north end of Lake Chaplain (Stand 1-17, about 10.7 acres) is intended to be maintained as a mixed shrub/brush and grass meadow. It was determined in 1998 that the alders would be reduced to a few narrow corridors connecting the planted conifer row near the road to the shoreline. Alders were removed in the conifer row in 1998, and elsewhere in the stand in 2000 and 2001, using brush-cutting equipment in dry portions of the stand and hand tools in the wetter areas. Cleared areas were reseeded with the same seed mixture used on the pipeline ROW.

## 3.6 NEST STRUCTURES

### 3.6.1 Floating Nest Platforms

District staff monitored the two platforms at Lost Lake (Figure 8) and the one platform on the Williamson Creek Arm of Spada Lake (Figure 9) when they were conducting other activities on the tracts. Pied-billed grebe used the north platform at Lost Lake. The nest was composed of a small amount of down and had two broken creamy white eggs. District biologists did not observe wildlife use of the other floating platforms in 2001.



### 3.6.2 Nest Boxes

The nest boxes at Lost Lake (Figure 8), Spada Lake (Figure 9), and Lake Chaplain (Figure 10) tracts were maintained and monitored by District staff during the 2001 nesting season. One nest box was installed in March, downstream of the concrete ford in the SW corner of Lost Lake. Another was installed in Wetland Buffer 3 east of the filtration plant on the Lake Chaplain Tract. One nest box at Spada Lake was knocked off the tree possibly by a bear, and has not been recovered.

Production was estimated by examining eggshell remains in the boxes. 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 (egg membrane present, no presence of duckling remains). Nesting results are summarized in Table 3. Wood ducks used three of the nest boxes at Lost Lake. Wood ducks used one of the boxes on the Lake Chaplain Tract, and both bufflehead and wood ducks used another one of the boxes on the Lake Chaplain Tract. Downy feathers and nest dishes were found in a few boxes, but further nesting attempts were apparently not made. Several boxes (5 out of 10) at Lost Lake had squirrel nests of moss in them when checked in early spring. These nests were not disturbed because the Western Gray Squirrel is listed as threatened by the state and as a species of concern by the federal government. (Additionally, no sightings of Eastern Gray Squirrels have been made on project lands to date.) Northern Flying Squirrels were confirmed in 2 of these 5 boxes. No signs of successful nesting were observed at Spada Lake.

In the year 2001, five of the 24 boxes were used successfully with 40 to 41 wood ducks and two bufflehead hatched. Last year about the same number of wood ducks were hatched out with 19 to 20 hooded mergansers hatched and no bufflehead. Overall, nest box success was about 21% in 2001, down from 32% in 2000. The Spada Lake boxes bring down the success rate possibly because other habitat conditions there are poorer, such as forage and hiding cover. In the future, nest boxes may be placed in areas farther up in the Williamson Creek drainage, where the habitat may be more suitable.

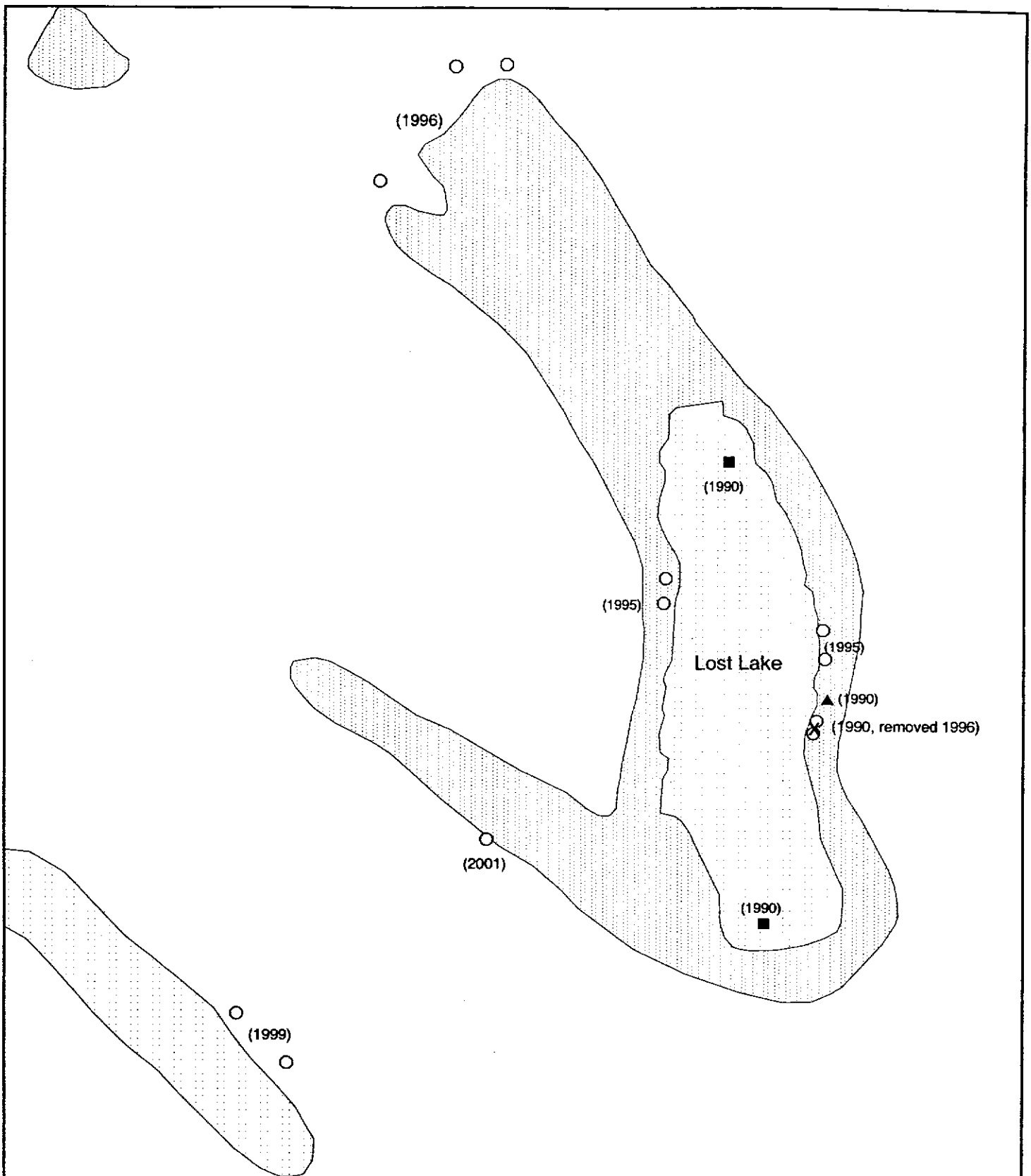


FIGURE 8. NEST STRUCTURES AT LOST LAKE

Duck Nest Box  
 Floating Nest Platform  
 Osprey Platform  
 Structure Removed



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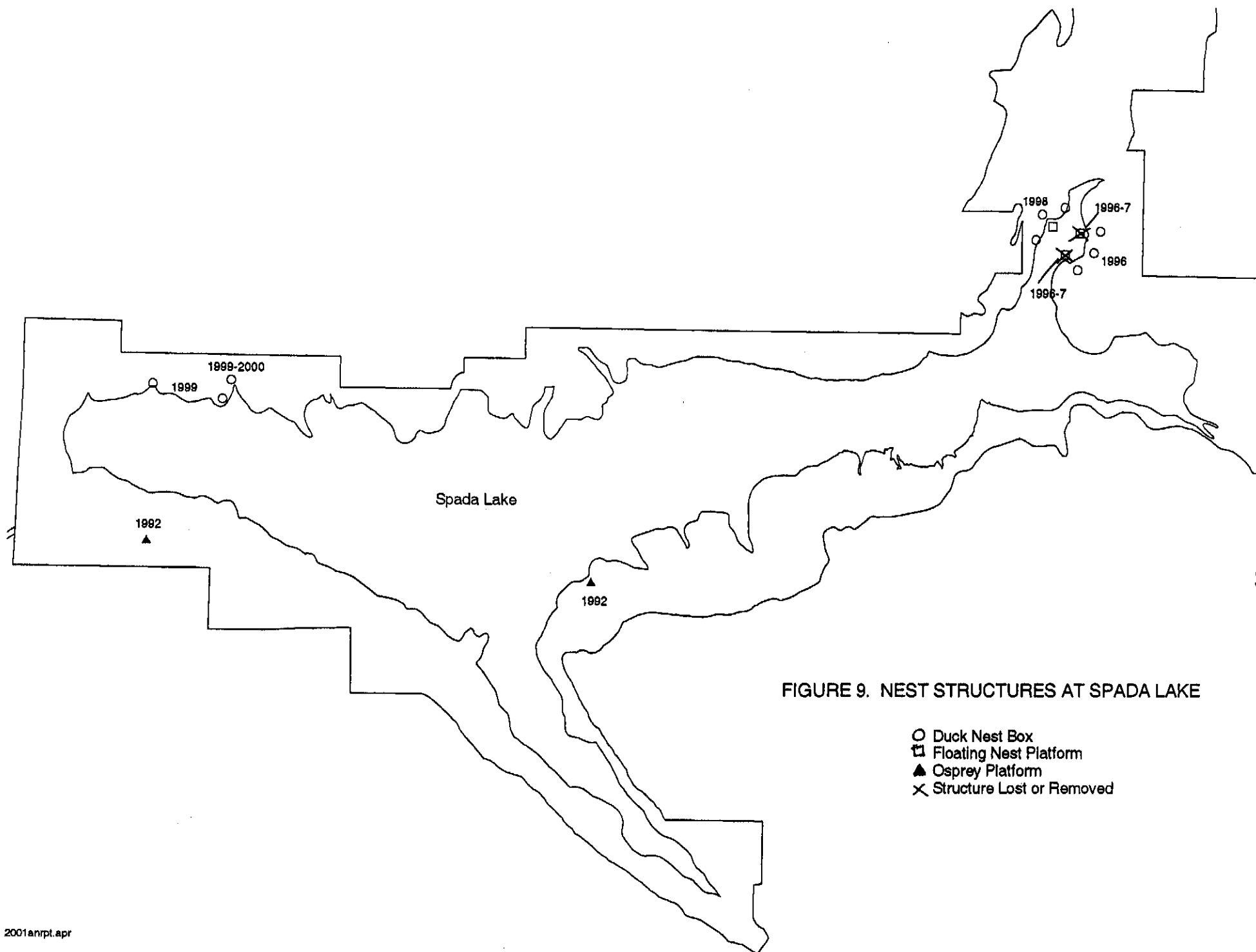


FIGURE 9. NEST STRUCTURES AT SPADA LAKE

- Duck Nest Box
- Floating Nest Platform
- ▲ Osprey Platform
- × Structure Lost or Removed

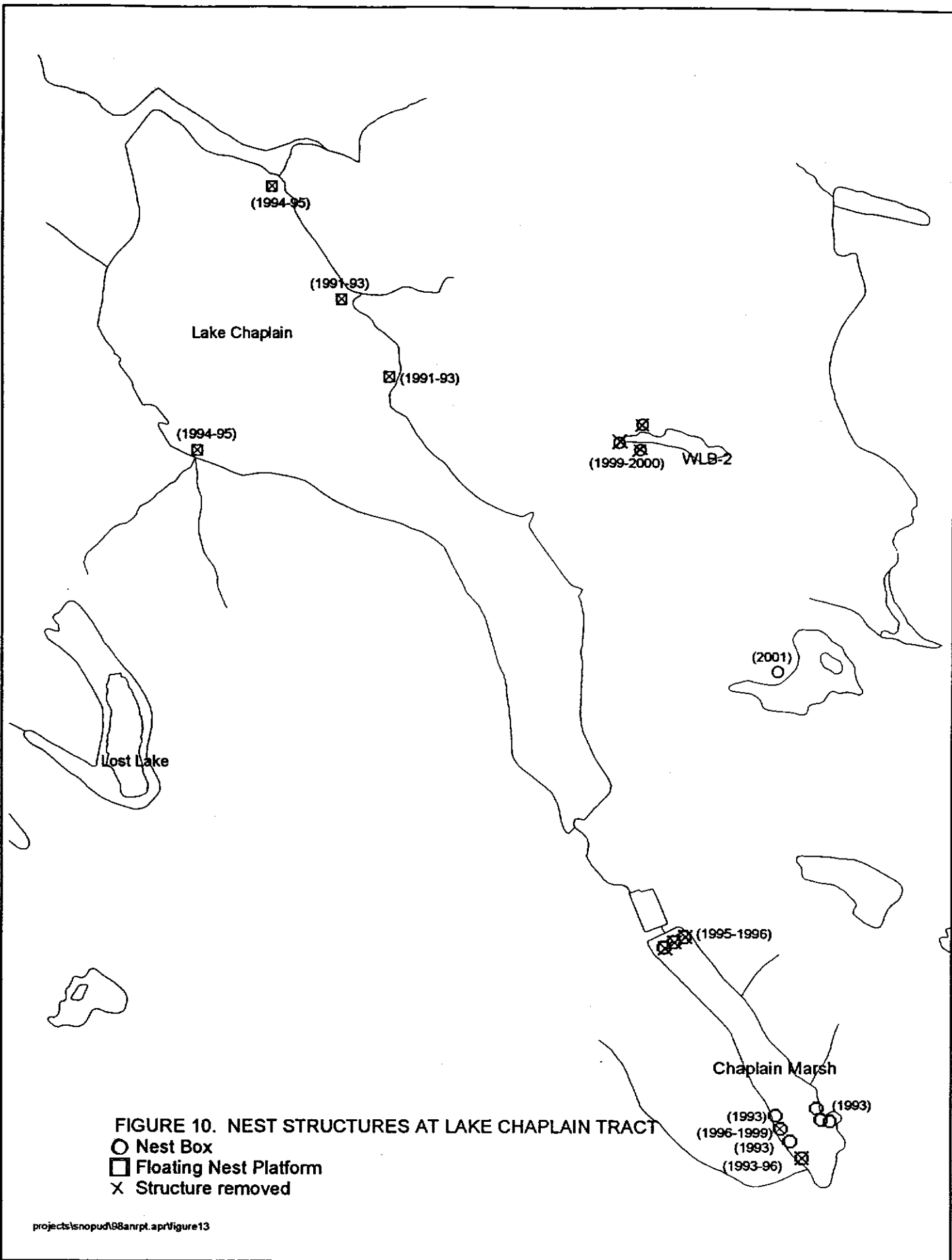


FIGURE 10. NEST STRUCTURES AT LAKE CHAPLAIN TRACT

- Nest Box
- Floating Nest Platform
- X Structure removed

**Table 3. Use of Nest Boxes on WHMP Lands**

Site	Number of Boxes	Number of Boxes with Duck Eggs	Number of Successful Boxes	Number of Eggs Hatched by Species	Number of Boxes Used by Other Species
Lost Lake Tract	10	3	3 (30%)	29-30 wood ducks	5 (Flying squirrels & other Sciurids)
Lake Chaplain Tract	6	2	2 (33%)	11 wood ducks 2 bufflehead	0
Spada Lake Tract	8	0	0	0	2 (Abandoned yellow-jacket nests)
Totals	24	5	5 (21%)	40-41 wood ducks 2 bufflehead	7

### 3.6.3 Osprey Nest Platforms

District staff monitored the osprey nest platforms at Lost Lake and Spada Lake (Figs. 8 and 9) when they were performing other duties on the tracts, during spring and summer 2001. No osprey activity was observed on the nesting platforms this year. It appears the osprey moved to a nesting site on DNR land in 1999. The District cleared branches around the platform at Lost Lake last year to try to improve it as a potential nesting site for osprey, but no use was observed in 2001.

### 3.6.4 Bald Eagle Nesting

The bald eagle nest established in 1997 on the Lake Chaplain Tract was occupied by nesting bald eagles from mid-March through mid-May 2001. It appears that the nesting attempt failed, because eagles were not observed on the nest after mid-May.

## 3.7 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.

- Pacific Giant Salamander on Williamson Creek Tract
- Several Loon sightings at Spada Lake & Lake Chaplain
- Barrow's Goldeneye at Spada Lake
- Waterfowl on Lake Chaplain: Common Merganser, American Widgeon, Gadwall, Shoveler, Common Goldeneye, Canada Geese, Pied-billed grebe catching fish
- Waterfowl in Chaplain Marsh: Ring-necked duck, Pied-billed grebe, Mallard, Bufflehead
- Bald eagle perched on snag in Williamson Creek Arm, July.
- Osprey near Lost Lake platform
- Osprey on snag near South Shore platform at Spada Lake
- Coopers hawk at Lake Chaplain
- Red-tailed hawk at Lake Chaplain

- Ruffed Grouse at Lost Lake
- Kingfisher at Chaplain Marsh
- Yellow Warbler on nest with 1 chick and 3 eggs at Spada Lake
- Bobcat and beaver tracks in mud along Williamson Creek Arm, July.
- Bobcats - north end of Williamson Creek Tract; west of Spada Lake; and 2 on Lake Chaplain Tract
- Flying Squirrels at Lost Lake Tract
- Black bear with 2 cubs north of Lost Lake
- Otters in Lost Lake
- Black-tailed deer (does, fawns, spikes and 2-pt bucks) on various project lands
- Skunk at Williamson Creek

### **3.8 BIOSOLIDS APPLICATION**

The City of Everett monitored vegetation growth and water quality in Chaplain Creek in relation to biosolids applications on units Hors1-93, Hors2-93 and Divr1-95. The units and the application procedures were described in the 1996 Annual Report and the 2000 Annual Report, and monitoring procedures were described in the 1996 Annual Report. Water quality data has been collected from August 1996 to November 2001. Nitrates in both upstream and downstream sampling points remain low, with nitrate levels downstream of the project slightly higher than nitrates from samples collected upstream (Figure 11a). Fecal coliforms (Figure 11b), ammonia (Figure 11c) and total phosphorus remain low both upstream and downstream of the project. Some of the sampled parameters, such as fecal coliforms and nitrates, show predictable seasonal variations, but no biosolids effect on water quality is apparent.

Vegetation has been monitored on control plots and Hors 1-93 and Hors 2-93 (treated units) from June 1997 to 1999. No monitoring was conducted in 2000, when additional biosolids were applied to the units during the summer. Monitoring was conducted again in September 2001. The control and the treated units have approximately 120 percent cover for all understory species. There has been an increase in palatable species cover in the two treated units, whereas the control unit has not increased. Understory plants increased in height from 1997 to 2001 in the treated units, but not in the control unit.

### **3.9 DEER FORAGE MONITORING**

Deer forage availability was sampled in late June-July 2001 on Hors 3-93 and Divr 1-95, which were harvested in 1993 and 1995, respectively, and Donkey Damper Unit 2 (Donk 2-02) prior to harvest (Fig.2). Results are in preparation (Figure. 12)

### **3.10 WILLIAMSON CREEK TRACT**

In 2001 District biologists collected baseline data (Table 4) for the Williamson Creek Tract on two old growth stands, 10-11 and 10-12 (Figure 6). Procedures for data collection are described in the Cumulative Summary, Williamson Creek Tract section of this report. The benefits of creating snags and coarse woody debris were assessed in stands 10-1, 10-3, 10-4, and 10-5. Tree size is generally too small to allow for creation of CWD at this time, but this will be re-evaluated in 10 years. Snag creation potential

was also limited due to tree size; however, some snags were created in stands 10-1, 10-3, 10-4 & 10-5.

**Table 4. WILLIAMSON CREEK STANDS INVENTORIED AND SNAGS CREATED IN 2001.**

Stand #	Date	Snags	CWD	Understory Vegetation	Photo Doc.
10-11	7/12/01	2 transects	2 transects	2 transects	2 transects
10-12	10/12/01	1 transect	1 transect	1 transect	1 transect
10-1	Nov 2001	13 created			
10-3	Nov 2001	29 created			
10-4	Dec 2001	13 created			
10-5	Dec 2001	12 created			

Data from year 2001 show an average of six snags/acre (Table 5) on the old growth stands 10-11 and 10-12 (the goal of 5% coverage has not yet been met on stand 10-11). Stands 10-11 and 10-12 have an average of 49 and 36 CWD/acre, respectively (Table 6). Pacific silver fir and hemlock dominate the overstory with huckleberry, hemlock under 6 feet tall, moss and deer fern seen most often in the understory plots (Figure 13).

**Table 5. WILLIAMSON CREEK 2001 SNAG INVENTORY RESULTS.**

Stand #	Cover Type	Decay Class	Snags/ac.	Avg. Diameter (in.)	Avg. Height (ft.)
10-11	Old Growth	1 & 2	4.0	32.3	49.0
		3, 4 & 5	2.0	32.5	40.0
		All decay classes	6.0	32.3	46.0
10-12	Old Growth	1 & 2	0.0		
		3, 4 & 5	6.0	30.7	38.3
		All decay classes	6.0	30.7	38.3

**Table 6. WILLIAMSON CREEK 2001 CWD INVENTORY RESULTS.**

Stand #	Cover Type	Decay Class	CWD/ac.	Avg. Diameter (in.)	Avg. Length (ft.)
10-11	Old Growth	1 & 2	26.0	20.0	55.3
		3, 4 & 5	23.0	29.1	34.6
		All decay classes	49.0	24.3	45.6
10-12	Old Growth	1 & 2	16.0	26.3	73.8
		3, 4 & 5	20.0	23.9	39.5
		All decay classes	36.0	24.9	54.7

FIGURE 11A. BIOSOLIDS APPLICATION MONITORING - NITRATES (mg/L)

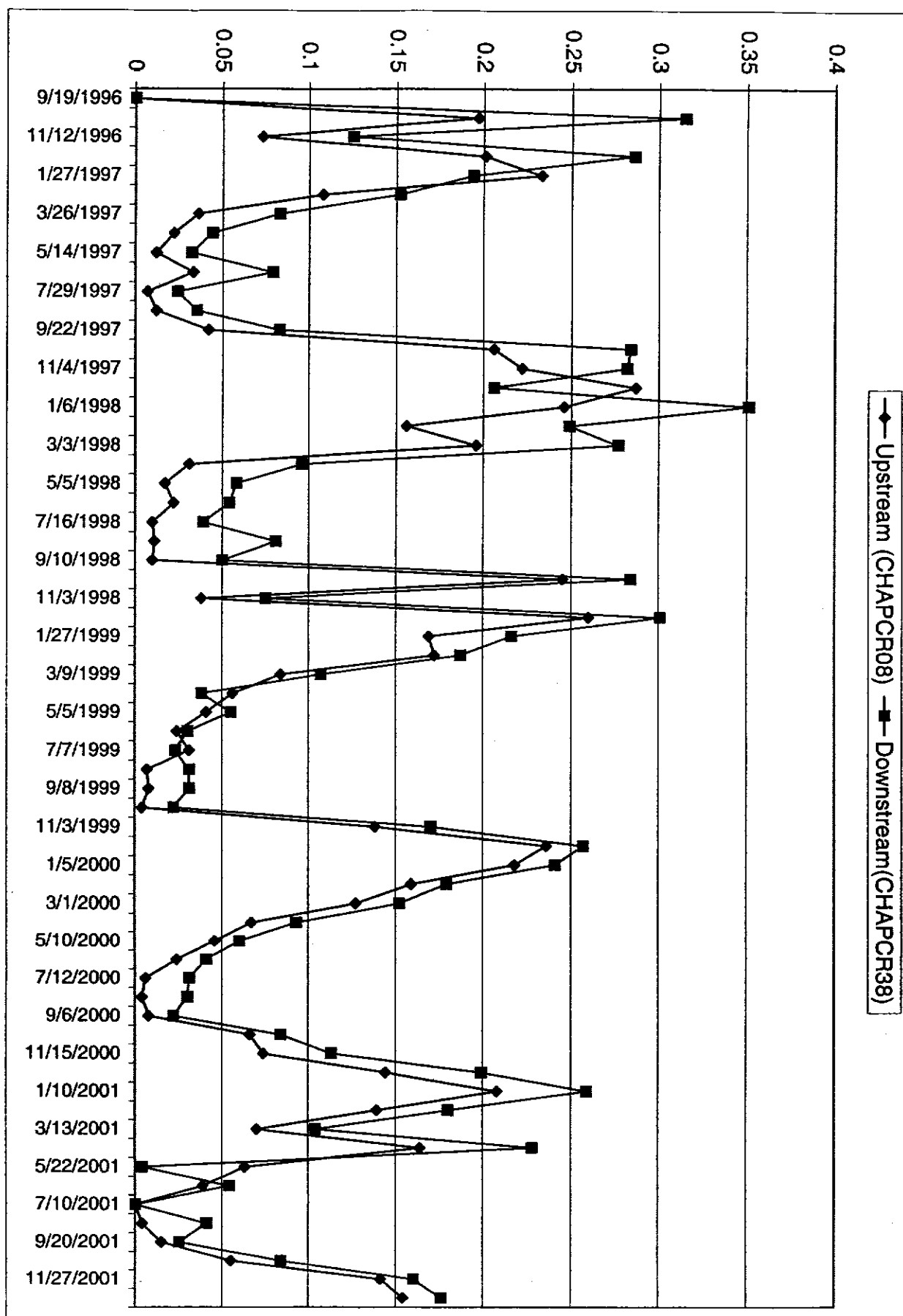


FIGURE 11B. BIOSOLIDS APPLICATION MONITORING - FECAL COLIFORMS (CFU/100mL)

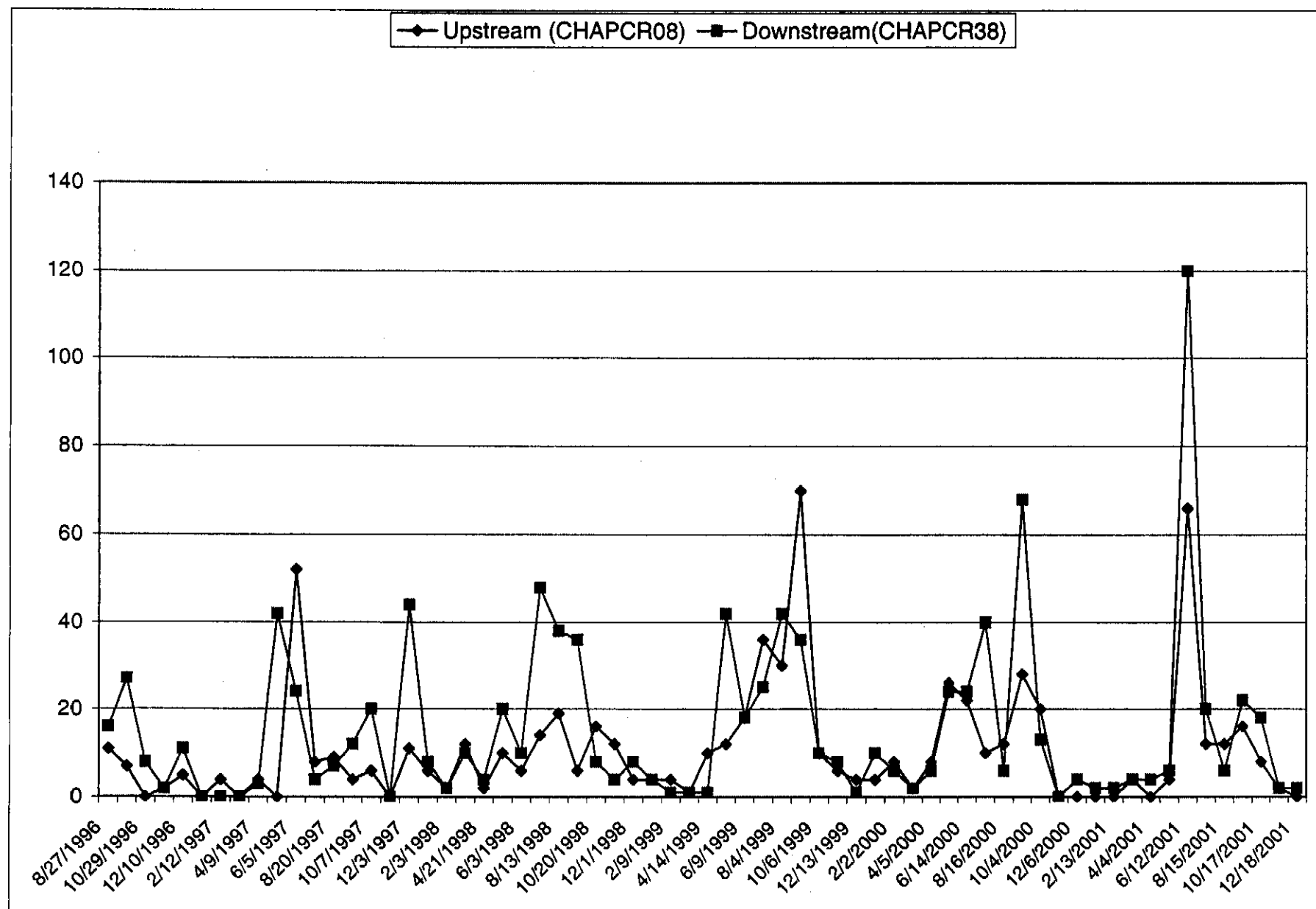


FIGURE 11C. BIOSOLIDS APPLICATION MONITORING - AMMONIA (mg/L)

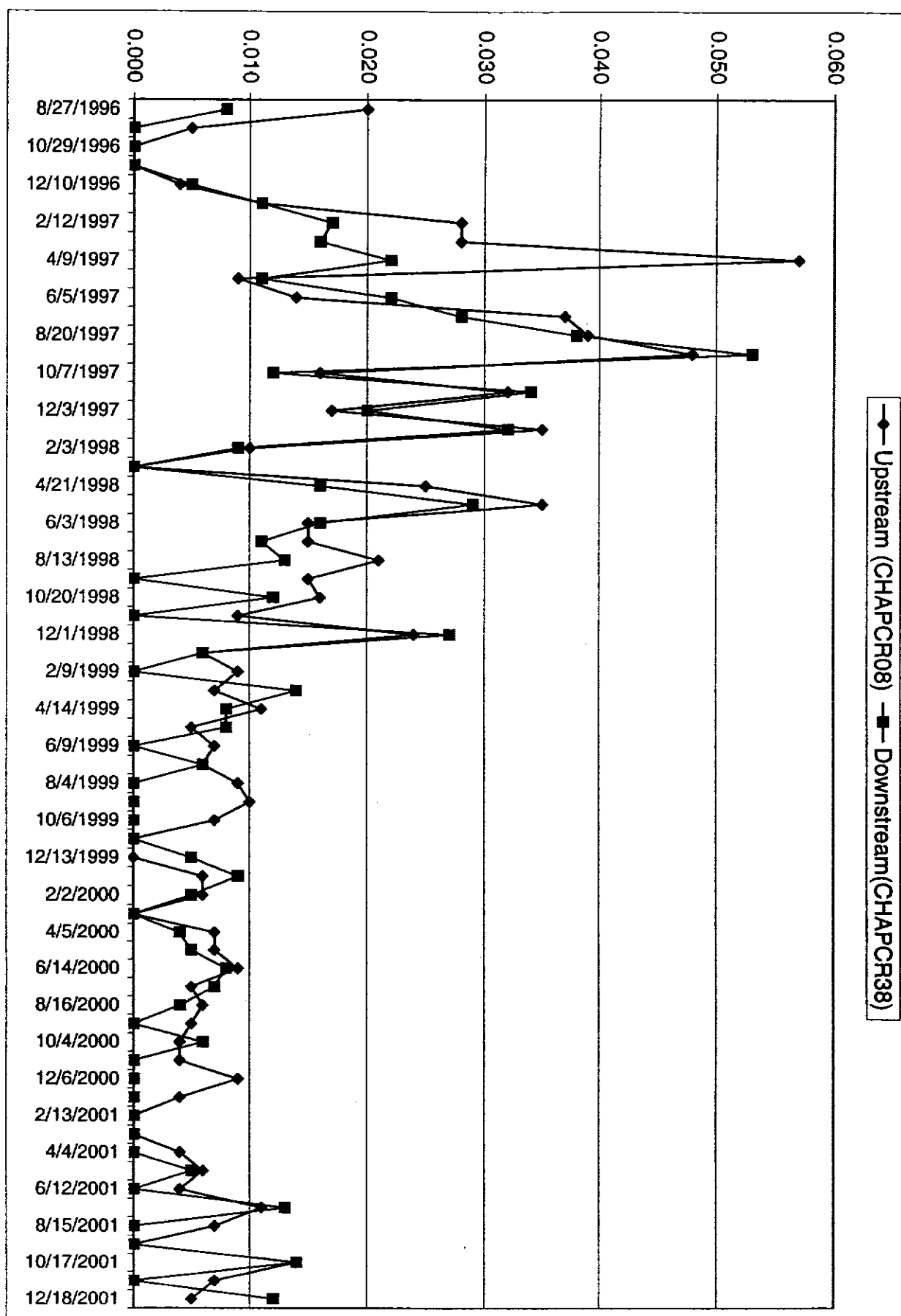
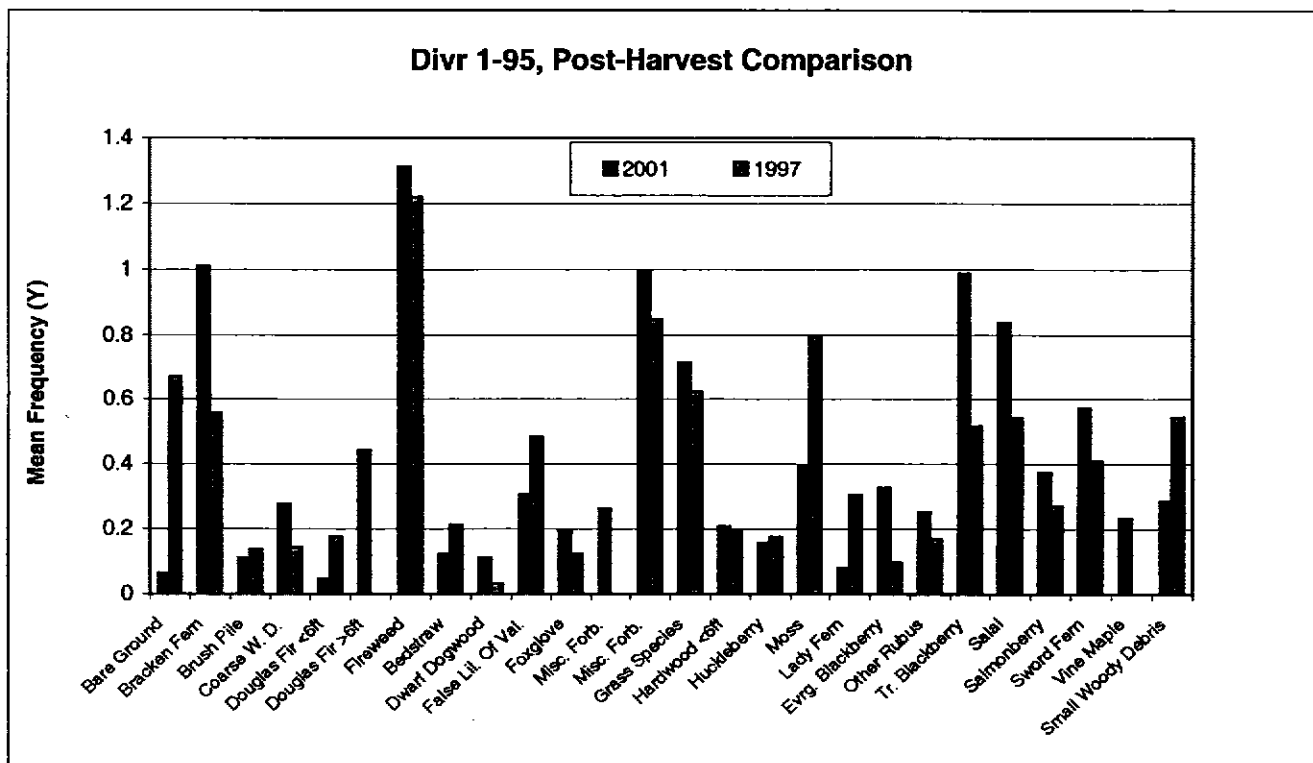
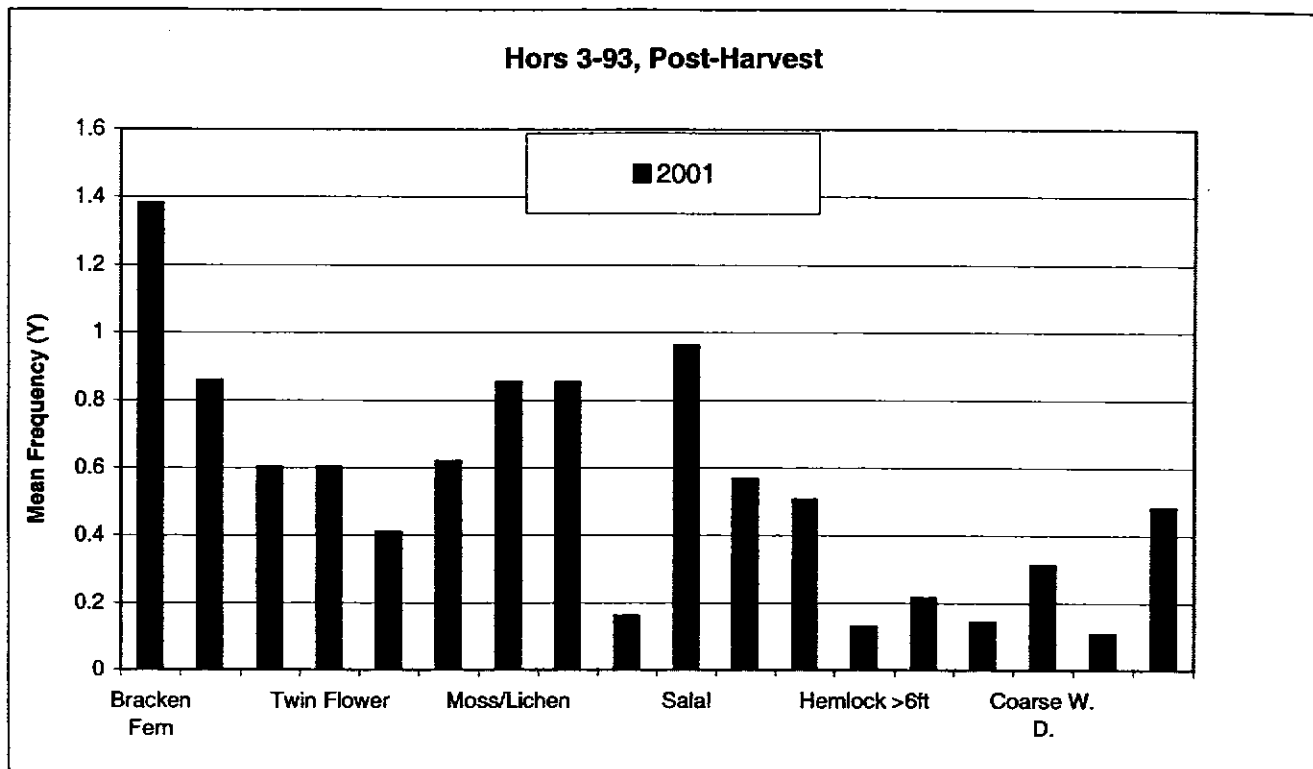




Figure 12. Deer Forage Monitoring Results, 2001



**Figure 13 WILLIAMSON CREEK OLD GROWTH STANDS 10-11 AND 10-12**



The early successional forested stands (10-1, 10-3, 10-4, and 10-5) adjacent to Williamson Creek (Figure 5) were inventoried in 2000. The WHMP calls for retaining stands 10-1 and 10-4 as riparian forest without harvesting through the life of the plan. These stands were cover-typed as riparian, mixed, and small saw timber coniferous forest in the WHMP, which requires snag management, maintenance and monitoring in these stands. No snags were found within the transects in stand 10-1 and an average of 1.8 snags/acre were found within the transects in stand 10-4 (Table 12). Snag creation was initiated in stand 10-1 in fall of 2001 (Table 1), and will be completed to the extent possible in spring 2002. 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 1).

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 12). The average number of CWD/acre was 3.9 and 2.1 on stands 10-3 and 10-5 respectively (Table 13). Snag creation was completed for both stands during the fall/winter of 2001. Twenty-nine snags were created in stand 10-3 and 12 snags were created in stand 10-5 (Table 1). Stand 10-3 had several irregularly distributed pockets of natural snags which were found, and thereby reduced the number of created snags required.

### **3.11 LAND MANAGEMENT AT LAKE CHAPLAIN**

A project to improve the road drainage on the Lake Chaplain Road that was started in 2000 was completed during the summer of 2001. During this project 16 culverts were replaced with larger culverts and seven additional culverts were installed to provide additional drainage for this road.

A Road Maintenance and Abandonment Plan (RMAP), required under the Washington State Forest Practices Act, was started on the Lake Chaplain Tract road network. The RMAP must include a complete inventory of all forestland owners' road systems and a detailed plan to bring all of the forest roads used for forest practices after 1974 up to current standards within 15 years. All roads and railroad grades on forest land that have not been used since 1974 must also be inventoried for potential damage to a public resource, but no plan for improvements on these roads and railroad grades is required.

### **3.12 LAND MANAGEMENT ON DISTRICT PROPERTY**

The District prepared and submitted an RMAP Inventory Scheduling Proposal in March 2001. The proposal was approved, and the District worked with a consulting forester to prepare a RMAP for the entire District owned wildlife mitigation lands. The final RMAP was submitted to DNR in October and approved in December 2001. Implementation and reporting will begin in 2002.

The District has maintained contact and worked with DNR regarding DNR's Natural Resource Conservation Areas (NRCA) planning in the Upper Sultan Basin. The District commented on fire management on District owned property.

A Routine Road Maintenance Agreement was completed with the DNR for roads associated with project mitigation lands. Also, a supplemental easement was obtained on a portion of road (CD-147 in the RMAP) owned by DNR that will be used to access Spada Lake Tract lands for wildlife management purposes on land south of Culmback Dam.

### **3.13 SECURITY MEASURES AT LAKE CHAPLAIN/JACKSON PROJECT FACILITIES**

Heightened security measures at the City's water treatment facilities and the Jackson Project facilities have been implemented since 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 gate is closed on weekends. The gates at Olney Pass were closed, restricting public vehicle access to the Spada Lake Tract. Restriction of public access is under re-evaluation at the time of preparation of this report.

## **4.0 CUMULATIVE SUMMARY**

A summary of all activities completed under the WHMP, from the earliest implementation in 1988 through the end of December 2001, is presented in this section. Appendix 1 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 harvest units east of the filter plant. Construction on additional portions of the road system on the west side of the tract was started in 2001 (Figure 2).

#### **4.1.2 Timber Harvest**

Harvest activity to date is depicted in Figure 14. All of the unit boundaries have been reconfigured somewhat 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 7. However, the final harvest program

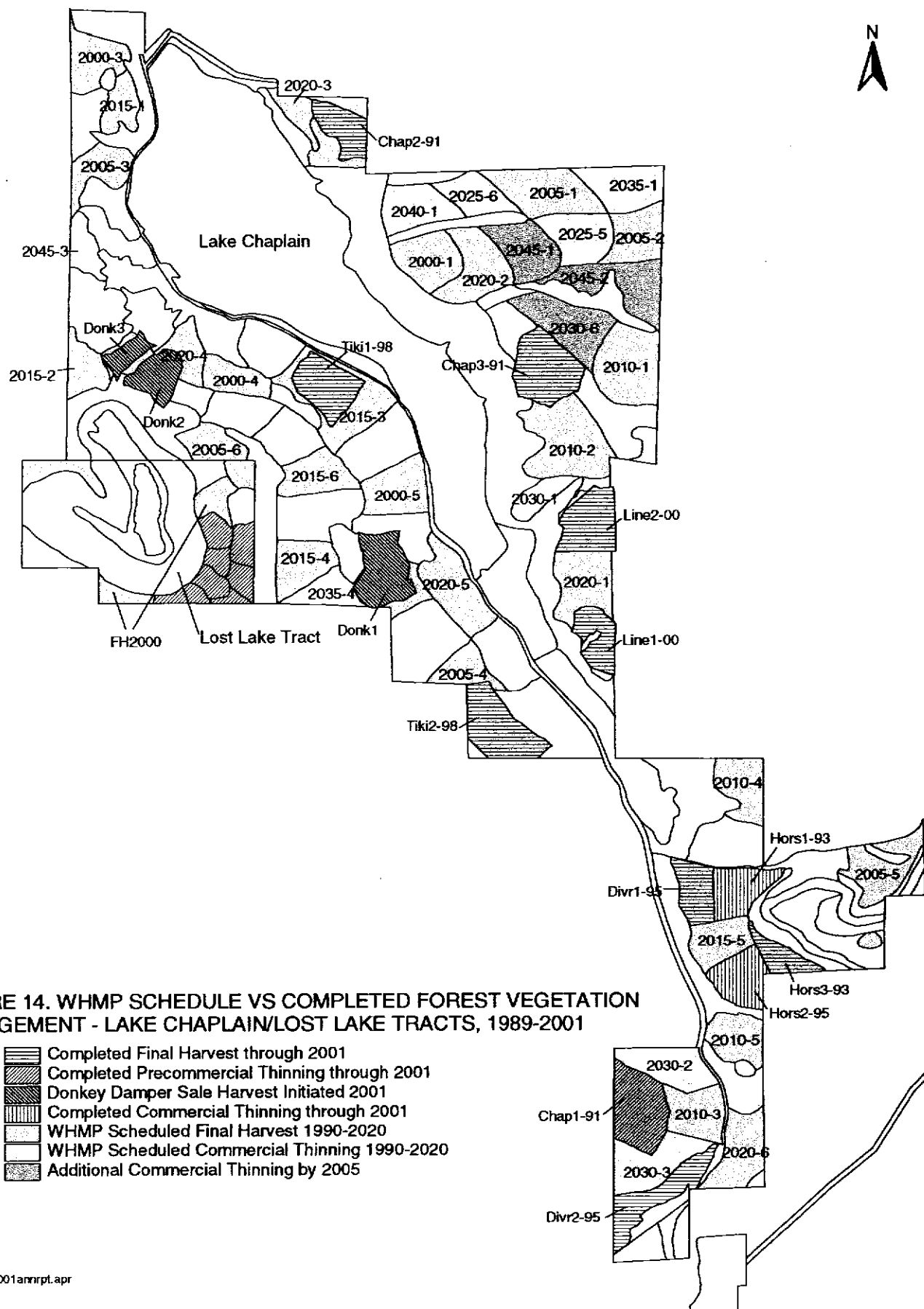


FIGURE 14. WHMP SCHEDULE VS COMPLETED FOREST VEGETATION MANAGEMENT - LAKE CHAPLAIN/LOST LAKE TRACTS, 1989-2001

complies with the WHMP's schedule and requirements including the restriction on harvest unit size and the required green-up period for adjacent harvest units.

<b>Table 7. Modifications of the Final Harvest (FH) Schedule on Lake Chaplain Tract</b>		
<b>New Unit Name (see Fig. 15)</b>	<b>Scheduled FH</b>	<b>Reasons for Modification</b>
2005-5 ("Gold Camp" unit)	1990	Existing wildlife habitat value is high. Unit Divr2-95 (portions of units originally scheduled for FH in 2005 and 2030) was harvested instead of 2005-5 in 1995
2030-3	2005 (part) and 2030 (part)	Units originally scheduled for FH in 2005 and 2030 reconfigured into Divr2-95 and 2030-3

Commercial thinning scheduled in the WHMP (Figure 14) 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 8. Two units that were not scheduled in the WHMP were thinned in 1993 (Table 8).

<b>Table 8. Modifications of the Commercial Thinning (CT) Schedule on Lake Chaplain Tract</b>		
<b>Unit</b>	<b>Scheduled CT</b>	<b>Reasons for Modification</b>
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

\* Thinned in 1993

Additional opportunities for commercial thinning in the northeast and northwest corners of the Lake Chaplain Tract are under evaluation, following the hemlock looper outbreak observed in 2001 (Figure 14). Possibly some harvest units will be rescheduled, or the type of harvest may change. The mix of final harvest units and commercial thinning units in these corners has not yet been determined, but the required "green-up" period between adjacent harvest units will be observed. If very significant and widespread die-off results from the hemlock looper defoliation, the co-licensees may propose relaxing the green-up provision, and will consult the agencies before undertaking any action.

#### 4.1.3 Management of Roads and Post-harvest Units

All final harvest units have been seeded with a grass/forb mix on bare areas, and replanted with Douglas fir and red cedar seedlings. Road ROW's have also been 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.

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.

#### **4.2 FOREST VEGETATION MANAGEMENT (LOST LAKE TRACT)**

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 (see Section 3.3 of this 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 (Figure 3).

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 3). 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 will be 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). The units were marked for future harvest, pending improvements in timber prices.

#### 4.4 SNAG MANAGEMENT

Snag management activity from the beginning of implementation in 1989 through 2001 is shown in Figure 15 and summarized in Tables 9a and 9b. A target was established in the 1994 Annual Report to complete snag inventories in a large number of units on the Lake Chaplain and Lost Lake Tracts by the end of the 1998. This target was achieved in 1998, with the exception of four units that were removed from the inventory following the decision to commercially thin them (see Section 3.2.1 of the 1998 Annual Report). Snag creation on these four units will follow the harvest to achieve the WHMP's required size distribution. On all other targeted units, if sufficient snags to comply with the WHMP's requirements did not exist, snags were created to meet the requirements. Snag inventory/creation has been completed on all Lake Chaplain and Lost Lake units that have been harvested or thinned, and all units scheduled for harvest by 2020, except one scheduled for commercial thinning within 20 years.

Snag creation and management activity on the Lake Chaplain and Lost Lake Tracts from 1989 through 2001 is presented in Figure 15 and summarized in Table 10a. To date, snag inventory and creation has been conducted on 54 units, totaling 1,148 acres between these two tracts. A total of 2,034 snags have been created on these two tracts. All but one of these units meets WHMP requirements for snag number and size distribution.

Additionally, 15 units totaling 381 acres on the Williamson Creek and Spada Lake Tracts have been inventoried and/or had snag creation from 1999 through 2001 (Figure 16). Of these, 8 units totaling 256 acres now meet the WHMP requirements for snags (table 10b).

For all tracts, 69 units totaling 1,529 acres have had snag inventories and/or creation since 1989. A total of 2,142 snags have been created, with 61 units (1,396 acres) now meeting the WHMP requirements of at least 3.07 snags per acre in the appropriate size classes. Inventories and/or creation have been conducted on the Lake Chaplain, Williamson Creek, Spada Lake and Lost Lake Tracts. The entire Lost Lake Tract now meets the WHMP requirements for snags, except for Stand 7-4, which was harvested in the 1970's and does not have trees large enough for snag creation.

A detailed discussion of modifications to the snag management program was presented in the 1994 Annual Report (Section 4.2). In 1996 the inventory/monitoring methods for snags were revised. Methods were field tested in 1997 and revised in 1998. Long-term monitoring of created snags at the Lake Chaplain and Lost Lake Tracts was conducted in 1998, 1999 and 2001. Snag management procedures specific to the Williamson Creek Tract were developed in 1999.



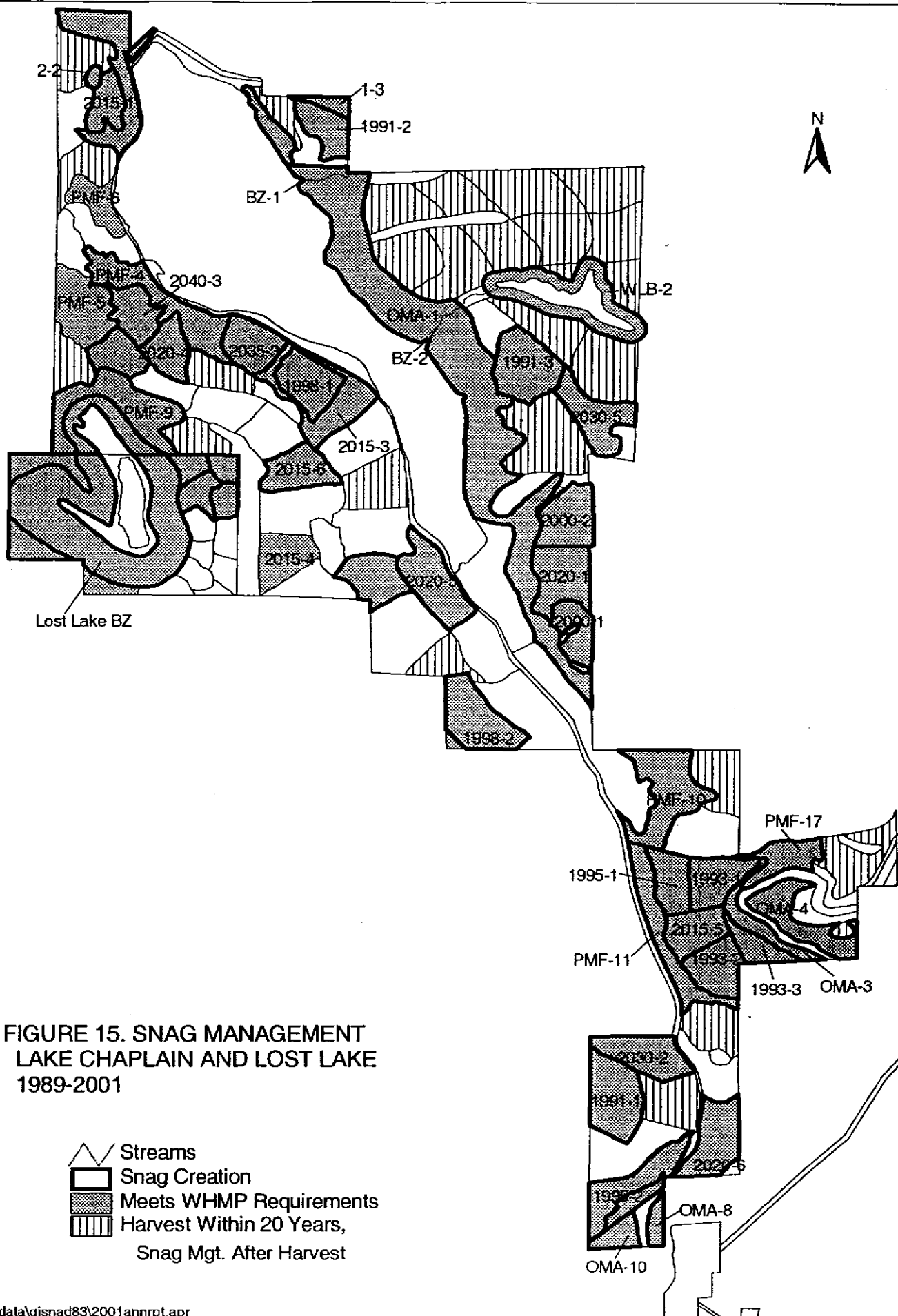


FIGURE 15. SNAG MANAGEMENT  
LAKE CHAPLAIN AND LOST LAKE  
1989-2001

**Table 9a. Summary of Snag Management Through 2001 - 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	√ Includes natural and created snags
2020-6	12.0	26	17.7	50.5	6.3	√ Includes created snags only
2030-2	22.1	60	17.0	50.3	3.1	√ Includes natural and created snags
2030-5	24.0	48	18.0	50.0	3.2	√ Includes natural and created snags
2035-3	18.5	30	18.0	55.0	4.9	√ Includes natural and created snags
2040-3	16.3	14	21.4	50.0	6.9	√ Includes natural and created snags
Lost Lake 7-1	93.7	234	18.1	62.2	3.3	√ Includes natural and created snags
Lost Lake 7-2	34.0	80	17.3	61.7	3.2	√ Includes natural and created snags
Lost Lake 7-3	4.0	0	n/a	n/a	3.1+	√ Natural snags only
OMA1a	74.8	14	17.9	68.3	4.3	√ 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
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	√ Includes natural and created snags
OMA 8	5.3	7	18.1	54.3	18.4	√ Includes natural and created snags
OMA 10	8.6	4	20.0	56.3	18.4	√ Includes natural and created snags
PMF 4	31.8	54	16.5	46.2	4.9	√ Includes created snags only
PMF 5	27.4	0	23.5	47.3	5.3	√ Includes natural snags only
PMF 6	13.3	0	23.9	64.3	6.0	√ Includes natural snags only
PMF 7a <sup>11</sup>	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	√ Includes natural and created snags
PMF 9	52.2	71	17.3	54.9	3.1	√ Includes natural and created snags
PMF 10	34.1	56	18.3	45.1	4.5	√ Includes natural and created snags

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
PMF 11	12.0	25	16.8	43.7	4.3	√ Includes natural and created snags
PMF 15	6.8	0	14.4	35.0	10.6	√ Includes natural and created snags
PMF 17	14.7	35	17.0	58.1	4.4	√ Includes natural and created snags
Stand 1-3 <sup>12</sup>	4.4	0	n/a	n/a	3.1+	√ Natural snags only
Buffer Zone 1	2.3	15	16.4	63.8	9.8	√ Includes natural and created snags
Buffer Zone 2	1.4	7	15.9	46.6	5.0	√ Includes natural and created snags
Buffer Zone 3	8.7	23	16.6	46.6	4.5	√ 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	√ Includes natural and created snags
CHAP1-91	26.0	75	16.6	33.5	3.1	√ 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	√ Includes natural and created snags
HORS1-93	20.0	0	14.5	89.0	11.5	√ Includes natural snags only
HORS2-93	18.0	23	16.9	55.2	4.6	√ Includes natural and created snags
HORS3-93	13.7	37	16.0	33.8	3.1	√ Includes natural and created snags
DIVR1-95	15.6	42	16.8	50.3	3.1	√ Includes natural and created snags
DIVR2-95	19.7	59	18.3	47.9	3.1	√ Includes natural and created snags
TIKI 1-98	21.0	54	55.6	17.5	3.1	√ Includes natural and created snags
TIKI 2-98	23.8	73	18.0	56.1	3.1	√ Includes natural and created snags
LINE 1-00	14.8	42	18.0	65.4	3.0	√ Includes natural and created snags
LINE 2-00	22.0	62	17.4	66.4	3.1	√ Includes natural and created snags
DONK 1-01	23.5	67	17.1	65.3	3.1	√ Includes natural and created snags
DONK 2-01	21.4	58	18.0	67.6	3.0	√ Includes natural and created snags
TOTALS	1140	2022	Totals for those 53 units which meets WHMP requirements.			
	1148	2034	Totals for all 54 units having snag management activity to date.			
BOLD denotes those units where snag management activity occurred in 2001						
√ Meets WHMP requirements for size class distribution and number per acre.						
11 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.						
12 Remainder of stand, exclusive of already delineated units.						

Table 9b. Summary of Snag Management Through 2001 - Williamson Creek & Spada Lake Tracts

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
Stand 9-24 <sup>1</sup>	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	√ Includes natural and created snags
Stand 9-47	4.3	10	15.7	64.0	3.0	√ Includes natural and created snags
Stand 9-126 <sup>11</sup>	23.7	0	16.3	44.5	0.4	Natural snags only
Stand 9-180 <sup>12</sup>	7.4	0	21.4	65.0	1.2	Natural snags only
Stand 10-1 <sup>12</sup>	21.2	13	16.1	52.5	0.6	Created snags only
Stand 10-3	18.7	28	19.3	32.9	3.0	√ Includes natural and created snags
Stand 10-4	7.5	13	16.8	40.1	3.5	√ Includes natural and created snags
Stand 10-5	15.1	12	22.7	37.0	3.5	√ Includes natural and created snags
Stand 10-11 <sup>13</sup>	50.5	0	32.3	46.0	6.0	Natural snags only
Stand 10-12 <sup>13</sup>	6.3	0	30.7	38.3	6.0	Natural snags only
Stand 10-2 <sup>13</sup>	4.2	0	15.1	12.0	1.3	Natural snags only
Stand 10-6 <sup>13,4</sup>	133.4	0	34.5	33.2	13.0	Natural snags only
Stand 10-7 <sup>13,4</sup>	68.8	0	28.5	40.2	14.0	Natural snags only
Stand 10-9 <sup>13,4</sup>	3.7	0	24.2	45.0	9.5	√ Natural snags only
<b>TOTALS</b>	<b>54</b>	<b>76</b>	Totals for those 6 units which meets WHMP requirements.			
	<b>381</b>	<b>108</b>	Totals for all 15 units having snag management activity to date.			
<b>BOLD denotes those units where snag management activity occurred in 2001</b>						
<b>√ Meets WHMP requirements for size class distribution and number per acre.</b>						
<sup>1</sup> Trees not of adequate size for snag creation, re-evaluate in 10 years.						
<sup>12</sup> Inventories conducted, snag creation will be completed in 2002.						
<sup>13</sup> Old-growth stand; will not have pro-active snag management.						
<sup>14</sup> 5% sampling not yet completed						

## **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.

### **4.6.2 Power Pipeline Right-of-Way**

Annual seeding of the pipeline ROW with a mixture of grasses and forbs has been conducted and there now exists a good layer of herbaceous material along the entire ROW. Small bare areas still exist, primarily in areas of sandy or rocky soil, or where ORV damage has disturbed the vegetation.

Quantitative sampling of the ROW has been performed for four successive years to document the effects of the ROW management procedures and identify any changes that may be necessary. Thus far, the monitoring does not appear to identify any changes that are necessary, but shows that annual seeding and allowing the plants to go to seed prior to mowing in the fall are producing the desired effect on most of the ROW. The more than 60 shrub groups planted on the ROW in 1998 and 1999 are surviving well, but spreading slowly due to poor soil conditions.

Restoration of a portion of the access road and replacement of a washed out culvert were completed in 1999.

#### **4.6.3 North End of Lake Chaplain and Chaplain Marsh**

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 required plantings adjacent to Chaplain Marsh 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, 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 a small number of cascara saplings to test whether this species is suitable for the site. Survival of the tree species has been greater than 90 percent, and growth has been variable: crabapples have grown more than ash and hawthorn. Of the shrubs, only Nootka rose has survived and grown well on this site. Many huckleberries and serviceberries have persisted, but have grown very slowly.

### **4.7 NEST STRUCTURES**

All of the nest structures that were required by the WHMP have been installed and monitored annually thereafter. Figures 8 through 10 of this report summarize past nest structure locations. In 1990, two floating nest platforms were placed in Lost Lake (Fig. 8). The required two duck nest boxes were installed at Lost Lake in 1990. One osprey platform was installed at Lost Lake in 1990 and two at Spada Lake in 1992 (Fig. 9).

#### **4.7.1 Floating Nest Platforms**

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 (Fig. 10). In February 1996 the floating platforms at Lake Chaplain were moved to Spada Lake (Fig. 9). One was destroyed in late 1996 or early 1997 by unknown causes, 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.

The floating platforms have been used for resting and feeding by waterfowl and otters, with the only breeding attempt noted to date being the north platform at Lost Lake this year.

#### 4.7.2 Nest Boxes

In 2001 there was a total of 24 functional waterfowl nest boxes on mitigation lands. Figure 8 through 10 of this report show nest box locations throughout implementation since the original two required nest boxes were installed in 1990 at Lost Lake.

The nest boxes have been monitored every year since installation. Waterfowl used over half of the boxes each year (61% in 1997) until 1998, when nest box success was 16%. Nest box success was only 10% in 1999. In 2000 overall nest box success was 32%. In 2001 overall nest box success was 21%. Success in 2001 at Lost Lake, Lake Chaplain Tract and Spada Lake was 30%, 33% and 0% respectively.

#### 4.7.3 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.

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 monitored on a regular basis.

### 4.8 BIOSOLIDS APPLICATION

The City of Everett applied 12.5 dry tons of biosolids per acre to units Hors 2-93 (2035-6) and Hors 1-93 (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 Hors 1-93, Hors 2-93, Hors 3-93, and Divr1-95. Unit's Hors 1-93 and Hors 2-93 received 37.5 dry tons per acre of soil amendment, and units Hors 3-93 and Divr 1-95 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. 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.

## 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:

<b>Table 10. Summary of Deer Forage Monitoring Schedule</b>				
<b>Unit Name</b>	<b>Harvest Year</b>	<b>Pre-Harvest Monitoring</b>	<b>Post-Harvest Sampling</b>	
Chap 1-91	1991	1997 (2010-3)	1997	1999
Hors 3-93	1993		1998	2001
Divr 1-95	1995	1997 (2015-5)	1997	2001
Tiki 1-98	1998	1998	2000	
Tiki 2-98	1998	1998	2000	
Line 1-00	2000	1999		
Donk 2-02	2002	2002		

## 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 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 11. Note that old growth inventory includes snags, CWD, understory vegetation inventory and photo documentation. Wetland inventories will be done every five years. The table indicates that the initial wetland survey was completed in Stand 10-10. Baseline inventory will be complete once 15.5 old growth transects have been completed.



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 are being conducted in old growth stands to descriptively characterize snags, CWD and understory vegetation. Baseline surveys began in 1998. Snags and CWD are inventoried following the standards for sampling these elements on the Lake Chaplain and Lost Lake Tracts. The minimum size for snags is 10' tall and 11" dbh, for CWD it is 10' long and 11" diameter at the large end. On the Williamson Creek Tract, transects are located along reasonably accessible walking routes determined in the field. The goal is to sample enough transects within each stand over the next several years to provide at least 5 percent coverage. Each transect is 330' x 66' (0.5 acres). Understory vegetation on old growth stands is inventoried by sampling 1/100th-acre circular plots at each end of the snag and CWD transects. Species occurrence is noted and notes are taken describing the biologist's overall characterization of the stand. During the surveys, photos are taken to illustrate stand characteristics that the biologists consider representative of these stands and descriptive notes are taken.

Tables 12 and 13 summarize data for snags and CWD collected to date. The number of snags on the old growth stands ranges from 1.3 to 14 per acre. The amount of CWD on old growth stands ranges from 12.9 to 52.4 per acre.

**Table 11. WILLIAMSON CREEK BASELINE INVENTORY SUMMARY.**

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	30	Old growth	2000
10-7	58	Old growth	1999,2000
10-8	0	Old growth	
10-9	100	Old growth	1999
10-10	100	Wetlands	1998
10-11	40	Old growth	2001
10-12	100	Old growth	2001
10-13	100	Photodoc	1998
10-14	100	Photodoc	1998,1999
10-15	100	Photodoc	1999

**Table 12. WILLIAMSON CREEK TRACT SNAG CUMULATIVE INVENTORY SUMMARY**

Stand #	Cover Type	Snags/ac. (all decay classes)	Avg. Diameter (in.)	Avg. Height (ft.)
10-1	Riparian/Mixed	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	Riparian/Mixed	2.8	24.3	31.3
10-6 (<5%)	Old Growth	13.0	34.5	33.2
10-7 (<5%)	Old Growth	14.0	28.5	40.2
10-9	Old Growth	9.5	24.2	45.0
10-11 (<5%)	Old Growth	6.0	32.3	46.0
10-12	Old Growth	6.0	30.7	38.3

**Table 13. WILLIAMSON CREEK CWD CUMULATIVE INVENTORY SUMMARY**

Stand #	Cover Type	CWD/ac. (all decay classes)	Avg. Diameter (in.)	Avg. Length (ft.)
10-1	Riparian/Mixed	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	Riparian/Mixed	2.1	19.7	56.5
10-6 (<5%)	Old Growth	38.0	22.8	38.6
10-7 (<5%)	Old Growth	30.0	29.0	53.3
10-9	Old Growth	52.4	24.0	43.9
10-11 (<5%)	Old Growth	49.0	24.3	45.6
10-12	Old Growth	36.0	24.9	54.7

#### 4.12 LAND MANAGEMENT

The District has worked with landowners in the Sultan Basin over the life of the WHMP 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 for which the District has provided time and effort in the past have included recreational pursuits, timber harvest, surveying, and road maintenance and abandonment. The District completed a Routine Road Maintenance Agreement with DNR in 2001, for roads providing access to project mitigation lands. The DNR is in the process of preparing a

Natural Resource Conservation Area (NRCA) plan for the Upper Sultan Basin and the District has been following that process and providing input since 1999. 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.

## **5.0 WORK PLANNED FOR 2002**

### **5.1 FOREST VEGETATION MANAGEMENT**

#### **5.1.1 Lake Chaplain Tract**

The two units of the Donkey Damper Sale will be logged in early 2002 and replanted with Douglas fir and western red-cedar. Chap2-91 will be precommercially thinned with the following specifications:

- Leave Douglas fir at 12'x12' spacing
- Leave all Western red-cedar
- Leave all hardwoods, except
- Prune maple stump sprouts to 2 to 3 stems

Setup work will be done on the next (unnamed) sale units.

Tree seedlings on all harvest units will be monitored for survival and vigor. Conifer and hardwood densities on the three units of the 1991 Chaplain Sale will be evaluated and a schedule will be developed for future precommercial and commercial thinning activities.

We will complete work on GTA management procedures in 2002, and draft management plans for existing GTA's.

#### **5.1.2 Spada Lake Tract**

Spada Lake stands 9-36, 37, and 38 will be precommercially thinned.

#### **5.1.3 Lost Lake Tract**

Harvest units identified in Section 3.1.5 may be set up for future commercial thinning, pending discussions with the regulatory agencies.

### **5.2 SNAG MANAGEMENT**

Stands that have already been inventoried on the Spada Lake and Williamson Creek Tracts will be the first priority for snag completion in the year 2002. These include stand 9-180 on the Spada Lake Tract (see Fig. 5) and stands 10-1 and 10-2 on the Williamson Creek Tract (Fig. 6). Additional stands on the Lake Chaplain Tract will be inventoried and snags created as needed. Stands on the Spada Lake Tract will be inventoried based on Figure 3-2 of the Spada Supplement.

Also in 2002, long-term monitoring will begin on stands on the Lake Chaplain and Lost Lake Tracts where snags were created 10 years ago. The objective on harvested units is to determine whether the snags designated for each unit are still standing and whether

any replacements are now needed. Each created snag will be visited to verify its status, with notes regarding use and current decay class being taken. Snag inventories within those units will be conducted according to the snag SOP, to capture information relating to naturally occurring snags. Deficiencies in the numbers of natural plus created snags will be remedied during the next snag creation contract.

### **5.3 COARSE WOODY DEBRIS MANAGEMENT**

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

### **5.4 REVEGETATION**

#### **5.4.1 Spada Lake Drawdown Zone**

Survival of wetland plantings and natural recruitment of vegetation will be monitored on the two shoreline revegetation sites in 2002.

#### **5.4.2 Power Pipeline Right-of-Way**

Shrubs will be planted on the ROW in spring 2002 to provide additional foraging and hiding habitat. Native species such as Nootka rose, mock orange, red-osier dogwood and pacific ninebark will be planted. Soil amendments such as imported compost will be added to increase moisture and nutrient retention. A compost or mulch layer will be applied to the new plantings and to shrubs planted in 1998 and 1999. Disturbed soil around the new plantings will be seeded with a clover mix to provide additional nitrogen as well as reduce competition from in seeding by alder and hemlock seedlings.

#### **5.4.3 Chaplain Marsh, North End of Lake Chaplain, and Powerhouse Site**

Monitoring will be conducted as in previous years.

### **5.5 NEST STRUCTURES**

The 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. Monitoring of the floating nest platforms at Lost Lake will be reinstated in 2002 since there was use of the north platform in 2001. At the end of the nesting season the floating platforms will be visited to look for signs of use by wildlife. The floating nest platform at the east end of Spada Lake will be visited by boat and inspected when duck nest boxes in the vicinity are checked in June.

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.

## **5.6 DEER FORAGE MONITORING**

The following harvest units will be sampled in 2002: Chap 1-91 and Line1-2000.

## **5.7 WILLIAMSON CREEK TRACT**

Baseline old growth inventorying will continue on the Williamson Creek Tract in 2002. Snag creation will be completed for stands 10-1 and 10-2 in the spring of 2002.

## **5.8 LAND MANAGEMENT**

The District will begin implementation of the RMAP and will prepare and submit an annual report to DNR. The City will complete its RMAP and submit it to the DNR.

The District 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.

## **5.9 SECURITY MEASURES AT LAKE CHAPLAIN/JACKSON PROJECT FACILITIES**

A security assessment of these sites is in progress, and additional changes may occur in 2002, which could include surveillance cameras, additional gates, reconfigured gates or changes in locations. Impacts on public access to the Lake Chaplain Tract and other Jackson Project lands will be considered in this assessment.

## 6.0 SCHEDULE OF ACTIVITIES FOR 2002

Major Activities	Location	Quantity
Road Construction	Lake Chaplain Tract	Complete road to Donkey Damper units
Final Harvest		
Timber Harvest	Donkey Damper Sale	Complete 3 units
Timber Sale (Lake Chaplain)	TBD	TBD
Sale Layout (Lake Chaplain)	Unnamed Sale, see Fig. 2	2 units (acreage TBD)
Commercial Thinning		
Sale Layout	Lost Lake Tract	Stands 7-1, 7-2, 7-3 (acreage TBD), pending agency review
Reforestation/seeding	Donkey Damper Sale	2 units
Harvest Unit Stocking	L. Chaplain Tract, all previously harvest units	10 units
Precommercial Thinning	Spada Lake Tract	2 units (approx. 38 ac.)
	Lake Chaplain Tract	Complete Chap2-91
Snag Creation	Lake Chaplain Tract	10+ units, as needed
Snag Inventory	Lake Chaplain Tract, Spada Lake Tract, Williamson Creek	10+ units on L. Chaplain Tract; other tracts TBD
CWD Creation	Lake Chaplain Tract	Donkey Damper Sale
CWD Inventory	Lake Chaplain Tract	TBD
Revegetation		
Grass seeding/fertilizer Shrub plantings	Pipeline ROW	As needed to improve bare spots
Monitoring		
Revegetation Site Monitoring/Maintenance	West side, Chaplain Marsh North end, L. Chaplain Powerhouse site Spada L. drawdown zone Pipeline ROW	Monitoring of all planted/seeded areas. Maintenance as needed: Weeding, brush thinning, etc.
Deer Forage	Lake Chaplain Tract	3 units
Snags	L. Chaplain, Lost Lake Tracts	100+ created snag trees
Nesting Structures	Lost Lake, Spada Lake, and Chaplain Tract	Monitor all structures .
Wetland Monitoring	Lost Lake	All wetlands designated in SOPs
Williamson Creek	Stands 10-6, 10-7, 10-8, 10-11	Continue old growth baseline inventory; complete snag creation on 10-1 and 10-2
Biosolids Application	L. Chaplain Tract	None planned
Understory monitoring	Hors1-93, Hors2-93	2 units plus controls
Water quality monitoring	Chaplain Creek	2 stations
GTA and BZ Management	All established units	Monitor and develop long-term management plans
Land Management	Spada Lake Tract	Begin RMAP implementation.
	Lake Chaplain Tract	Complete RMAP

# APPENDIX 1 – WHMP Implementation Milestones

(This table will be updated in the final version)

General Activity Category	Management Tract	Milestone	Annual Report Reference – (Section/page #)
Timber Harvest	Lake Chaplain	Chaplain Sale	1991 (3.3.1, p.6), 1992 (3.2.1, p.4)
	Lake Chaplain	Horseshoe Sale	1992 (3.2.2, p.6), 1993 (3.1.1, p.6)
	Lake Chaplain	Diversion Sale	1995 (3.1.1, p.6)
	Lake Chaplain	Tiki Sale	1997 (3.1.1, p.2), 1998 (3.1.1, p.2)
	Lake Chaplain	Line Tree Sale	1997 (3.1.1, p.2), 1998 (3.1.2, p.5), 1999 (3.1.2, p.2), 2000 (3.1.1, p.4)
	Lake Chaplain	Donkey Damper Sale	1999 (3.1.4, p.5), 2000 (3.1.1, p.4)
	Lake Chaplain	Salvage Sales	1993 (3.1.2, p.6), 1998 (3.1.1, p.2), 1999 (3.1.1, p.2)
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	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	Chaplain Sale	1999 (3.1.5, p.5)
	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)
	Lost Lake	Harvest Planning	2000 (3.2.2, p.6)
	Spada Lake	Harvest Planning	2000 (3.2.3, p.7)
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)

<b>General Activity Category</b>	<b>Management Tract</b>	<b>Milestone</b>	<b>Annual Report Reference – (Section/page #)</b>
	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	Snag Monitoring	1998 (3.2.2, p.7), 1999 (3.2.2, p.9)
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)
Revegetation	Spada Lake	Drawdown Zone Test Plantings	1994 (3.3.1, p.6), 1995 (3.4.1, p.12), 1996 (3.4.1, p.10), 1997 (Fig.4), 1998 (3.4.1, p.10), 1999 (3.4.1, p.11)
	Pipeline ROW	Revegetation Design	1991 (3.5, p.19)
	Pipeline ROW	Seeding	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)
	Pipeline ROW	Plant shrubs and trees	1997 (3.4.2, p.11), 1998 (3.4.2, p.10), 1999 (3.4.2, p.12)
	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	1992 (3.4, p.10), 1998 (3.4.5, p.12), 1999 (3.4.5, p.12), 2000 (3.4.2, p.13)
	Lake Chaplain	Plantings along Chaplain Marsh	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	1993 (3.3, p.11), 1999 (3.4.3, p.12)
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)
	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)
	Lost Lake	Osprey Platform	1990 (3.8, p.8), 1999 (3.5.3, p.19), 2000 (3.5.3, p.19)



<b>General Activity Category</b>	<b>Management Tract</b>	<b>Milestone</b>	<b>Annual Report Reference – (Section/page #)</b>
	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)
	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)
	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)
	Spada Lake	Osprey Platforms	1992 (3.7, p.11), 1999 (3.5.3, p.19), 2000 (3.5.3, p.19)
Bald Eagle Nest	Lake Chaplain	Monitoring	1997 (3.5.4, p.19), 1998 (3.5.4, p.18), 1999 (3.5.4, p.20), 2000 (3.5.4, p.20)
Biosolids Application	Lake Chaplain	Biosolids Application	1996 (3.8, p.18), 1998 (3.7, p.18), 2000 (3.7, p.20)
	Lake Chaplain	Monitoring	1996 (3.8, p.18), 1997 (3.7, p.19), 2000 (3.7, p.20)
Deer Forage Monitoring	Lake Chaplain	Implementation Decisions & Methods	1991 (3.10.1, p.21), 1996 (3.9, p.18), 1997 (3.8.1, p.19)
		Forage Availability Results	1991 (3.10.1, p.22), 1996 (3.9, p.18), 1997 (3.8.2, p.22), 1998 (3.8, p.18), 1999 (3.7, p.20), 2000 (3.8, p.24)
		Utilization Results	1991 (3.10.1, p.22)
Land Acquisition	Lost Lake		1989 (3.1, p.2)
	Lake Chaplain		1991 (3.1, p.3)
	Spada Lake		1990 (3.1, p.2)
	Williamson Creek		1991 (3.1, p.3)
Management Plans & Land Use Decisions	Lake Chaplain	Chaplain Property Comprehensive Plan	1995 (3.7, p.17)
	Lake Chaplain	Shoreline Zone development permit	1995 (3.7, p.17)
	Lake Chaplain	Zoning Code change	1996 (3.7, p.15)
	Lake Chaplain	Bald Eagle Nest Site Management Plan	1997 (Attachment 1)
	Lost Lake	Concrete Ford Installation	1991 (3.2, p.3)
	Spada Lake	Supplemental Plan	1997 (Attachment 2)

<b>General Activity Category</b>	<b>Management Tract</b>	<b>Milestone</b>	<b>Annual Report Reference – (Section/page #)</b>
ROW Management Special Agency Consultation	Power Pipeline	Gate to restrict public access	1994 (3.3.2, p.7)
	All management tracts	Agency tour of WHMP Sites	1997 (3.9, p.22)
		FERC Environmental Inspection	1999 (3.9, p.31)
Other Monitoring	Williamson Creek	Monitoring	1999 (3.8, p.26), 2000 (3.9, p.24)

**APPENDIX A – AGENCY CONSULTATION MEETING  
APRIL 5, 2002**

WHP Agency Meeting - April 5, 2002

<u>Name</u>	<u>Agency</u>	<u>Phone #</u>
Lisa Egtvedt	DNR	(360) 856-3500
Bernice Tannenbaum	PUD	425-783-1746
Bruce Meaker	PUD	425-783-1722
GARY ENGMAN	WDFW	425 775 1311 x122
Karen Bedrossian	PUD	425 783-1774
Don Farwell	City of Everett	425-257-8204
Dan Mathias	"	425-257-8855
Dan Thompson	"	425-257-8223

**JACKSON HYDROELECTRIC PROJECT  
WILDLIFE HABITAT MANAGEMENT PLAN  
Agency Meeting Minutes  
April 5, 2002**

**In Attendance:**

City of Everett – Don Farwell, Dan Thompson, Dan Mathias  
District – Bernice Tannenbaum, Karen Bedrossian, Bruce Meaker  
USFWS – Gwill Ging (by telephone)  
WDFW – Gary Engman  
WDNR – Lisa Egtvedt

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**A. Introductions**

**B. Update on WHMP Implementation**

- **Hemlock Looper Outbreak**

Don described the status of the hemlock looper and phantom looper outbreaks in the vicinity of Lake Chaplain and Lost Lake. DNR determined that trees on about 11,000 acres have suffered defoliation, including 1,000 acres in the Lake Chaplain Tract and 100 acres in the Lost Lake Tract. The extent of mortality due to defoliation has not yet been determined. Hemlocks are more likely to succumb to defoliation than Douglas fir.

Don will set up some infected hemlock-dominated harvest units (2000-3 and 2005-3) in the north portion of the Tract, and will leave the fir-dominated stands he worked on in 2001 for future harvest (See Figure 14, p. 30). He may also set up two additional hemlock stands: 2005-1 and 2005-2.

Gwill—Will this change be consistent with the WHMP requirement for allowing a “green-up” period between the harvest of adjacent units?

Don—Yes, the WHMP allows units to be harvested within ten years of the scheduled harvest date. A salvage sale may also be a possibility.

- **Revegetation Monitoring**

Bernice reviewed the revegetation experiments on the Spada Lake shoreline. Slough sedge is the only surviving species, and it is slowly spreading via rhizomes. Planted sedges can no longer be distinguished from volunteers. She proposed discontinuing formal monitoring of the sites, and offered to visit the sites in conjunction with other activities that take us to the area.

Gwill—It’s ok to terminate formal monitoring, but when we are in the area, he would like us to photodocument the sites over time.

- **Nest Structures**

Bernice reviewed the history of floating waterfowl nest platforms in Lost Lake and Spada Lake. At Spada Lake, only one platform remains in the Williamson Creek arm, which has had no waterfowl nesting activity. With the abandonment of the North Shore Road, the platform can no longer be viewed from a vantage point. Bernice proposed discontinuing regular monitoring during the breeding season, and offered to inspect the platform for signs of nesting use whenever other activities take us to the area. Regular

monitoring of the 2 Lost Lake platforms, one of which was used by nesting pied-billed grebes in 2001, will continue,

Gwill and Gary—Both accepted the change.

Bernice reviewed the history of the osprey platforms at Lost Lake and Spada Lake. The Lost Lake platform and one platform at Spada Lake had some nest-building activity soon after they were installed, but subsequently no use at all. Ospreys have nested in trees on the north ridge above the Sultan River gorge since the platforms were installed. She proposed eliminating regular monitoring of the Spada Lake platforms.

Gwill—That would be acceptable, but he wondered if the platforms were in very exposed sites that were not accepted by the birds. Perhaps the locations were too windy?

Bernice—The nests in trees above the gorge were also very exposed. No reason to believe that winds would be any different around the lake.

- **Security Concerns in the Sultan Basin**

Bruce reviewed the temporary closure of the Sultan Basin. The South Shore Rd. and the 6000 Rd. gates were closed at Olney Pass following the 9/11/01. The District wants to re-open portions of the Basin for public recreation use, but needs to protect Jackson Project facilities from possible attack. There is public interest in accessing the Sultan River gorge via the 4210 road for water sports. The District and City are currently discussing various solutions. At present, they feel that the South Shore Rd. gate at Olney Pass could be re-opened to the public, which would allow access to Rec. Sites 2, 3, 4 and 5. The District and City wish to restrict access to Culmback Dam, while allowing use of road 4210 for access to the river and mining claims in the vicinity.

Options include opening the 6000 Rd. gate at Olney Pass and placing a gate at the intersection of 4210 and 6000 that would close off the Dam. This option does not accomplish significant protection for the dam, as this intersection is only about ¼ mile away.

Gwill—What about miners needing to cross the dam?

Bruce—They don't need to cross the dam to access their claims.

Another option is to close the gate at Olney pass, with a changeable combination lock that could allow "controlled access" to approved recreational and mining users.

Alternatively, a security guard could be posted to Olney Pass, who would allow approved individuals to access the 6000 Rd.

Two major washouts on Basin roads need repairs as soon as the snow has melted: One washout is located on the 6000 Rd. midway between Olney Pass and Culmback Dam, and the other is on the South Shore Rd. west of the South Fork bridge.

Gary—Will this affect opening day at the rec sites? How bad are the slides and when will they be repaired?

Bruce—The sites won't be open for opening day of fishing, but even without the road failure, the snowpack is still too deep on the South Shore Rd. The 6000 Rd. slide is definitely undrivable, and it has higher priority for repairs, possibly in early summer.

The extent of the repair needed on South Shore Rd. isn't known yet. The District and city received a response from the Federal Aviation Administration regarding the request to close the air space over the Jackson Project to low-flying aircraft. The FAA stated they don't have the authority to close air space.

- **Security at Lake Chaplain**

Don described changes in security measures at Lake Chaplain. The electronic gate at the filter plant is kept closed at all times. The south gate is closed on weekdays from 6 pm to 6 am, and all day on weekends. Public access by any means is prohibited when the gate is closed. The city will do a vulnerability assessment of the watershed and roads to determine options. Possibly a new gate will be installed farther north on the Chaplain Rd., and the south gate will be re-opened on weekends.

Gary—Will the agencies have an opportunity to comment on a draft of the plan? Where would the new gate be placed?

Don—Assumes comments will be allowed. The location of the new gate is not known yet, and will be based on the recommendation of a security specialist.

- **Timber Management at Spada Lake**

Bernice summarized studies of timber management options at Spada Lake and described recent management decisions. The District will precommercially thin (PCT) the northwest corner of the property (Stands 9-36 and 9-37) in 2002. We will request funding to commercially thin Stands 9-120, 9-121, 9-183-, 9-142, 9-150 and 9-184 in the District's 2003 budget. Karen mentioned that the DNR's plan for adjacent NRCAs doesn't call for active management of second growth stands.

Gary and Gwill expressed concerns over slash load that PCT generates, but agreed that long-term benefits for wildlife will follow. Regarding commercial thinning, Gwill asked whether District management will want us to harvest the highest value trees and maximize revenue. Bernice said that detailed contract specifications would be developed to avoid this result. Don explained that the District's contract specifications and instructions to loggers would aim to remove the trees with lowest future value and retain the trees with highest future value. Dan Thompson noted that contracts typically assign penalties for failure to comply with specifications. Gwill and Gary agreed that this was logical, but wanted to be assured that there would be no management pressure to generate maximum revenue. They would like to see the contract language specific to this sale, when it is developed, that requires loggers to remove lower value trees.

- **Timber Management at Lost Lake**

Bernice reviewed studies of timber management options at Lost Lake, and the reasons for departing from the WHMP schedule of small-scale clearcuts on the Tract. She described four options under consideration and the advantages and disadvantages of each:

- 1) Low-intensity commercial thinning
- 2) Medium-intensity commercial thinning
- 3) Salvage harvest in response to expected blowdown along south edge of property, plus mortality due to hemlock looper defoliation
- 4) No management action at this time, but retain the option to pursue commercial thinning after a "green-up" period on adjacent clearcuts

Gary said that he prefers the idea of delaying harvest because it is difficult to justify producing more forage at this time. He noted that the landscape has changed dramatically since the WHMP was written. He is in favor of retaining an option for reduced harvest in the future, and Gwill agreed. Local environmentalists expressing concern over timber harvest at Lost Lake contacted both of them. Gwill and Gary see the Lost Lake Tract as a good example for adaptive management.

- **Sultan Water Pipeline Project**  
Bernice described plans for the water supply/bridge project.

#### **C. Problems and Concerns**

Gary asked for a change in Figure 14 of the draft report, to show planned harvest units at Lake Chaplain within the next 20 years, similar to what is shown in Figure 15.

#### **D. Future Reports/Meetings**

Bernice said that the co-licensees will continue to produce annual reports that will be distributed to the agencies. No future meetings were planned, but Don noted that he may request a meeting in the event of a massive die-off of trees at Lake Chaplain. If this happens he may want to change the harvest schedule specified in the WHMP. Gwill and Gary said they would consider a future meeting if this happens.

#### **E. Summary of Management Decisions**

The District requested concurrence with the following changes in the WHMP schedule:

- Discontinue formal monitoring of the Spada Lake shoreline revegetation sites. Agency reviewers agreed, but want photodocumentation of the sites to continue.
- Discontinue regular monitoring of the floating platform at Spada Lake. Agency reviewers agreed.
- Discontinue regular monitoring of the Spada Lake osprey platforms. Agency reviewers agreed.
- Eliminate clearcuts scheduled at Lost Lake Tract. Replace with option to perform commercial thinning in the future. Agency reviewers agreed to this change.

The District will provide the agencies with contract specifications for timber harvest in the Spada Lake Tract, and ensure that higher value trees will be retained.

The District will inform the agencies of security plans in the basin and at Lake Chaplain.