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PUD No. 20847

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Wildlife Habitat Management Plan  
2003 Annual Report  
Jackson Hydroelectric Project – FERC #2157 License article 53

Dear Colleagues:

A copy of the 2003 Annual Report on the Jackson Project Wildlife Habitat Management Program is enclosed for your records.

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

Sincerely,

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**2003 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 2004**

**2003 ANNUAL PROGRESS REPORT  
WILDLIFE HABITAT MANAGEMENT PLAN**

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# 2003 ANNUAL PROGRESS REPORT WILDLIFE HABITAT MANAGEMENT PLAN

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## 1.0 SUMMARY

Accomplishments of the year 2003 on the Wildlife Habitat Management Plan (WHMP) for the Henry M. Jackson Hydroelectric Project are presented in this report. A cumulative summary of tasks accomplished since the initiation of the WHMP in 1988 is also presented in this report. Problems or changes needed during implementation of the WHMP are discussed, and updated schedules are presented. A draft of this report was submitted for comments to the U.S. Fish and Wildlife Service (USFWS), the Washington Department of Fish and Wildlife (WDW), and the Tulalip Tribes. The Washington Department of Natural Resources (DNR) was also consulted.

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

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

### 1.1 MAJOR TASKS ACCOMPLISHED DURING 2003

- Continue implementation of Lake Chaplain Tract RMAP
- Continue implementation of Spada Lake and Lost Lake Tract RMAPs
- Snag creation on Spada Lake Tract and Lake Chaplain Tract
- Snag inventory (Spada Lake, Lake Chaplain and Williamson Creek Tracts)
- Monitoring of revegetation and wetland sites (Lost Lake, Lake Chaplain Tract)
- Deer forage monitoring (Lake Chaplain Tract)
- Monitoring of vegetation coverage on power pipeline ROW (Project Facilities Tract)
- Monitoring of nest structures (Lake Chaplain, Lost Lake and Spada Lake Tracts)
- Long-term snag monitoring (Lost Lake Tract, Lake Chaplain Tract)
- Long-term coarse woody debris monitoring (Lake Chaplain Tract)
- Began commercial thinning of selected units at Spada Lake Tract
- Preliminary evaluation of forest management options on additional Spada Lake Tract units
- Continued monitoring and baseline data collection at Williamson Creek Tract

## **1.2 TASKS SCHEDULED FOR 2004**

- Sale and final harvest (tentative) of Phone Line Sale (Lake Chaplain Tract)
- Precommercial thinning on Chaplain Unit 2 (tentative)
- Reconnaissance for 2004 timber sale (tentative) (Lake Chaplain Tract)
- Complete commercial thinning on Spada Lake Tract
- Evaluate precommercial thinning on Spada Lake Tract (tentative)
- Plantation monitoring (Lake Chaplain Tract)
- Snag monitoring (Lake Chaplain and Lost Lake Tracts)
- Snag creation on Spada Lake Tract and Lake Chaplain Tract
- Snag inventory on Spada Lake, Williamson Creek and Lake Chaplain Tracts
- Monitor nest structures
- Monitor revegetation sites
- Deer forage monitoring (Lake Chaplain Tract)
- Monitor buffer zones and green tree areas in harvested units (Lake Chaplain Tract)
- Implement RMAPs (Lake Chaplain, Spada Lake Tracts)
- Monitor Williamson Creek Tract
- Begin preparation of the Spada Lake Tract Plan for 2006-2015

## **2.0 INTRODUCTION**

The 2003 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 2003 (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 2004 are 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.

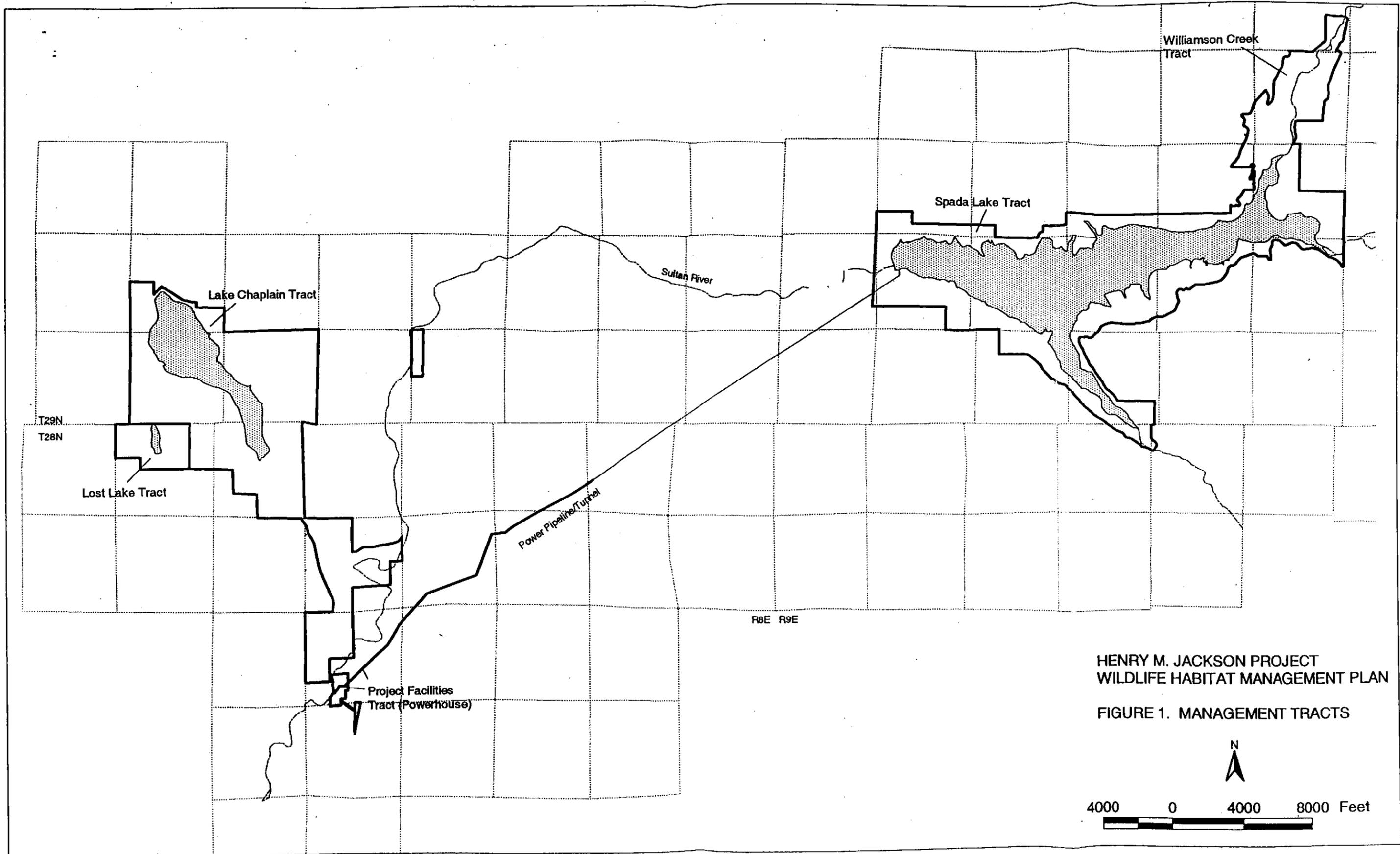
## **3.0 WORK COMPLETED DURING 2003**

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

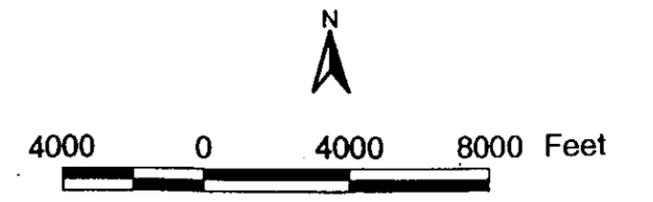
There was no forest stand management or planning activity in 2003. Units laid out in 2002 for the Phone Line Sale, as reported in the 2002 Annual Report, remain under consideration for harvest in the near future.

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

Forest Practice applications were submitted to the DNR in 2002 for eight second growth timber stands on the Spada Lake Tract, as described in the 2002 Annual Report (Figure 2). The DNR approved all of the application in late 2002/2003. In January 2003 the



HENRY M. JACKSON PROJECT  
 WILDLIFE HABITAT MANAGEMENT PLAN  
 FIGURE 1. MANAGEMENT TRACTS



District's forestry consultant did a detailed timber cruise of these stands and refined his preliminary cost/benefit analysis for commercial thinning. The District decided to pursue the project for those portions of the stands that did not require major road construction or reconstruction in order to achieve wildlife habitat improvements while reducing risks to water quality. The decision to eliminate road construction reduced the acreage from approximately 165 ac. to 100 ac. The Department of Natural Resources approved the District's amended Forest practices applications for these stands in 2003. District management approved the action, and the eight stands (9-120, 9-121, 9-183, 9-142, 9-150, 9-184, 9-111 and 9-135) were sold in July 2003. Logging operations began in October 2003 and continued through the end of the year (Figure 2). Unit 9-135 was thinned during this period.

Stands 9-80 and 9-48 on the north shore of Spada Lake were evaluated by the forestry consultant for future silvicultural management (Figure 3). Stand 9-48 may be a reasonable candidate for commercial thinning using helicopters to yard the logs, based on preliminary density plots, and the thinning would very likely benefit understory development. The stand has approximately 250 trees per acre greater than or equal to 8 inches dbh, of which over half are Douglas fir; the remainder are primarily western hemlock. While relative density of the largest trees is within the range of optimal density for wood production, the understory forage for wildlife is largely absent. Using USFS timber volume models and helicopter logging cost estimates, harvesting half of the overstory and yarding to Recreation Site 3 is expected to be marginally profitable at current log prices.

Most of Stand 9-80 was precommercially thinned in the past, but would still benefit from small gap creation, for example, by creating clusters of snags. A small densely-stocked patch of smaller-diameter trees that was never thinned would benefit from precommercial thinning. No specific management decisions were made for these units in 2003.

### **3.3 SNAG AND CWD MANAGEMENT**

#### **3.3.1 Snag Inventory and Creation**

On the Spada Lake Tract, snag creation on stand 9-8 was begun in 2002. In 2003, creation was completed on this unit with a total of 329 snags being created over two years across the 106 acres of this stand (Table 1 and Figure 4). Stand 9-8 was scheduled in the Spada Supplement to be precommercially thinned between 1996 and 2000, but access to the unit by road was not possible due to the abandonment of the north shore road. The size distribution of trees on this and many other stands within this tract, and in many cases their inaccessibility to commercial harvest operations, has led to the necessity to create openings in the forest using methods other than traditional thinning or harvesting. The density of stand 9-8 ranges from 400 to 1000 trees per acre, based on the land exchange inventories conducted in the late 1980's. Diameters of the trees are also widely variable. To allow light to reach the forest floor and thereby encourage understory growth, as well as reduce competition among the remaining overstory trees, small scale gap creation was initiated in 2002, and continued in 2003. While the snag contractor was topping a selected tree, any others within reach were also topped, with anything larger than 11" being counted as a snag. Since the gap created by this method is relatively small, snag trees were grouped together to create larger openings, and sub canopy trees were skinned near the base to kill the tree standing and enlarge the gap to

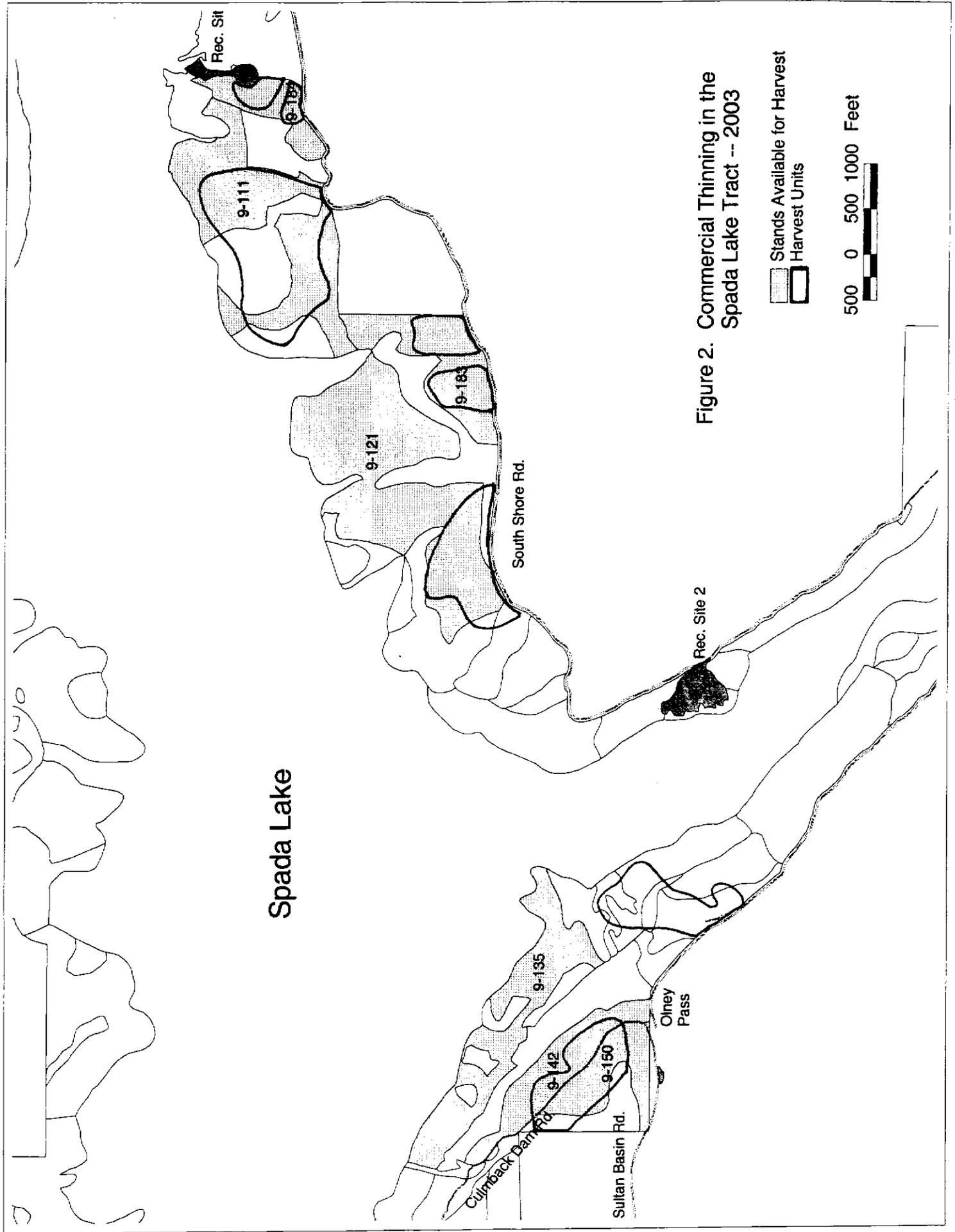


Figure 2. Commercial Thinning in the Spada Lake Tract -- 2003

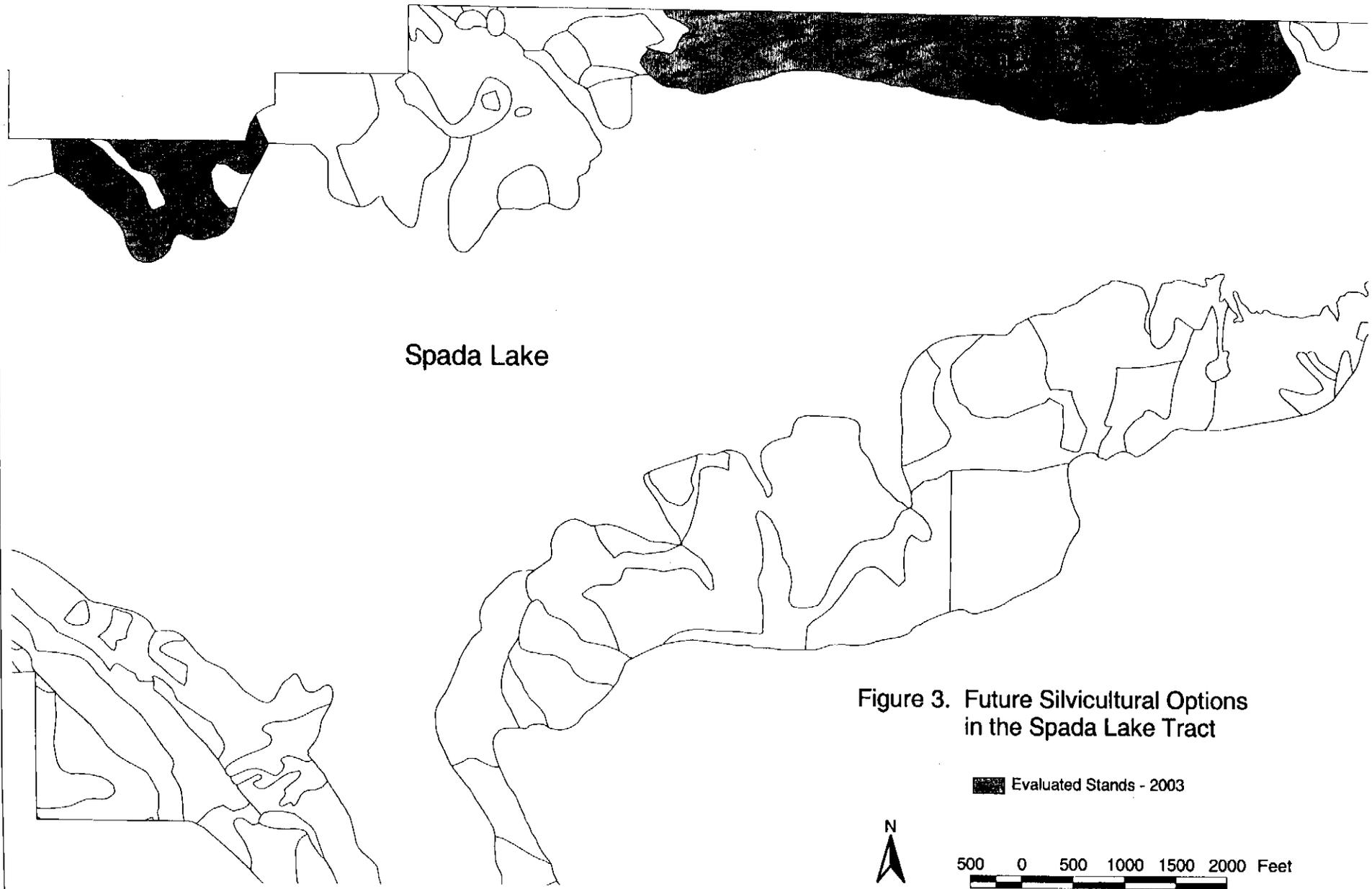


Figure 3. Future Silvicultural Options in the Spada Lake Tract

█ Evaluated Stands - 2003



500 0 500 1000 1500 2000 Feet

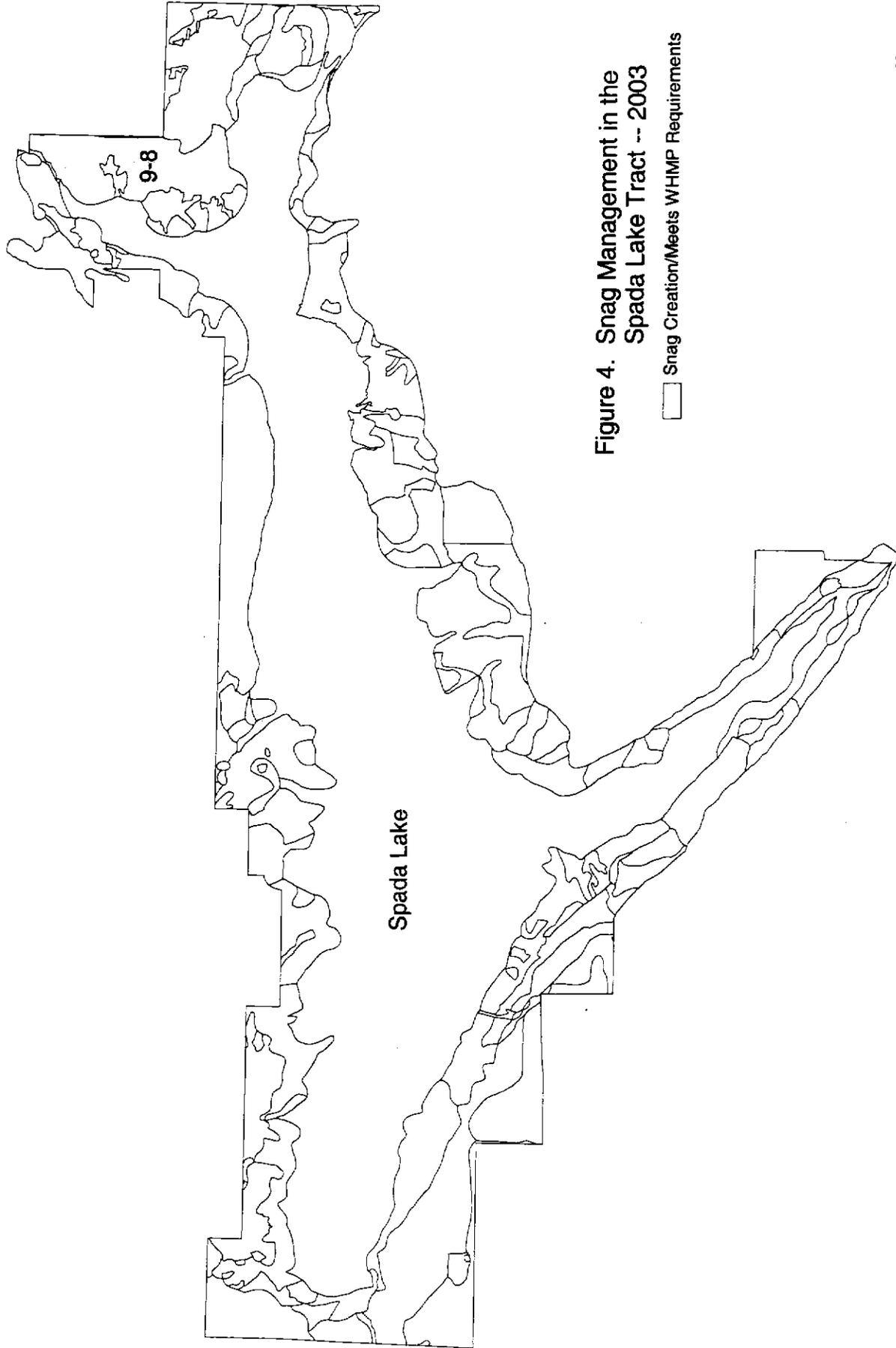


Figure 4. Snag Management in the Spada Lake Tract -- 2003

□ Snag Creation/Meets WHMP Requirements



1000 0 1000 2000 3000 Feet

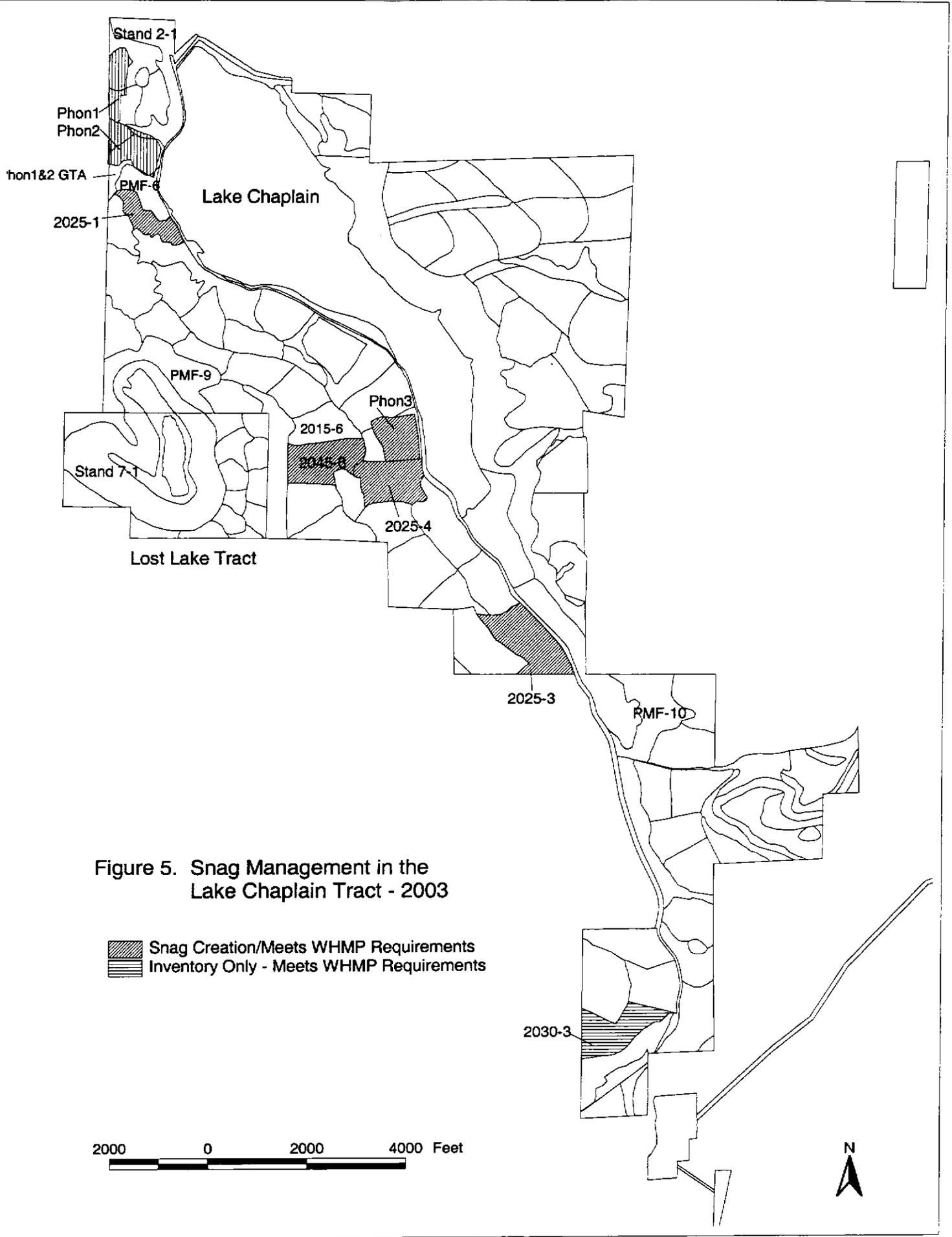


Figure 5. Snag Management in the Lake Chaplain Tract - 2003

 Snag Creation/Meets WHMP Requirements  
 Inventory Only - Meets WHMP Requirements

2000 0 2000 4000 Feet



approximately ¼ acre in size. A selected set of these gaps will be monitored in the future to evaluate the effect on understory growth and rate of canopy closure. This option will likely be utilized in other stands on the Spada Lake Tract where thinning is not feasible and snag creation is required.

For the Lake Chaplain Tract, inventory and creation were completed on 7 units totaling 164 acres and requiring creation of 240 snags (Table 1 and Figure 5). Several of the units where snag creation occurred are scheduled for harvest activity in 2025, so this was the last entry until the units are set up for harvest. Snag trees were created in Phon3, a unit that was set up for harvest in 2002. As described in the 2002 Annual Report, no snag trees will be created in Phon1 and Phon2, and the existing snag inventory in the 5 acre GTA adjacent to Phon2, plus some snags along the western edges of Units 1 and 2 may meet the requirements for snags in the two harvest units. If not, additional snags may be created in the GTA, the wetland buffer zone adjacent to Unit 1, or the area northeast of Unit1.

**TABLE 1. SUMMARY OF SNAG MANAGEMENT ACTIVITIES IN 2003**

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
<b>Lake Chaplain Tract</b>						
2025-1	28.0	24	16.5	65.4	4.1	√ Includes natural and created snags
2025-3	31.7	86	17.4	65.0	3.9	√ Includes natural and created snags
2025-4	26.0	49	17.0	66.9	4.2	√ Includes natural and created snags
2030-3	21.0	0	17.2	70.8	6.8	√ Includes natural snags only
2045-6	14.0	15	17.8	70.1	3.8	√ Includes natural and created snags
Donk1-02	24.0	8	17.1	65.3	3.1	√ Includes natural and created snags
Phon3	19.0	58	16.5	66.6	3.1	√ Includes natural and created snags
<b>Spada Lake Tract</b>						
Stand 9-8	106.0	196	15.2	60.5	3.3	√ Includes natural and created snags
<b>Williamson Creek Tract<sup>1</sup></b>						
Stand 10-6	133.4	0	31.3	34.6	12.3	√ Includes natural and created snags
Stand 10-7	68.8	0	29.3	38.5	11.1	√ Includes natural and created snags
Stand 10-8	8.5	0	31.0	43.8	9.0	√ Includes natural and created snags
<b>TOTALS</b>	<b>480</b>	<b>436</b>	Totals for those 11 units with snag management in 2003			
<sup>1</sup> Old-growth stand; will not have pro-active snag management						

### 3.3.2 Long-Term Snag Monitoring

Created snags and a few naturally occurring snags of known age were monitored to track decay processes and use by wildlife on harvest units and forested stands at Lake Chaplain and Lost Lake. Snags in the following units were revisited in 2003: Stands 2-1, 7-1 (part), unit 2015-6, PMF-9 and PMF-10 (Figure 5). Results were tabulated and added to records obtained in previous years.

## 3.4 REVEGETATION

### 3.4.1 Powerhouse Site

Ten mast/fruit tree groups and ten shrub/tree groups were established near the Powerhouse in 1993 and 1994. Earlier plantings were described in the 1993 Annual Report and the 1997 Annual Report. Planted species included Oregon ash, western crabapple, black hawthorn, red-flowering currant, serviceberry, Nootka rose and red huckleberry. Five cascara, eight crabapple and one serviceberry were added in the shrub/tree groups in April 1997, and numerous volunteer shrubs and trees grew on the site, including Red alder, Douglas fir, Buddleia, thimbleberry, salmonberry, and willow spp. The plantings were monitored annually through 1998, as reported in previous Annual Reports, and in 2003 (Table 2). Some species (serviceberry, red flowering currant and huckleberry) did not perform well at this site, which has dry compacted, rocky soil. Some additional shrubs were planted in 2003 to fill in the shrub/tree groupings and experiment with different species, as follows: 10 black hawthorn, 20 serviceberry and 20 tall Oregon grape.

**TABLE 2. CONDITION OF TREE AND SHRUB GROUPS AT POWERHOUSE**

Species	No. Planted (1993, 1994, 1997)	No. Present in 2003	Condition of Plants
Crabapple	47	35	E: 4, G: 13, F: 7, P: 11
Oregon Ash	14	7	E: 4, G: 3
Black Hawthorn	26	15	E: 2, G: 4, F:8, P: 1
Red flowering currant	33	1	F: 1
Serviceberry	53	11	G: 2, P: 9
Nootka rose	32	TNTC	E: 4, G: 5, F:19 +TNTC, P: 7
Red huckleberry	43	8	E: 1, F: 2,P: 5
Cascara	5	1	P: 1
E – excellent, G -- good, F – fair, P – poor TNTC – too numerous to count			

### 3.4.2 Pipeline ROW

No active revegetation occurred on the pipeline ROW in 2003. Currently, there are numerous areas where native vegetation such as spirea, salal and thimbleberry are spreading onto the fringes of the ROW from the unmaintained portion. Some of these areas were flagged off prior to mowing in the late fall to allow them to become established. This type of encouragement will be monitored and will likely continue on additional areas of the ROW in 2004.

Of the shrubs planted in previous years, the roses (Nootka, swamp and rugosa) and red-osier dogwood appear to be establishing the best. Other species, such as ocean spray, ninebark and serviceberry are surviving, but not growing rapidly. Additional plantings may be considered in the future, but currently, the favored method of re-establishing shallow rooted shrubs will be to allow them to encroach from the fringes of the ROW and protect them from mowing.

Noxious weeds are monitored and controlled on an annual basis. To date, the only noxious weeds found on the ROW are Scotch broom and tansy ragwort. In each case, their locations, general descriptions of the severity of infestation, and control efforts have been noted to assist in monitoring efforts.

Annual photo documentation along the ROW was performed again in 2003, to provide an illustration of the changes that have occurred over time and through different management strategies.

## 3.5 NEST STRUCTURES

### 3.5.1 Floating Nest Platforms

District biologists monitored the two platforms at Lost Lake (Figure 6) and the one platform on the Williamson Creek Arm of Spada Lake (Figure 10) when they were conducting other activities on the tracts. The missing platform from Williamson Creek that was found submerged in 2002 was dug out and moved to the North Fork. The platform ended up on land most of the summer because of low water levels and will be moved further out into the reservoir in spring. In March 2003 new floats were installed on the platform at the south end of Lost Lake. The overgrown vegetation in the center of both platforms on Lost Lake was cut and piled and the tall vegetation was left around the periphery. Remnants of an old goose egg were found on the platform at the south end of the lake at that time. District biologists did not observe wildlife use of the floating platforms in 2003.

### 3.5.2 Nest Boxes

The nest boxes at Lost Lake (Figure 6), Spada Lake (Figure 7 and 8), and Lake Chaplain (Figure 9) tracts were maintained and monitored by District staff during the 2003 nesting season. Two boxes were added at Lost Lake and one box was added at Chaplain Marsh. 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).

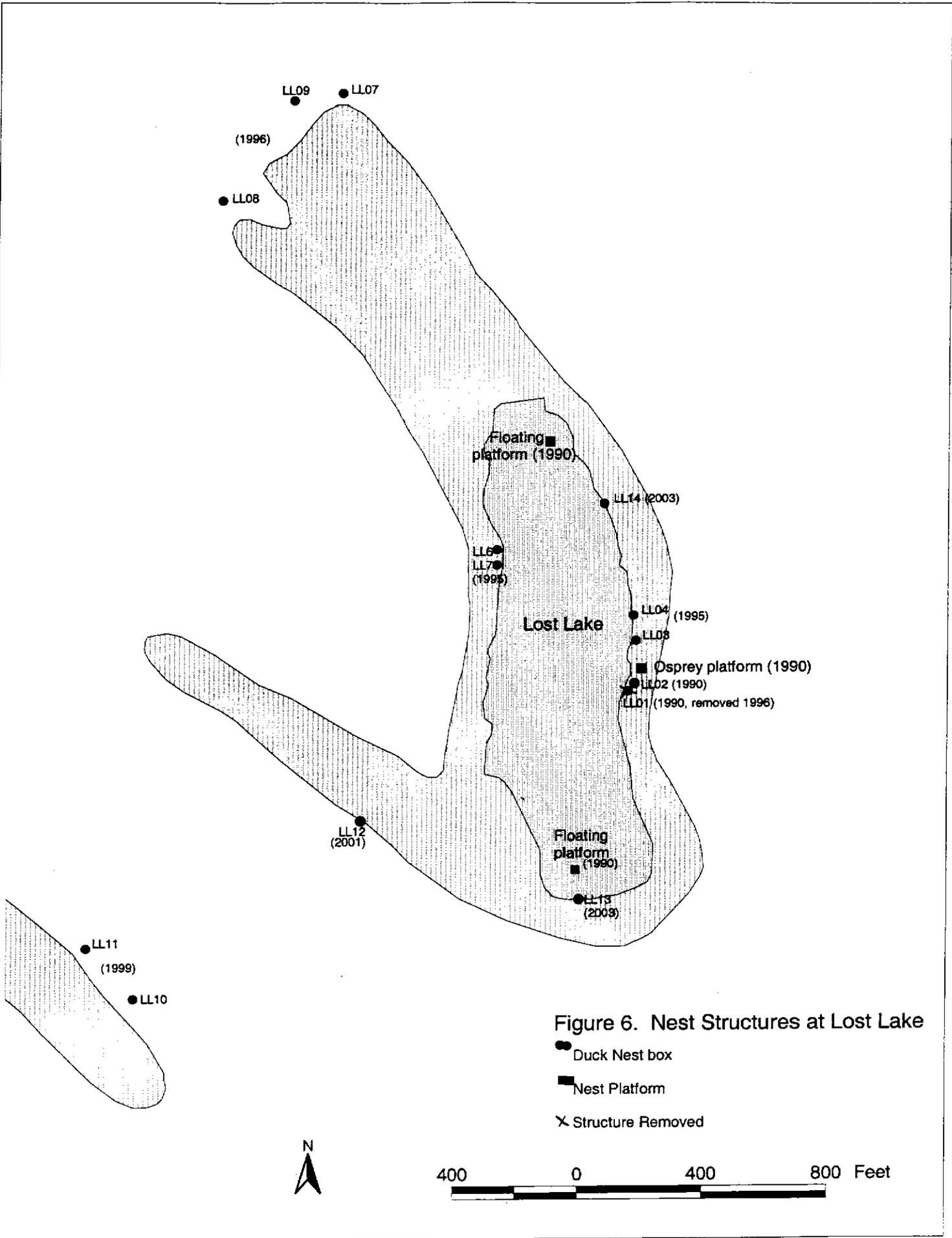


Figure 6. Nest Structures at Lost Lake

- Duck Nest box
- Nest Platform
- X Structure Removed



Figure 7. Nest Structures at East End Spada Lake

- Duck Nest Box
- Nest Platform
- X Structure Removed

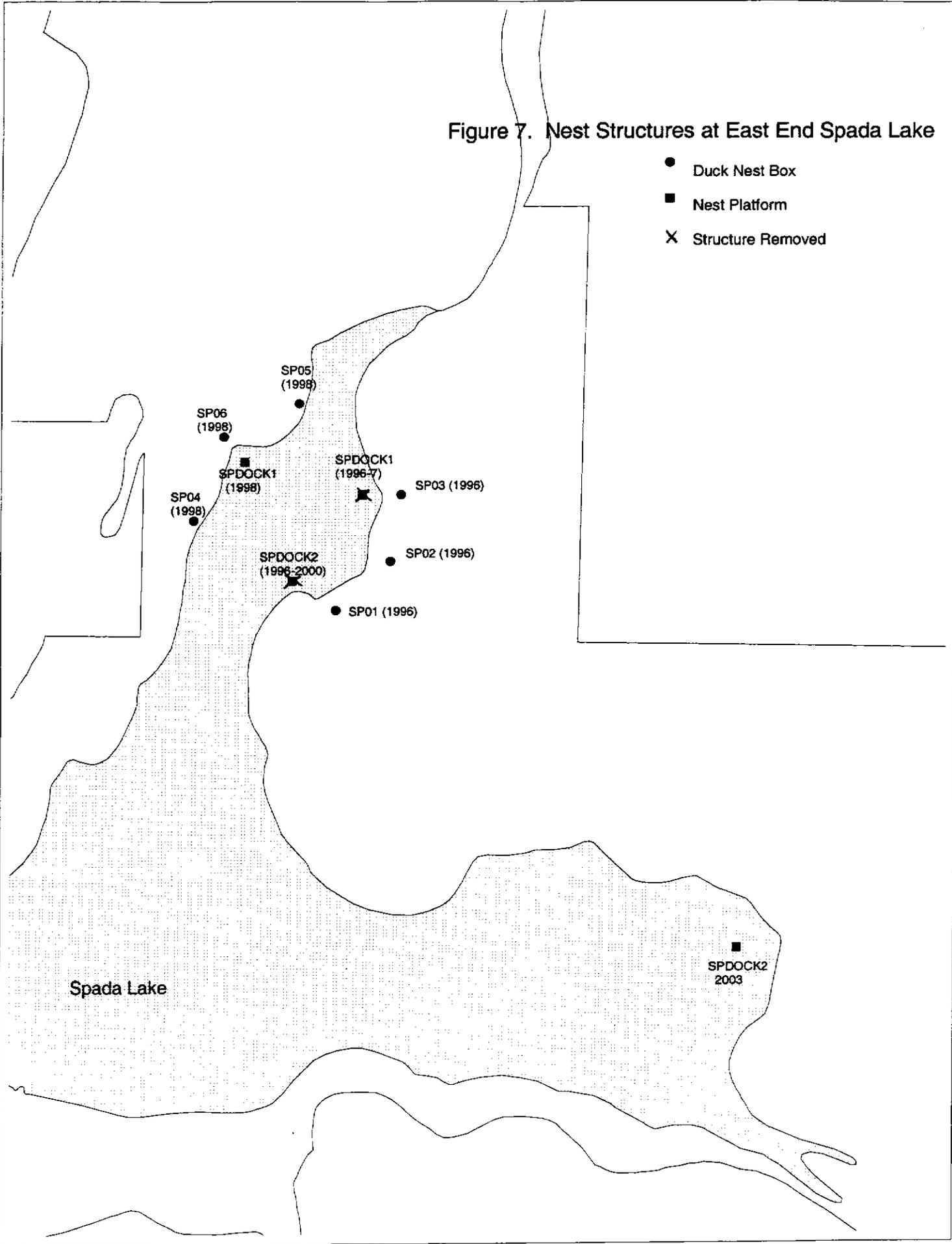
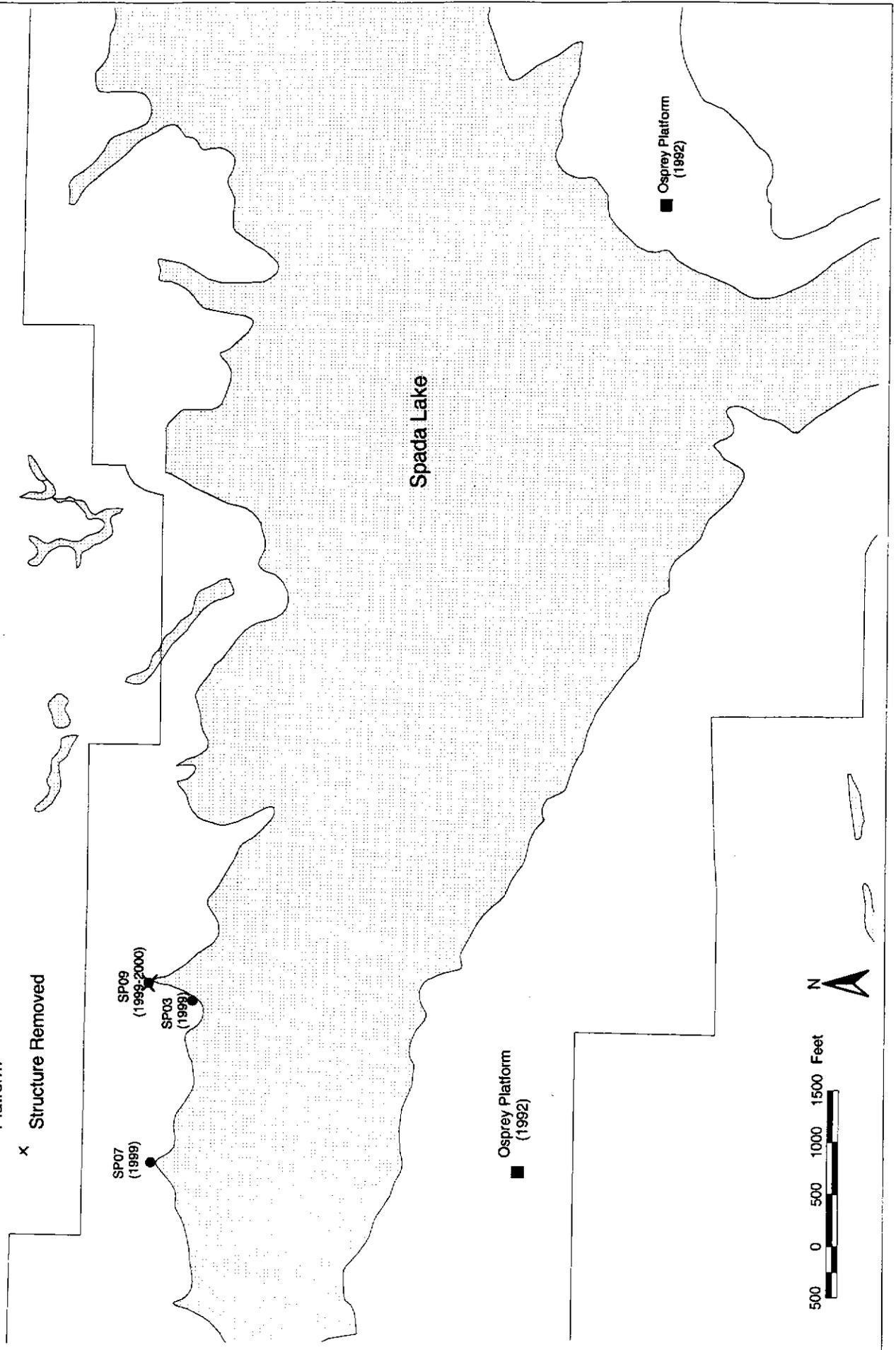


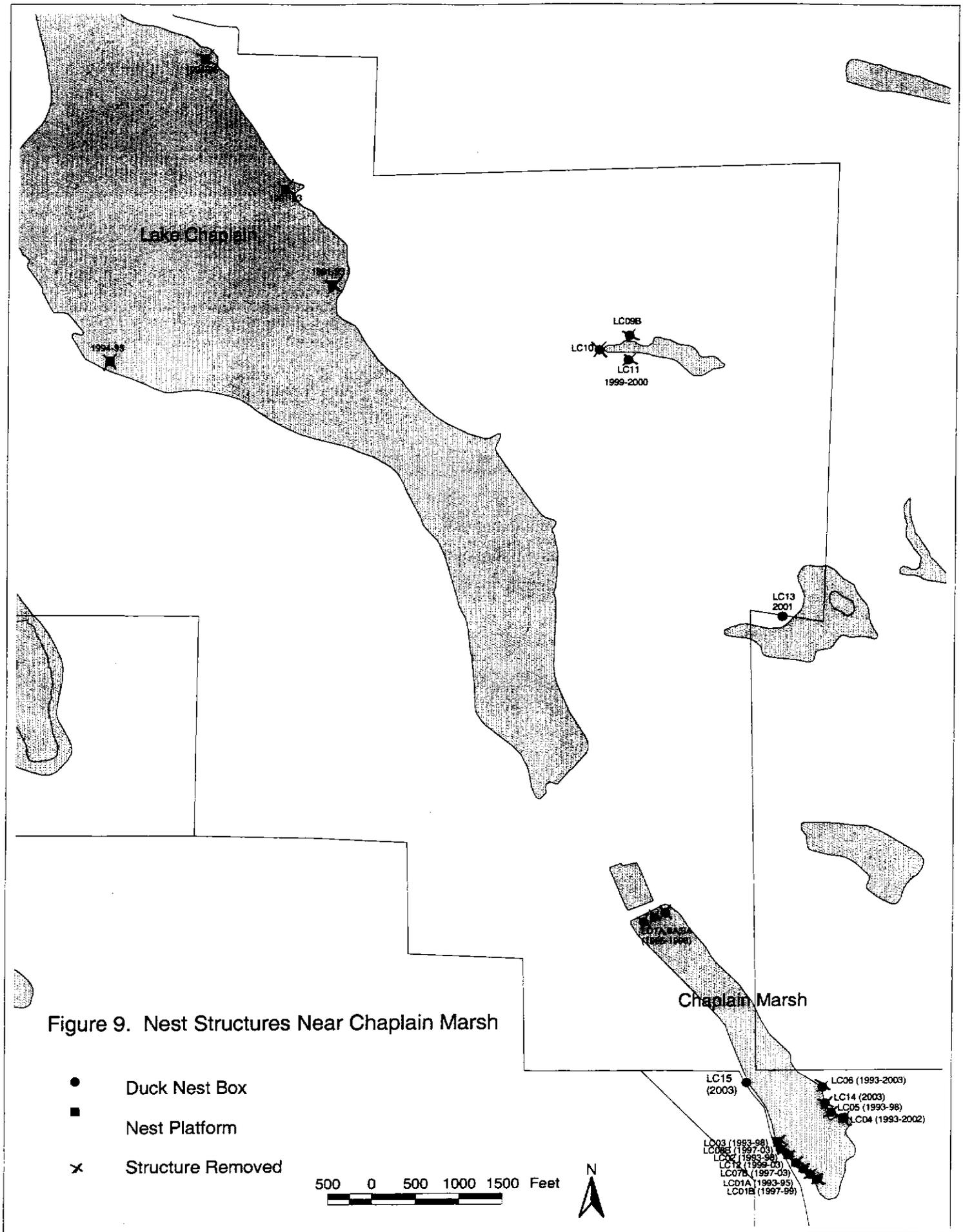
Figure 8. Nest Structures at West End Spada Lake

● Duck Nest Box

■ Platform

x Structure Removed





Nesting results are summarized in Table 3. In 2003, wood ducks used three of the nest boxes at Lost Lake and hooded mergansers used three. Hooded mergansers used at least two of the boxes on the Lake Chaplain Tract. The shell fragments could not be identified by species in two of the boxes. Five of the boxes showed signs of predation and damage by bear. Three of those had eggs in them. Based on the condition of the eggshell fragments, membranes and nesting material present, these boxes appear to have been damaged after fledging. One of the boxes at Spada Lake had 12 bufflehead eggs in it. Five boxes at Lost Lake and three boxes at Spada Lake had squirrel nests in them. One of those nests was occupied by two flying squirrels. Two of the boxes with squirrel nests in them also had eggs in them and one of those boxes was successful.

In 2003, seven of the 27 boxes were used successfully with 14 wood ducks and 10 hooded mergansers hatched. Last year 22 wood ducks, seven bufflehead and 8 mergansers were hatched out. Overall, nest box success was about 26% in 2003, down from 29% in 2002. The same numbers of boxes were successful in 2002 and 2003; however, three new boxes were added in 2003. Two of those boxes (at Lost Lake) were used by wood ducks. Every year the Spada Lake boxes bring down the success rate, possibly because other habitat conditions there are poorer, such as forage and hiding cover. This year one of those boxes was used by bufflehead.

<b>Site</b>	<b>Number of Boxes</b>	<b>Number of Boxes with Duck Eggs</b>	<b>Number of Successful Boxes</b>	<b>Number of Eggs Hatched by Species</b>	<b>Number of Boxes Used by Other Species</b>
Lost Lake Tract	12	6	3 (25%)	14 wood ducks 5 hooded mergansers	5 squirrel nests
Lake Chaplain Tract	7	4	4 (57%)	5+ hooded mergansers	5 boxes damaged by bear
Spada Lake Tract	8	1	0	12 Bufflehead eggs	1 - 2 Flying squirrels in nest 3 squirrel nests
Totals	27	11	7 (26%)	14 wood ducks 10+ hooded mergansers	15

### 3.5.3 Osprey Nest Platforms

District staff monitored the osprey nest platforms at Lost Lake (Figure 6) and Spada Lake (Figure 9) when they were performing other duties there during spring and summer 2003. Osprey were not observed on any of the platforms in 2003.

### 3.5.4 Bald Eagle Nesting

The bald eagle nest established in 1997 on the Lake Chaplain Tract was occupied by nesting bald eagles in 2003. It appears that one eagle was successfully fledged from the nest. Adult bald eagles were observed at the nest from mid-April until August. A chick/fledgling was observed on the nest in June, July and August.

### 3.6 OTHER WILDLIFE OBSERVATIONS

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

- Osprey in tree, Williamson Creek, 8/5/03.
- Four juvenile buffleheads, Williamson Creek, 8/5/03
- Doe and fawn below Olney Pass on South Shore Road, 8/5/03
- Two osprey flying over Williamson Creek, 8/14/03.
- Bobcat hit by truck near Olney Pass, 5/8/03
- Bobcat on road to Lost Lake, 6/03
- Black bear – numerous sightings around Spada Lake
- Black bear – numerous sightings around Lake Chaplain Tract
- Ruffed Grouse, with chicks near Lost Lake, 5/03, plus other adults sighted
- Bald Eagle on nest at Lake Chaplain, spring/summer/03
- Ruffed Grouse, Pipeline ROW, 6/03
- Cedar Waxwing, near Lost Lake, 6/03
- Turkey Vultures (3), North end of Lake Chaplain Tract, 6/03
- Red-tailed hawk with freshly killed mountain beaver, on C-1000 road, Lake Chaplain Tract, 7/16/03
- Brown Creeper, pair, Lake Chaplain Tract, 6/03
- Common Goldeneye (4), mouth of Williamson Creek, 8/03
- Bobcat, numerous sightings & sign near Lake Chaplain & Lost Lake
- Mallard ducks, numerous sightings on Spada Lake and Lost Lake
- Wood duck chicks, south end of Lost Lake, 6/19/03
- Kingfisher, Chaplain Marsh, 4/03
- Pileated woodpecker, Chaplain Marsh, 4/03
- Loon, near site 4 at Spada Lake, 4/03, heard loon calling from Rec. Site 3, 8/14/03, plus other multiple sightings,
- Otter, North fork area of Spada Lake, 4/03
- Bufflehead, 3 pair, Williamson Creek mouth, 4/03
- Raven, Williamson Creek mouth, 4/03
- Barred Owl, NW corner of Spada Lake tract, 8/03
- Deer, numerous sightings, Lake Chaplain & Lost Lake Tracts
- Cedar Waxwing, 2 pair, Chaplain Marsh, 8/03
- Pied-billed grebe, Chaplain Marsh, 8/03
- Loon, Lake Chaplain, 4/11/03, 4/17/03, 7/16/03, 10/03
- Bufflehead, 4 pair, Lost Lake, 11/03, plus numerous other sightings
- Hooded Merganser, 2 males, Lost Lake, 11/03
- Goldeneye, 2 males, Lake Chaplain, 11/03
- Bufflehead, 2 pair, Lake chaplain, 11/03
- Hooded Merganser, 12+ individuals, Lake Chaplain, 11/03
- Great Blue Heron, Lake Chaplain, 11/03
- Ring-neck, 9 individuals, Lake Chaplain, 11/03
- Pied-billed Grebe, north end Lake Chaplain, 7/16/03
- Bobcat tracks, Williamson Creek area, 12/03
- Coyote, Pipeline ROW, 12/03

### 3.7 BIOSOLIDS APPLICATION

The City of Everett monitored water quality in Chaplain Creek in relation to biosolids applications on units Hors1-93, Hors2-93 and Divr1-95 in 1996 and 2000. 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 through December 2003. Results obtained in 2003 indicate the same patterns of seasonal variations for contaminants, all within the acceptable range, that have been found in previous years. These patterns were reported for fecal coliforms, nitrates and ammonia in the 2002 Annual report, Section 3.10, Figures 12-14).

### 3.8 DEER FORAGE MONITORING

Deer forage availability was sampled in late June-July 2003 on Divr1, (harvested in 1995), and Tiki1 and Tiki2, (harvested in 1998) (Figures 10, 11 and 12, respectively). Eight years after harvest, Divr1-95 still has a dense diverse understory that is dominated by fireweed, bracken fern, various *Rubus* species, grasses and salal. The two Tiki units are now five years post-harvest, and their understory layers have these species in abundance, plus sword fern and moss. Unvegetated areas in all three harvest units have decreased in frequency since the first post-harvest samples.

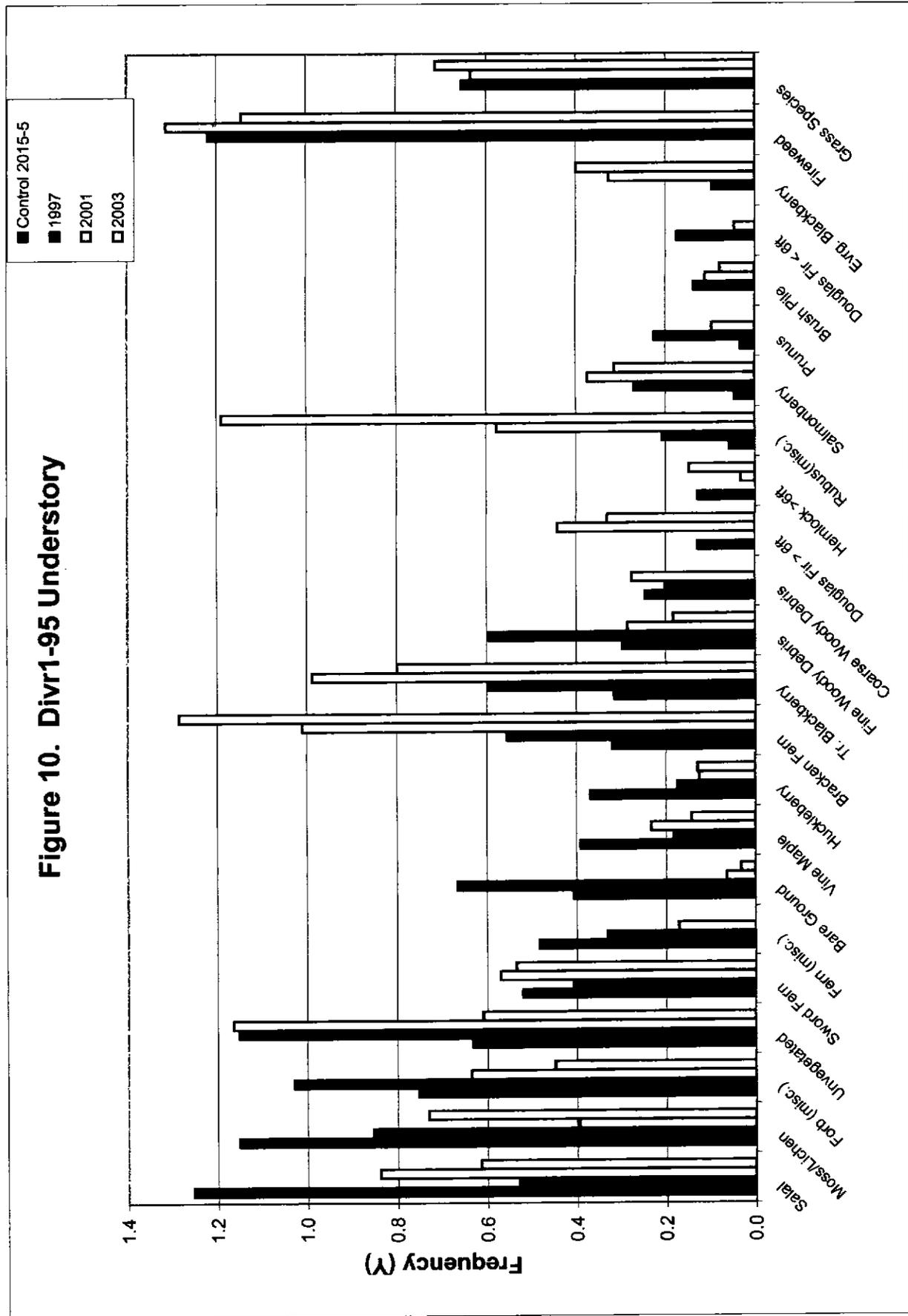
### 3.9 WILLIAMSON CREEK TRACT

In 2003 District biologists collected baseline data (Table 4) for the Williamson Creek Tract on three old growth stands, 10-6, 10-7 and 10-8 (Figure 13). Procedures for data collection are described in the Cumulative Summary, Williamson Creek Tract section of this report. Baseline inventory was completed in all of the old growth stands.

<b>Stand #</b>	<b>Date</b>	<b>Snags</b>	<b>CWD</b>	<b>Understory Vegetation</b>	<b>Photo Doc.</b>
10-6	7/10, 8/5/03	6 transects	6 transects	6 transects	6 transects
10-7	8/5/03	3 transects	3 transects	3 transects	3 transects
10-8	8/5, 8/14/03	2 transects	2 transects	2 transects	2 transects

Results from the 2003 snag surveys on old growth Stands 10-6, 10-7 and 10-8 are summarized in Table 5. In transects inventoried in 2003, the average number of snags per acre in Stand 10-6 ranged from 8 to 14. An average of 7.3 and 9.0 snags per acre occurred in Stands 10-7 and 10-8, respectively. These results were added to the cumulative totals from previous years' data and are shown in Section 4.11, Table 13 of this document.

Figure 10. Divr1-95 Understory



**Figure 11. Tiki1-98 Understory**

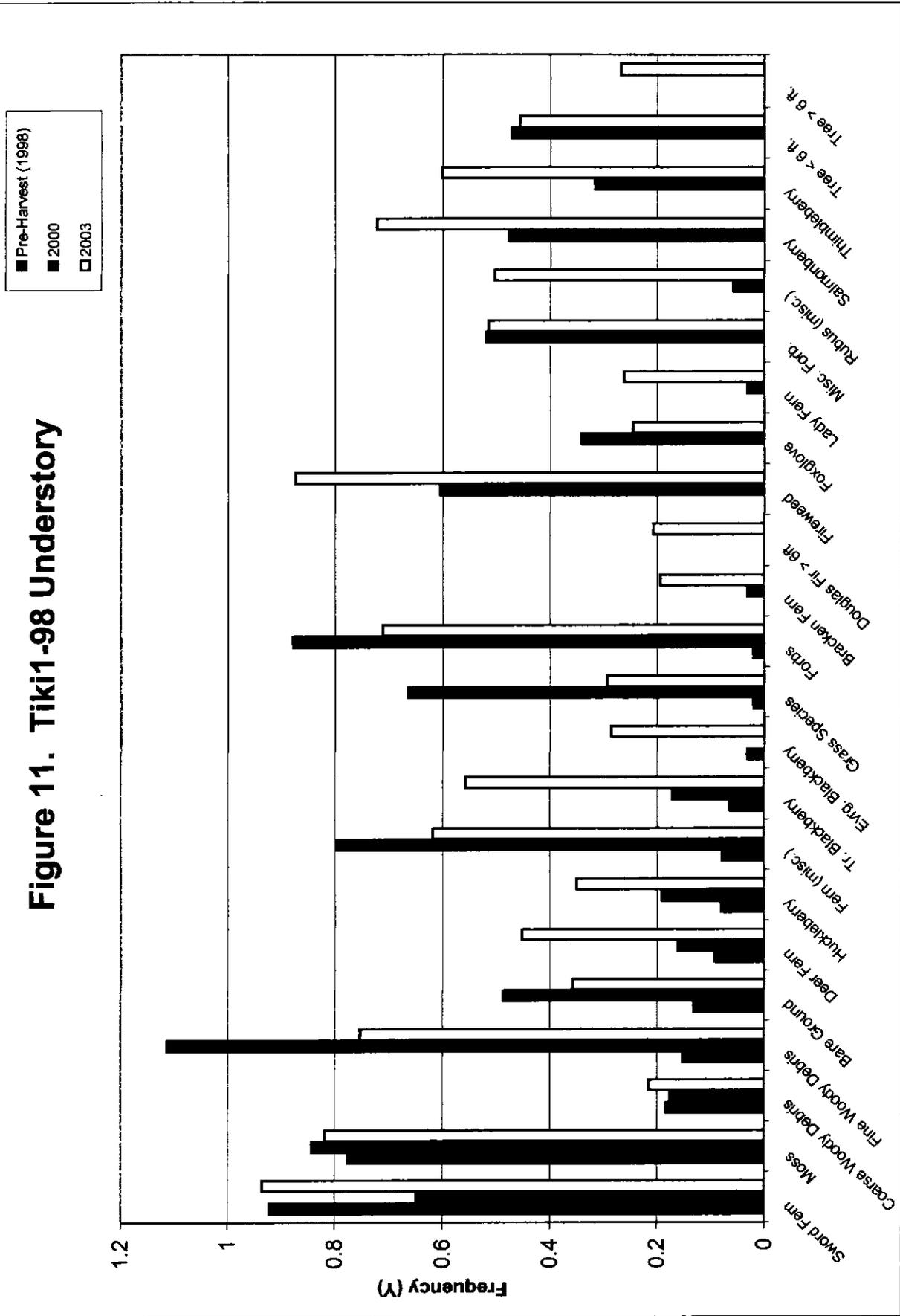
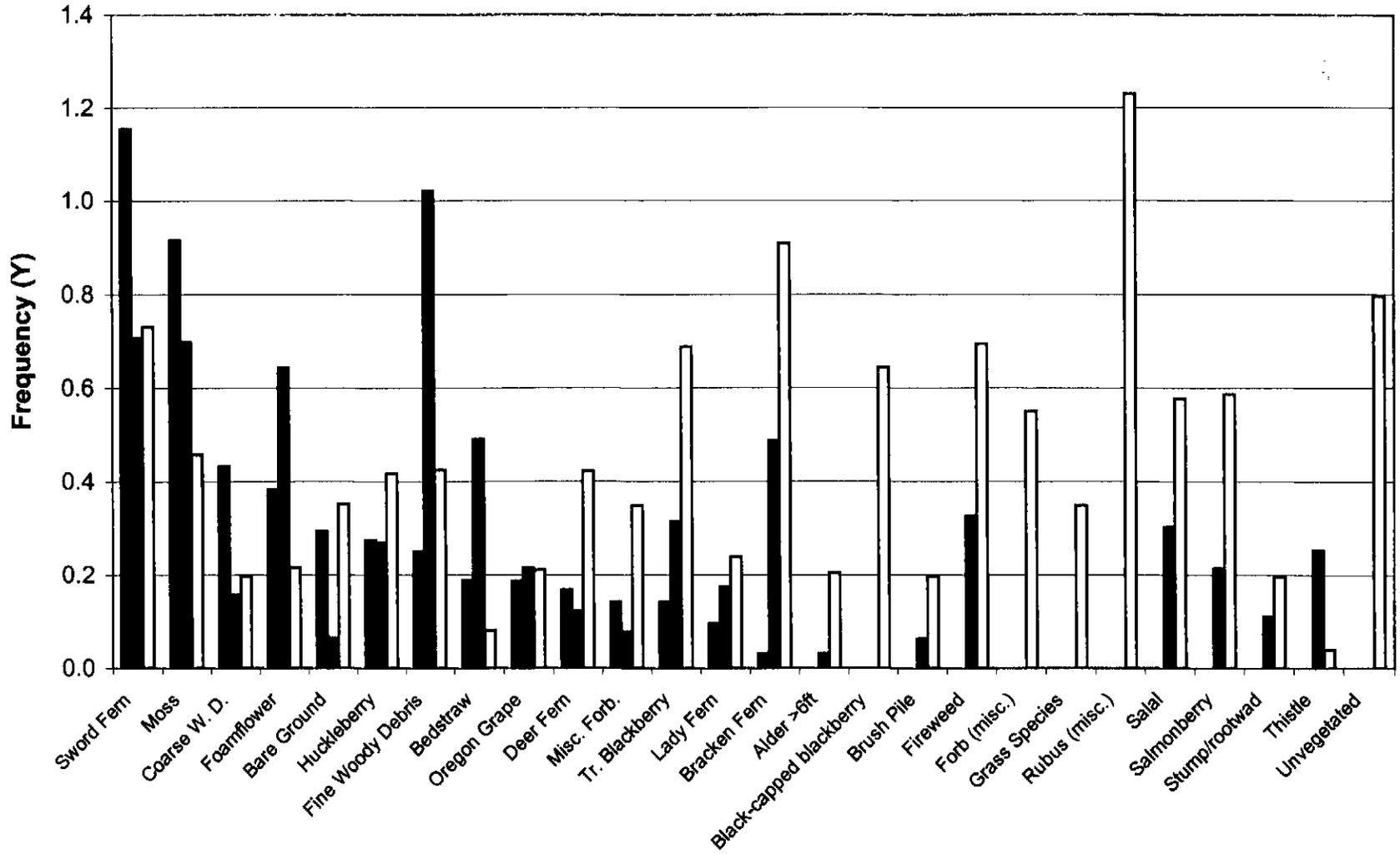
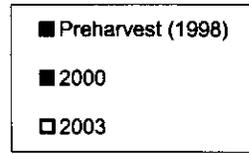


Figure 12. Tiki2-98 Understory



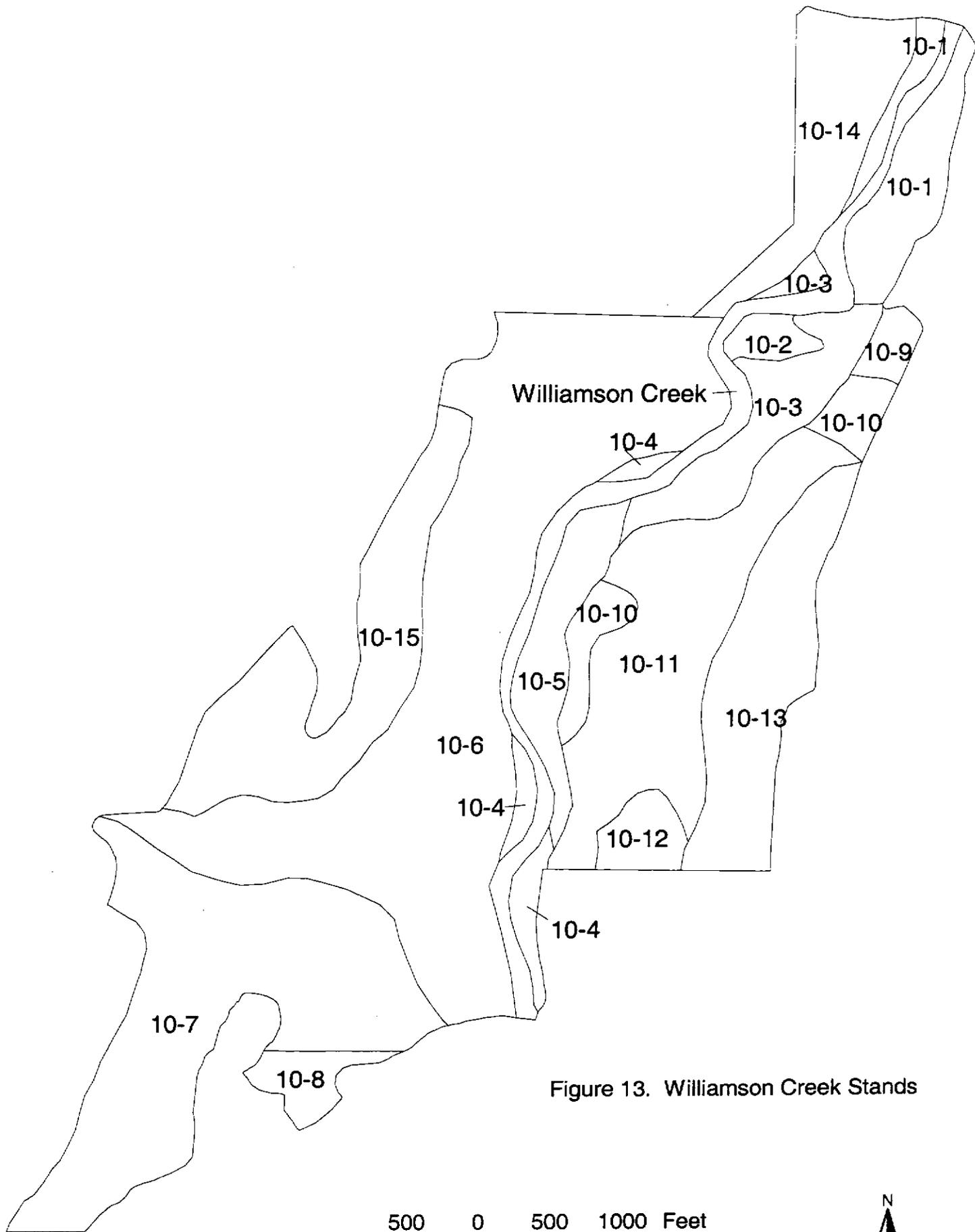


Figure 13. Williamson Creek Stands

500 0 500 1000 Feet



**TABLE 5. WILLIAMSON CREEK 2003 SNAG INVENTORY RESULTS**

Stand #	Transects #	Cover Type	Decay Class	Avg. #/acre	Avg. DBH (in.) <sup>1</sup>	Avg. Height (ft.) <sup>2</sup>
10-6	9 & 10	Old Growth	1 & 2	2.0	27.5	85.0
			3, 4 & 5	9.0	24.3	27.8
			All decay classes	<b>11.0</b>	<b>24.9</b>	<b>38.2</b>
10-6	11 & 12	Old Growth	1 & 2	2.0	36.0	25.0
			3, 4 & 5	12.0	32.6	28.3
			All decay classes	<b>14.0</b>	<b>33.1</b>	<b>27.9</b>
10-6	13 & 14	Old Growth	1 & 2	2.0	15.0	42.5
			3, 4 & 5	6.0	32.5	34.2
			All decay classes	<b>8.0</b>	<b>28.1</b>	<b>36.3</b>
10-7	5, 6 & 7	Old Growth	1 & 2	1.3	36.5	80.0
			3, 4 & 5	6.0	30.2	24.1
			All decay classes	<b>7.3</b>	<b>31.4</b>	<b>34.3</b>
10-8	1 & 2	Old Growth	1 & 2	2.0	38.0	61.0
			3, 4 & 5	7.0	29.0	38.9
			All decay classes	<b>9.0</b>	<b>31.0</b>	<b>43.8</b>

Results of the CWD inventories on Stand 10-6, transects 9 through 14 varied from 14 CDW /acre to 56 CWD/acre (Table 6). Inventory results in 2003 on Transects 10-7 and 10-8 were 21 and 12 CWD/acre, respectively. These results were added to the cumulative totals from previous years' data and are shown in Section 4.11, Table 13 of this document.

In Stand 10-6, transect 12, one 60 foot tall, decay class 4 snag with a DBH of 52 had been topped by a saw. The top of that tree was a 70 foot long CWD. In transect 13 near the end of the transect, large stumps were observed and several small trees were cut similar to a precommercial thin. This is possibly why fewer snags (1) and CWD (7) were encountered along this transect. There were wide, wet drainages which crossed transects 10 and 11 and a dry drainage crossing transect 13, which potentially decreased the number of CWD encountered. 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 (Figures 14 and 15).

<sup>1</sup> Minimum snag diameter recorded in these surveys is 11 inches DBH

<sup>2</sup> Minimum snag height recorded in these surveys is 10 feet.

**TABLE 6. WILLIAMSON CREEK 2003 CWD INVENTORY RESULTS**

Stand #	Transect #	Cover Type	Decay Class	CWD/acre	Avg. Diameter (in.)	Avg. Length (ft.)
10-6	9	Old Growth	1 & 2	6.0	13.3	63.3
			3, 4 & 5	44.0	18.3	27.9
			All decay classes	<b>50.0</b>	<b>17.7</b>	<b>32.2</b>
10-6	10	Old Growth	1 & 2	4.0	23.5	55.0
			3, 4 & 5	28.0	20.5	36.8
			All decay classes	<b>32.0</b>	<b>20.9</b>	<b>39.1</b>
10-6	11	Old Growth	1 & 2	10.0	17.4	51.0
			3, 4 & 5	34.0	22.7	33.0
			All decay classes	<b>44.0</b>	<b>21.5</b>	<b>37.1</b>
10-6	12	Old Growth	1 & 2	4.0	35.5	67.5
			3, 4 & 5	40.0	25.1	38.7
			All decay classes	<b>44.0</b>	<b>26.0</b>	<b>41.3</b>
10-6	13	Old Growth	1 & 2	2.0	12.0	85.0
			3, 4 & 5	12.0	23.8	54.2
			All decay classes	<b>14.0</b>	<b>22.1</b>	<b>58.6</b>
10-6	14	Old Growth	1 & 2	12.0	30.2	66.7
			3, 4 & 5	44.0	23.4	30.2
			All decay classes	<b>56.0</b>	<b>24.9</b>	<b>38.0</b>
10-7	5, 6 & 7	Old Growth	1 & 2	9.0	34.5	42.8
			3, 4 & 5	12.0	24.6	23.5
			All decay classes	<b>21.0</b>	<b>28.9</b>	<b>31.8</b>
10-8	1 & 2	Old Growth	1 & 2	10.0	32.0	60.8
			3, 4 & 5	2.0	17.0	24.0
			All decay classes	<b>12.0</b>	<b>29.5</b>	<b>54.7</b>

**3.10 LAND MANAGEMENT AT LAKE CHAPLAIN**

No land management activity occurred at the Lake Chaplain Tract in 2003.

**3.11 LAND MANAGEMENT ON DISTRICT PROPERTY**

The District continued implementation of its Road Maintenance and Abandonment Plan (RMAP) which includes the roads on the Spada Lake, Williamson Creek, Lost Lake and Project Facility Lands Tracts. Road maintenance was the main focus in 2003. The road from Olney Pass to the dam (CD Road) was brushed out to help prevent debris from clogging the ditches and culverts. Heavy rainfall caused additional problems on the CD road and DNR issued a "non-violation Notice to Comply" to the District. The District hired a geotechnical engineer to prepare a short-term and long-term plan to address



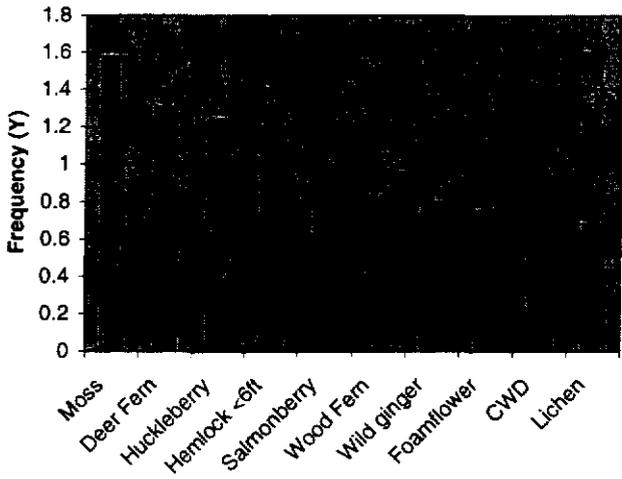
Stand 10-6



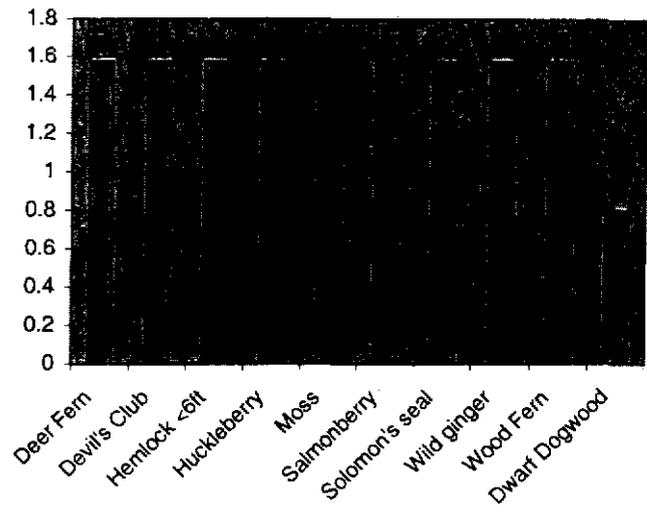
Stand 10-7

Figure 14. Williamson Creek Tract Stands 10-6 and 10-7

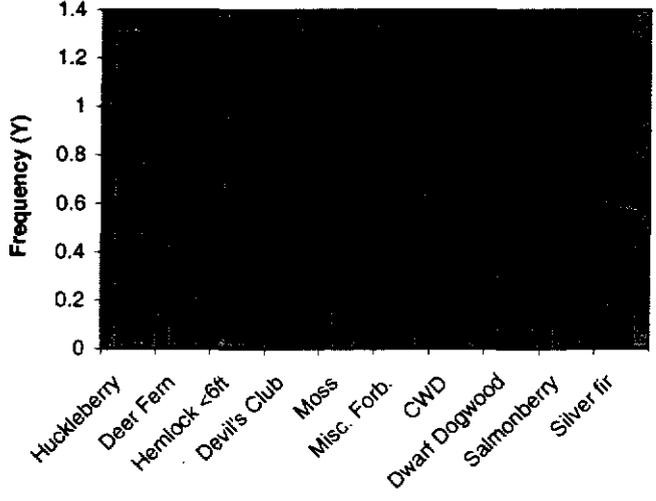
Stand 10-6



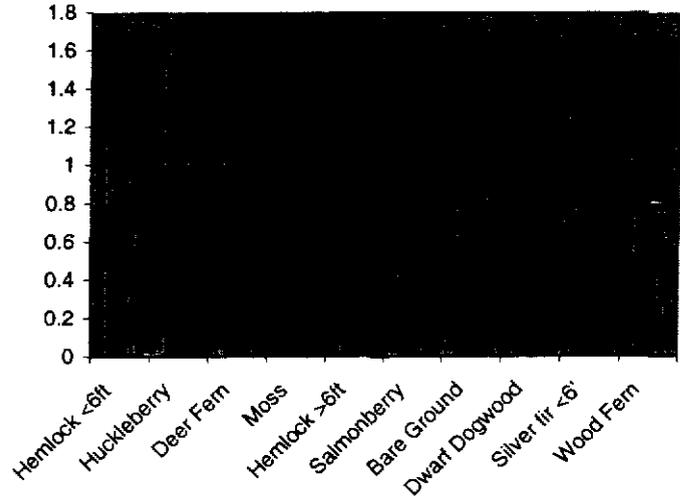
Stand 10-9



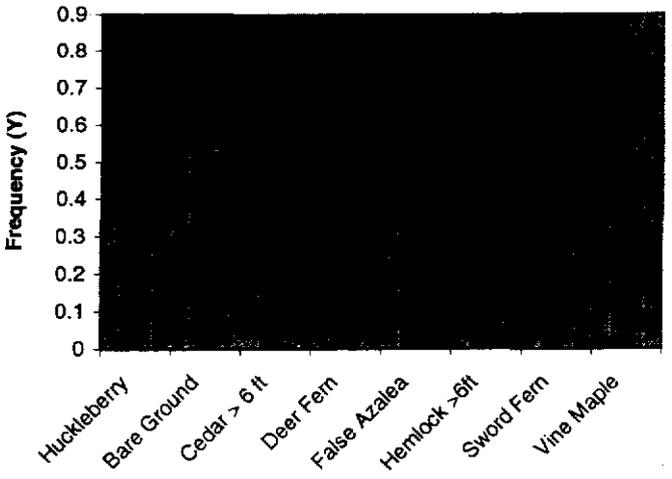
Stand 10-7



Stand 10-11



Stand 10-8



Stand 10-12

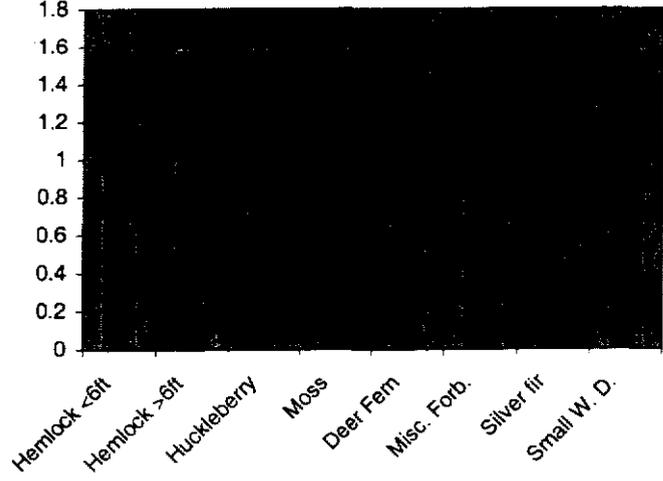


Figure 15. Williamson Creek Old Growth Understory, Most Frequently Occurring Species

issues on that road. The short-term plan was implemented in December of 2003. The required annual report and plan for next year were prepared and submitted to DNR.

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

Heightened security measures at the City's water treatment facilities and the Jackson Project facilities were implemented following the events of September 11, 2001. The electric gate south of the filter plant at Lake Chaplain is kept closed at all times, and the south gate was closed on weekends during 2003.

Public vehicle access to the Spada Lake Tract is controlled by gates at Olney Pass. The South Shore Road gate was opened to allow access to Recreation Sites 2, 3, 4 and 5 and the DNR trailheads during spring, summer and fall, but was temporarily closed in October 2003 to protect logging equipment (see Section 3.2). Restrictions on access to the Culmback Dam area continued through 2003. The Olney Pass gate was locked, and additional gates were constructed. Members of the public that can demonstrate a legitimate right and need to have access to lands on the west-end of the reservoir may obtain limited controlled access by inquiring at the powerhouse.

### **3.13 FERC INSPECTION**

The co-licensees conducted a tour of the WHMP lands and Spada Lake recreation sites for a FERC inspector on May 13, 2003. A summary of the tour and his report are provided in Appendix 2.

## **4.0 CUMULATIVE SUMMARY**

A summary of all activities completed under the WHMP, from the earliest implementation in 1988 through the end of December 2003, 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 16. 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 continued in 2001 and 2002 (Figure 16). The RMAP for the Lake Chaplain Tract was completed in 2002, and implementation is underway.

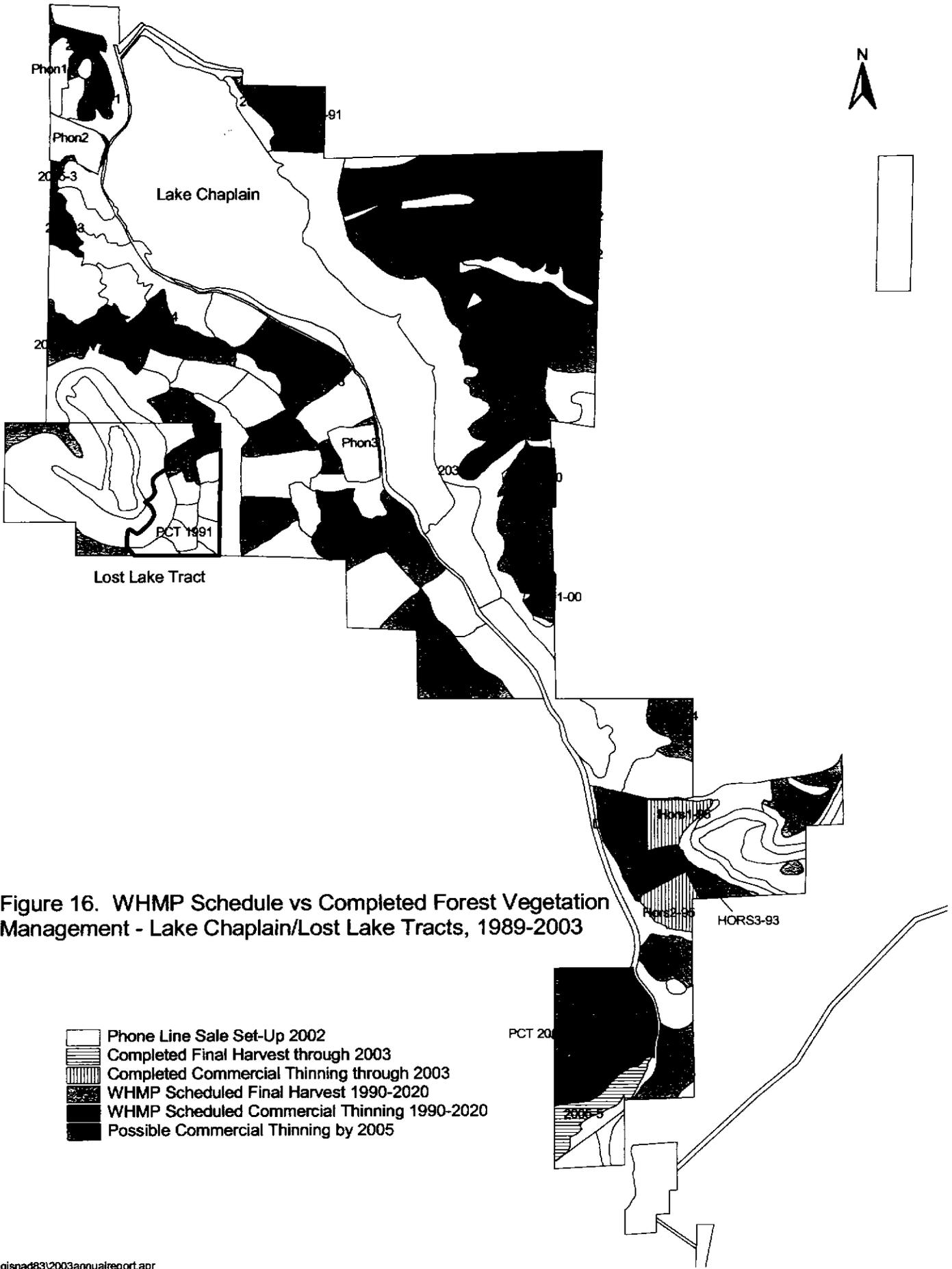


Figure 16. WHMP Schedule vs Completed Forest Vegetation Management - Lake Chaplain/Lost Lake Tracts, 1989-2003

#### 4.1.2 Timber Harvest

Harvest activity to date is depicted in Figure 16. All of the unit boundaries have been reconfigured somewhat from the diagram in the WHMP to improve operational feasibility, reduce impacts to streams and wetlands, and reduce the length of access roads. As part of the process, boundaries of permanent mixed forest stands, stream and wetland buffer zones, and old growth management areas have been established. There have been some substitutions of final harvest units, as summarized below in Table 7. However, the final harvest program complies with the WHMP's schedule and requirements including the restriction on harvest unit size.

<b>New Unit Name (see Fig. 21)</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
Phon1	2000-3 (part) and 2035-2 (part)	Portions of units originally scheduled for FH in 2000 and 2035 reconfigured into Phon1
Phon2	2005-3 (part) and 2035-2 (part)	Portions of units originally scheduled for FH in 2005 and 2035 reconfigured into Phon2 (see Section 3.1.3 of this annual report for details.

Commercial thinning scheduled in the WHMP (Figure 16) 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>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

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

All final harvest units were seeded with a grass/forb mix on bare areas, and replanted with Douglas fir and red cedar seedlings. Road ROW's were also seeded, and access roads outside the closed watershed have been gated to prevent vehicular access by the public. Small timber salvage sales were held associated with final harvest of some units:

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

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

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

Stand 7-4 was precommercially thinned in 1991 and monitored annually through 2000 (Figure 17). The slash has begun to decompose, and access through the stand has gradually improved over time. The shrub layer, especially salmonberry, has responded to the reduction in the tree canopy, and signs of deer browsing have been observed.

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

#### 4.3 FOREST VEGETATION MANAGEMENT (SPADA LAKE TRACT)

The Spada Supplement, a plan for lands surrounding Spada Lake that were acquired in 1991, was approved by the FERC in 1997. The Spada Supplement calls for commercial and precommercial thinning of some forest stands on the Tract. Three young second growth stands (totaling about 30 acres) on the south shore of Spada Lake were precommercially thinned in September 1996. Two second growth stands totaling about 38 acres on the south fork were precommercially thinned in 2000 and two stands totaling about 38 acres in the northeast corner of the property were precommercially thinned in 2002 (Figure 18).

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

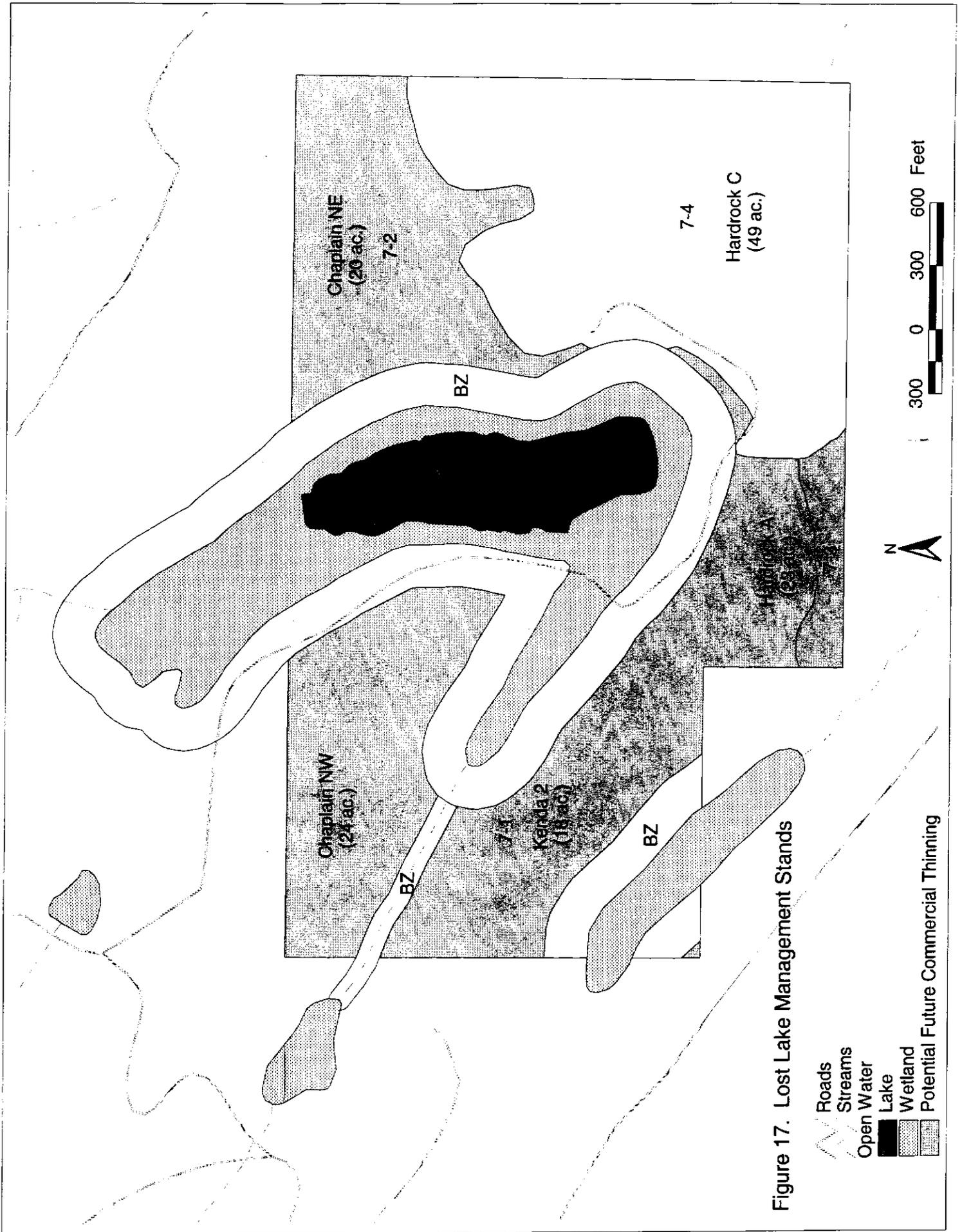
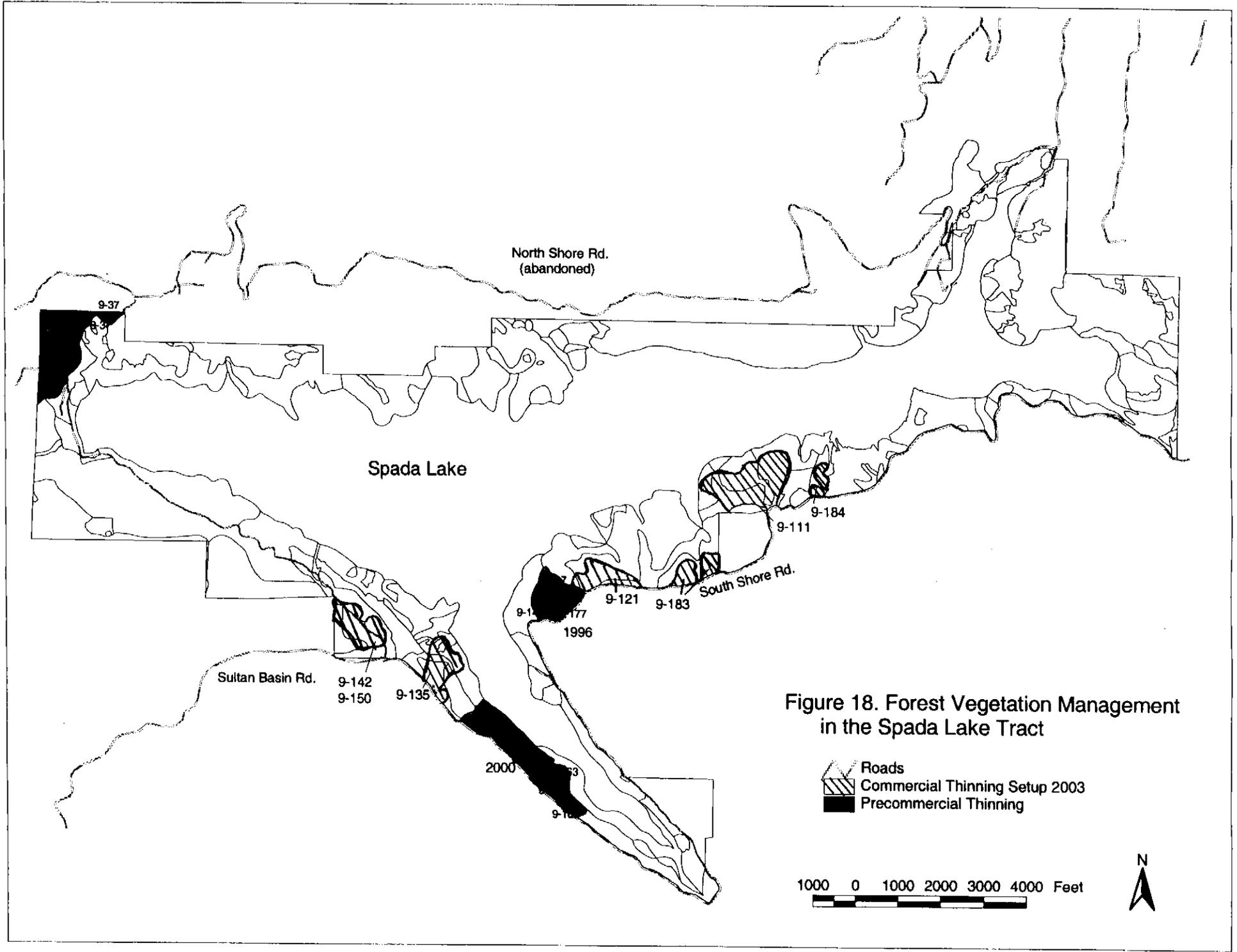


Figure 17. Lost Lake Management Stands



A forestry contractor performed a feasibility study of timber harvest on second growth stands at the Spada Lake Tract that can be accessed by road (see Section 3.1.5 of the 2000 Annual Report). Eight stands were set up for commercial thinning, and Forest Practices applications were approved by the DNR in 2002. Harvest unit boundaries were modified in 2003, following a detailed timber cruise and cost/benefit analysis, and areas requiring road reconstruction and new construction were eliminated from the plan. The modified units were sold in 2003 and logging began adjacent to unit 9-135 in October 2003 (Figure 2).

#### **4.4 SNAG MANAGEMENT**

Figure 19 and Table 9 show all units on the Lake Chaplain and Lost Lake Tracts where snag management activity has occurred to date. Sixty units (1,156 acres) have been inventoried and had all necessary snag creation. Of these 60 units, all but one meets the WHMP snag requirements. The remaining unit (wetland buffer 1) will be completed in 2004.

Snag creation through 2003 that has occurred on the Spada Lake and Williamson Creek Tracts is shown on Figures 20 and 21, respectively, and data are summarized in Table 10. To date, 603 acres on these tracts have had some snag management activity, including inventory and/or snag creation. Old growth stands in the Williamson Creek Tract have sufficient natural snags to meet the WHMP requirements, and snags were created primarily on second growth stands. Fifteen of the 20 stands having snag management activity to date are in compliance with WHMP requirements.

#### **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.

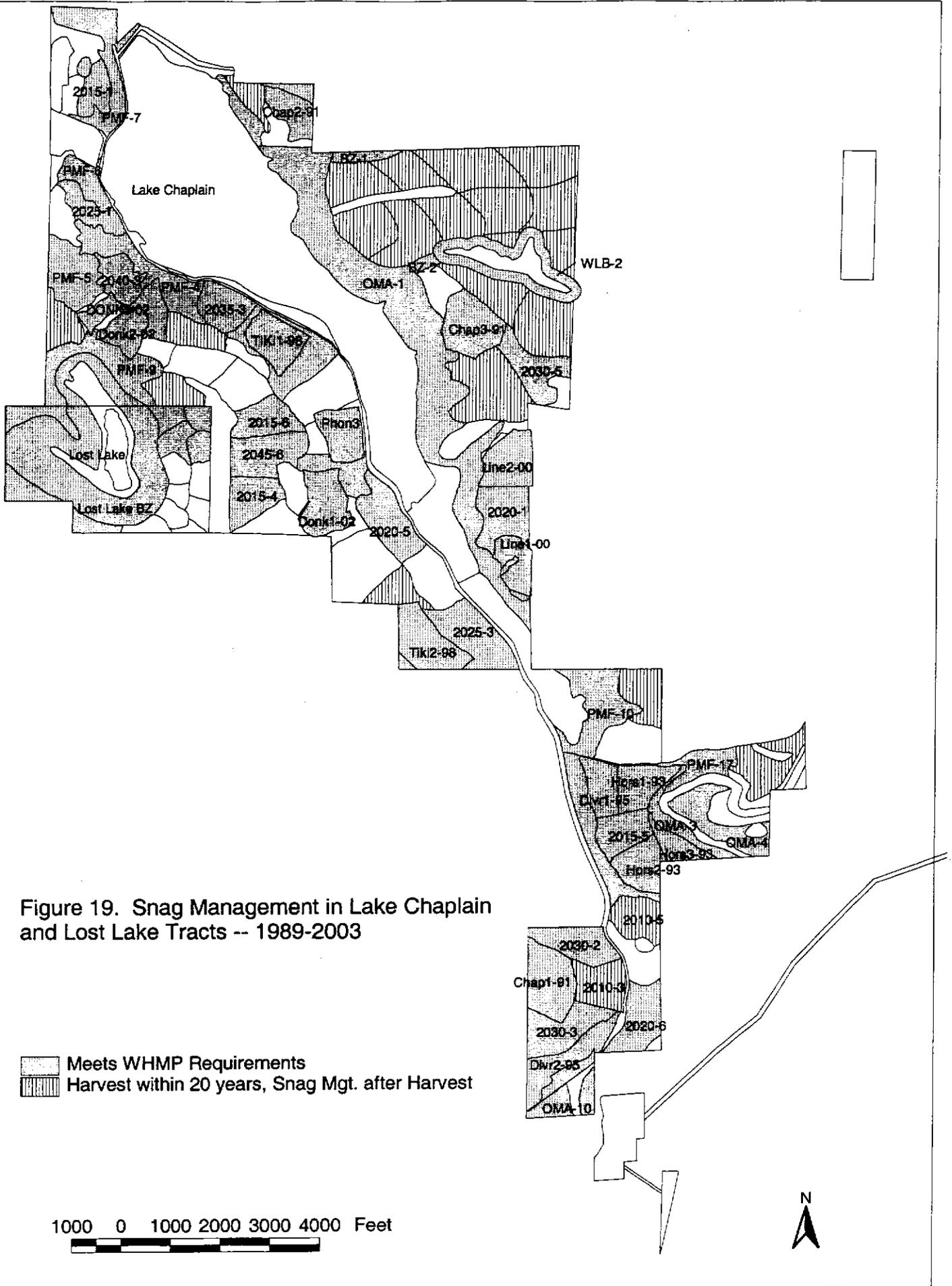


Figure 19. Snag Management in Lake Chaplain and Lost Lake Tracts -- 1989-2003

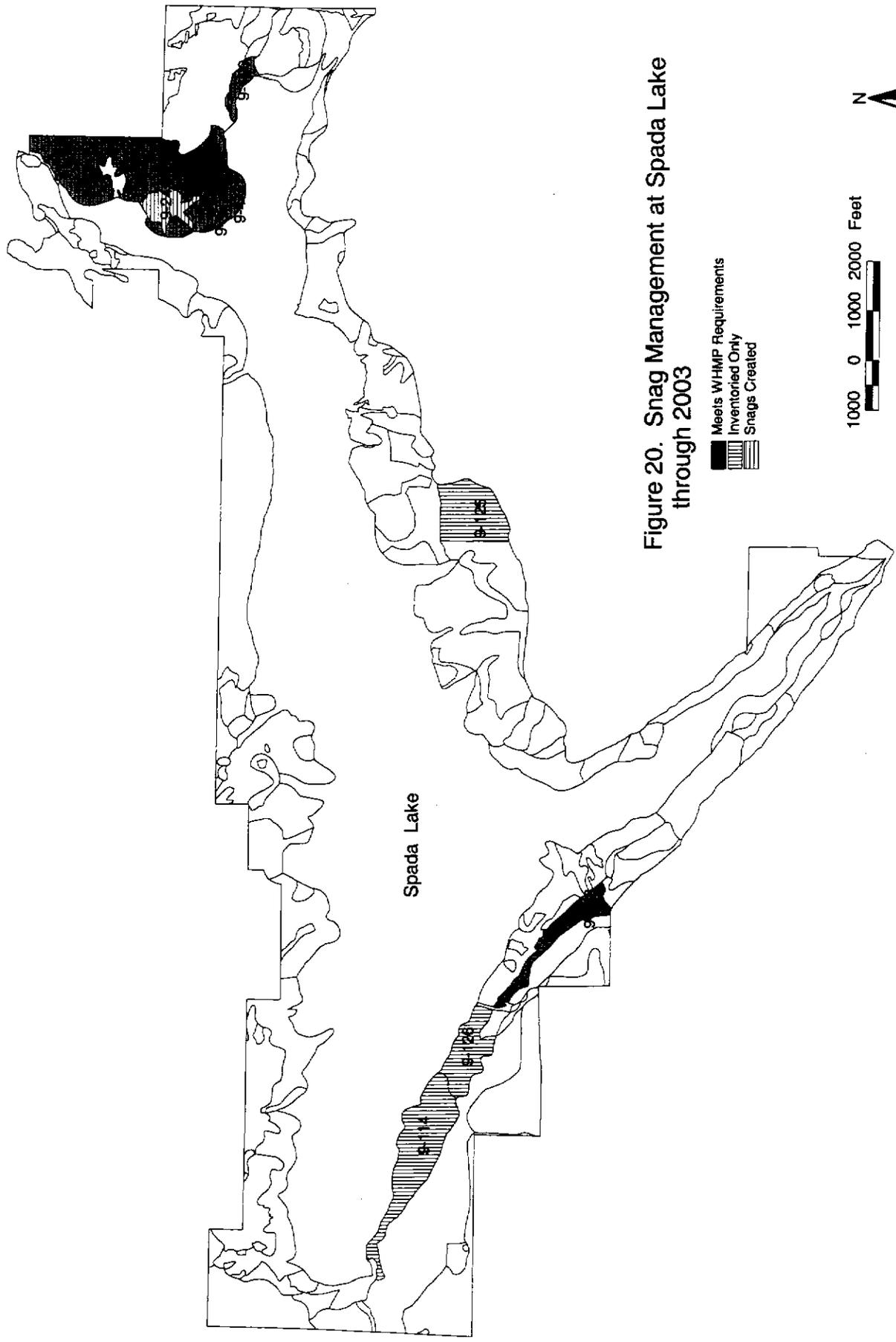


Figure 20. Snag Management at Spada Lake through 2003

- Meets WHMP Requirements
- Inventoried Only
- Snags Created

1000 0 1000 2000 Feet



**Table 9. Summary of Snag Management Through 2003 - Lake Chaplain & Lost Lake Tracts**

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
2025-1	28.0	24	16.5	65.4	4.1	√ Includes natural and created snags
2025-3	31.7	86	17.4	65.0	3.9	√ Includes natural and created snags
2025-4	26.0	49	17.0	66.9	4.2	√ Includes natural and created snags
2030-3	21.0	0	17.2	70.8	6.8	√ Includes natural snags only
2045-6	14.0	15	17.8	70.1	3.8	√ Includes natural and created snags
PHON3	19.0	58	16.5	66.6	3.1	√ Includes natural and created snags
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
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
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

<b>Table 9. Summary of Snag Management Through 2003 - Lake Chaplain &amp; Lost Lake Tracts</b>						
<b>UNIT</b>	<b>ACRES</b>	<b>NUMBER CREATED</b>	<b>AVG. DBH (in.)</b>	<b>AVG. HT. (ft.)</b>	<b># PER ACRE</b>	<b>NOTES</b>
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	17.5	55.6	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
<b>TOTALS</b>	<b>1148</b>	<b>1940</b>	Totals for the 59 units which meet WHMP requirements.			
	<b>1156</b>	<b>1952</b>	Totals for all 60 units having snag management activity to date.			
<b>LOST LAKE TRACT</b>						
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
<b>TOTALS</b>	<b>132</b>	<b>314</b>	Totals for all 3 units having snag management activity to date, all of which meet WHMP requirements for snags.			
<b>BOLD denotes those units where snag management activity occurred in 2003</b>						
√ Meets WHMP requirements for size class distribution and number per acre.						
√1 Fewer than 3.07 snags/acre exist because fewer snags than required were created due to lack of overstory trees in this forested wetland area. Unit will be revisited in 10 years for further snag opportunities. Unit is counted as meeting WHMP requirements.						
√2 Remainder of stand, exclusive of already delineated units.						

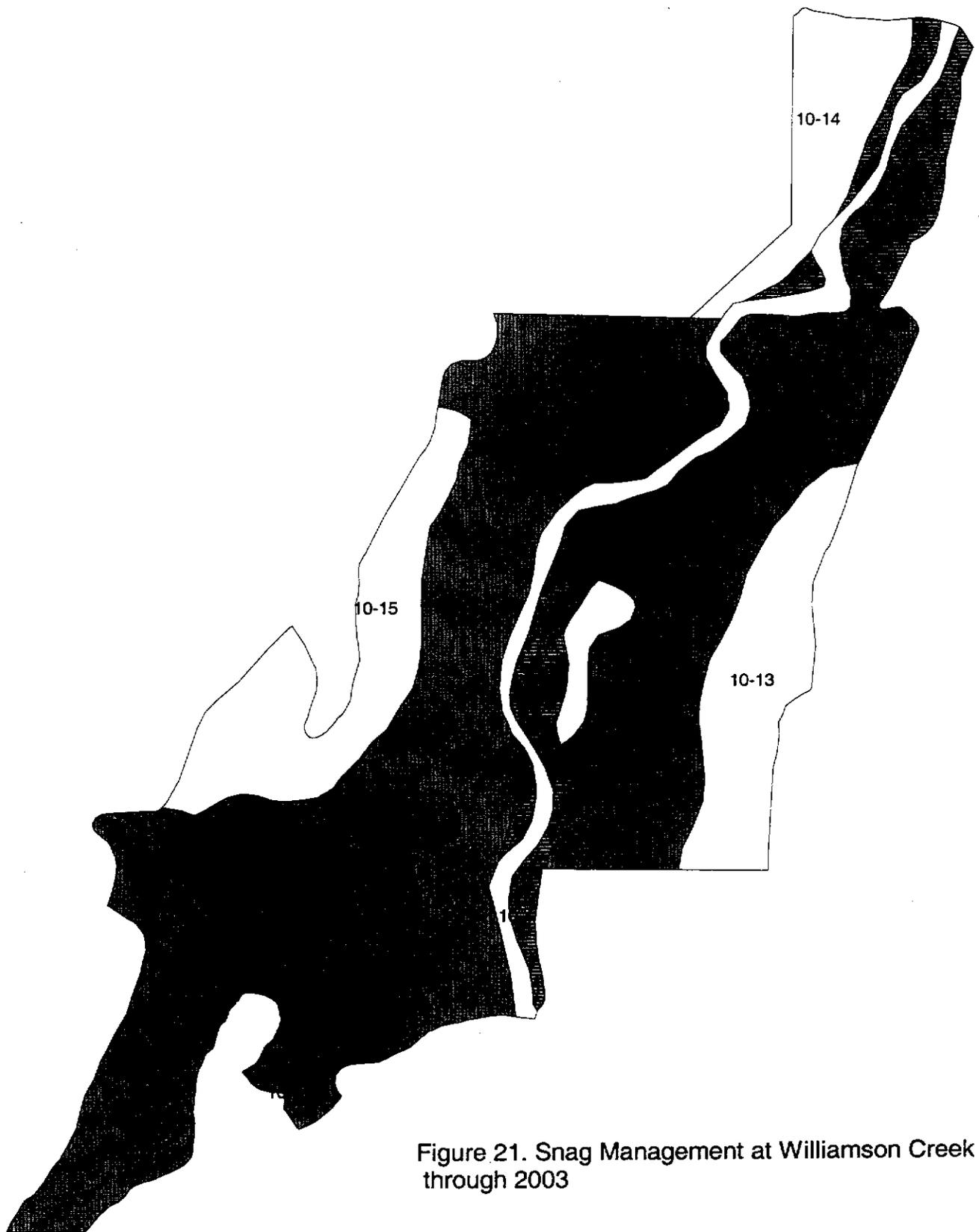


Figure 21. Snag Management at Williamson Creek through 2003

-  Meets WHMP Requirements
-  Inventoried
-  Snag Creation



**Table 10. Summary of Snag Management Through 2003 - Spada Lake and Williamson Creek Tracts**

UNIT	ACRES	NUMBER CREATED	AVG. DBH (in.)	AVG. HT. (ft.)	# PER ACRE	NOTES
<b>SPADA LAKE TRACT</b>						
Stand 9-8	106.0	196	15.2	60.5	3.3	√ Includes natural and created snags
Stand 9-24 <sup>11</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 9-114 <sup>12</sup>	53.0	0	n/a	n/a	n/a	Re-visit in 10 years
Stand 9-125 <sup>12</sup>	33.0	0	n/a	n/a	n/a	Re-visit in 10 years
Stand 9-126 <sup>12</sup>	23.7	0	16.3	44.5	0.4	Natural snags only, re-visit in 10 years
Stand 9-173	20.5	0	34.9	58.8	5.8	√ Natural snags only
Stand 9-180	7.4	14	21.4	65.0	4.2	√ Includes natural and created snags
<b>TOTALS</b>	<b>143</b>	<b>233</b>	Totals for those 5 units which meets WHMP requirements.			
	<b>265</b>	<b>252</b>	Totals for all 9 units having snag management activity to date.			
<b>WILLIAMSON CREEK TRACT</b>						
Stand 10-6 <sup>11</sup>	133.4	0	31.3	34.6	12.3	√ Natural snags only
Stand 10-7 <sup>11</sup>	68.8	0	29.3	38.5	11.1	√ Natural snags only
Stand 10-8 <sup>11</sup>	8.5	0	31.0	43.8	9.0	√ Natural snags only
Stand 10-1 <sup>13</sup>	21.2	68	16.4	57.1	3.2	√ Created snags only
Stand 10-2 <sup>11</sup>	4.2	0	15.1	12.0	1.3	Natural 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 10-9 <sup>11</sup>	3.7	0	24.2	45.0	9.5	√ Natural snags only
Stand 10-11 <sup>11</sup>	50.5	0	32.3	46.0	6.0	√ Natural snags only
Stand 10-12 <sup>11</sup>	6.3	0	30.7	38.3	6.0	√ Natural snags only
<b>TOTALS</b>	<b>334</b>	<b>121</b>	Totals for those 10 units which meets WHMP requirements.			
	<b>338</b>	<b>121</b>	Totals for all 11 units having snag management activity to date.			
<b>BOLD denotes those units where snag management activity occurred in 2003</b>						
√ Meets WHMP requirements for size class distribution and number per acre.						
<sup>11</sup> Old-growth stand; pro-active snag management not required. <sup>12</sup> Trees not of adequate size for snag creation, re-evaluate in 10 years. <sup>13</sup> No natural snags found during inventory.						

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

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

Portions of the pipeline right-of-way where grasses and forbs have been slow to establish naturally have been seeded with a mixture of ryegrasses, fescues and clovers and fertilized. Other management actions include the placement of tree root wads and planting of native shrubs, and placement of rocks and gates to reduce damage by off-road vehicles. The majority of the ROW is now covered with a healthy herbaceous layer. Off-road vehicle disturbance is still an occasional problem, but has been greatly reduced by gates and other barriers.

#### 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 area was reseeded in 2001 following alder removal.

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

#### 4.6.4 Powerhouse Site

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

have grown very slowly. Volunteer species that have done well on this site include non-native *Buddleia sp.* and native thimbleberry, red alder and salmonberry.

## 4.7 NEST STRUCTURES

Figures 6 through 9 of this report show locations of nest structures in existence in 2003, including several that were newly-placed in 2003. Locations of these nest structures and others that have been moved, or were destroyed, in the past are shown in Figures 9, 10 and 11 of the 2002 Annual Report.

### 4.7.1 Required Nest Structures

All of the nest structures that were required by the WHMP have been installed and monitored annually thereafter. In 1990, two floating nest platforms and two duck nest boxes were installed at Lost Lake. One osprey platform was installed at Lost Lake in 1990 and two at Spada Lake in 1992.

### 4.7.2 Floating Nest Platforms

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

The floating platforms have been used for resting and feeding by waterfowl and otters, with the only breeding attempts noted to date being the north platform at Lost Lake in 2001 and possibly the south platform at Lost Lake in 2003. Pied-billed grebe used the north platform at Lost Lake in 2001. The nest was composed of a small amount of down and had two broken creamy white eggs. Remnants of a goose egg were observed on the south platform in March 2003.

### 4.7.3 Nest Boxes

In 2003 there was a total of 27 functional waterfowl nest boxes on mitigation lands. 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 and 2002 overall nest box success was 21% and 29%, respectively. Success was 26% in 2003. Success in 2003 at Lost Lake, Lake Chaplain Tract and Spada Lake was 25%, 57% and 0% respectively.

### 4.7.4 Osprey Nest Platforms

The osprey platform at Lost Lake produced one fledgling in 1994 and one in 1995. Nesting was attempted in 1996, 1997, 1998, and possibly in 1999, but was not successful. It appears the osprey moved to a nest site on DNR land in 1999. No osprey

use of the platform at Lost Lake was observed in 2000 or 2001. Osprey used the platform in 2002, but nesting attempts did not appear to be successful. No osprey activity was observed in 2003.

A nest was partially constructed at the osprey platform near the South Fork Sultan River at Spada Lake during 1994, and in 1995 osprey completed a nest and were observed setting prior to abandoning the nest in June. Nesting has not been observed on the osprey platforms at Spada Lake since then. A nest was actively used from 1996 through 1998 downstream from Culmback Dam. That nesting site was replaced by another nesting site on the same hillside, which was actively used by osprey in 1999. Results for this nest site are *uncertain since 2000, as it is not on project lands and not easily observed.*

#### 4.7.5 Bald Eagle Nest

The bald eagle nest on the east shore of Lake Chaplain has been monitored since nest construction began in 1996 with the following results:

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

A nest site management plan was developed in 1996 by the City of Everett and the Washington Department of Wildlife.

## 4.8 BIOSOLIDS APPLICATION

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

Two water quality monitoring sites were established on Chaplain Creek. Creek waters were sampled monthly beginning in August 1996 through the end of 2001. Parameters examined were nitrates, phosphorus, fecal coliform, ammonia, and chloride. Water quality monitoring has indicated no deleterious biosolids effect on the water quality parameters measured.

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

#### 4.9 DEER FORAGE MONITORING

A revised sampling procedure was finalized in 1997, after several other procedures proved unsatisfactory in previous years. The 1997 procedure has been used in monitoring the following Lake Chaplain Tract units:

Unit Name	Harvest Year	Pre-Harvest Monitoring	Post-Harvest Monitoring		
			1997	1999	2002
Chap1-91	1991	1997 (2010-3)	1997	1999	2002
Hors3-93	1993		1998	2001	
Divr1-95	1995	1997 (2015-5)	1997	2001	2003
Tiki1-98	1998	1998	2000	2003	
Tiki2-98	1998	1998	2000	2003	
Line1-00	2000	1999	2002		
Donk2-02	2002	2001			
Phon3	tbd	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 (Figure 13) has focused on baseline inventories of the stands for snags, CWD, understory vegetation, wetlands and photo documentation. The status of inventorying on each stand is summarized in Table 12. Note that old growth inventory includes snags, CWD, understory vegetation inventory and photo documentation. Wetland monitoring will be conducted at least every five years. Baseline inventory was completed in 2003. Monitoring activities will continue.

Field procedures beyond those described in the WHMP have been developed specifically for the Williamson Creek Tract, as described more fully in the Williamson Creek Standard Operating Procedures (PUD 1999). Baseline surveys were conducted in old growth stands to descriptively characterize snags, CWD and understory vegetation.

Baseline surveys began in 1998 and were completed in 2003. Snags and CWD were inventoried following the standards for sampling these elements on the Lake Chaplain and Lost Lake Tracts. The minimum size for snags was 10' tall and 11" DBH, for CWD it was 10' long and 11" diameter at the large end. On the Williamson Creek Tract, transects were located along reasonably accessible walking routes determined in the field. The goal was to sample enough transects within each stand to provide at least 5 percent coverage. Each transect was 330' x 66' (0.5 acres). Understory vegetation on old growth stands was inventoried by sampling 1/100th-acre circular plots at each end of the snag and CWD transects. Species occurrence was noted and notes were taken describing the biologist's overall characterization of the stand. During the surveys, photos were taken to illustrate stand characteristics that the biologists consider representative of these stands and descriptive notes were taken.

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

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

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

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

<b>Stand #</b>	<b>Cover Type</b>	<b>CWD/ac. (all decay classes)</b>	<b>Avg. Diameter (in.)</b>	<b>Avg. Length (ft.)</b>
10-1	Small Saw/Riparian	3.0	24.3	25.7
10-2	Old Growth	12.9	19.8	63.6
10-3	Riparian/Mixed	4.0	18.8	24.7
10-4	Riparian/Mixed	1.5	27.3	50.8
10-5	Large Saw/Riparian	2.1	19.7	56.5
10-6	Old Growth	38.0	22.8	40.6
10-7	Old Growth	21.1	29.0	49.2
10-8	Old Growth	12.0	29.5	54.7
10-9	Old Growth	52.4	24.0	43.9
10-11	Old Growth	37.6	25.7	41.8
10-12	Old Growth	36.0	24.9	54.7

The WHMP calls for retaining stands 10-3 and 10-5 for late successional stage species. These stands were cover-typed as mixed, deciduous, riparian, and large saw timber coniferous forests in the WHMP, which requires ensuring adequate snags and CWD on these two stands. Snag management and monitoring is required for the life of the plan. The baseline snag and CWD inventories were completed in these two stands in 2000. The average number of snags/acre was 0.4 and 2.8 on stands 10-3 and 10-5 respectively (Table 13). The average number of CWD/acre was 3.9 and 2.1 on stands 10-3 and 10-5 respectively (Table 14). Snag creation was completed for both stands during the

fall/winter of 2001. Twenty-eight snags were created in stand 10-3 and 12 snags were created in stand 10-5 (Table 10). Stand 10-3 had several irregularly distributed pockets of natural snags which were found, and thereby reduced the number of created snags required.

## **4.12 LAND MANAGEMENT**

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

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

In compliance with Washington Forest Practice Rules (WAC 222-24-050 through 052), the District prepared and submitted in 2001, a Road Maintenance and Abandonment Plan (RMAP) Inventory Scheduling Proposal and an RMAP covering all of the District owned wildlife mitigation lands. Implementation of the RMAP began in 2002. Spur roads SL-22, SL-61 and SL67 were officially abandoned in the Sultan Basin under WAC 222-24-052(3). The District hired a geotechnical engineer in 2003 to prepare plans for maintaining the road from Olney Pass to the dam. The City completed its RMAP for the Lake Chaplain Tract in 2002 and obtained DNR approval.

The District and the DNR negotiated a Routine Road Maintenance Agreement in 2001 for roads associated with project mitigation lands in the Sultan Basin. Also in 2001, a supplemental easement was obtained on a portion of road CD-147 (see District RMAP) owned by DNR.

## **5.0 WORK PLANNED FOR 2004**

### **5.1 FOREST VEGETATION MANAGEMENT**

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

The three units of the Phone Line Sale may be sold and harvested in 2004, depending on timber prices. If the sale goes forward, road construction will take place; otherwise the units will be harvested when the timber market becomes more favorable.

Reconnaissance work on the next timber sale, currently unnamed, may begin in 2004. Chap2-91 may 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

Hors3-93 may be evaluated for possible precommercial thinning.

Tree seedlings on all harvested units will be monitored for survival and vigor.

We will complete work on GTA management procedures in 2004, and draft management plans for existing GTAs.

#### 5.1.2 Spada Lake Tract

Commercial thinning of the eight Spada Lake stands described in Section 3.2 will be completed in 2004. Some additional stands may be evaluated for precommercial thinning in 2003 or 2004.

### 5.2 SNAG MANAGEMENT

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

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

### 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

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

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

In 2004, shrub plantings will be monitored to note the condition of surviving plants and to determine if additional plantings are needed. The areas of natural in-growth will also be monitored to assess the value of utilizing this method of revegetation on the pipeline ROW.

Noxious weeds will be controlled as in previous years, with their locations and control efforts noted.

#### 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

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

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

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

### 5.6 DEER FORAGE MONITORING

The following harvest units will be monitored in 2003: Divr1-95, Tiki1-98, and Tiki2-98.

### 5.7 WILLIAMSON CREEK TRACT

Baseline inventories have been completed on the Williamson Creek Tract. Standard Operating Procedures call for monitoring of the wetlands, old growth and mixed forest stands on a continuing, but less intense basis. Monitoring of the wetlands may be conducted on the Williamson Creek Tract in 2004.

## 5.8 LAND MANAGEMENT

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

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

## 6.0 SCHEDULE OF ACTIVITIES FOR 2004

Major Activities	Location	Quantity
Road Construction	Lake Chaplain Tract	Construct road to Phone Line Sale units (tentative)
Final Harvest		
Timber Sale (Phone Line Sale)	Lake Chaplain Tract	3 units (approx. 46.9 ac.) (tentative)
Timber Harvest (Phone Line)	Lake Chaplain Tract	(tentative)
Sale Layout (2004 sale)	Lake Chaplain Tract	TBD
Commercial Thinning		
Timber Harvest	Spada Lake Tract	Units 9-111, 9-120, 9-121, 9-135, 9-142, 9-150, 9-183, 9-184
Harvest Unit Stocking	Lake Chaplain Tract, all previously harvest units	16 units
Monitoring		
Precommercial Thinning setup	Spada Lake Tract	TBD
Snag Creation	Lake Chaplain Tract	1 unit, others tbd
Snag Inventory	Lake Chaplain Tract, Spada Lake Tract	TBD
CWD Creation	Lake Chaplain Tract	Phone Line Sale, Unit 3 (tentative)
Revegetation		
Grass seeding/fertilizer	Pipeline ROW	As needed to improve bare spots
Shrub plantings		
Monitoring		
Revegetation Site Monitoring/Maintenance	West side, Chaplain Marsh North end, Lake Chaplain Powerhouse site Pipeline ROW	Monitoring of all planted/seeded areas. Maintenance as needed: Weeding, brush thinning, etc.
Deer Forage	Lake Chaplain Tract	3 units
Snags	Lake Chaplain, Lost Lake Tracts	Created snag trees
CWD	Lake Chaplain Tract	2 Line Tree units
Nesting Structures	Lost Lake, Spada Lake, and Chaplain Tract	Monitor all structures

<b>Major Activities</b>	<b>Location</b>	<b>Quantity</b>
Wetland Monitoring	Lost Lake, Williamson Creek	All wetlands designated in SOPs
Williamson Creek monitoring		wetlands
Biosolids Application	Lake Chaplain Tract	None planned
Understory monitoring		None planned
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	RMAP implementation
	Lake Chaplain Tract	RMAP implementation

## APPENDIX 1 – WHMP IMPLEMENTATION MILESTONES

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), 2002 (3.1.3, p.4)
	Lake Chaplain	Donkey Damper Sale	1999 (3.1.4, p.5), 2000 (3.1.1, p.4), 2002 (3.1.3, p.4)
	Lake Chaplain	Phone Line Sale	2002 (3.1.3, p.4), 2003 (3.1, p.2)
	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	Donkey Damper Sale	2002 (3.1.2, p.4)
	Lake Chaplain	Line Tree Sale	2000 (3.1.2, p.4)
Roads	Lake Chaplain	S1000 (Chaplain Sale)	1991 (3.3.1, p.6)
	Lake Chaplain	C1300 (Chaplain Sale)	1991 (3.3.1, p.6)
	Lake Chaplain	C1900 (Tiki Sale)	1997 (3.1.2, p.5)
	Lake Chaplain	SP1500 (Tiki Sale)	1997 (3.1.2, p.5)
	Lake Chaplain	SP1000 (Tiki Sale)	1997 (3.1.2, p.5)
	Lake Chaplain	SP1300 (Tiki Sale)	1997 (3.1.2, p.5)
	Lake Chaplain	Linetree Sale	1999 (3.1.3, p.5)
	Spada Lake	North Shore Road	1997 (4.3, p.28), 1999 (3.8, p.26)
Forest Vegetation Management	Lake Chaplain	Chaplain Sale	1999 (3.1.5, p.5), 2002 (3.1.4, p.7)
	Lost Lake	Precommercial Thinning	1991 (3.3.2, p.9)
	Spada Lake	Precommercial Thinning	1996 (3.1.5, p.6), 2000 (3.2.1, p.6), 2002 (3.2.2, p.7)
	Lost Lake	Harvest Planning	2000 (3.2.2, p.6), 2002 (3.3, p.7)
	Spada Lake	Harvest Planning	2000 (3.2.3, p.7), 2002 (3.2.2, p.7), 2003 (3.2,p2)
Stream and Wetland Buffer Zone Management	Lake Chaplain	Snag creation and monitoring	

<b>General Activity Category</b>	<b>Management Tract</b>	<b>Milestone</b>	<b>Annual Report Reference – (Section/page #)</b>
GTA Management	Lake Chaplain	Chaplain Sale Unit 1	1994 (3.1.3, p.5)
Snag Management	Lake Chaplain	Implementation Decisions	1990 (3.3, p.6), 1993 (3.2, p.8), 1996 (3.2, p.6)
	Lake Chaplain and Lost Lake	Snag Inventory Results	1991 (3.4, p.9), 1992 (3.3, p.6), 1995 (3.2, p.7), 1997 (3.2.2, p.7), 1998 (3.2.1, p.5), 1999 (3.2.1, p.5), 2000 (3.3.1, p.9)
	Lake Chaplain	Snag Creation	1990 (3.3, p.6), 1991 (3.4, p.12), 1992 (3.3, p.6), 1993 (3.2, p.8), 1994 (3.2, p.6), 1995 (3.2, p.7), 1996 (3.2, p.6), 1997 (3.2.2, p.7), 1998 (3.2.1, p.7), 1999 (3.2.1, p.5), 2000 (3.3.1, p.9), 2003 (3.3.1, p.9)
	Lake Chaplain and Lost Lake	Snag Monitoring and Mapping	1998 (3.2.2., p.7), 1999 (3.2.2, p.9), 2002 (3.4.3, p.15)
	Williamson Creek	Snag Creation	2002 (3.4.1, p.10))
	Spada Lake	Snag Creation	2002 (3.4.1, p.10), 2003 (3.3.1, p4)
	Williamson Creek	Snag Inventory	2002 (3.10, p.33)
CWD Management	Lake Chaplain	Implementation Decisions	1991 (3.10.2, p. 27), 1992 (3.9.2, p.12), 1993 (4.5, p.22), 1994 (3.6.6, p.10), 1995 (3.3.2, p.11), 1995 (Appendix A-Exhibits 1-3), 1996 (3.3, p.10)
	Lake Chaplain	CWD Inventory Results	1991 (3.10.2, p.27), 1993 (3.7.2, p.14), 1995 (Appendix A-Exhibit 4)
	Lake Chaplain	CWD Creation	1994 (4.7.6, p.18), 1995 (3.3.1, p.7), 1995 (Appendix A-Exhibit 4), 1998 (3.3, p.9)
	Lake Chaplain	CWD Monitoring	1998 (3.3, p.9), 1999 (3.3, p.5), 2000 (3.3.2, p.9)
	Williamson Creek	CWD Inventory Results	2002 (3.10, p.33)
Revegetation	Spada Lake	Drawdown Zone Test Plantings	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), 2002 (3.5.1, p.15)
	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)

<b>General Activity Category</b>	<b>Management Tract</b>	<b>Milestone</b>	<b>Annual Report Reference – (Section/page #)</b>
	Pipeline ROW	Plant shrubs and trees	1997 (3.4.2, p.11), 1998 (3.4.2, p.10), 1999 (3.4.2, p.12), 2002 (3.5.2, p.15)
	Pipeline ROW	Place tree root wads	1989 (3.3, p.3), 1995 (3.4.2, p.13)
	Lake Chaplain	Revegetation Design	1991 (3.5, p.19)
	Lake Chaplain	Plantings at north end of lake	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), 2003 (3.4.1, P10)
Nest Structures	Lost Lake	Floating platforms	1991 (3.6, p.20), 1992 (3.5, p.10), 1993 (3.4, p.11), 1998 (3.5.1, p.13), 1999 (3.5.1, p.14), 2000 (3.5.1, p.13), 2002 (3.6.2, p.18), 2003 (3.5.1, p.11)
	Lost Lake	Duck nest boxes	1990 (3.7, p.8), 1995 (3.5.2, p.16), 1996 (3.5.2, p.13), 1999 (3.5.2, p.14), 2000 (3.5.2, p.13), 2002 (3.6.2, P.18), 2003 (3.5.2, p.11)
	Lost Lake	Osprey Platform	1990 (3.8, p.8), 1999 (3.5.3, p.19), 2000 (3.5.3, p.19), 2002 (3.6.3, P.22), 2003 (3.5.3, p.16)
	Lake Chaplain	Floating platforms	1991 (3.6, p.20), 1992 (3.5, p.10), 1993 (3.4, p.11), 1994 (3.4, p.7), 1999 (3.5.1, p.140)
	Lake Chaplain	Duck Nest Boxes	1993 (3.5, p.11), 1995 (3.5.2, p.16), 1996 (3.5.2, p.13), 1997 (3.5.1, p.16), 1999 (3.5.2, p.14), 2000 (3.5.2, p.13), 2002 (3.6.2, p.18), 2003 (3.5.2, p.11)
	Spada Lake	Floating Platforms	1996 (3.5.1, p.13), 1997 (3.5.1, p.16), 1999 (3.5.1, p.14), 2000 (3.5.1, p.13), 2002 (3.6.1, p. 18), 2003 (3.5.1, p.11)
	Spada Lake	Duck Nest Boxes	1996 (3.5.2, p.13), 1998 (3.7, p.18), 1999 (3.5.2, p.14), 2000 (3.5.2, p.13), 2002 (3.6.2, p.18)
	Spada Lake	Osprey Platforms	1992 (3.7, p.11), 1999 (3.5.3, p.19), 2000 (3.5.3, p.19), 2002 (3.6.3, p.22), 2003 (3.5.3, p.16)
Bald Eagle Nest	Lake Chaplain	Monitoring	1997 (3.5.4, p.19), 1998 (3.5.4, p.18), 1999 (3.5.4, p.20), 2000 (3.5.4, p.20), 2002 (3.6.4, p.22)
Biosolids Application	Lake Chaplain	Biosolids Application	1996 (3.8, p.18), 1998 (3.7, p.18), 2000 (3.7, p.20)

<b>General Activity Category</b>	<b>Management Tract</b>	<b>Milestone</b>	<b>Annual Report Reference – (Section/page #)</b>
	Lake Chaplain	Monitoring	1996 (3.8, p.18), 1997 (3.7, p.19), 2000 (3.7, p.20), 2002 (3.8, p.23), 2003 (3.7, p.18)
Deer Forage Monitoring	Lake Chaplain	Implementation Decisions & Methods	1991 (3.10.1, p.21), 1996 (3.9, p.18) 1997 (3.8.1, p.19)
		Forage Availability Results	1991 (3.10.1, p.22), 1996 (3.9, p.18) 1997 (3.8.2, p.22), 1998 (3.8, p.18), 1999 (3.7, p.20), 2000 (3.8, p.24), 2002 (3.9, p.23), 2003 (3.8, p.18)
		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)
	PUD Properties	Road Maintenance and Abandonment Plan	2002 (3.12, p.36), 2003 (3.11, p.24)
	Lake Chaplain	Road Maintenance and Abandonment Plan	2002 (3.11, p.36)
ROW Management Special Agency Consultation	Power Pipeline All management tracts	Gate to restrict public access Agency tour of WHMP Sites FERC Environmental Inspection	1994 (3.3.2, p.7) 1997 (3.9, p.22) 1999 (3.9, p.31)
Security Measures	Lake Chaplain and JHP Facilities	Heightened security measures	2002 (3.13, p.36), 2003 (3.12, p.27)
Other Monitoring	Williamson Creek	Monitoring	1999 (3.8, p.26), 2000 (3.9, p.24), 2002 (3.10, p.24), 2003 (3.9, p.18)

Henry M. Jackson Hydroelectric Project  
2003 FERC Environmental and Public Use Inspection

**Tour Schedule**  
May 13, 2003

7:30 a.m.	Meet at Dutch Cup Restaurant, Sultan
7:45 - 8:20	Travel to and inspect Rec Site 1 (Olney Pass) (Public Use Facilities and project information)
8:20 - 8:45	Travel to and inspect Rec Site 2 (South Fork) (Public Use Facilities and project information)
8:45 - 9:10	Travel to and inspect Rec Site 3 and 4 (South Shore & Nighthawk) (Public Use Facilities and project information)
9:10 - 9:30	Travel to and inspect Rec Site 5 (Bear Creek) (Public Use Facilities and project information)
9:30 - 10:20	Travel to and inspect Rec Site 6 (Culmback Dam) (Public use facilities, project information, log boom area, minimum flows below Culmback)
10:20 - 11:05	Travel to and inspect Rec Site 8 (Overlook) (Overview of areas of precommercial thinning, location of osprey platforms, drawdown zone plantings)
11:05 - 12:15	Travel and inspect Pipeline Right of Way (Grass seeding, vegetation management, habitat creation)
12:15 - 1:05	Tour of Powerhouse (Including Lunch) (Operations impacts on stream conditions)
1:05 - 1:30	Travel to and inspect public access road to Horseshoe Bend and lower pipeline ROW
1:30 - 1:50	Travel to and inspect Sultan River access off Trout Farm Road (Boating access to lower river)
1:50 - 2:25	Travel to and inspect Sultan River access gates across from Powerhouse and at Chaplain Creek Gage
2:25 - 2:50	Travel to and inspect Diversion Dam Area (Chaplain Area Wildlife Management, cutting units, diversion dam flow control point, assess to upper Sultan River)
2:50 - 3:40	Travel to and inspect Lost Lake Area (Lost Lake Area Wildlife Management, Public Use Facilities, Wildlife Management on Lake Chaplain)
3:40 - 4:00	Travel to City Filter Plant
4:00 - 4:20	Summarize Tour Findings and Requirements
4:20 - 4:40	Return to Dutch Cup

ENVIRONMENTAL INSPECTION REPORT  
(ELECTRONICALLY SUBMITTED)  
FEDERAL ENERGY REGULATORY COMMISSION

Portland Region

Date of Inspection May 13, 2003

Name Henry M. Jackson (Sultan) Project No. 2157-WA

Development(s) Culmback & Sultan Diversion

Snohomish County Public Utility District (PUD) No. 1  
Licensee and City of Everett License Type Major

License Issued June 1, 1961 License Expires May 31, 2011

Location Sultan River Snoqualmie National Forest  
(waterway) (reservation)

Snohomish Washington  
(county) (state)

Inspector Charles E. Klinkenberg

Licensee Representatives Ms. Bernice Tannenbaum, Ms. Karen Bedrossian and Messrs. Bruce Meaker and Barry Chrisman representing PUD; and Mr. Dan Mathias representing the City of Everett.

Other Participants Mr. Erich Gaedeke, Fisheries Biologist of the Washington, D.C. DHAC staff. Members of resource agencies were invited, but none attended the inspection.

Summary of Findings

No matters requiring follow-up action were observed during the inspection.

Submitted May 28, 2003

Charles E. Klinkenberg  
Environmental Specialist