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DEPARTMENT OF
E C O L O G Y

Aquatic Plants Technical Assistance Program

2000 Activity Report

September 2001

Publication No. 01-03-034

printed on recycled paper



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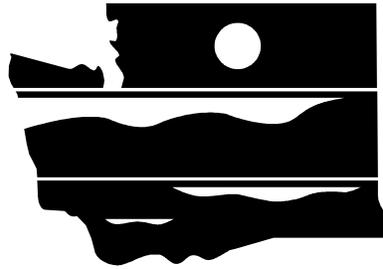
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Aquatic Plants Technical Assistance Program

2000 Activity Report

*by
Jenifer Parsons and Sarah O'Neal*

Environmental Assessment Program
Olympia, Washington 98504-7710

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Table of Contents

	<u>Page</u>
List of Figures and Tables.....	ii
Acknowledgments.....	iii
Abstract.....	v
Introduction.....	1
Technical Assistance.....	2
Site Visits.....	3
Introduction.....	3
Site Visit Objectives.....	3
Field Methods.....	3
Aquatic Plant Survey Results.....	4
General Results.....	4
<i>Hydrilla Verticillata</i> – An Update.....	9
Rare Plants.....	9
Kress Lake Study.....	10
Introduction.....	10
Study Site.....	10
Methods.....	11
Results and Discussion.....	12
Herbarium.....	14
Methods Used in Aquatic Plant Identification.....	14
Methods Used in Collection and Preservation.....	14
Aquatic Weed Management Fund Related Activities.....	15
References.....	17
Appendix A Site Visit Summary Table 1994-1999	
Appendix B <i>Myriophyllum spicatum</i> Distribution Map	
Appendix C Locations of aquatic invasive non-native species	
Appendix D Plant Identification References	
Appendix E Herbarium Specimens, Grouped by Family	

List of Figures and Tables

Page

Figures

Figure 1. Known locations of <i>Egeria densa</i> in Washington, 1999.....	7
Figure 2. Known locations of <i>Myriophyllum aquaticum</i> in Washington, 1999.	8
Figure 3. Kress Lake.....	10

Tables

Table 1. Scientific and common plant names	1
Table 2. Aquatic plant technical outreach activities - 2000	2
Table 3: Locations of aquatic plant monitoring in 2000, and invasive aquatic species.....	5
Table 4: Aquatic plant species present in Kress Lake prior to herbicide treatment.....	11
Table 5: Macrophyte frequency and results from Chi-square analysis.....	13
Table 6: Mean biomass and ANOVA results from common species	13
Table 7. List of applicants for AWMF grant funds in 2000 and the amount awarded	16

Acknowledgments

There are many people we would like to thank for contributions to this document and the projects described within:

- ◇ Kathy Hamel and Allen Moore for assistance in sampling Kress Lake.
- ◇ Susan O'Neal, Matt Lannon, Art O'Neal, Maggie Bell-McKinnon, Amanda Robbins, Brent Smith, Trevin Taylor and Roland McGill for assistance with field sampling.
- ◇ Dave Hallock, Rob Plotnikoff, Kathy Hamel and Michelle Ideker for reviewing and publishing the document.
- ◇ Dr. William Ehinger for assistance with statistical analysis of the Kress Lake data.

Abstract

The objectives of the Aquatic Plant Technical Assistance Program are to

- ◇ provide advice on aquatic plant identification, biology, and management to government agencies and the public
- ◇ document aquatic plant distribution and habitat through site visits
- ◇ assist with evaluating projects supported by Freshwater Aquatic Weed Program grant money

During the 2000 field season, aquatic plant data were gathered at 44 different waterbodies located throughout the state. Several previously unknown populations of non-native invasive aquatic plants were recorded. *Myriophyllum spicatum* (Eurasian watermilfoil) was found in Tapps Lake, Pierce County and in Lake Sutherland, Clallam County. *Lythrum salicaria* (purple loosestrife) was previously unknown from Windmill Lake in Grant County. *Typha angustifolia* (narrow leaf cat-tail) was discovered in Kapowsin Lake, Pierce County. Also, one location of *M. spicatum* was reported by an aquatic plant control consultant in the part of Silver Lake, Spokane County that is north of Medical Lake Road. In addition to routine aquatic plant monitoring, a special project investigating the impact of low levels of the contact herbicide endothall was conducted on Kress Lake in Cowlitz County.

Other accomplishments for this project during 2000 include the following: gathered plants for the herbarium collection, provided educational and technical outreach to private and public entities, and assisted with projects funded by Freshwater Aquatic Weed Program grant money.

Introduction

Legislative action in 1991 (RCW 43-21A.660) established the Freshwater Aquatic Weed Account to provide expertise on aquatic plant issues and a source of grant money for local aquatic plant management projects. The need for this program was recognized when the spread of aquatic plant problems in the state's public waters outgrew the ability of agencies to adequately address them. To provide technical expertise for aquatic plants, one full-time position was created within the Environmental Assessment Program of the Department of Ecology. The objectives for this position are as follows:

- Provide technical assistance on aquatic plant identification and management to government agencies and the public
- Conduct site visits to identify aquatic plants, evaluate plant community structure and identify the existence or potential for problems, particularly as they relate to invasive non-native aquatic plants
- Assist with rating grant applications to the Freshwater Aquatic Weed Account

The purpose of this report is to document the progress of the Aquatic Plant Technical Assistance Program with respect to these objectives during 2000, concentrating on site visit results. The program this year was scaled back because the principal researcher, Jenifer Parsons, was unavailable most of the year. The field work and much of the data work was conducted by Sarah O'Neal.

To reduce confusion, all plants are referred to by their scientific names. Table 1 lists the common names for the plants most frequently mentioned in the text.

Table 1. Scientific and common plant names.

Scientific Name	Common Names
<i>Cabomba caroliniana</i>	fanwort
<i>Egeria densa</i>	Brazilian elodea
<i>Hydrilla verticillata</i>	hydrilla
<i>Ludwigia hexapetala</i>	water primrose
<i>Lysimachia vulgaris</i>	garden or yellow loosestrife
<i>Lythrum salicaria</i>	purple loosestrife
<i>Myriophyllum aquaticum</i>	parrotfeather
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil
<i>Nymphaea odorata</i>	fragrant waterlily
<i>Typha angustifolia</i>	narrow leaf cattail
<i>Utricularia inflata</i>	big floating bladderwort

Technical Assistance

After the Freshwater Aquatic Weed Account was established, an external advisory committee identified technical assistance for aquatic plant taxonomy, ecology, and management as a high priority for the new Freshwater Aquatic Weed Management Program. Technical assistance was later defined as “Provid(ing) technical expertise within Ecology and to other agencies, local governments, lakes groups, and the general public regarding aquatic plant ecology and taxonomy, aquatic plant management, development of integrated aquatic plant management plans, and other aquatic plant management issues. Assistance will be provided through on-site visits, development of technical reports, participation in public workshops, and presentations to private and public groups and societies.”

Providing technical assistance involves working with public and private sectors to develop a broad understanding of the roles aquatic plants play in the ecosystem and how human behavior influences aquatic plant communities. Table 2 lists activities where we provided formal technical assistance. We also assisted the public and local governments on an informal basis through phone conversations, identification of mailed plant specimens, and informal meetings that are not listed.

Over the seven years of this program we have produced publications on various aspects of aquatic plant biology, ecology, identification, control and sampling. Much of this information is available on Ecology’s web pages at <http://www.ecy.wa.gov/> under “Environmental Info / Watersheds”.

Table 2. Aquatic plant technical outreach activities - 2000.

Function	Date	Location	Role
Western Aquatic Plant Mgmt Society (WAPMS) newsletter	1/00		Edited and published the Winter edition
Wrote article for BASS newsletter	1/00		Article discussed Non-native Aquatic Plants in Washington
Edited paper presented to federal legislators	2/00		Paper discussed the impact of invasive plants on wetlands and waterways
WAPMS newsletter	3/00		Wrote articles, edited and produced newsletter
Reed Canarygrass Symposium	3/00	Olympia, WA	Attended symposium on biology and control of reed canarygrass
Manuscript submitted to the Journal of Aquatic Plant Management	3/00		Paper titled ‘The Use of 2,4-D to Selectively Control an Early Infestation of Eurasian Watermilfoil in Loon Lake, Washington’
WAPMS newsletter	9/00		Wrote articles, edited and produced newsletter
Workshop ‘Herbicides as an Integrated Pest Management Tool for Aquatic Vegetation Management’	9/00	Olympia, WA	Presented talk on aquatic plant sampling methods
WAPMS newsletter	12/00		Edited and produced newsletter

Site Visits

Introduction

This section documents aquatic plant surveys conducted during the 2000 field season by Sarah O'Neal and several volunteers (see acknowledgements section). The general purpose of site visits was to identify aquatic plants, targeting exotic invasive species. We also evaluated plant community structures, estimated the extent of, or potential for aquatic plant problems, and suggested possible management options. Another important aspect of the site visits was to expand the aquatic plant database and herbarium collection. One special project was also undertaken this year assessing the effects of low levels of the herbicide endothall on the aquatic plant community of Kress Lake, Cowlitz County.

Site Visit Objectives

The specific 2000 site visit objectives were as follows:

- Revisit selected lakes with exotic invasive plants in order to assess plant population changes since earlier surveys
- Revisit other selected lakes considered to be at high risk for a non-native plant invasion
- Conduct field surveys in selected lakes that had not been previously surveyed by this program
- Continue plant community monitoring projects on selected lakes
- Collect detailed plant biomass and frequency data from Kress Lake, Cowlitz County

After the site visits any newly discovered populations of invasive non-native species were reported to the local weed board representative or county extension agent. Also, sightings of plants listed as rare by the State Natural Heritage Program (Washington Natural Heritage Program, 1997) were reported appropriately.

Field Methods

For a detailed discussion of field methods and data quality control, refer to Aquatic Plant Sampling Protocols (Parsons, 2001) and the Aquatic Plant Technical Assistance Final Quality Assurance Project Plan (Parsons, 1995b). The main goal of field site visits is to create the most comprehensive species list possible for each waterbody. This facilitates the discovery of potentially problematic aquatic plants and provides baseline aquatic plant distribution information.

For most lakes the method used is to circumnavigate the littoral zone in a small boat. When a different plant or type of habitat is observed, samples are collected for identification using a

weighted rake, by hand-pulling or by visual observation. In addition, notes on species distribution, abundance, and maximum depth of growth are made. This method was recommended by other aquatic plant researchers (Sytsma, 1994; Warrington, 1994) and was used successfully during the previous five years. However, it should be noted that because the surveys are conducted from the surface, small populations of any plant species may be overlooked.

Secchi depth and alkalinity data were also collected on selected lakes. This was ancillary to the plant data, so time and logistical constraints limited the frequency of sample collection. These parameters were chosen because they have been shown to influence plant community type (Srivastava *et al.*, 1995; Smart, 1990; Kadono, 1982; Hellquist, 1980) and because they are relatively easy to obtain. The alkalinity samples were collected in open water to minimize the diel influence of macrophytes. Alkalinity was measured using a Hach® field test kit model AL-DT with a digital titrator to determine phenolphthalein and total alkalinity as CaCO₃. Secchi depth was measured in deep, open water using a 20.3 cm (8 inch) diameter black and white secchi disk.

All field visits occurred between late spring and early fall to correspond with the time of maximal plant growth and flowering. Sampling locations were recorded with a written description, visual placement on a map, and with a Global Positioning System (GPS) unit. We collected voucher specimens of any unusual plant species and known or suspected exotic species. These were pressed, mounted, and retained in the herbarium collection (see Herbarium section in this report). All data were recorded on field forms and entered into a relational database (see Parsons 1995a for a database design description).

Aquatic Plant Survey Results

During the 2000 field season 45 site visits were made to 44 different waterbodies. Highlights of results from these surveys are provided in the following section. In addition, several projects will be elaborated on in subsequent sections. These include:

- an update on the *Hydrilla verticillata* eradication project in Pipe and Lucerne Lakes
- rare plants found
- results from the Kress Lake herbicide assessment project

General Results

Table 3 lists the lakes where aquatic plant data were gathered during the 2000 field season, the extent of the survey, and any aquatic plants listed with the Washington State Noxious Weed Control Board that were found (Chapter 16-750 WAC). A similar table with data summarizing all seven years of this program is contained in Appendix A. The primary author will provide additional information on any of the listed waterbodies upon request.

Table 3. Locations of aquatic plant monitoring in 2000, and invasive aquatic species.

County	Waterbody Name	WRIA	Date	Survey Extent	Invasive Species
Adams	Herman Lake	41	9/27/00	entire littoral	<i>L. salicaria</i>
Clallam	Beaver Lake	20	8/15/00	entire littoral	none
	Crescent Lake	19	8/15/00	boat launch areas	none
	Pleasant Lake	20	8/15/00	entire littoral	none
	Sutherland Lake	18	8/14/00	entire littoral	<i>M. spicatum</i>
Cowlitz	Kress Lake	27	6/13/00	entire littoral	<i>M. spicatum</i>
	Kress Lake	27	8/24/00	entire littoral	none
Franklin	Kahlotus Lake	36	9/28/00	one area, from shore	none
Grant	Canal Lake	41	9/27/00	entire littoral	<i>L. salicaria</i>
	Heart Lake	41	9/26/00	entire littoral	none
	Long Lake (17N-29E-32)	41	9/27/00	entire littoral	none
	Soda Lake	41	9/26/00	entire littoral	none
	Warden Lake	41	9/26/00	entire littoral	none
	Windmill Lake	41	9/27/00	entire littoral	<i>L. salicaria</i>
Grays Harbor	Aberdeen Lake	22	8/16/00	entire littoral	none
	Failor Lake	22	8/16/00	entire littoral	none
	Sylvia Lake	22	8/16/00	entire littoral	none
Jefferson	Leland Lake	17	9/14/00	entire littoral	<i>E. densa</i>
Kitsap	Horseshoe Lake	15	7/20/00	entire littoral	none
Mason	Benson Lake	14	7/20/00	entire littoral	none
	Isabella Lake	14	7/18/00	entire littoral	none
	Island Lake	14	7/13/00	entire littoral	none
	Limerick Lake	14	7/13/00	entire littoral	<i>E. densa, U. inflata</i>
	Lost Lake	14	7/18/00	entire littoral	none
	Mason Lake	14	9/13/00	selected locations	none
	Nahwatzel Lake	22	7/14/00	entire littoral	none
	Phillips Lake	14	8/17/00	entire littoral	none
	Spencer Lake	14	8/17/00	entire littoral	none
Pend Oreille	Big Meadow	61	7/26/00	west basin	none
Pierce	Bay Lake	15	9/13/00	entire littoral	<i>L. salicaria</i>
	Kapowsin Lake	10	9/20/00	northeast half	<i>T. angustifolia</i>
	Tapps Lake	10	9/21/00	boat launch area	<i>M. spicatum</i>
Skagit	Cranberry Lake	3	9/11/00	north end, from shore	none
	Erie Lake	3	9/11/00	entire littoral	none
	Heart Lake (35N-01E-36)	3	9/11/00	entire littoral	<i>M. spicatum</i>
Snohomish	Flowing Lake	7	9/12/00	entire littoral	none
Spokane	Liberty Lake	57	7/27/00	four sites	<i>M. spicatum</i>
	Newman Lake	57	7/26/00	north end	none
	Silver Lake	34	7/28/00	entire littoral	none
Stevens	Black Lake	59	7/25/00	entire littoral	none
	Deep Lake	61	7/25/00	all but west shore	none
	Deer Lake	59	7/27/00	boat launch areas	none
	Jumpoff Joe Lake	59	7/27/00	entire littoral	none
Thurston	Munn Lake	13	9/7/00	entire littoral	none
Whatcom	Silver Lake	1	9/12/00	entire littoral	<i>Butomus umbelatus</i>

The results of these surveys include the discovery of previously unknown populations of several listed noxious weeds. *Myriophyllum spicatum* was found in Lake Sutherland, Clallam County and Tapps Lake, Pierce County. One location of *M. spicatum* was reported by an aquatic plant control consultant in the part of Silver Lake, Spokane County that is north of Medical Lake Road (Lamb 2000). *Lythrum salicaria* was previously unknown from Windmill Lake in Grant County. Also, the *Typha angustifolia* from Kapowsin Lake, Pierce County was first discovered this year, and another possible location at Herman Lake, Grant County needs to be verified during the time of flowering in 2001. If verified, it will be the first confirmed location of this invasive cattail in eastern Washington.

Appendix B and Figures 1 and 2 contain maps illustrating where known populations of the noxious invasive aquatic plants *Myriophyllum spicatum*, *Egeria densa*, and *Myriophyllum aquaticum* occur in Washington. Appendix C is a table listing the known locations of other aquatic invasive non-native species listed with the Washington State Noxious Weed Control Board (Chapter 16-750 WAC). The maps and table include sites that have been visited by Aquatic Plant Management Program personnel and those reported by reliable sources. Also included are waterbodies where weed eradication efforts have been undertaken within the last five years. If no recurrence of the targeted weed occurs in five years, then the lake or pond is removed from the list or maps. Locations that have had successful weed eradication programs include Goss Lake, Island County; Silver Lake, Cowlitz County; and Surfside Lake, Pacific County.

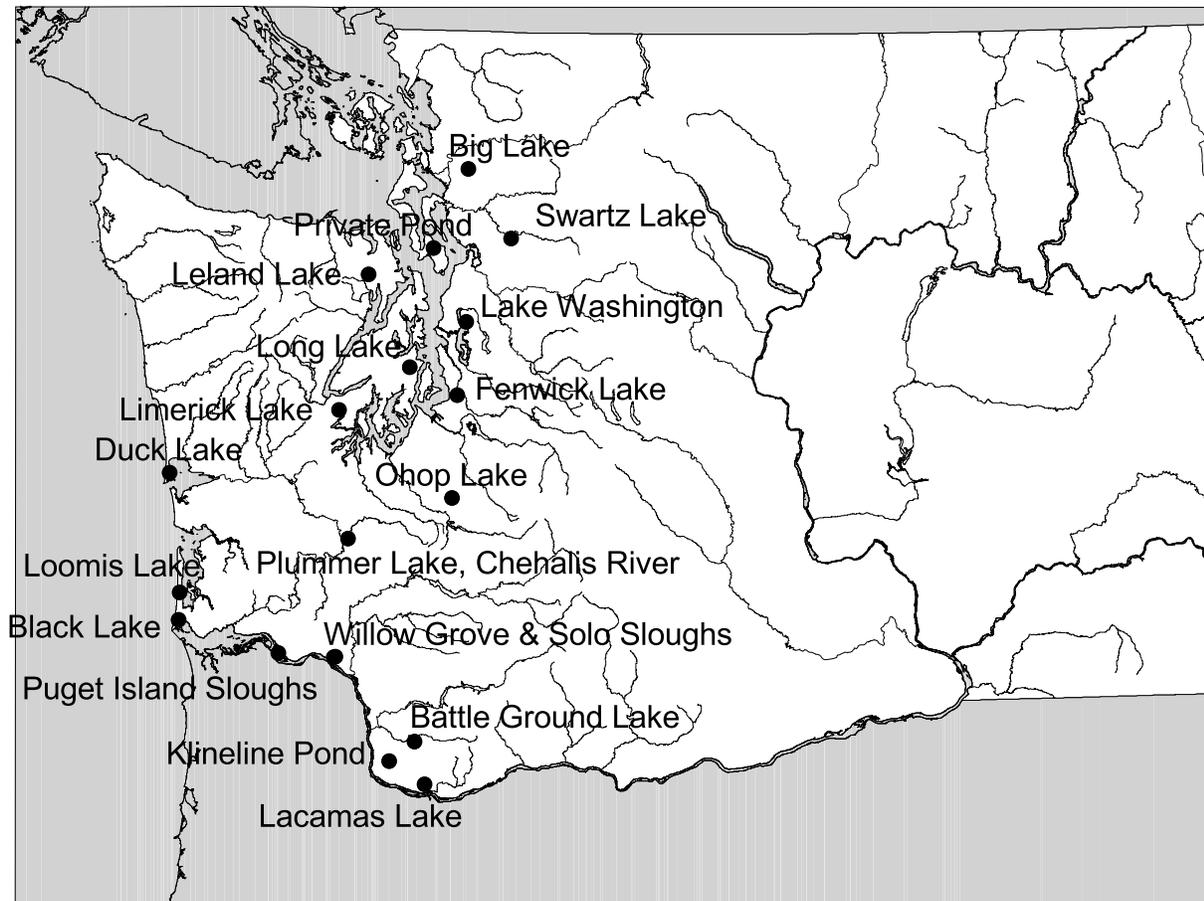


Figure 1. Known locations of *Egeria densa* in Washington, 2000.

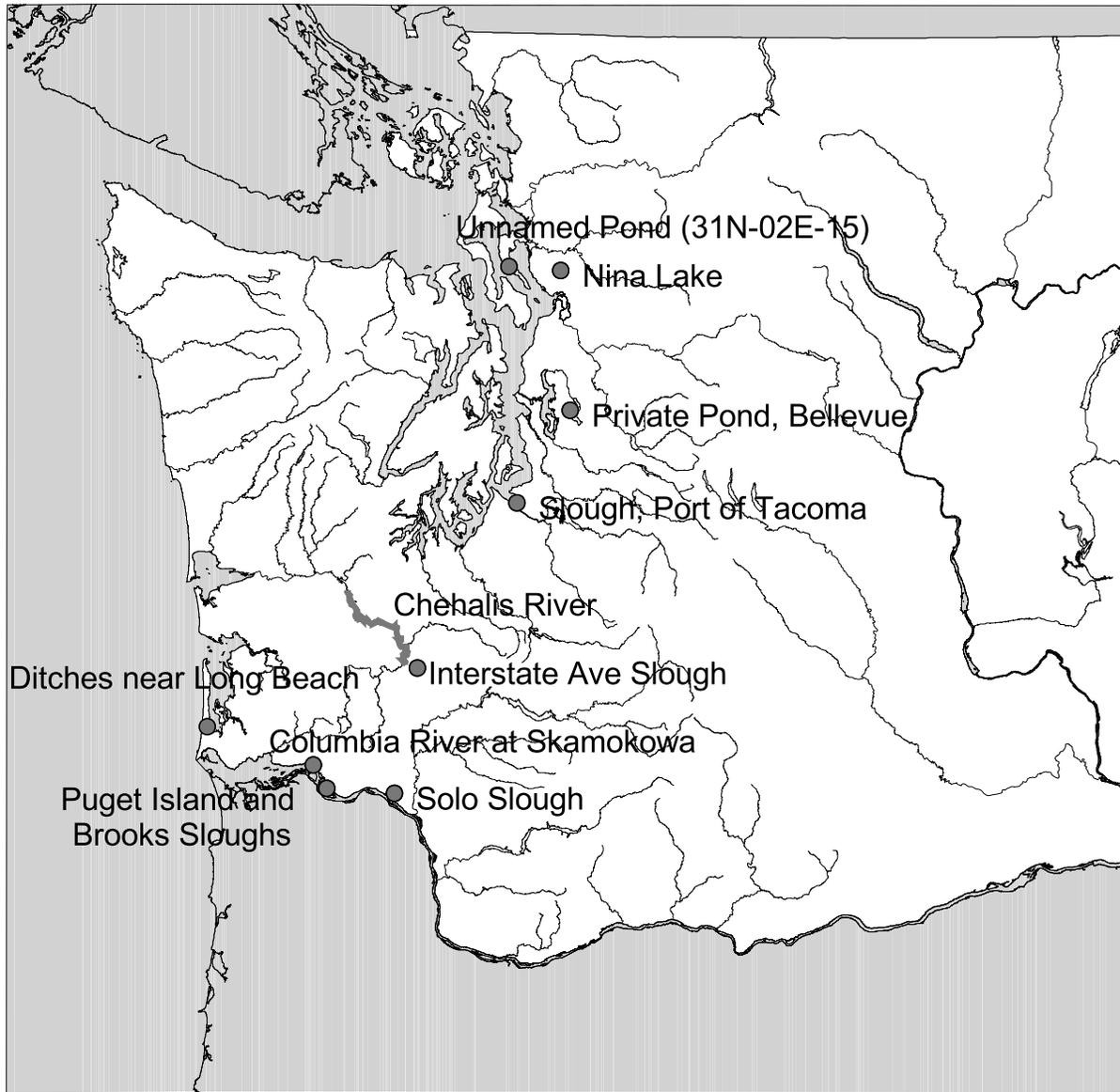


Figure 2. Known locations of *Myriophyllum aquaticum* in Washington, 2000.

Hydrilla Verticillata – An Update

The presence of *Hydrilla verticillata* was confirmed in Pipe and Lucerne Lakes (King County) on June 1, 1995. *Hydrilla* is an aggressive, non-native aquatic plant which will out-compete native vegetation if given the opportunity. Where it has become established (in the southern United States as far north as Connecticut and west to California), its rapid growth has radically changed aquatic environments. It is particularly difficult to control due to its many propagation strategies which include tubers, turions, plant fragments, and seeds. Federal and State agencies spend millions of dollars each year attempting to control its growth (Langeland, 1990; Anderson, 1987).

Because this was the first known population of *Hydrilla* in the northwest, aggressive action was taken to attempt its eradication. During the summers of 1995 through 1997, the 73 acre Pipe/Lucerne Lake system was treated with the systemic aquatic herbicide fluridone (brand name Sonar®) each year. A complete discussion of the events leading to these treatments during the first two years is provided in Parsons (1997). In the summers of 1998 and 1999 the population had been reduced enough to switch to a pelleted form of the herbicide which was applied to selected areas still supporting *Hydrilla*. In the summer of 2000 the treatment with pelleted herbicide continued in selected areas, and hand pulling by divers was initiated in other areas where tuber germination was persisting. The divers worked carefully to remove the tuber as well as the sprout.

In the spring of 2001 divers will again assess the population. Comparisons will be made between the area treated with herbicide and those where hand pulling took place. The treatment method for 2001 will likely be continued hand pulling by divers (Walton, 2001).

Rare Plants

In addition to the weedy species, populations of plants listed as rare by the Washington Natural Heritage Program (WNHP) (Washington Natural Heritage Program, 1997) were observed during the field surveys. Two previously unknown populations of *Heteranthera dubia* (water star-grass) were found in Pierce and Whatcom Counties. Also, previously observed populations of *Lobelia dortmanna* (water lobelia) in Mason County, and *H. dubia* in Stevens County were visited. All sightings were reported to the WNHP database manager.

Kress Lake Study

Introduction

The Kress Lake Project is a cooperative effort between Ecology, the Washington Department of Fish and Wildlife (WDFW), and ElfAtochem (now Cerexagri). In 2000, Cerexagri representatives approached Ecology with a proposal to treat a test lake in Washington with the contact aquatic herbicide Aquathol K® (active ingredient endothall). The project purpose is to demonstrate the ability of Aquathol K® to control an exotic species (*Myriophyllum spicatum*) and to improve the fishery and lake access for anglers. Ecology is monitoring the effects of the herbicide on the aquatic plant community. The WDFW agreed to track the effects on the fish community. The herbicide application was performed by a licensed applicator at the expense of the herbicide manufacturer.

Study Site

Kress Lake in Cowlitz County was selected as the test site because it is both a popular fishing lake and has a nuisance population of *Myriophyllum spicatum*. It was also attractive because the State owns the lake and shoreline, so no lake front property owners would be impacted by the study.

Kress Lake is a 30 acre manmade lake located just off of Interstate 5 about 20 miles south of Kelso in southwest Washington State (Figure 3). It is more or less oval in outline with a maximum depth of 18 feet. The shoreline consists of a short steep bank with trees and shrubs. A walking trail circles the lake at the top of the embankment. The lake is managed by WDFW for fishing from shore or small boats. No combustion engines are allowed.

Prior to initiation of this study the aquatic plant community extended throughout the lake. *Myriophyllum spicatum* was the dominant plant, and formed a ring of surfacing vegetation around the lake edge. Two pondweed species and the macroalgae *Chara* sp. made up the majority of the remaining species (Table 4).

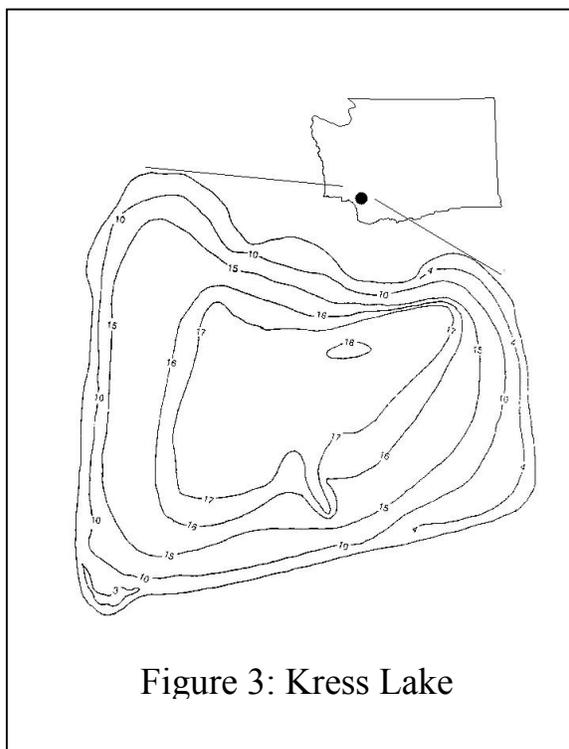


Figure 3: Kress Lake

The WDFW manages Kress Lake for a mixed fishery. Fish species present include rainbow trout, brown trout, cutthroat, steelhead, channel catfish, largemouth bass, bluegill, pumpkinseed, crappie and warmouth. It is a popular recreation area for anglers as well as recreational boaters, hikers, and horseback riders (Kelsey, 2001).

Table 4. Aquatic plant species present in Kress Lake prior to herbicide treatment.

Scientific Name	Common Name
<i>Chara</i> spp.	Musk grass
<i>Elodea canadensis</i>	American waterweed
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil
<i>Potamogeton amplifolius</i>	Big leaf pondweed
<i>Potamogeton</i> sp	Thin-leaf pondweed
<i>Utricularia vulgaris</i>	Common bladderwort

Methods

Aquatic Plants

The aquatic plant community was assessed before the herbicide treatment (June 13, 2000) and ten weeks after treatment (August 24, 2000). Biomass and frequency data were gathered at points throughout the lake each time. Follow-up studies to collect the same suite of data are planned for June of 2001 and 2002.

Frequency Data

Plant samples were gathered systematically at points on a 30.5 meter (100 foot) grid for the frequency data analysis. The grid was developed using Geographical Information System (GIS) (Madsen 1999). However, in the field the point coordinates from the GIS did not correspond with the data the Global Positioning System (GPS) unit was providing. Due to the small size of the lake, the field personnel felt they could visually estimate the point locations with sufficient accuracy.

At each point samples were gathered from the port side of the boat. A plant sampling device was thrown twice, and all recovered species were recorded. The sampling device consisted of two metal leaf rakes bolted back to back with the handles removed and replaced with a 30 meter marked rope. The depth of each sample site was also recorded.

Data were entered into a relational database and the statistical package SYSTAT® was used to perform Chi-square two-by-two analyses on the common species to look for differences between the before- and after-treatment data. The probability was adjusted using a Bonferroni correction to account for multiple comparisons.

Biomass

Biomass data were gathered at points located throughout the lake. These points were randomly selected from the same point grid used for the frequency data collection. Samples were collected with a metal rake attached to a long aluminum handle. The rake was lowered to the substrate and turned 360° to collect the plants within the circle scribed by the rake tongs. The rake was 0.38 meters wide, so sampled approximately a 0.1 square meter area. The sample was brought to the surface and placed into a plastic bag labeled with the sample location and depth. The samples were transported to the lab where they were sorted by species and placed into preweighed and numbered paper bags. They were dried in a forced air oven at approximately 95° C, until they reached a constant weight. They were then weighed to .01 gram accuracy and the bag weight was subtracted to give the macrophyte dry weight. These data were entered into a relational database and analyzed for differences in the before- and after-treatment data using Analysis of Variance (ANOVA). We performed a $\log_{10}+1$ transformation on the data to approximate a normal distribution.

Herbicide Application

The first herbicide application took place on June 21, 2000. Ten acres were treated around the edge of the lake using Aquathol K®. The application rate was 1.5 ppm, using about 6 gallons per acre. The second treatment was a month later. Another 10 acres were treated out from the shoreline toward the center of the lake using the same application rates and amounts (McNabb, 2001).

Results and Discussion

Point Intercept Frequency

A total of 185 samples were collected on the two sample dates, 90 in June and 95 in August. For the data analysis the *Potamogeton* spp. (pondweeds) were grouped together due to difficulty in differentiating the species. *Elodea canadensis* and *Utricularia vulgaris* were omitted from the analysis because they were only found in a few samples. The results from the Chi-square analysis are given in Table 5. There was no significant difference in the frequency with which *Chara* sp. was found. There was a significant decrease in the frequency of observation of *M. spicatum* and *Potamogeton* spp. There was a significant increase in the frequency of points where no plants were observed between the two study dates. These results indicate that the herbicide reduced the frequency with which the vascular plants were found, while not affecting the macroalgae *Chara* sp. The vascular plants were being reduced to the point of eliminating plant cover completely in locations throughout the lake.

Table 5. Macrophyte frequency and results from Chi-square analysis.

	% present		P-value
	June	August	
<i>Chara</i> spp.	12	18	0.093
<i>M. spicatum</i>	41	13	0.000*
<i>Potamogeton</i> spp.	20	5	0.000*
No plants	7	20	0.000*

* significant at $P \leq .0125$

Biomass

Biomass data were gathered at 60 locations throughout the lake, 30 in June and 30 in August. As with the point intercept frequency data, the *Potamogeton* spp. were combined and the *E. canadensis* and *U. vulgaris* were omitted from the analysis due to too few occurrences. The results of the ANOVA are provided in Table 6. The only plant showing a significant change over the study period was the *M. spicatum*, with a significant decrease.

Table 6. Mean biomass (with standard deviation in parentheses) and ANOVA results from common species.

	Biomass (g/m ²)		P-value
	June	August	
<i>Chara</i>	222 (502)	381 (687)	0.803
<i>M. spicatum</i>	79 (82)	1 (3)	0.000*
<i>Potamogeton</i> sp.	20 (53)	2 (6)	0.496

* significant at $P \leq .05$

These results indicate that the herbicide endothall (Aquathol K®) significantly reduced both the biomass and frequency of observation of *M. spicatum* over the study period. The results from *Potamogeton* spp. indicate that they were reduced in frequency, but the plants that were left were not significantly reduced in biomass. The increase in the frequency of points without plants could be the result of the *M. spicatum* die back. The lack of impact to *Chara* spp. indicates that macroalgae are not impacted by endothall.

Herbarium

Methods Used in Aquatic Plant Identification

All plants were identified to the lowest taxonomic group possible, usually to species unless critical features of the plant were missing (such as flowers or fruits). To assure proper identification, a number of books and other sources were consulted as cross references (Appendix D). In addition, several people from within and outside the agency are consulted in cases where identification is difficult. If this is not conclusive, the plant is sent to national taxonomic experts for an opinion. Kartesz (1994), The Jepson Manual (Hickman, 1993), and personal consultation with authors of the Flora of North America (Flora of North America Editorial Committee, 1993) are used to ensure the nomenclature is current.

Methods Used in Collection and Preservation

The methods used to preserve collected aquatic plants were those of Haynes (1984). First, all available plant parts (roots, stem, and flowering parts) were collected and sealed in a wet plastic bag. Within three days, but usually sooner, the plants were washed, identified, and arranged on a sheet of 100% rag herbarium paper. If the plant was too limp to maintain its shape in air, it was arranged on the paper in a tray of water. The herbarium sheets with plants and a written site description were then sandwiched between newspaper, blotter paper and cardboard in a plant press. When the specimen dried, it was fixed to the paper with herbarium glue or binding tape (if it was not already sufficiently adhered from the wet pressing process). A label with identification and collection information was attached. These finished reference specimens are stored in a sealed herbarium cabinet located in the Ecology headquarters building benthic laboratory.

Currently, the herbarium collection contains 118 unique taxa from 40 families (Appendix E). There are a total of 377 specimens, and in most cases each species is represented by more than one specimen. Each time a noxious weed is found, a collection is made and kept as a record. Additional taxa will be added to the herbarium as they are collected in future years. Also, specimens from aquatic plant mapping projects funded under the Aquatic Weed Management grant program are housed in this herbarium. The collection is available to both Ecology staff and the public as a reference and permanent record.

Aquatic Weed Management Fund Related Activities

Money was available from the Aquatic Weed Management Fund (AWMF) to fund a grant cycle in autumn 2000 for fiscal year 2001. This year we had approximately \$300,000 to fund projects qualifying for assistance. Table 7 lists the 11 applicants that applied for funding. Since the amount of funding available was not sufficient to cover all projects applying for money, the projects were ranked in order of priority by a team of Ecology employees familiar with lake issues. The highest ranking 8 projects were either fully or partly funded.

In addition to the regular funding cycle, three applications for early infestation funds were received and funded during 2000. They were for Lake Sutherland in Clallam County, and Fan Lake and Davis Lake, both in Pend Oreille County. Each was a mapping and control project to combat early infestations of *Myriophyllum spicatum*. For additional information on this grant program and the use of the monies contact Kathy Hamel at the Department of Ecology, Water Quality Program.

Table 7. List of applicants for AWMF grant funds in 2000 and the amount awarded.

Applicant Name	Project Title	Requested Amount	Amount Funded
Pacific Conservation District	Loomis Lake Eurasian Watermilfoil Control	\$ 63,900	\$63,900
Lewis County	Brazilian Elodea Eradication – Chehalis River	\$ 60,000	\$60,000
Skagit County	Erie/Campbell Lakes Plan Implementation	\$ 73,500	\$40,000
University of Washington	Weevil Performance Project	\$ 45,000	\$20,000
Wahkiakum Co. NWCB*	Wahkiakum Aquatic Weed Control Plan	\$ 30,000	\$30,000
Bremerton Parks and Rec Dep	Kitsap lake Water Quality Improvement Project	\$ 31,500	\$31,500
WA Dept Fish and Wildlife	Chehalis R. Purple Loosestrife Control	\$ 27,260	\$27,260
Yakima Co. NWCB	Purple loosestrife Education and Awareness	\$ 6,158	\$6,158
Snohomish Co. NWCB	Stillaguamish Japanese Knotweed Control	\$ 43,250	\$0
Okanogan Co. NWCB	Surveying/Preventing Invading Species Project	\$ 54,900	\$0
City of Lakewood	Lake Louise Vegetation Management Plan	\$ 30,000	\$0
		\$465,468	\$278,818

* NWCB = Noxious Weed Control Board

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Appendix A

Site Visit Summary Table 1994-2000

County	Waterbody Name	WRIA	Date	Survey Extent	Noxious Aquatic Weeds
Adams	Herman Lake	41	7/28/98	whole lake	<i>Lythrum salicaria</i>
			9/27/00	whole littoral	
	Sprague Lake	34	9/16/97	south half	none
	9/1/99		selected areas	none	
Asotin	Snake River at Chief Timothy S.P.	35	8/4/97	3 sites	none
Chelan	Antilon Lake	47	8/31/94	from shore, N and S ends	none
	Chelan Lake	47	8/31/94	from City Park shore	<i>Myriophyllum spicatum</i>
	Dry Lake	47	8/31/94	from shore, east end	none
	Fish Lake	45	6/16/97	west shore	none
			8/12/99	west end	<i>Lysimachia vulgaris</i>
	Roses Lake	47	8/31/94	south shore	none
			6/17/97	whole littoral	none
	Wapato Lake	47	8/31/94	entire shoreline	<i>Myriophyllum spicatum</i>
			6/27/95	whole littoral	
			8/8/95	whole littoral	
			9/11/95	whole littoral	
			6/24/96	whole littoral	
			7/15/96	milfoil sites	
			9/16/96	milfoil sites	
			7/16/97	whole littoral	
Wenatchee Lake	45	8/10/99	whole lake		
		9/1/94	west end, east boat launch	none	
Clallam	Beaver Lake	20	8/9/99	east and west ends	none
			7/9/96	whole littoral	none
			8/15/00	whole littoral	none
	Crescent Lake	19	7/10/96	4 sites	none
			8/15/00	boat launch areas	none
	Ozette Lake	20	7/9/96	3 sites	none
	Pleasant Lake	20	7/11/96	whole littoral	none
			8/15/00	whole littoral	none
	Sutherland Lake	18	7/11/96	whole littoral	none
			8/14/00	whole littoral	<i>Myriophyllum spicatum</i>
Unnamed (30N-04W-17)	18	7/13/95	ID from plant sample	<i>Myriophyllum spicatum</i>	
Clark	Battleground Lake	28	4/13/94	from dock only	<i>Egeria densa</i>
			6/17/99	whole lake	<i>Egeria densa</i>
	Caterpillar Slough	28	8/15/95	spot check from boat	<i>Myriophyllum spicatum</i>
	Columbia River at Ridgefield	28	8/15/95	spot check from boat	<i>Myriophyllum spicatum</i> <i>Lythrum salicaria</i>
	Lacamas Lake	28	9/3/97	whole littoral	<i>Egeria densa</i>
			6/17/99	whole lake	<i>Egeria densa</i>
Vancouver Lake	28	8/15/95	spot check from shore	none	
Columbia	Snake River at Little Goose Dam	35	8/5/97	spot check, boat	<i>Myriophyllum spicatum</i>
	Snake River near Lyons Ferry	35	8/5/97	spot check, boat	<i>Myriophyllum spicatum</i>
Cowlitz	Kress Lake	27	9/30/99	whole shore	<i>Myriophyllum spicatum</i>
			6/13/00	whole lake	
			8/24/00	whole lake	
	Merrill Lake	27	6/23/99	several sites	none
	Sacajawea Lake	25	8/4/98	3 sites, shore	none
			6/23/99	whole lake	none
	Silver Lake	26	9/7/94	several locations thru' lake	<i>Myriophyllum spicatum</i>
			9/19/95	several sites, from boat	none
			8/4/98	south half	none
			9/30/99	launch area	none
	Solo Slough	25	4/13/94	spot check from shore	<i>Myriophyllum aquaticum</i>
			7/14/94	spot check from shore	<i>Cabomba caroliniana</i>
			8/16/95	from shore	<i>Egeria densa</i>
			8/8/96	from shore	<i>Ludwigia hexapetala</i>
			5/28/97	spot check from shore	<i>Myriophyllum spicatum</i>
	Willow Grove Slough	25	8/4/98	1 site, shore	
			4/13/94	spot check from shore	<i>Cabomba caroliniana</i>
			7/14/94	spot check from shore	<i>Myriophyllum spicatum</i>
8/16/95			several sites, from boat	<i>Egeria densa</i>	
Douglas	Jameson Lake	44	6/26/96	1 site from shore	none
			8/22/95	5 sites, whole littoral	none
Ferry	Curlew Lake	60	8/2/96	4 sites (launches)	none
			8/13/97	5 sites (launches)	none
			5/19/98	2 sites, boat	none
			7/28/99	10 sites, launches	none
			8/23/95	whole littoral	none
	Ellen Lake	58	8/23/95	whole littoral	none

County	Waterbody Name	WRIA	Date	Survey Extent	Noxious Aquatic Weeds
	Ferry Lake	52	8/13/97	whole littoral	none
	Swan Lake	52	8/13/97	whole littoral	none
	Trout Lake	58	8/22/95	whole littoral	none
	Twin Lakes	58	8/23/95	4 sites, both lakes	none
8/14/97			3 sites, both lakes	none	
Franklin	Kahlotus Lake	36	9/28/00	one area, from shore	none
	Scooteney Reservoir	36	7/26/95	spot check from shore	<i>Myriophyllum spicatum</i>
	Snake River - Lower Monumental	33	8/20/96	spot check, boat	<i>Myriophyllum spicatum</i>
	Snake River at Ice Harbor Dam	33	8/19/96	spot check, boat	<i>Myriophyllum spicatum</i>
	Snake River at Levey Park	33	8/19/96	spot check, boat	none
	Snake River at Windust Park	33	8/20/96	spot check, boat	none
	Snake River at Lyons Ferry	34	8/5/97	spot check, boat	<i>Myriophyllum spicatum</i>
Garfield	Snake River at Lower Granite Dam	35	8/4/97	spot check, boat	none
Grant	Alkali Lake	42	7/16/96	whole littoral	none
	Babcock Ridge Lake	41	7/24/95	2 sites, whole littoral	<i>Myriophyllum spicatum</i> <i>Lythrum salicaria</i>
			6/25/96	spot check, shore	none
	Banks Lake	42	8/30/95	4 sites, whole littoral	<i>Myriophyllum spicatum</i>
	Blue Lake	42	7/16/96	whole littoral	none
	Burke Lake	41	6/28/94	entire shoreline	<i>Lythrum salicaria</i>
			9/19/96	whole littoral	<i>Myriophyllum spicatum</i>
			9/24/97	whole littoral	
			9/9/98	whole lake	
			9/29/99	whole lake	
	Canal Lake	41	8/30/95	4 sites, whole littoral	<i>Lythrum salicaria</i>
			9/27/00	whole littoral	
	Corral Lake	41	7/25/95	whole littoral	<i>Lythrum salicaria</i>
	Crater Lake	41	7/24/95	spot check from shore	none
	Deep Lake	42	6/25/96	whole littoral	none
	Dry Falls Lake	42	6/25/96	spot check, shore	none
	Evergreen Lake	41	6/27/94	entire shoreline	<i>Lythrum salicaria</i>
			9/12/95	8 transects, whole littoral	<i>Myriophyllum spicatum</i>
			9/18/96	8 transects, whole littoral	
			9/23/97	8 transects, whole littoral	
			9/9/98	whole lake	
			9/28/99	whole lake	
	Frenchman Hills	41	7/29/98	1 site, shore	<i>Lythrum salicaria</i>
	Heart Lake	41	9/26/00	whole littoral	none
	Lenore Lake	42	7/17/96	whole littoral	none
	Long Lake (17N-29E-32)	41	8/31/95	2 sites, whole littoral	none
			9/27/00	whole littoral	none
	Moses Lake	41	7/15/98	10 sites, boat	<i>Lythrum salicaria</i>
	Park Lake	42	6/26/96	whole littoral	none
			9/10/98	whole lake	none
	Potholes Reservoir	41	8/7/94	6 sites on N & W side	<i>Myriophyllum spicatum</i>
			7/16/98	10 sites, boat	none
	Quincy Lake	41	6/28/94	entire shoreline	<i>Lythrum salicaria</i>
			9/13/95	3 transects, whole littoral	
			9/17/96	3 transects, whole littoral	
			9/22/97	whole littoral	
			9/8/98	whole lake	
			9/29/99	whole lake	
	Rocky Ford Cr	41	7/28/97	spot check, shore	<i>Lythrum salicaria</i>
	Soda Lake	41	7/25/95	whole littoral	none
			9/26/00	whole littoral	none
	Stan Coffin Lake	41	6/29/94	entire shoreline	<i>Myriophyllum spicatum</i> <i>Lythrum salicaria</i>
	Warden Lake	41	7/25/95	2 sites, whole littoral	<i>Lythrum salicaria</i>
			7/28/98	whole lake	
			9/26/00	whole lake	none
	Winchester Wasteway	41	7/26/95	spot check from shore	<i>Lythrum salicaria</i>
			7/28/98	1 site, shore	
Windmill Lake	41	8/30/95	south end	none	
		9/27/00	whole littoral	<i>Lythrum salicaria</i>	
Grays Harbor	Aberdeen Lake	22	7/22/96	whole littoral	none
			8/16/00	whole littoral	none
			9/9/95	2 sites, from shore	<i>Egeria densa</i>
	Duck Lake	22	8/18/98	main lake	<i>Lythrum salicaria</i> <i>Myriophyllum spicatum</i>
9/21/99			10 sites		
Failor Lake	22	6/25/97	whole littoral	none	

County	Waterbody Name	WRIA	Date	Survey Extent	Noxious Aquatic Weeds	
			8/16/00	whole littoral	none	
	Quinault Lake	21	10/7/96	75% of littoral	none	
	Sylvia Lake	22	7/22/96	whole littoral	none	
			8/16/00	whole littoral	none	
Island	Cranberry Lake	6	8/24/94	4 sites around lake	none	
			9/5/96	spot check, shore	none	
	Crockett Lake	6	9/4/96	spot check, shore	none	
	Deer Lake	6	9/4/96	whole littoral	none	
	Goss Lake	6	9/5/96	whole littoral	none	
			8/4/99	whole lake	none	
	Lone Lake	6	9/4/96	whole littoral	<i>Lythrum salicaria</i>	
Jefferson	Anderson Lake	17	7/8/96	whole littoral	none	
	Crocker Lake	17	5/24/94	northwest half - littoral	none	
			6/14/95	whole littoral		
			6/11/96	whole littoral		
			8/27/97	whole littoral		
			9/3/98	whole lake		
	Leland Lake	17	5/24/94	entire shoreline	<i>Egeria densa</i>	
			6/14/95	whole littoral		
			10/3/95	whole littoral		
			11/8/95	Egeria site		
			6/11/96	whole littoral		
			7/2/96	whole littoral		
			10/2/96	whole littoral		
			8/27/97	spot check		
			9/3/98	whole lake		
	10/7/99	whole lake				
	9/14/00	whole lake				
Tarboo Lake	17	7/2/96	whole littoral	none		
King	Alice Lake	7	8/12/99	whole lake	<i>Lysimachia vulgaris</i>	
					<i>Lythrum salicaria</i>	
	Desire Lake	8	9/7/99	whole lake	whole lake	<i>Lythrum salicaria</i>
						<i>Myriophyllum spicatum</i>
	Lucerne Lake	9	6/9/95	outlet	<i>Hydrilla verticillata</i>	
			7/15/95	spot check	<i>Myriophyllum spicatum</i>	
	Meridian Lake	9	7/10/97	whole littoral	<i>Lythrum salicaria</i> <i>Myriophyllum spicatum</i>	
	Morton Lake	9	8/19/97	whole littoral	none	
	Otter (Spring) Lake	8	7/8/99	whole lake	<i>Myriophyllum spicatum</i>	
					<i>Typha angustifolia</i>	
	Pipe Lake	9	6/1/95	several sites, divers	<i>Hydrilla verticillata</i>	
			6/9/95	near boatlaunch, outlet	<i>Myriophyllum spicatum</i>	
			7/12/95	from shore		
			7/15/95	6 sites, biomass samples		
			8/1/95	6 sites, biomass samples		
			6/18/96	spot check, boat		
			7/21/97	3 sites		
			6/9/98	whole lake		
	11/17/98	3 sites, boat				
	6/10/99	selected areas				
	Sawyer Lake	9	8/7/97	whole littoral	<i>Myriophyllum spicatum</i>	
			7/21/99	whole lake	<i>Typha angustifolia</i>	
	Steel Lake	9	5/11/94	entire shoreline, divers	<i>Myriophyllum spicatum</i>	
Shady Lake	9	7/8/99	whole lake	<i>Myriophyllum spicatum</i>		
Washington Lake	8	8/24/98	Juanita Bay	<i>Egeria densa</i>		
				<i>Myriophyllum spicatum</i>		
Wilderness Lake	9	8/19/97	whole littoral	<i>Lythrum salicaria</i> <i>Myriophyllum spicatum</i>		
Kitsap	Buck Lake	15	7/22/98	whole lake	<i>Lythrum salicaria</i>	
	Horseshoe Lake	15	8/22/96	whole littoral	none	
			7/20/00	whole littoral	none	
	Island Lake	15	7/22/98	whole lake	none	
	Kitsap Lake	15	8/3/95	2 sites, whole littoral	none	
			8/28/97	4 sites	none	
			7/1/98	south end	none	
	Long Lake	15	9/12/94	several locations	<i>Egeria densa</i>	
			3/17/95	6 transects, whole littoral	<i>Myriophyllum spicatum</i>	
			7/22/97	2 sites	<i>Lythrum salicaria</i>	
			8/28/97	3 sites		
8/17/99			selected areas			
Mission Lake	15	9/9/96	whole littoral	none		

County	Waterbody Name	WRIA	Date	Survey Extent	Noxious Aquatic Weeds
			6/18/98	whole lake	<i>Utricularia inflata</i>
	Panther Lake	15	8/2/95	whole littoral	none
	Square Lake	15	7/22/97	spot check, shore	none
			6/2/99	1 site, shore	<i>Utricularia inflata</i>
	Wildcat Lake	15	10/4/95	4 sites, whole littoral	none
			8/20/98	whole lake	none
	William Symington Lake	15	9/16/98	whole lake	none
	Wye Lake	15	7/1/98	1 site, shore	<i>Utricularia inflata</i>
Kitsap/Mason	Tiger Lake	15	9/9/96	whole littoral	none
			6/14/99	whole lake	none
Kittitas	Cle Elum Reservoir	39	7/29/98	1 site, shore	none
	Easton Lake	39	8/30/94	spot check from shore	none
			6/18/97	spot check, shore	none
	Kiwanis Pond	39	8/30/94	spot check from shore	none
	Lavender Lake	39	6/18/97	whole littoral	<i>Myriophyllum spicatum</i>
			7/27/98	whole lake	
	unnamed fishing pond	39	8/30/94	most of shoreline	none
	Unnamed Ponds near Easton	39	6/18/97	spot check, shore	none
	unnamed ponds	39	8/30/94	spot checks	<i>Lythrum salicaria</i> at one
Wild Duck Lake	39	7/27/98	2 sites, shore	none	
		7/12/99	whole lake	none	
Klickitat	Columbia River at Bingen	29	8/14/95	spot check from shore	<i>Myriophyllum spicatum</i>
	Columbia River at Maryhill	30	8/14/95	spot check from boat	<i>Myriophyllum spicatum</i>
	Horsethief Lake	30	8/14/95	spot check from shore	<i>Myriophyllum spicatum</i>
			6/17/99	1 site, shore	<i>Amorpha fruticosa</i>
Spearfish Lake	30	6/17/99	whole shore	<i>Epilobium hirsutum</i>	
Lewis	Carlisle Lake	23	8/20/97	whole littoral	none
	Chehalis River	23	7/27/95	shoreline, from boat	<i>Myriophyllum aquaticum</i>
			9/10/96	1 site from shore	
			7/23/97	spot check, shore	<i>Egeria densa</i>
			8/20/97	1 mile of river	
	Interstate Ave Slough	23	8/20/97	spot check, shore	<i>Myriophyllum aquaticum</i>
	Mayfield Reservoir	26	10/5/98	south half	<i>Myriophyllum spicatum</i>
Plummer Lake	23	8/20/97	whole littoral	<i>Egeria densa</i>	
Swofford Pond	26	9/15/98	east end	<i>Myriophyllum spicatum</i>	
Lincoln	Sprague Lake	34	8/6/94	cove at NE end of lake	none
Mason	Benson Lake	14	7/23/96	whole littoral	none
			7/20/00	whole littoral	none
	Devereaux Lake	15	8/16/94	spot check from shore	none
	Haven Lake	15	8/16/94	entire shoreline	none
			6/8/98	whole lake	none
	Isabella Lake	14	7/19/94	entire shoreline	none
			8/2/95	checked for rare plant	none
			8/18/97	whole littoral	<i>Lythrum salicaria</i>
			7/18/00	whole littoral	
	Island Lake	14	7/23/96	whole littoral	<i>Myriophyllum spicatum</i>
			6/24/97	whole littoral	
			7/9/98	whole littoral	
			7/13/00	whole littoral	none
	Limerick Lake	14	8/15/94	entire shoreline	<i>Egeria densa</i>
			7/13/95	spot check, boat	<i>Utricularia inflata</i>
			7/22/97	2 sites	
			7/8/98	whole lake	
			7/13/00	whole lake	
	Lost Lake	14	8/11/94	entire shoreline	none
			6/10/97	whole littoral	none
			7/18/00	whole littoral	none
	Lystair (Star) Lake	22	6/12/98	whole lake	none
	Maggie Lake	15	8/19/98	whole lake	none
	Mason Lake	14	8/7/96	whole littoral	none
			9/14/98	whole lake	<i>Myriophyllum spicatum</i>
			9/22/99	whole shore	
			9/13/00	selected areas	
	Nahwatzel Lake	22	6/26/97	whole littoral	none
			7/14/00	whole littoral	none
Phillips Lake	14	7/20/98	whole lake	none	
		6/8/99	whole lake	none	
		8/17/00	whole lake	none	
Spencer Lake	14	8/15/94	most of shoreline	<i>Lythrum salicaria</i>	
		7/13/95	spot check, boat	<i>Lythrum salicaria</i>	
		8/22/96	south end, boat	none	

County	Waterbody Name	WRIA	Date	Survey Extent	Noxious Aquatic Weeds	
			7/22/97	2 sites	none	
			6/15/99	whole lake	<i>Utricularia inflata</i>	
			8/17/00	whole lake		
		Tee Lake	15	8/19/98	whole lake	none
		Trails End (formerly Prickett)	15	6/16/98	whole lake	<i>Lythrum salicaria</i> <i>Utricularia inflata</i>
		Wooten Lake	15	8/16/94	most of shoreline	none
	6/16/98			whole lake	none	
	7/22/99			whole lake	none	
	Okanogan	Aeneas Lake	49	7/25/94	entire shoreline	none
				7/12/99	south end	none
		Alta Lake	48	6/29/95	whole littoral	none
		Big Twin Lake	48	8/9/95	most of littoral	none
8/11/99				whole lake	none	
		Blue Lake (37N-25E-22)	49	7/14/99	whole lake	none
		Bonaparte Lake	49	8/27/96	whole littoral	none
		Buffalo Lake	53	8/21/95	3 sites, boat	none
		Chopaka Lake	49	7/13/99	selected areas	none
		Conconully Lake	49	7/26/94	7 sites thru' shoreline	<i>Myriophyllum spicatum</i>
		Conconully Reservoir	49	7/26/94	north end	none
9/18/97				whole littoral	<i>Myriophyllum spicatum</i>	
		Crawfish Lake	52	8/28/96	whole littoral	none
		Davis Lake	48	8/9/95	whole littoral	none
8/10/99				1 site, shore	none	
		Duck (Bide-a-Wee) Lake	49	8/28/96	spot check, shore	none
9/18/97				spot check	none	
		Ell Lake	52	7/15/99	whole lake	none
		Fish Lake	49	7/26/94	entire shoreline	none
7/14/99				whole lake	none	
		Green Lake	49	6/29/95	2 sites, whole littoral	none
		Leader Lake	49	8/29/96	whole littoral	none
		Little Twin Lake	48	8/9/95	whole littoral	none
8/11/99	whole lake			none		
	Long Lake	52	7/15/99	whole lake	none	
	Omak Lake	49	8/28/96	north end, boat	none	
Okanogan	Palmer Lake	49	7/27/94	boatlaunches, from shore	none	
			6/28/95	whole littoral	none	
			7/13/99	whole lake	<i>Myriophyllum spicatum</i>	
		Patterson Lake	48	8/10/95	2 sites, whole littoral	none
	8/10/99			whole lake	none	
		Pearygin Lake	48	8/10/95	3 sites, whole littoral	<i>Lythrum salicaria</i>
	8/11/99			whole lake		
		Round Lake	52	7/15/99	whole lake	none
		Sidley Lake	49	8/27/96	spot check, shore	none
		Spectacle Lake	49	7/27/94	5 sites, various locations	none
	8/27/96			whole littoral	none	
	9/17/97			3 sites	none	
	7/14/99			selected areas	none	
	Wannacut Lake	49	7/28/94	3 sites	none	
	Whitestone Lake	49	7/27/94	5 sites, various locations	<i>Myriophyllum spicatum</i>	
6/28/95			6 sites, whole littoral	<i>Lythrum salicaria</i>		
8/26/96			whole littoral			
9/17/97			whole littoral			
7/13/99			1 site, shore	<i>Myriophyllum spicatum</i>		
Pacific	Black Lake	24	7/12/94	spot check, shore	<i>Egeria densa</i>	
			8/8/96	most of shoreline		
			8/26/97	whole littoral		
			6/22/99	1 site, shore	<i>Myriophyllum spicatum</i>	
		Island Lake	24	7/14/94	entire shoreline	none
	8/26/97			whole littoral	none	
		Loomis Lake	24	7/13/94	most of shoreline	none
	8/25/97			whole littoral	<i>Myriophyllum spicatum</i>	
	6/22/99			whole lake	<i>Egeria densa</i>	
		O'Neil Lake	24	7/12/94	entire littoral	none
8/25/97	spot check, shore			none		
	Surfside Lake	24	7/13/94	5 sites from bridges	none	
8/25/97			spot check, shore	none		
Pend Oreille	Bead Lake	62	8/12/97	coves, 5 sites	none	
	Big Meadow	61	7/26/00	west basin	none	
	Browns Lake	62	7/31/96	spot check, shore	none	
8/25/99			whole lake	none		

County	Waterbody Name	WRIA	Date	Survey Extent	Noxious Aquatic Weeds
	Davis Lake	62	8/2/94	most of littoral	none
			7/30/96	north end, boat launch	<i>Myriophyllum spicatum</i>
			8/12/97	whole littoral	
	Diamond Lake	55	8/2/94	boatlaunch, from shore	none
			7/31/96	east end, boat launch	none
			8/11/97	west half	none
	Fan Lake	55	8/3/94	entire shoreline	<i>Lythrum salicaria</i>
			8/12/97	whole littoral	
	Frater Lake	59	8/1/96	spot check, shore	none
	Half Moon Lake	62	7/31/96	north end	none
	Horseshoe Lake	55	7/13/98	west half	none
	Kent Meadows Lake	62	8/25/99	2 sites, shore	none
	Leo Lake	59	7/28/99	whole lake	none
	Little Spokane River	55	8/2/94	at Fertile Valley Rd crossing	<i>Myriophyllum spicatum</i>
			8/2/94	at Haworth Rd crossing	none
	Marshall Lake	62	8/1/94	3 sites, mostly at inlets	none
			8/24/99	whole lake	<i>Myriophyllum spicatum</i>
	Mill Lake	62	8/1/96	2 sites, shore	none
	Nile Lake	62	8/1/96	spot check, shore	<i>Myriophyllum spicatum</i>
	Parker Lake	62	8/24/99	1 site, shore	none
	Pend Oreille River	62	8/1/96	spot check, shore	<i>Myriophyllum spicatum</i>
	Sacheen Lake	55	8/2/94	3 sites, covered entire shore	<i>Myriophyllum spicatum</i>
					<i>Lythrum salicaria</i>
Skookum Lake, North	62	7/31/96	spot check, shore	none	
		8/24/99	whole lake	none	
Skookum Lake, South	62	7/31/96	whole littoral	none	
Sullivan Lake	62	8/1/96	north and south, boat	none	
Trask Pond	57	8/25/99	shore	none	
Unnamed Wetland near Usk	62	8/1/96	shore	none	
Pierce	American Lake	12	10/4/94	4 sites	none
			10/6/98	whole lake	none
	Bay Lake	15	9/28/95	whole littoral	<i>Lythrum salicaria</i>
			9/13/00	whole littoral	
	Carney Lake	15	7/1/98	1 site, shore	none
	Clear Lake	11	7/21/94	entire shoreline	<i>Myriophyllum spicatum</i>
			6/12/96	whole littoral	
			6/23/97	whole littoral	<i>Typha angustifolia</i>
			7/6/99	whole lake	
	Harts Lake	11	6/17/96	spot check, shore	<i>Myriophyllum spicatum</i>
			7/3/96	whole littoral	
			6/24/99	whole lake	
	Kapowsin Lake	10	9/20/00	northeast half	<i>Typha angustifolia</i>
	Ohop Lake	11	7/25/96	whole littoral	<i>Egeria densa</i>
			9/25/97	whole littoral	
	Rapjohn Lake	11	7/25/96	whole littoral	none
			8/2/99	whole lake	none
	Silver Lake	11	6/17/96	spot check, shore	none
	Spanaway Lake	12	9/11/96	whole littoral	<i>Lythrum salicaria</i>
	Steilacoom Lake	12	6/19/96	spot check, boat	none
			8/26/98	whole lake	none
			10/21/98	1 site, boat	none
	Tanwax Lake	11	7/21/94	entire shoreline	none
9/12/96			whole littoral	none	
7/6/99			whole lake	<i>Typha angustifolia</i>	
Tapps Lake	10	9/21/00	boat launch area	<i>Myriophyllum spicatum</i>	
Whitman Lake	11	8/5/99	whole lake	none	
San Juan	Cascade Lake	2	9/9/97	whole littoral	none
	Hummel Lake	2	9/8/97	whole littoral	none
	Mountain Lake	2	9/9/97	whole littoral	none
	Sportsman Lake	2	9/10/97	whole littoral	none
Skagit	Beaver Lake	3	8/25/94	entire shoreline	none
			9/15/99	whole lake	<i>Myriophyllum spicatum</i>
	Big Lake	3	8/23/94	3 sites, extreme ends	<i>Egeria densa</i>
			8/23/94	& launch	<i>Myriophyllum spicatum</i>
			9/15/99	whole lake	
	Campbell Lake	3	6/7/94	entire shoreline	none
			8/13/96	whole littoral	<i>Myriophyllum spicatum</i>
			7/2/97	whole littoral	
			8/4/99	whole lake	
Cavanaugh Lake	5	8/24/98	whole lake	none	
Clear Lake (34N-05E-07)	3	8/25/94	boatramp only	<i>Myriophyllum spicatum</i>	

County	Waterbody Name	WRIA	Date	Survey Extent	Noxious Aquatic Weeds			
			9/15/99	whole lake				
	Cranberry Lake	3	8/25/98	2 sites, shore	none			
			9/11/00	north end, from shore	none			
	Erie Lake		3	8/24/94	Entire shoreline	none		
				8/13/96	spot check, shore	none		
				7/2/97	whole littoral	none		
				9/16/99	whole lake	none		
				9/11/00	whole lake	none		
	Everett Lake	4	8/15/96	spot check, shore	none			
	Heart Lake (35N-01E-36)		3	8/24/94	most of shoreline	none		
				8/13/96	whole littoral	none		
				8/25/98	whole lake	<i>Myriophyllum spicatum</i>		
				9/11/00	whole lake			
	McMurray Lake		3	6/6/94	entire shoreline	<i>Myriophyllum spicatum</i>		
				8/23/94	entire shoreline			
8/3/99				whole lake				
Pass Lake	3	7/2/97	spot check, shore	none				
Sixteen Lake		3	6/6/94	entire shoreline	<i>Myriophyllum spicatum</i>			
			8/3/99	whole lake				
Skamania	Coldwater Lake	26	8/27/98	80% of shore	<i>Myriophyllum spicatum</i>			
	Drano Lake	29	6/17/99	1 site, shore	<i>Myriophyllum spicatum</i>			
Snohomish	Blackmans Lake	7	8/5/98	whole lake	<i>Lythrum salicaria</i>			
	Flowing Lake	7	9/12/00	whole littoral	none			
	Goodwin Lake	7	6/20/95	3 sites, littoral survey	<i>Myriophyllum spicatum</i>			
	Howard Lake	5	7/20/99	whole lake	none			
	Ki Lake	5	7/19/99	whole lake	none			
	Martha Lake (31N-04E-18)	5	7/20/99	whole lake	none			
	Martha Lake (27N-04E-01)	8	8/5/98	whole lake	none			
	Nina Lake	7	6/20/95	2 sites, from shore	<i>Myriophyllum aquaticum</i>			
	Riley Lake	5	7/19/99	whole lake	<i>Lythrum salicaria</i>			
	Roesiger (north arm) Lake				7	8/6/98	whole lake	<i>Myriophyllum spicatum</i>
								<i>Lythrum salicaria</i>
	Roesiger (south arm) Lake				7	8/25/94	east side, littoral	none
						6/21/95	spot check, boat	none
						8/29/95	most of shoreline	none
						8/6/98	whole lake	<i>Myriophyllum spicatum</i>
Shoecraft Lake	7	8/15/96	whole littoral	<i>Myriophyllum spicatum</i>				
Stevens Lake	7	9/10/97	4 sites	none				
Spokane	Amber Lake	34	8/5/94	at boatramp, from shore	none			
	Badger Lake	34	8/5/94	2 sites at extreme ends	none			
	Chapman Lake	34	8/24/95	3 sites	none			
	Clear Lake	43	8/4/94	4 sites, most of shoreline	none			
	Downs Lake	34	8/3/94	from shore - one location	none			
	Eloika Lake	55	8/3/94	3 sites, missed some places	<i>Myriophyllum spicatum</i>			
	Fishtrap Lake	43	8/4/94	3 sites	none			
	Liberty Lake				57	7/13/98	whole lake	<i>Myriophyllum spicatum</i>
						7/27/00	4 sites	
	Long Lake (reservoir)				54	8/6/94	2 sites near boatlaunch	<i>Lythrum salicaria</i>
						8/25/95	1 site	<i>Nymphoides peltata</i>
						8/31/99	selected areas	<i>Myriophyllum spicatum</i>
	Medical Lake	43	7/14/98	whole lake	none			
	Medical, West Lake	43	7/14/98	whole lake	none			
	Newman Lake				57	8/31/99	south end	none
7/26/00						north end	none	
Silver Lake				34	8/4/94	only at boatramp (closed)	none	
					8/24/95	2 sites	none	
					7/28/00	whole littoral	none	
					8/5/94	boatlaunch and south end	none	
Williams Lake				34	9/16/97	whole littoral	none	
Stevens	Black Lake	59	7/25/00	whole littoral	none			
	Deep Lake	61	7/30/97	whole littoral	none			
			7/25/00	all but west shore	none			
	Deer Lake	59	7/29/97	whole littoral	none			
			7/27/99	whole lake	none			
			7/27/00	boat launch areas	none			
	Gillette Lake	59	7/27/99	whole lake	none			
	Jumpoff Joe Lake	59	7/29/97	whole littoral	none			
			7/27/00	whole littoral	none			
	Loon Lake	59	9/25/96	whole littoral	<i>Myriophyllum spicatum</i>			
7/31/97			1 site	<i>Lysimachia vulgaris</i>				
6/24/98			whole lake	<i>Lythrum salicaria</i>				

County	Waterbody Name	WRIA	Date	Survey Extent	Noxious Aquatic Weeds
			8/11/98	whole lake	
			6/28/99	whole lake	
	Starvation Lake	59	7/26/99	whole lake	none
	Waitts Lake	59	7/30/97	whole littoral	<i>Lythrum salicaria</i>
Thurston	Black Lake	23	7/8/94	north end	none
			4/18/95	1 site to test methods	none
	Black River near Gate	23	8/18/98	1 site, shore	<i>Polygonum hydropiper</i>
			9/15/98	1 site, shore	
			9/30/98	5 mile reach	
			10/20/99	5 mile reach	
	Clear Lake	11	8/7/95	1 site	none
	Hicks Lake	13	5/24/95	3 sample sites, shoreline	<i>Utricularia inflata</i>
	Lawrence Lake	13	11/7/95	spot check from shore	none
	Long Lake	14	6/6/95	spot check	<i>Myriophyllum spicatum</i>
			9/20/95	milfoil site	
			10/18/95	spot check	
			11/2/95	milfoil site	
	Munn Lake	13	6/3/98	1 site, shore	<i>Utricularia inflata</i>
			10/14/98	1 site, shore	
			5/25/99	1 site, shore	
			6/21/99	whole lake	
		9/7/00	whole littoral		
Offutt Lake	13	7/7/98	whole lake	none	
Summit Lake	14	7/23/97	west end	none	
Ward Lake	13	7/6/98	whole lake	none	
Wahkiakum	Brooks Slough	25	6/22/99	1 site, shore	<i>Myriophyllum aquaticum</i>
	Columbia River at Cathlamet	25	8/16/95	spot check, boat	<i>Lythrum salicaria</i> <i>Myriophyllum spicatum</i>
	Columbia River at Skamokawa	25	8/8/96	spot check, boat	<i>Lythrum salicaria</i>
	Puget Island Sloughs	25	5/16/95	2 sloughs, from shore	<i>Egeria densa</i> <i>Myriophyllum aquaticum</i>
Walla Walla	Snake River - Lower Monumental Dam	33	8/20/96	spot check, boat	<i>Lythrum salicaria</i> <i>Myriophyllum spicatum</i>
	Snake River at Charbonneau Park	33	8/19/96	spot check, boat	none
	Snake River at Fishhook Park	33	8/19/96	spot check, boat	none
	Snake River at Ice Harbor Dam	33	8/19/96	spot check, boat	<i>Myriophyllum spicatum</i>
Whatcom	Cain Lake	3	8/14/96	whole littoral	none
			9/13/99	whole lake	none
	Samish Lake (East Arm)	3	6/30/97	whole littoral	none
			9/14/99	whole lake	none
	Samish Lake (West Arm)	3	6/30/97	whole littoral	none
			9/14/99	whole lake	none
	Silver Lake	1	7/1/97	whole littoral	<i>Butomus umbelatus</i>
			9/12/00	whole littoral	
	Terrell Lake	1	8/14/96	whole littoral	<i>Lythrum salicaria</i>
			9/14/99	whole lake	
Toad (Emerald) Lake	1	7/3/97	whole littoral	none	
Whatcom Lake	1	6/21/95	3 sites, littoral, west basin	<i>Myriophyllum spicatum</i>	
Wiser Lake	1	8/14/96	spot check, shore	none	
		7/1/97	whole littoral	none	
Whitman	Rock Lake	34	8/5/94	south boatramp, from shore	none
			9/15/97	spot check, shore	none
	Snake River at Central Ferry	35	8/5/97	spot check, shore	<i>Myriophyllum spicatum</i>
	Snake River at Little Goose Dam	35	8/5/97	spot check, boat	<i>Myriophyllum spicatum</i>
Snake River at Lower Granite Dam	35	8/4/97	spot check, boat	<i>Myriophyllum spicatum</i>	
Yakima	Dog Lake	38	7/30/98	whole lake	none
	Giffin Lake	37	7/19/95	from shore	none
	Leech Lake	39	7/30/98	whole lake	none
	Morgan Lake	37	7/19/95	spot check, from shore	none
	pond nr hwy 12	37	8/8/94	one spot, from shore	none
	Unnamed pond (14N-19E-31)	39	7/18/95	spot check, from shore	none
			7/29/98	1 site, shore	none
	Unnamed Ponds (12N-19E-20)	37	7/18/95	spot check, from shore	<i>Myriophyllum spicatum</i>
			7/29/98	4 sites, shore	<i>Lythrum salicaria</i>
	Wenas Lake	39	7/29/98	whole lake	none
	Yakima River	37	8/8/94	from Selah to Arboretum	<i>Lythrum salicaria</i>
		9/27/94	Arboretum to Union Gap	<i>Lythrum salicaria</i>	
		7/19/95	Mabton Bridge	none	

Appendix B

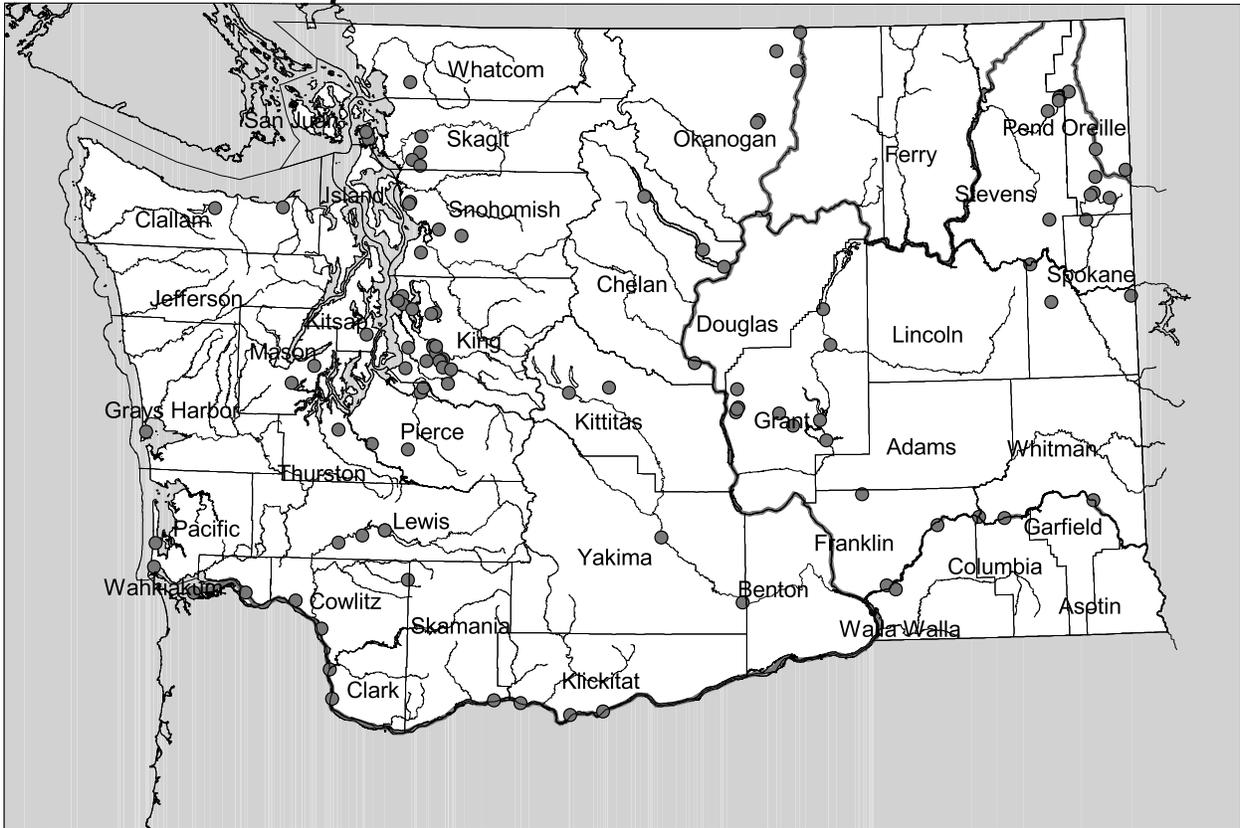
Myriophyllum spicatum Distribution Map

Lakes Known to Contain Eurasian milfoil (*Myriophyllum spicatum*), as of October, 2000

County	Waterbody Name	County	Waterbody Name
Chelan	Chelan Lake	Lewis, con't	Swofford Pond
	Cortez (Three) Lake	Mason	Island Lake
	Domke Lake		Mason Lake
	Wapato Lake	Okanogan	Conconully (Salmon) Lake
Clallam	Sutherland Lake		Conconully Reservoir
	unnamed pond		Okanogan River
Clark	Caterpillar Slough		Osoyoos Lake
	Columbia River at Ridgefield		Palmer Lake
Clatsop, OR	Columbia River at Astoria	Whitestone Lake	
Columbia	Snake River, Little Goose Dam	Pacific	Black Lake
			Loomis Lake
Cowlitz	Kress Lake	Pend Oreille	Davis Lake
	Willow Grove Slough		Diamond Lake
Franklin	Scooteney Reservoir		Fan Lake
	Snake River, Ice Harbor Dam		Little Spokane River
	Snake River, Lower Mon. Dam		Marshall Lake
	Snake River at Lyons Ferry	Nile Lake	
Grant	Babcock Ridge Lake	Pierce	Pend Oreille River
	Banks Lake		Sacheen Lake
	Billy Clapp Lake		Clear Lake
	Burke Lake		Harts Lake
	Evergreen Lake		Hidden Lake
	Moses Lake	Tapps Lake	
	Potholes Reservoir	Skagit	Big Lake
	Stan Coffin Lake		Campbell Lake
	Winchester Wasteway		Clear Lake (34N-05E-07)
	Winchester Wasteway Ext.		Heart Lake
Grays Harbor	Duck Lake		McMurray Lake
	King	Angle Lake	Sixteen Lake
Bass Lake		Skamania	Coldwater Lake
Desire Lake			Drano Lake
Green Lake		Snohomish	Goodwin Lake
Lucerne Lake			Roesiger Lake
Meridian Lake			Shoecraft Lake
Number Twelve Lake			Silver Lake (28N-05E-30)
Otter (Spring) Lake			Stevens Lake
Phantom Lake		Spokane	Eloika Lake
Pipe Lake			Liberty Lake
Sammamish Lake			North Silver Lake
Sawyer Lake			Black Lake
Shadow Lake			Gillette Lake
Shady Lake		Stevens	Heritage Lake
Ship Canal			Long Lake (Reservoir)
Star Lake			

County	Waterbody Name	County	Waterbody Name
(King)	Steel Lake		Loon Lake
	Union Lake		Sherry Lake
	Washington Lake		Thomas Lake
	Wilderness Lake		
Kitsap	Long Lake	Thurston	Long Lake
Kittitas	Lavender Lake		Scott Lake
	Private Pond	Wahkiakum	Columbia River, Cathlamet
Klickitat	Columbia River, Bingen	Walla Walla	Snake River, Ice Harbor Dam
	Columbia River, Maryhill		Snake River, Lower Mon. Dam
	Horsethief Lake	Whatcom	Whatcom Lake
Lewis	Cowlitz River	Whitman	Snake River, Low. Granite Dam
	Mayfield Reservoir	Yakima	Byron Lake
	Riffe Lake		Unnamed Ponds nr. Parker

M. spicatum locations, 2000



Appendix C

*Locations of aquatic invasive non-native species
(other than M. spicatum, E. densa and
M. aquaticum)*

Listed Noxious Weed	Weed Class*	County	Waterbody Name
<i>Cabomba caroliniana</i>	Class B	Cowlitz	Solo Slough
(fanwort)		Cowlitz	Willow Grove Slough
<i>Hydrilla verticillata</i>	Class A	King	Lucerne Lake
(hydrilla)		King	Pipe Lake
<i>Nymphoides peltata</i>	Class B	Spokane,	Long Lake (Reservoir)
(yellow floating heart)		Stevens	
<i>Potamogeton crispus</i>	monitor	Adams	Sprague Lake
(curly-leaf pondweed)		Clallam	Crescent Lake
		Clark	Caterpillar Slough
		Columbia	Snake River at Little Goose Dam
		Columbia	Snake River near Lyons Ferry
		Ferry	Curlew Lake
		Franklin	Snake River at Levey Park
		Franklin	Snake River at Lower Monumental Dam
		Franklin	Snake River at Lyons Ferry
		Franklin	Snake River at Windust Park
		Garfield	Snake River at Lower Granite Dam
		Grant	Babcock Ridge Lake
		Grant	Banks Lake
		Grant	Billy Clapp Lake
		Grant	Blue Lake
		Grant	Burke Lake
		Grant	Evergreen Lake
		Grant	Heart Lake
		Grant	Moses Lake
		Grant	Potholes Reservoir
		Grant	Stan Coffin Lake
		Grant	Winchester Wasteway
		King	Washington Lake
		Kitsap	Kitsap Lake
		Kitsap	Long Lake
		Kittitas	Unnamed Pond (17N-18E-11)
		Klickitat	Columbia River at Bingen
		Klickitat	Columbia River at Maryhill
		Klickitat	Horsethief Lake
		Klickitat	Spearfish Lake
		Lewis	Swofford Pond
		Okanogan	Patterson Lake
		Pierce	American Lake
		Pierce	Harts Lake
		Pierce	Ohop Lake
		Pierce	Spanaway Lake

Listed Noxious Weed	Weed Class*	County	Waterbody Name
<i>Potamogeton crispus</i> (curly-leaf pondweed)	monitor	Pierce	Steilacoom Lake
		Pierce	Tanwax Lake
		Skagit	Big Lake
		Skamania	Drano Lake
		Spokane	Long Lake (Reservoir)
		Spokane	Medical, West Lake
		Thurston	Long Lake
		Wahkiakum	Columbia River at Skamokawa
		Walla Walla	Snake River at Charbonneau Park
		Walla Walla	Snake River at Lower Monumental Dam - Walla Walla
		Whatcom	Wiser Lake
		Whitman	Rock Lake
		Whitman	Snake River at Central Ferry
		Whitman	Snake River at Little Goose Dam
		Whitman	Snake River at Lower Granite Dam
		Yakima	Unnamed pond (14N-19E-31)
		Yakima	Unnamed Ponds (12N-19E-20)
Yakima	Yakima River		
<i>Utricularia inflata</i> (swollen bladderwort)	monitor	Kitsap	Horseshoe Lake
		Kitsap	Mission Lake
		Kitsap	Square Lake
		Kitsap	Wye Lake
		Mason	Limerick Lake
		Mason	Spencer Lake
		Mason	Trails End (formerly Prickett)
		Thurston	Hicks Lake
Thurston	Munn Lake		

* Weed classes as stated by the Washington State Noxious Weed Control Board.

- Class A weeds require eradication
- Class B weeds are designated for control in areas of the state where their distribution is still limited
- Monitor weeds are plants of concern for which more data are being gathered

Appendix D

Plant Identification References

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Appendix E

Herbarium Specimens, Grouped by Family

Herbarium Specimens - Grouped by Family

Family	Scientific name	Common name
Alismataceae	<i>Alisma gramineum</i> <i>Sagittaria cuneata</i> <i>Sagittaria graminea</i> <i>Sagittaria rigida</i>	narrowleaf water-plantain Arumleaf arrowhead, wapato slender arrowhead bur arrowhead
Apiaceae	<i>Cicuta douglasii</i> <i>Hydrocotyle ranunculoides</i> <i>Lilaeopsis occidentalis</i>	western water-hemlock water-pennywort lilaeopsis
Asteraceae	<i>Megalodonta beckii</i>	water marigold
Azollaceae	<i>Azolla mexicana</i>	Mexican water-fern
Boraginaceae	<i>Myosotis laxa</i> <i>Myosotis scorpioides</i>	small flowered forget-me-not common forget-me-not
Brassicaceae	<i>Rorippa nasturtium-aquaticum</i> <i>Rorippa palustris</i> <i>Subularia aquatica</i>	water-cress marsh yellowcress awlwort
Butomaceae	<i>Butomus umbellatus</i>	flowering rush
Cabombaceae	<i>Brasenia schreberi</i> <i>Cabomba caroliniana</i>	watershield fanwort
Callitrichaceae	<i>Callitriche hermaphroditica</i> <i>Callitriche heterophylla</i> <i>Callitriche stagnalis</i> <i>Callitriche verna</i>	northern water-starwort different-leaved water-starwort pond water-starwort spring water-starwort
Campanulaceae	<i>Lobelia dortmanna</i>	water gladiole; water lobelia
Ceratophyllaceae	<i>Ceratophyllum demersum</i>	Coontail; hornwort
Characeae	<i>Nitella sp.</i> <i>Tolypella intricata</i>	stonewort macro algae
Crassulaceae	<i>Crassula aquatica</i>	pygmy-weed

Family	Scientific name	Common name
Cyperaceae	<i>Carex unilateralis</i>	one-sided sedge
	<i>Cyperus erythrorhizos</i>	red rooted cyperus
	<i>Dulichium arundinaceum</i>	Dulichium
	<i>Eleocharis acicularis</i>	needle spike-rush
	<i>Eleocharis sp.</i>	spike-rush
	<i>Scirpus acutus</i>	hardstem bulrush
	<i>Scirpus americanus</i>	american bulrush
	<i>Scirpus cyperinus</i>	wool-grass
	<i>Scirpus fluviatilis</i>	river bulrush
	<i>Scirpus maritimus</i>	seacoast bulrush
	<i>Scirpus nevadensis</i>	Nevada bulrush
	<i>Scirpus subterminalis</i>	water clubrush
Elatinaceae	<i>Elatine sp.</i>	waterwort
	<i>Elatine triandra</i>	three-stamen waterwort
Equisetaceae	<i>Equisetum fluviatile</i>	water horsetail
Fontinalaceae	<i>Fontinalis antipyretica</i>	water moss
Haloragaceae	<i>Myriophyllum aquaticum</i>	parrotfeather
	<i>Myriophyllum hippuroides</i>	western watermilfoil
	<i>Myriophyllum quitense</i>	waterwort watermilfoil
	<i>Myriophyllum sibiricum</i>	northern watermilfoil
	<i>Myriophyllum sp.</i>	water-milfoil
	<i>Myriophyllum spicatum</i>	Eurasian water-milfoil
	<i>Myriophyllum verticillatum</i>	whorled watermilfoil
Hippuridaceae	<i>Hippuris vulgaris</i>	common maretail
Hydrocharitaceae	<i>Egeria densa</i>	Brazilian elodea
	<i>Egeria najas</i>	Asian anacharis
	<i>Elodea canadensis</i>	common elodea
	<i>Elodea nuttallii</i>	Nuttall's waterweed
	<i>Hydrilla verticillata</i>	hydrilla
	<i>Vallisneria americana</i>	water celery
Isoetaceae	<i>Isoetes sp.</i>	quillwort
Juncaceae	<i>Juncus acuminatus</i>	tapered rush
	<i>Juncus bulbosus</i>	bulbous rush

Family	Scientific name	Common name
Lamiaceae	<i>Lycopus asper</i>	rough bungleweed
Lemnaceae	<i>Wolffia borealis</i>	water-meal
Lentibulariaceae	<i>Utricularia inflata</i> <i>Utricularia macrorhiza</i> <i>Utricularia minor</i> <i>Utricularia sp.</i> <i>Utricularia vulgaris</i>	big floating bladderwort common bladderwort lesser bladderwort bladderwort common bladderwort
Menyanthaceae	<i>Menyanthes trifoliata</i> <i>Nymphoides peltata</i>	buckbean water fringe
Najadaceae	<i>Najas flexilis</i> <i>Najas gradalupensis</i>	common naiad Guadalupe water-nymph
Nymphaeaceae	<i>Nuphar polysepala</i>	spatter-dock, yellow water-lily
Onagraceae	<i>Epilobium hirsutum</i> <i>Ludwigia hexapetala</i> <i>Ludwigia palustris</i>	fiddle-grass water primrose water-purslane
Poaceae	<i>Cinna latifolia</i> <i>Glyceria borealis</i> <i>Zizania aquatica</i>	wood reed-grass northern mannagrass wild rice
Polygonaceae	<i>Polygonum amphibium</i> <i>Polygonum hydropiper</i> <i>Polygonum hydropiperoides</i>	water smartweed marshpepper smartweed common smartweed
Pontederiaceae	<i>Heteranthera dubia</i>	water star-grass
Potamogetonaceae	<i>Potamogeton alpinus</i> <i>Potamogeton amplifolius</i> <i>Potamogeton crispus</i> <i>Potamogeton diversifolius</i> <i>Potamogeton epihydrus</i> <i>Potamogeton foliosus</i> <i>Potamogeton friesii</i> <i>Potamogeton gramineus</i> <i>Potamogeton illinoensis</i> <i>Potamogeton natans</i>	red pondweed large-leaf pondweed curly leaf pondweed snailseed pondweed, diverse leaf ribbonleaf pondweed leafy pondweed flat-stalked pondweed grass-leaved pondweed Illinois pondweed floating leaf pondweed

Family	Scientific name	Common name
	<i>Potamogeton nodosus</i>	longleaf pondweed
	<i>Potamogeton obtusifolius</i>	bluntleaf pondweed
	<i>Potamogeton pectinatus</i>	sago pondweed
	<i>Potamogeton praelongus</i>	whitestem pondweed
	<i>Potamogeton pusillus</i>	slender pondweed
	<i>Potamogeton richardsonii</i>	Richardson's pondweed
	<i>Potamogeton robbinsii</i>	fern leaf pondweed
	<i>Potamogeton vaginatus</i>	sheathing pondweed
	<i>Potamogeton zosteriformis</i>	eel-grass pondweed
Primulaceae	<i>Lysimachia nummularia</i>	creeping loosestrife
	<i>Lysimachia thyrsiflora</i>	tufted loosestrife
	<i>Lysimachia vulgaris</i>	garden loosestrife
Ranunculaceae	<i>Ranunculus aquatilis</i>	water-buttercup
	<i>Ranunculus flammula</i>	creeping buttercup
Ruppiaceae	<i>Ruppia maritima</i>	ditch-grass
Scrophulariaceae	<i>Gratiola neglecta</i>	hedge-hyssop
	<i>Limosella acaulis</i>	mudwort
	<i>Limosella aquatica</i>	mudwort
	<i>Lindernia dubia</i>	false-pimpernel
	<i>Veronica anagallis-aquatica</i>	water speedwell
Sparganiaceae	<i>Sparganium angustifolium</i>	narrowleaf bur-reed
	<i>Sparganium eurycarpum</i>	broadfruited bur-reed
	<i>Sparganium nutans</i>	small bur-reed
	<i>Sparganium sp.</i>	bur-reed
Typhaceae	<i>Typha angustifolia</i>	lesser cat-tail
Zannichelliaceae	<i>Zannichellia palustris</i>	horned pondweed