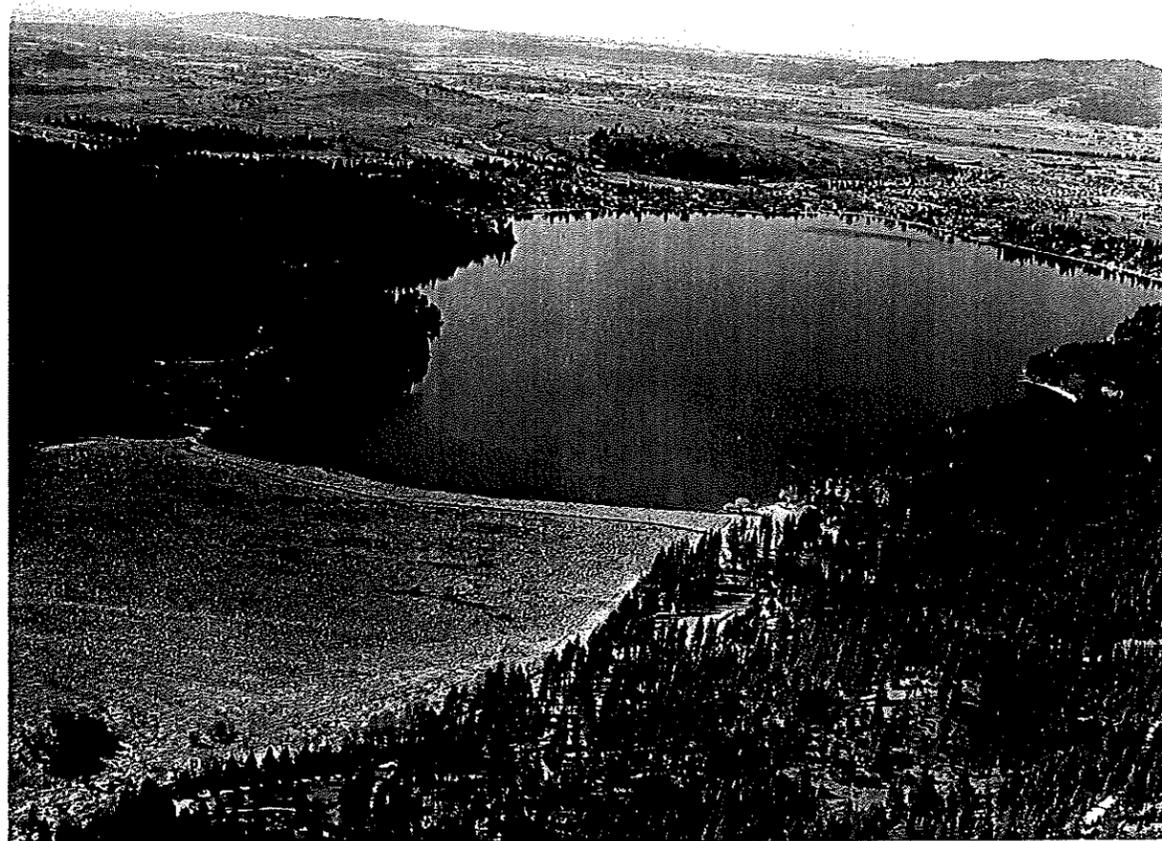


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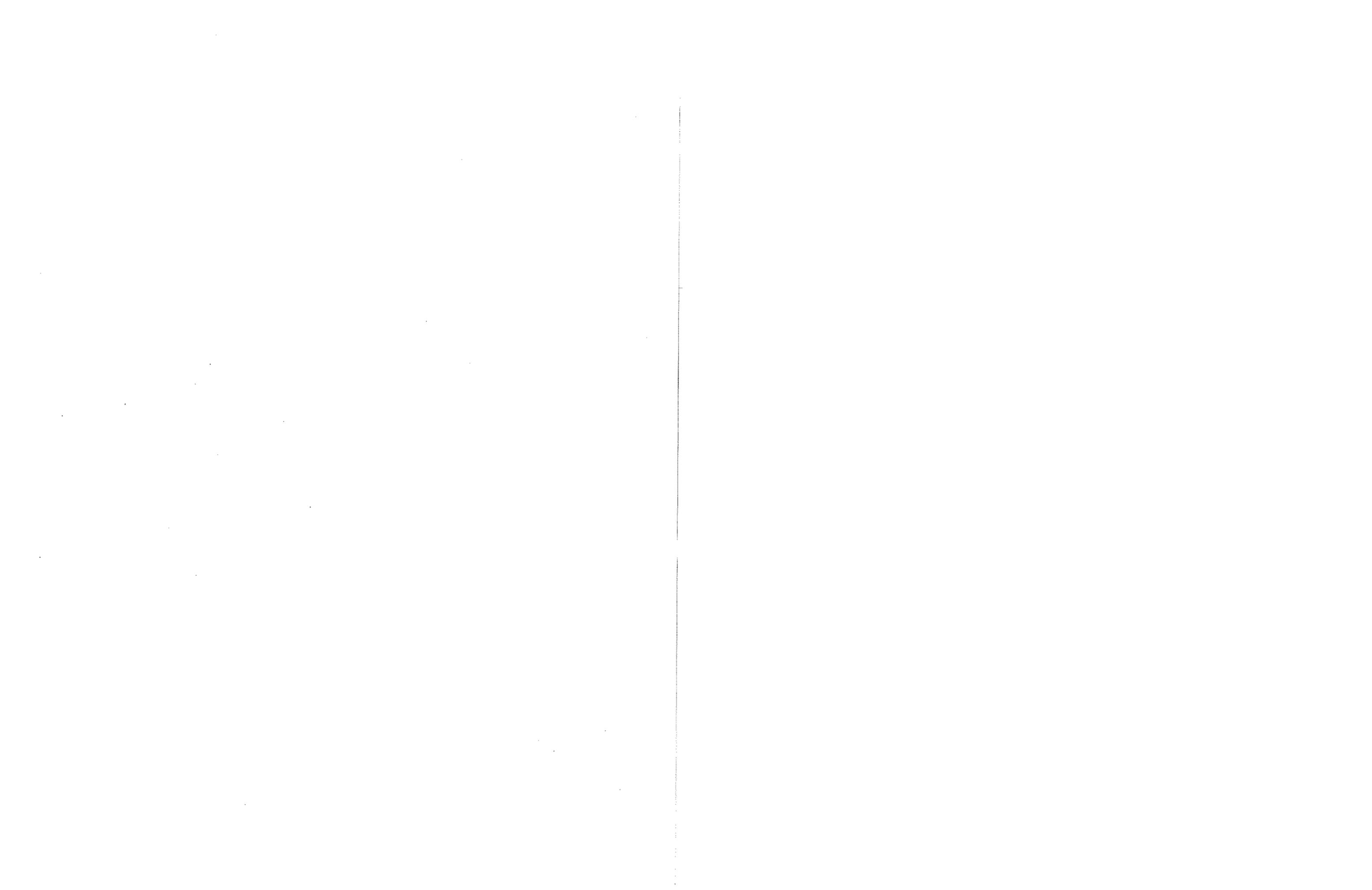
# *Liberty Lake Aquatic Weed Management Plan*

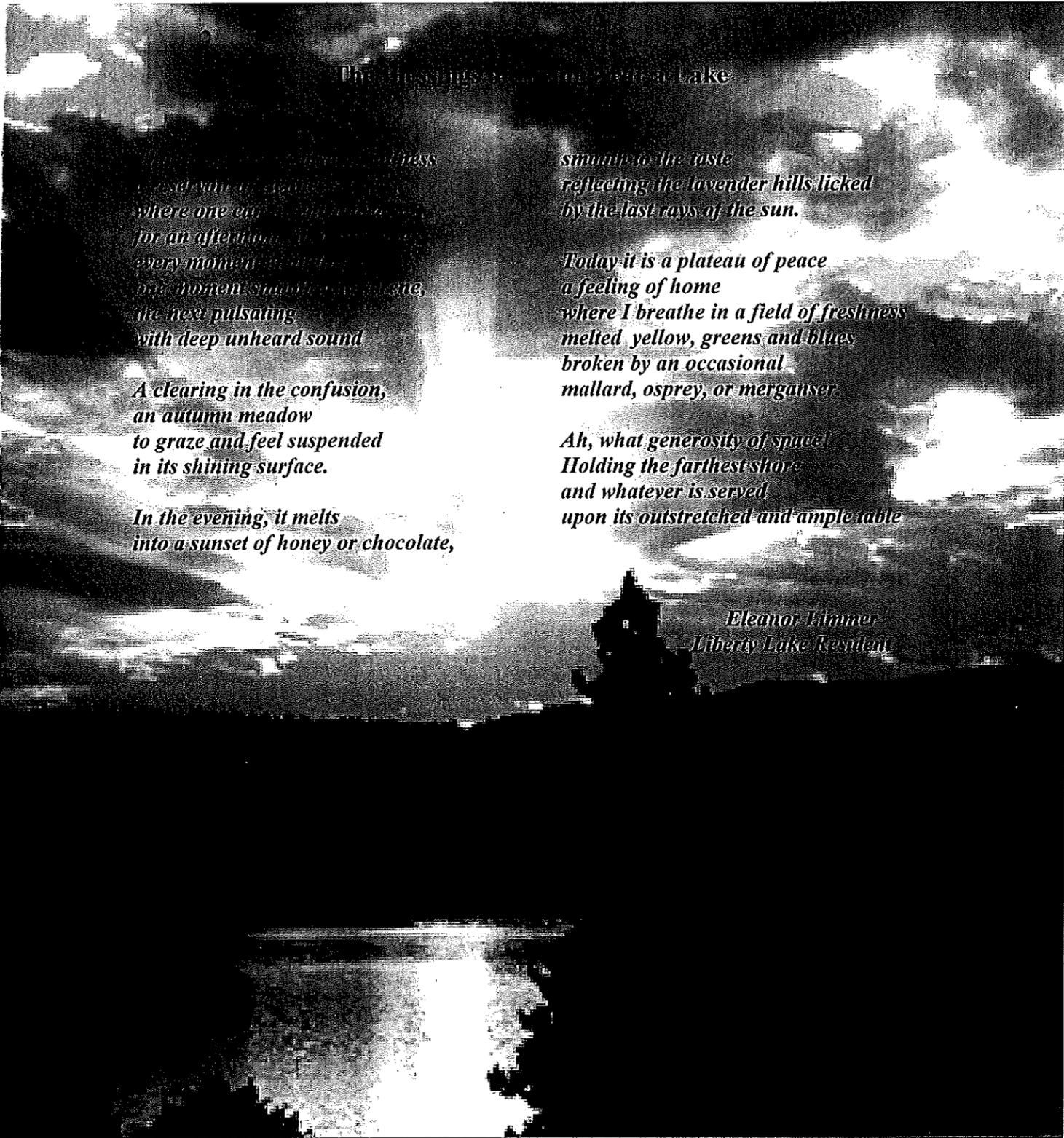


**February 2004**

**BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District**

Funded by Washington State Department of Ecology





*The Hearings of Liberty Lake*

*...the softness  
of a clear day  
where one can sit and gaze  
for an afternoon, or longer,  
every moment of the day  
and moment still to come,  
the next pulsating  
with deep unheard sound*

*A clearing in the confusion,  
an autumn meadow  
to graze and feel suspended  
in its shining surface.*

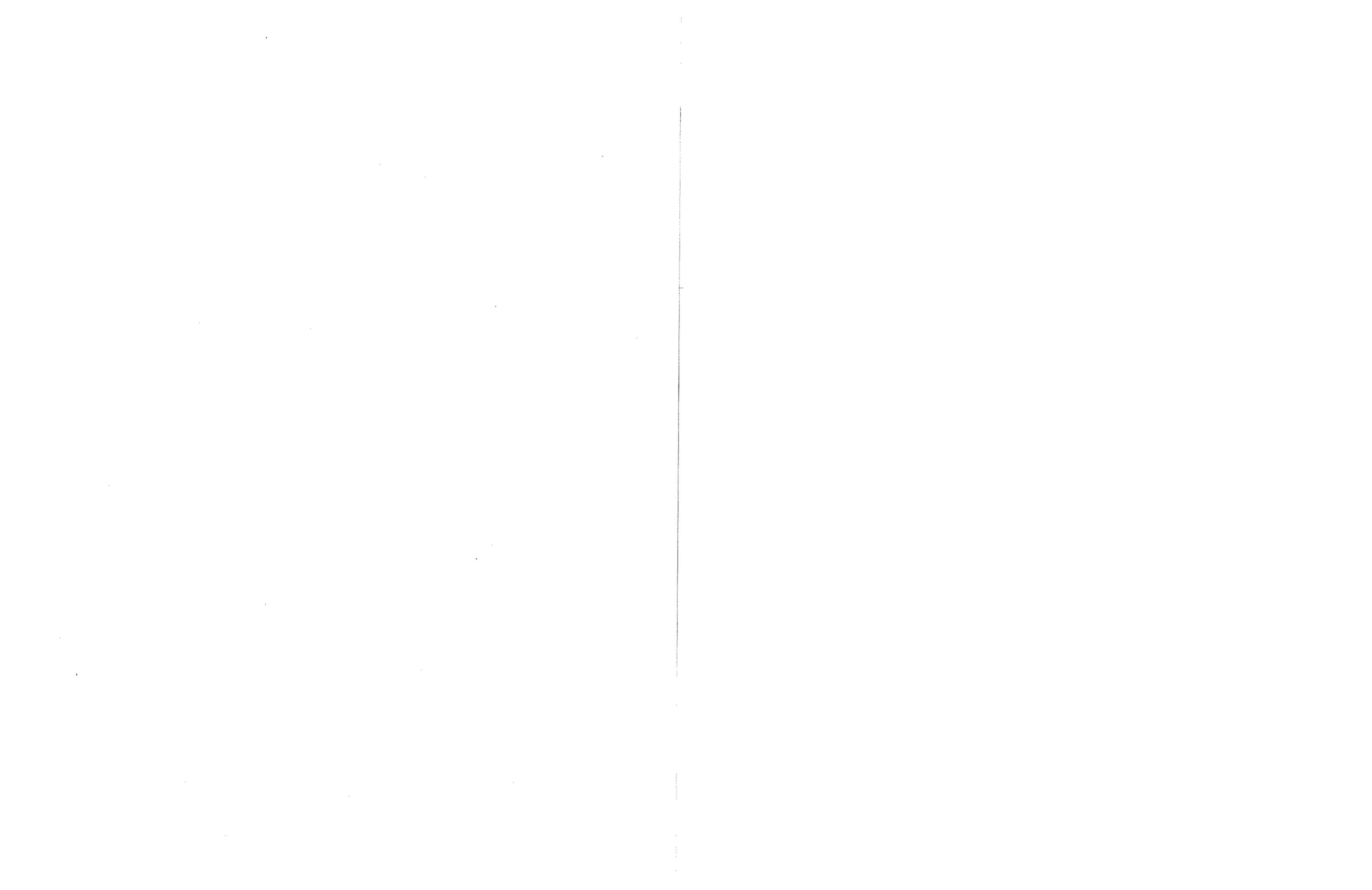
*In the evening, it melts  
into a sunset of honey or chocolate,*

*smooth to the taste  
reflecting the lavender hills licked  
by the last rays of the sun.*

*Today it is a plateau of peace  
a feeling of home  
where I breathe in a field of freshness  
melted yellow, greens and blues  
broken by an occasional  
mallard, osprey, or merganser.*

*Ah, what generosity of space!  
Holding the farthest shore  
and whatever is served  
upon its outstretched and ample table*

*Eleanor Limmer  
Liberty Lake Resident*



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**LIBERTY LAKE AQUATIC WEED MANAGEMENT PLAN**

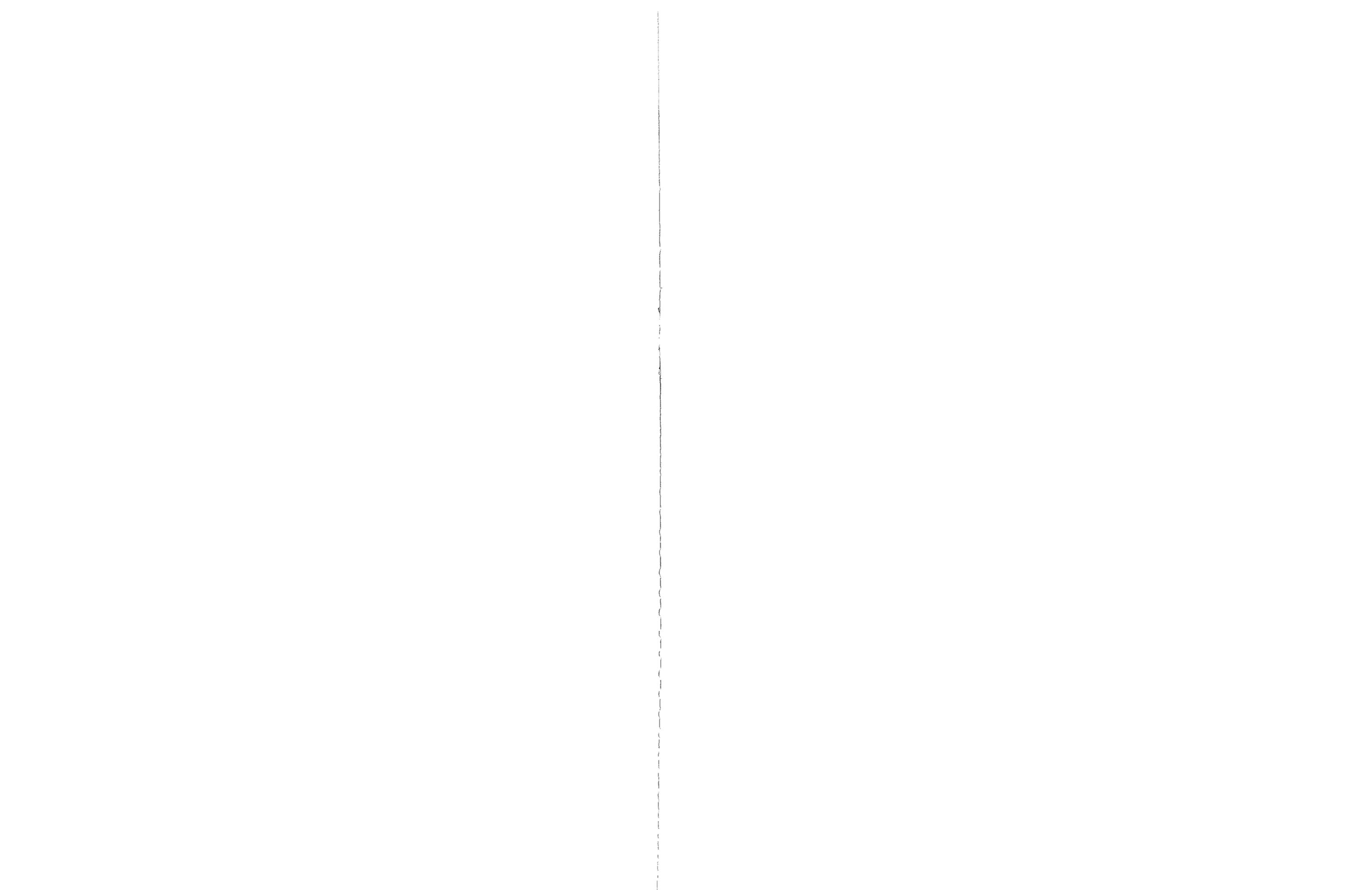
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**BiJay Adams  
Lake Protection Manager**

**Liberty Lake Sewer and Water District  
22510 E. Mission Avenue  
Liberty Lake, WA 99019**

**Funded by Washington State Department of Ecology**

**February 2004**



## **ACKNOWLEDGEMENTS**

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### **The Liberty Lake Sewer and Water District No.1**

Frank L. Boyle, Harley Halverson, Tom Agnew, Dr. F. Lee Mellish, BiJay Adams, Kathy Millick, Glenys Leestma, John Yake, Larry White, Mike Schmidt, Dan Grogg, and Mike West

### **The Liberty Lake Watershed Advisory Committee**

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### **4<sup>th</sup> Legislative District**

Senator Bob McCaslin, Rep. Lynn Schindler, and Rep. Larry Crouse



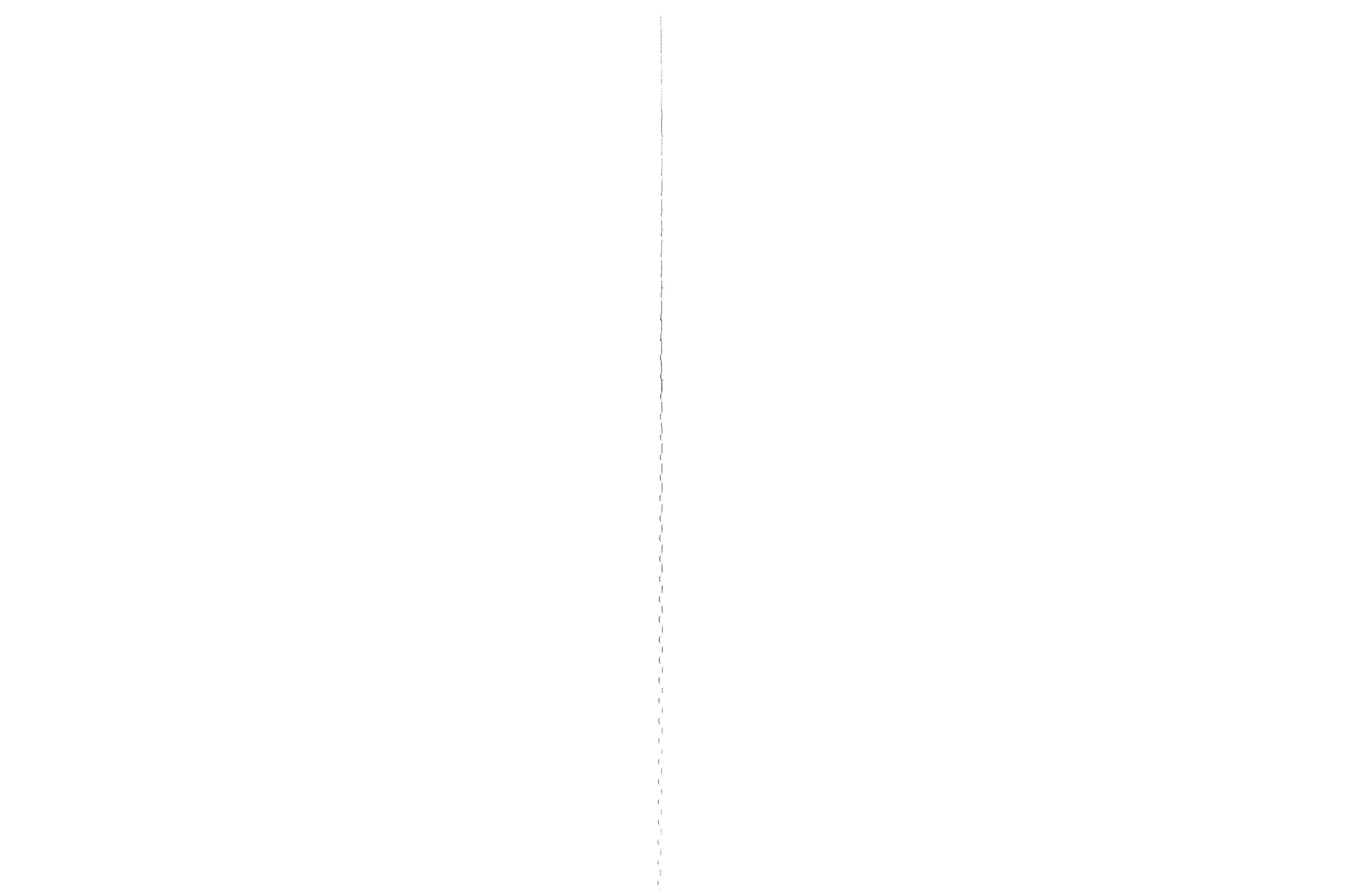
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## EXECUTIVE SUMMARY

In the 1960s, residents noted that nuisance water quality conditions were occurring earlier in the summer and fall and were becoming more aesthetically displeasing and noticeable each year. By late 1968, tons of decaying aquatic weeds and dried algal mats were being removed from the lake. This prompted the residents to become concerned about the lakes health and quality of water, and they turned to the Property Owner's Association to help remedy the problem. Members of the homeowners association contacted individuals in the Northwest purported to be knowledgeable about water quality and lake eutrophication. Contact was made with the State of Washington Water Research Center (SWWRC) at Washington State University (WSU) and a grass roots sampling and testing program was initiated that also included homeowners, graduate students, and the WSU Environmental Engineer Laboratories (Funk *et. al.*, 1968).



Late 1970's Blue-Green Algae bloom. The algae blooms were so pervasive that the entire lake surface would be covered for weeks at a time. The blooms shaded the macrophytes from the sun, causing them to die and float to the surface in large dark mats. The County Park swimming area is observable in the lower left side of the photograph.

The association also requested assistance from Spokane County to protect the lake by constructing a sewer system. In 1973, the residents took initiative to petition, vote, and elect three commissioners to represent a special purpose sewer district. Since 1973, the Liberty Lake Sewer and Water District (LLSWD) has taken many measures to protect the

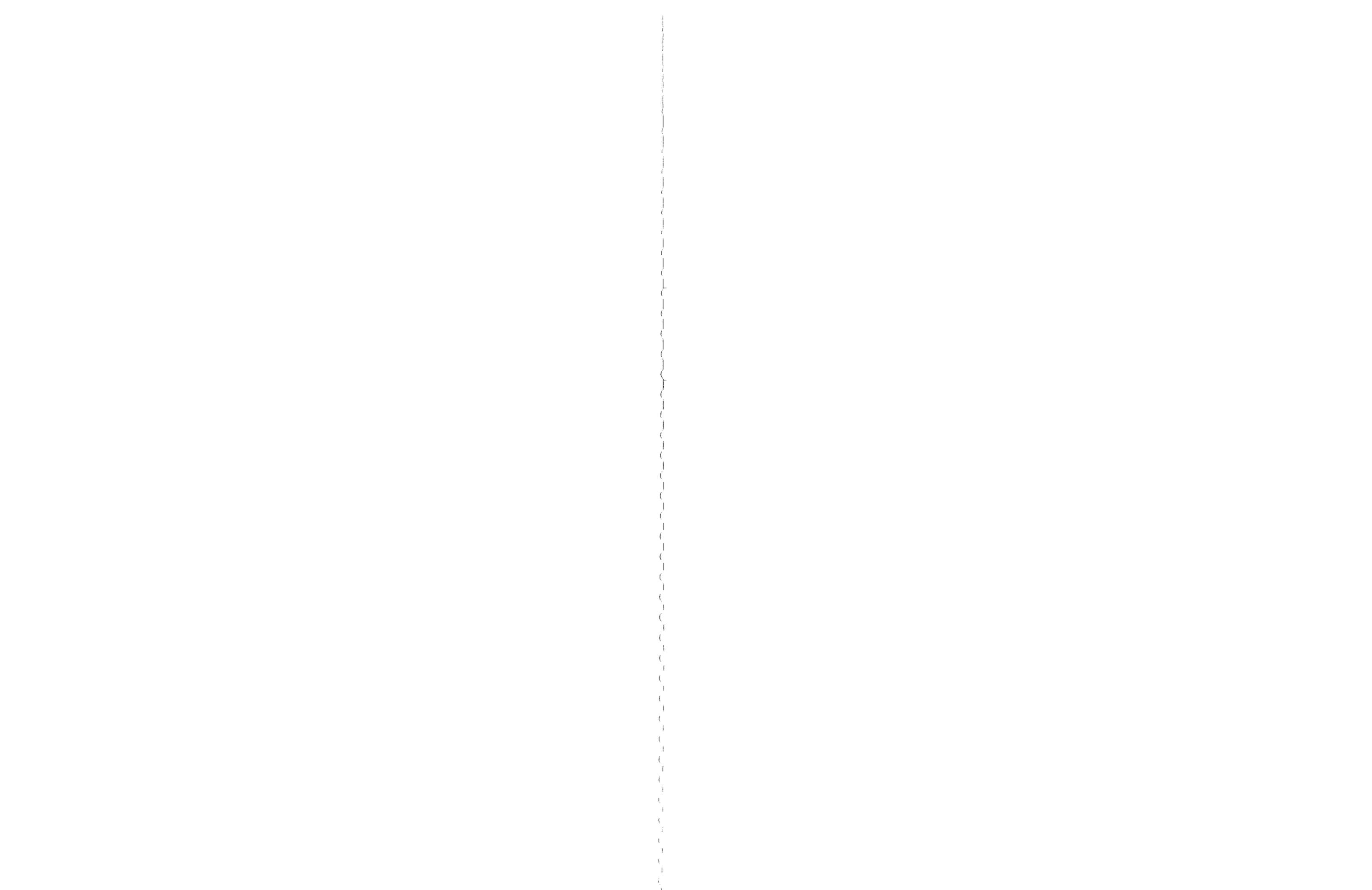


lake (according to Washington Law, RCW 57.08.005 section 9) and maintain the aesthetic beauty that has brought many residents to the area.

In 1975, the Liberty Lake Sewer and Water District requested and received approval for grant funding under the Clean Lakes Program for a lake restoration project. The SWWRC and the Civil Engineering Hydraulics Section at WSU carried out the joint study from 1974 to 1976. The study included in-lake chemical and physical testing, hydrology measurements, and analyses of nutrients in precipitation and watershed runoff. This study pinpointed atmospheric contributions, surface runoff, marsh drainage, and recycling of nutrients from sediments as sources of enrichment to the lake (Copp, 1976; Funk *et. al.*, 1976). Development of an integrated restoration plan was undertaken by Wright and Funk in 1974. This plan was based largely on the results of the ongoing research as well as previous studies. It delineated the need for watershed protection, reduction of marsh runoff, sewerage to reduce nutrient flow from populated areas, and dredging to remove a large portion of nutrient rich sediments that had accumulated over the numerous years of settlement. These activities were followed with alum treatment to remove suspended particulate matter and nutrients released from dredging activities. Entranco Engineers developed a facilities plan in 1976 that outlined the engineering activities needed to upgrade and enlarge the sewage collection system and build a new treatment plant. This firm later became Kennedy Engineers, and in 1979, they upgraded the facility plan and began design of the new wastewater treatment facility. The wastewater treatment facility was completed in 1982.

To further verify and refine nutrient sources from sediment, recycling, and the interaction of aquatic plants and algae blooms at Liberty Lake, the U.S. Environmental Protection Agency (USEPA) supported an extensive investigation during 1979 through 1981. Study results were reported in seven progress reports to the USEPA as well as project reports (e.g., Funk *et. al.*, 1979-82), in proceedings (Funk *et. al.*, 1982), and in journal articles (e.g., Gibbons and Funk, 1982; Mawson *et. al.*, 1983). Because of some concerns expressed by environmental groups, interested citizens, and a few agency personnel, extensive studies were carried out on the effect of restoration efforts on the lake's food chain organisms, including zooplankton, macroinvertebrates, macrophytes, and fish. All biological indicator studies to date indicate that the lake has remained in a healthy mesotrophic state since restoration. No large-scale algal bloom has occurred in the past thirty years. Liberty Lake, since restoration, has shown good resiliency. It is, however, a soft-water lake with limited buffering capacity. Heavy nutrient in-flow from any source combined with bottom oxygen depletion and subsequent release of nutrients can result in a return of heavy algal blooms.

As expected, continued residential growth and recreational use of the lake by transient boats increased the probability of transfer of nuisance aquatic plants such as Eurasian watermilfoil from infected waterways into Liberty Lake. A small infestation was discovered in the fall of 1995 and was effectively controlled by hand harvesting until 1997, when the infestation became too great to handle, then AquaKleen® Granular 2,4-D became the primary treatment. Clearwater Scuba, L.L.C utilized divers to pull the plants by hand, collect, and dispose of them. They were also successful in the spring and early summer of 1997, however by late summer, many clear days and hot weather combined



with a large increase in boat traffic caused fragments of milfoil to be scattered around the lake reinfesting many areas. Since that time, 2,4D treatments have occurred in sections of the lake in 1998, 1999, 2000, 2001, and 2003. Each spring, aquatic weed diving surveys are conducted by Liberty Lake Sewer and Water District and Clearwater Scuba, L.L.C. to evaluate potential growth and effective treatment.

The community and the district fear an increase in the density of the milfoil infestation could crowd out native vegetation and impede human recreation and aquatic habitat. Another concern of the district and the community is the potential for the spread of Eurasian watermilfoil to other lakes in the surrounding area. Liberty Lake is a popular recreational lake for the greater community and residents. Fortified by its history of active involvement, the community has a strong affinity to protect it. Thus in response to the numerous concerns, the Liberty Lake Sewer and Water District wants to evaluate all control options and means of management for suppression and future control of milfoil within Liberty Lake.

-----

## 1.1 WATERSHED AND LAKE CHARACTERISTICS

Liberty Lake is a 708-acre (1.1 square mile) soft-water mesotrophic lake situated 2.5 miles east of the City of Spokane Valley and 3 miles west of the Idaho border (see Figure 1.1). The City of Liberty Lake rests  $\frac{1}{4}$  mile north-northwest of the lake. The Liberty lake watershed lies within the Upper Spokane Watershed (USGS Cataloging Unit 17010305) and is contained within the Middle Spokane Water Resource Inventory Area (WRIA) #57. The Latitude and Longitude for Liberty Lake is 47° 39' 09" and 117° 05' 20".

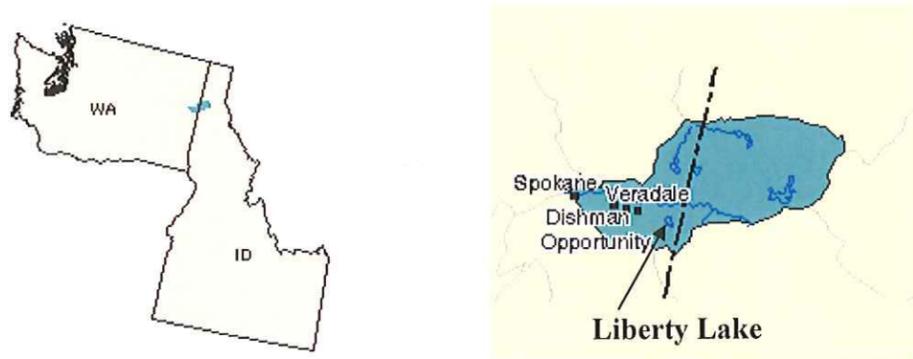
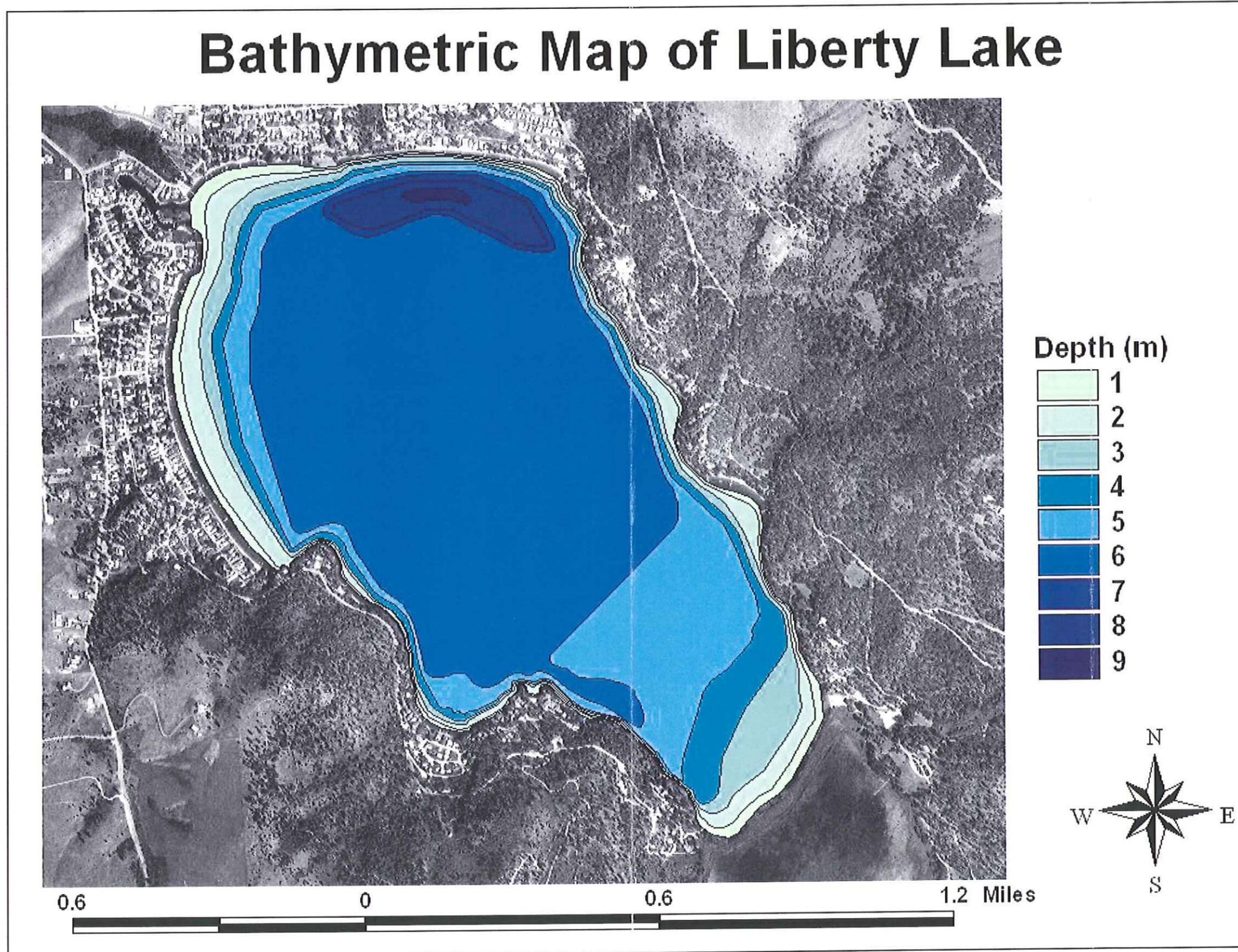


Figure 1.1 Liberty Lake vicinity map

The lake is enclosed on three sides by a small mountain range extending 2,870 feet above the lake surface (highest elevation 4,920 feet above sea level). The climate of the Liberty Lake region is temperate receiving an average annual precipitation of about 26 inches. The lake was formed by the damming of Liberty Creek during the Pleistocene Epoch by a lobe of the Cordilleran Ice Sheet and subsequent catastrophic outburst flood deposits (Moore *et. al.*, 2001). Liberty Lake has a mean depth of 23 feet (7 meters) and a maximum depth of 30 feet (9 meters) (see Figure 1.2).



Figure 1.2 Bathymetric map of Liberty Lake





The lake and incorporated area of Liberty Lake are known for their Real Estate and recreational value; they are heavily utilized by 80,000 to 100,000 visits per season (Funk *et. al.*, 1982). The 2003 statistics show that the average home in Liberty Lake sold for \$213,662, significantly higher than the neighboring City of Spokane Valley average of \$147,695 that is just 2.5 miles west (Liberty Lake Splash, 2004). Mike Balogh of Remax said that “Liberty Lake itself is a major factor in the Real Estate Market, because the location is so attractive to people, the average home sale price is significantly higher than throughout Spokane Valley” (Liberty Lake Splash, 2004).

Recreational activities on the lake include fishing, swimming, boating, water-skiing, and jet skiing. A large percentage of the lake shoreline is privately owned with two public access points for recreation. These include a County Park beach (situated in the southeast) and a Washington State Department of Fish and Wildlife boat launch (situated in the north). Figure 1.3 displays the main features of Liberty Lake that will be discussed in this Integrated Aquatic Weed Management Plan.

The *Shoreline Inventory and Assessment for Spokane County Lakes, 2002* states that the north, east and west lake shorelines are heavily developed with residential properties, private/public parks, and a golf course to the north. No development is around the inlet stream or the 155-ac seasonal wetland marsh area at the south end of the lake. Liberty Lake has approximately 5.14 miles of shoreline, and although the shoreline is well developed, the watershed is mostly undeveloped with abundant timber. The land that is developed is primarily privately owned. Liberty Lake and the majority of the contributing watershed fall under the jurisdiction of Spokane County in Washington. A portion of the southeast section lies in Idaho and is under the jurisdiction of Kootenai County. There are several overlapping political boundaries in the Liberty Lake area (see Figure 1.4 for the Liberty Lake Watershed and Landuse political boundaries).

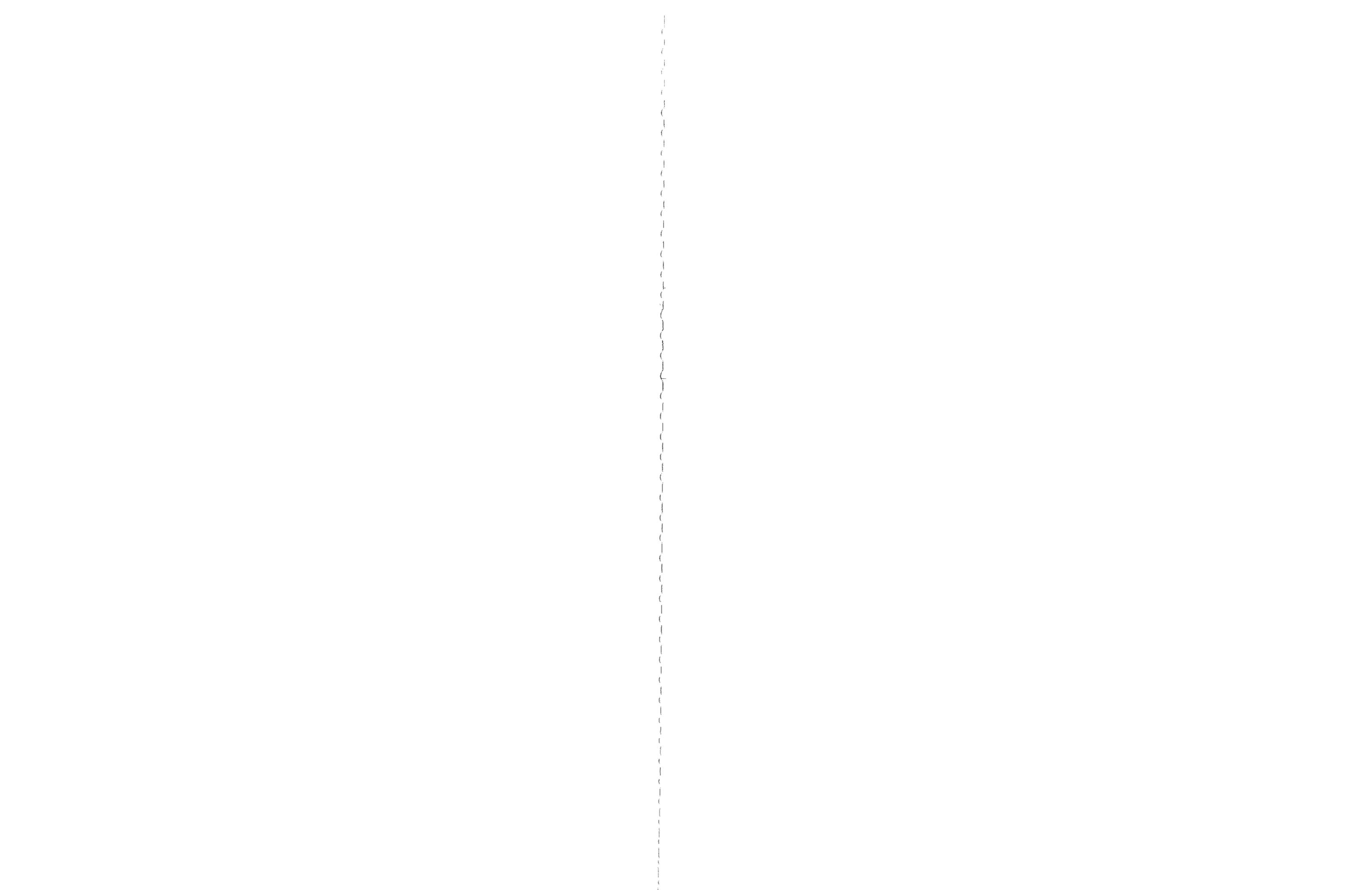


Figure 1.3 Map of the main features of Liberty Lake

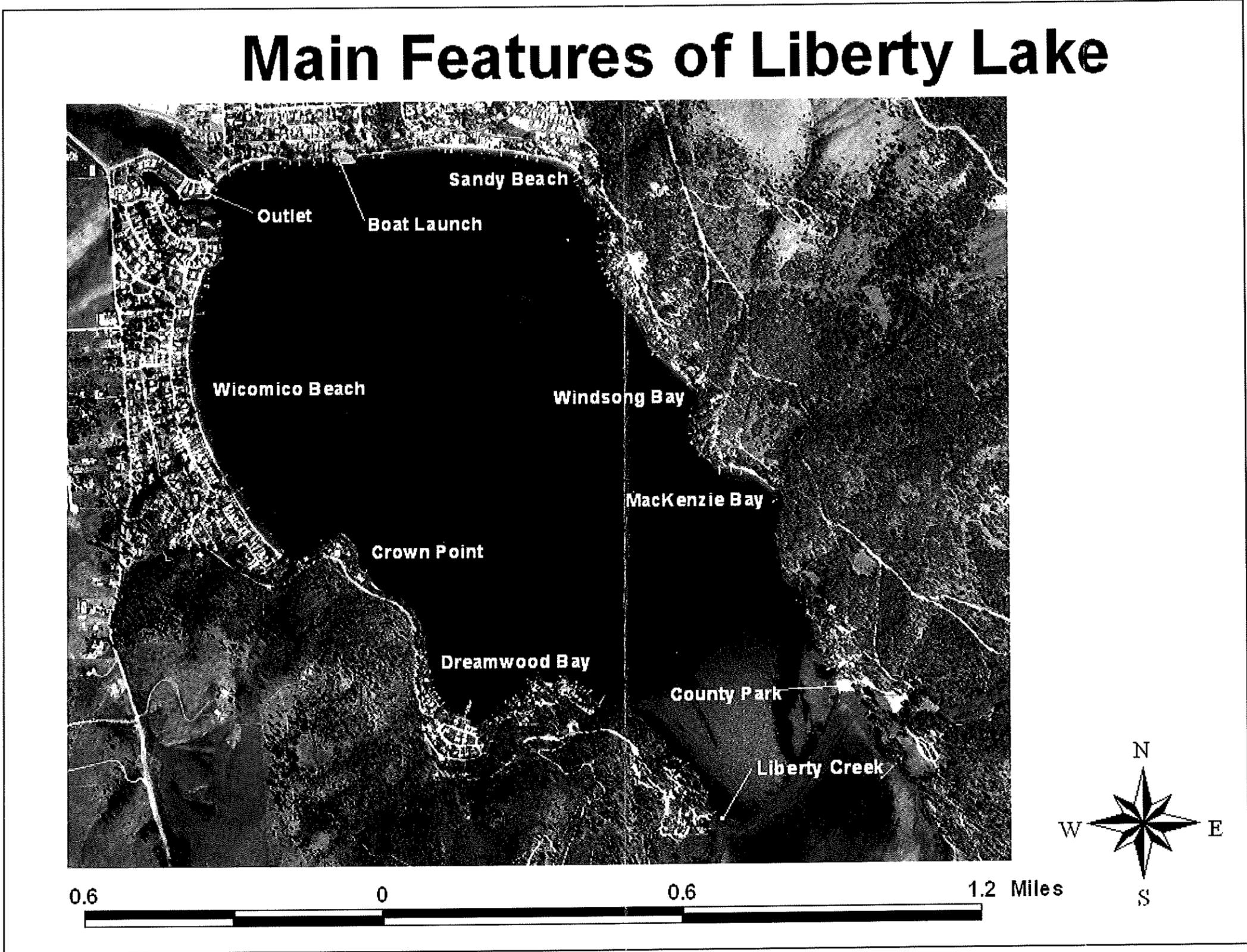
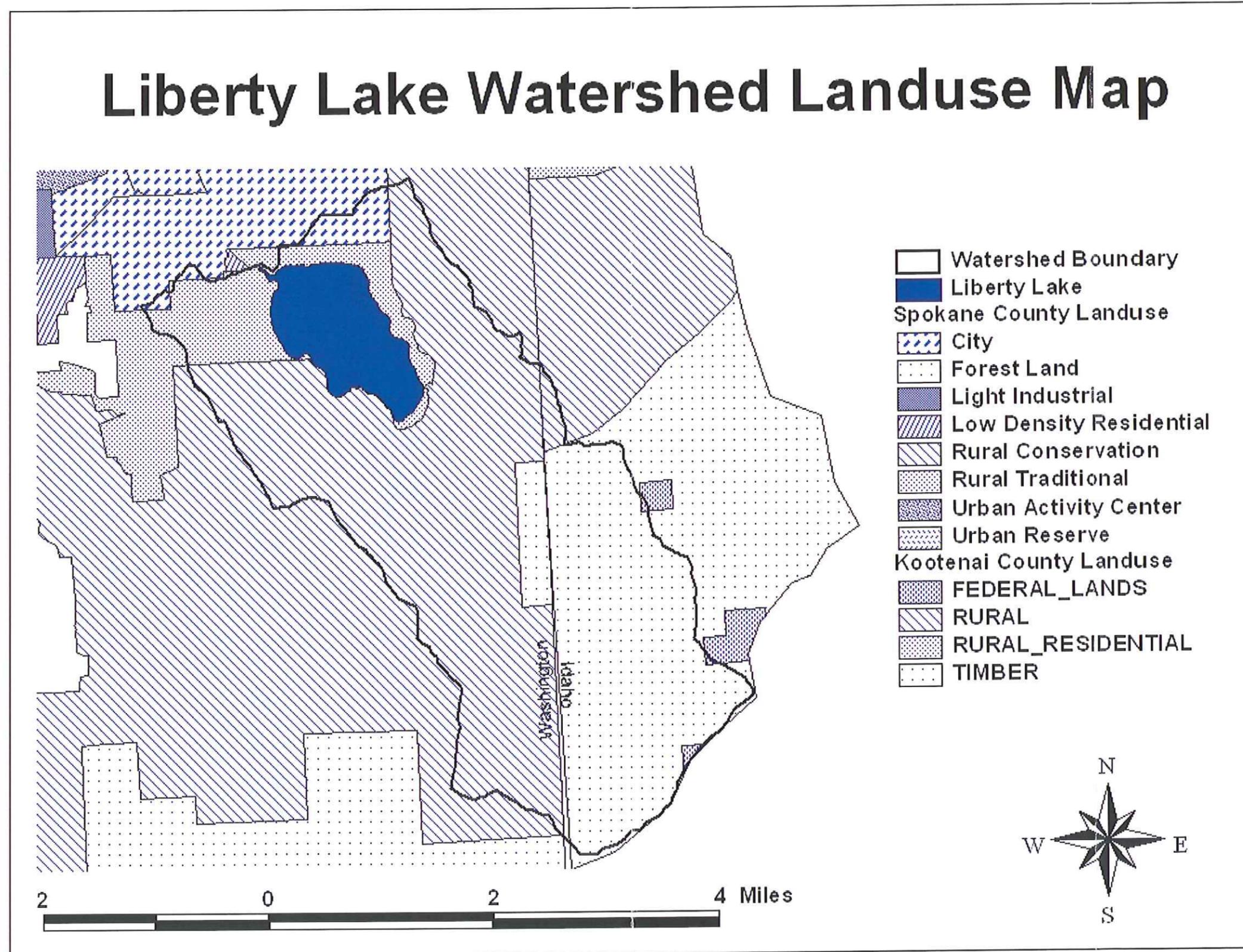




Figure 1.4 Liberty Lake Watershed and Landuse Map





The current shoreline designations for Liberty Lake include urban, rural, and conservancy (See Appendix A). Based on the Spokane County assessment, recommendations for updated shoreline designations were completed and the results are summarized in Appendix A. With increasing homebuilding and recreational use, combined with factors such as geology, stormwater runoff, invasive plants, and sensitive marsh areas, Liberty Lake is susceptible to significant degradation.

Liberty Creek is the main tributary to Liberty Lake, where it drains 8870 acres (14 square miles) of a mountainous basin, forested with ponderosa pine, grand fir, douglas fir, larch, white pine, alder, and aspen. Spokane County's Liberty Lake Regional Park encompasses 3,600 acres of this mountainous watershed, and is the largest county park in the state (Figure 2.2). Five hundred and eighty acres of this land is conservation property, purchased through the Conservation Futures and Natural Areas Land Management Program. The Conservation Futures and Natural Areas Land Management Program has been developed to establish guidelines for managing portions of Spokane County's open space lands. This program is intended to establish minimum land management practices, maintain watersheds and wetlands, preserve natural resources, and enhance wildlife frequenting these areas while preserving opportunities for passive recreational human enjoyment (Spokane County Parks and Recreation, 2002).

In 1994, a GIS survey broke down the land vegetative components found within the watershed and determined that about 42.6% of the watershed was considered forest and 3.5% was considered residential (Moore *et. al.*, 2001). According to the Washington State Department of Natural Resources search of the Natural Heritage Information System, there are no records for rare plants or high quality native ecosystems in the Liberty Lake vicinity (see Appendix J).

Through most of Liberty Creek's length, the creek is a swift stream of very cold, high quality, nutrient poor water, and generally exceeds Washington State Water Quality Standards for Class AA ("extraordinary") waters in all physical and chemical characteristics (Water Quality Criteria, Washington State Department of Ecology, 1982). Liberty Creek's initial name was Kalez Creek, which begins at an elevation of 4600 ft from southern, rocky, forested upland areas. Originally, Liberty Creek was thought to meander through the center of the 155-acre marsh at the south end of the lake. In the late 1800's the area surrounding the marsh was developed into a cattle ranch. The rancher diverted Liberty Creek into a hand-dug channel along the eastern edge of the marsh. Later the creek was diverted into another hand-dug channel along the western edge. The effect of the diversion structures resulted in more marsh acreage drying out and converting it into a wet meadow. The meadow was used to grow hay and timothy. In addition, chicken, geese, hogs, horses, and a herd of dairy cattle were pastured on the former wetland (Kennedy, 1979).

In 1934, the Bureau of Reclamation bifurcated Liberty Creek above the marsh in an effort to aid drying of the marsh. At the same time, a ditch was dug across the marsh paralleling the dike and a pump was installed near the southwest corner of the lake to pump waters out of the marsh. The purpose was to improve the marshland for hay cutting and cattle grazing purposes. The pump was removed after the County purchased the marsh and land

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in 1966. This was an effort to restore the wetland habitat for birds, animals, and aesthetic beauty. Since the purchase of the marsh and adjoining land by Spokane County, the marsh has been allowed to return to a wetland to improve its use by waterfowl and other wildlife.

Since the 1950s, Liberty Creek has flowed primarily in the man-made dike along the east edge of the marsh. The second man-made channel, along the west edge of the marsh, only occasionally carried water (extreme floods) until 1977 and 1979 when a diversion structure (including a Parshall flume) and channel improvements were constructed to control flushing of the marsh (Kennedy, 1979). Dikes around the marsh were repaired in April 1981 and again in December 1985. Since the diversion structure, respective flows are contained to 10% in the east channel and 90% to the west channel (see Figure 1.5 for details of the marsh and creek construction activity from 1900 to 1977). Because the preferred use of the marsh area is for wildlife habitat, it has never been an objective of the creek channel repairs or diversion structure construction to dewater the marsh. It is the intention of the Spokane County Parks Department that this area remain as a wetland habitat to provide plant and animal observation/study possibilities for park visitors.

Today the seasonally flooded marsh currently supports a wide variety of insect, bird, reptile, amphibian, and mammal species. On February 3, 2004, Chris Merker, Wetland Biologist for the Washington State Department of Ecology, and BiJay Adams, Lake Protection Manager for the Liberty Lake Sewer and Water District, categorized the 155-acre seasonal marsh at the south end of Liberty Lake. Based on the survey, the marsh is found to be in a higher class of a Category II wetland due to its high fish and wildlife habitat values, and its exceptional, undisturbed watershed (see Appendix M). According to the Washington State Wetland Rating System, Category II wetlands are wetlands with a moderately high level of functions. These wetlands are difficult, though not impossible, to replace. Although they occur more commonly than Category I wetlands, they still need a high level of protection. The Liberty Lake marsh was unable to rate as a Category I wetland due to the significant history of disturbance. The Washington State Wetland Rating System categorizes wetlands based on specific attributes and was designed to differentiate between wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the functions they provide (Washington State Department of Ecology, 2002).

The geological importance of Liberty Lake is that the lake has no natural outlet. The only outlet or disposal for flows from the lake and runoff is through infiltration of permeable rock and soil into the Spokane-Rathdrum Prairie Aquifer. There is however, a 1-mile fabricated channel and outlet structure to disperse runoff and flow into 2- 1-acre infiltration basins. The outlet structure consists of a 12.5 ft weir and three 2ft x 2ft metal slide gates that disperse flow into a 48-inch diameter concrete pipe. The weir outlet structure passes flow from the weir crest (elevation 2049.51) and/or slide gates, when opened, directly into the fabricated outlet channel. With the construction of this outlet, an adjudicated lake elevation of 2049.51 was established in 1951. The decision was designed to maintain adequate lake storage levels, to control flooding and runoff, while preserving aesthetic beauty and recreational use.



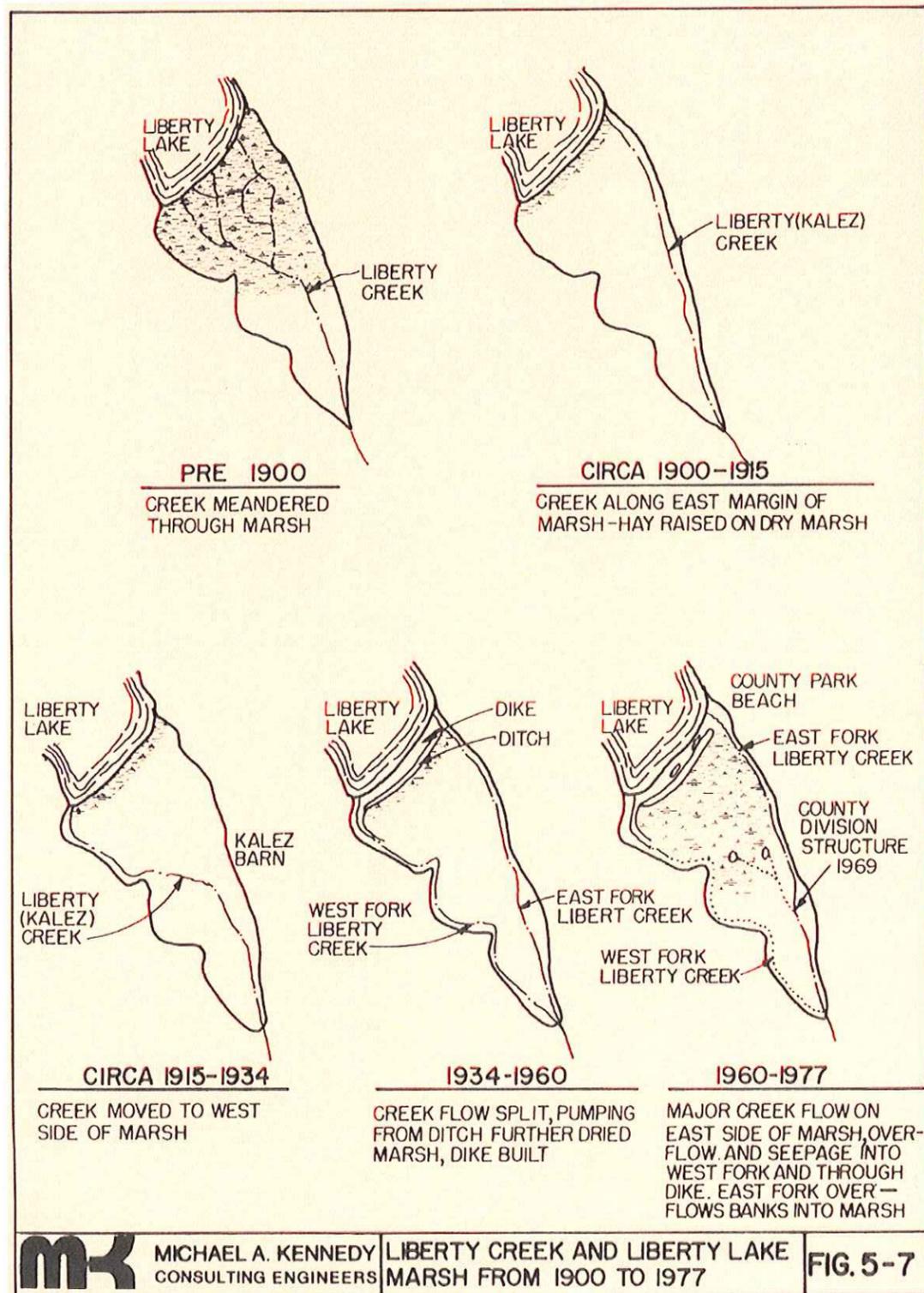


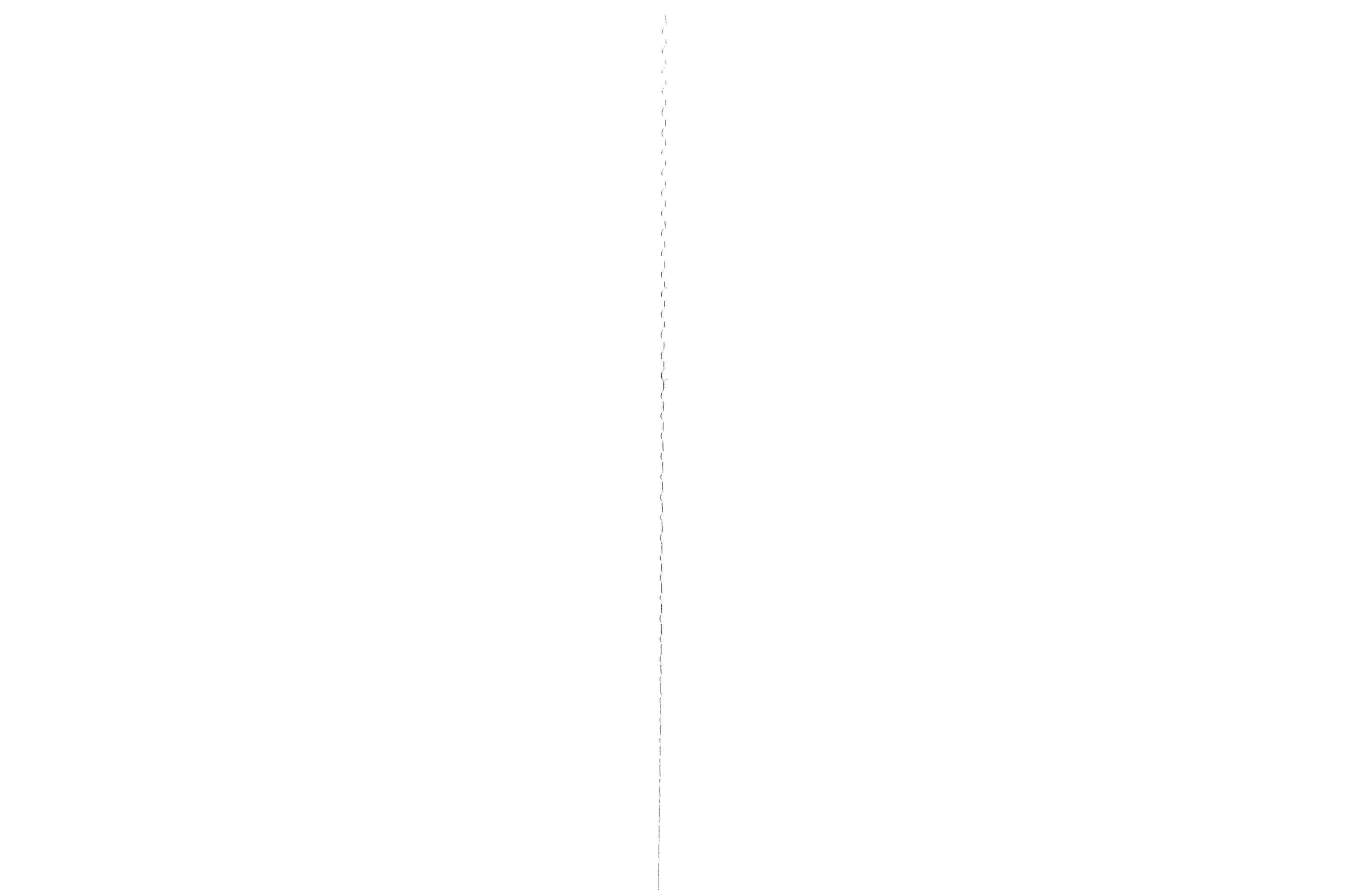
Figure 1.5 Liberty Creek and Liberty Lake Marsh from 1900 to 1977 (Kennedy, 1979)



Due to its location, the forest, wetland, range and riparian habitats, the Liberty Lake watershed supports an abundant variety of wildlife. Big game observed in the watershed includes white tailed deer, mule deer, elk, moose, black bear, and mountain lion. Small game animals include coyote, porcupine, beaver, muskrat, striped skunk, and raccoon. A variety of upland game birds exist in the watershed, these include ring necked pheasant, California quail, grey partridge, ruffed grouse, blue grouse, and wild turkey. In addition, the watershed holds a diverse amount of migratory and resident waterfowl. These include mallard duck, gadwall, great blue heron, American wigeon, teal, ring-billed gull, and Canada goose. Non-game raptors include bald eagle, osprey, red-tailed hawk, short-eared owl, and great horned owl (Moore *et. al.*, 2001). The bald eagle is the only known threatened or endangered species in the Liberty Lake area.

The lake also supports an abundant amount of game and non-game fish. In 1940, according to information obtained from the files of the Department of Game, the original species of fish found in Liberty Lake were whitefish and cutthroat trout. During the 1940's the Game Department planted the lake with large mouth bass and carp. These plantings were followed closely with perch, two species of sunfish, small mouth bass, crappie, and bullhead/catfish. In 1951, according to the Game Department, all of these planted fish had reproduced to the extent that overcrowding and dwarfing made them generally undesirable to anglers. In 1951, the game department made the decision to Rotenone the lake and replant with trout. Later in 1965, the game department decided to Toxaphene the lake and replant the following year with trout. Again, in 1974, the lake was Rotenoned by the Game Department, which was followed by massive algal blooms. In 1980, the Game Department undertook a fish study as part of the Restoration Project, and in 1983, the Game Department announced Liberty Lake would be Rotenoned in the fall of 1984. In 1984 (the following year of the announcement), the District organized a symposium on Rotenone and fish stocking techniques in shallow, eutrophic lakes. In that same year, approximately 200 concerned citizens attended a Game Commission hearing on Rotenone treatment, which had been scheduled for a Sunday morning. The outcome of the hearing resulted in the Game Commission deferring the Rotenone project for two years. A year later, in 1985, Senator Bob McCaslin set up a meeting between the District and the Director of the Game Department to discuss possible alternatives to the Rotenone project. The District reviewed the Game Department's submittal of research on Rotenone received by the Department of Ecology. In 1986, Senator McCaslin invited the director of the Department of Ecology to tour the facilities and lake to enlist Department of Ecology's support against the Rotenone project. Never again was Liberty Lake treated with Rotenone.

Currently a diverse fishery exists in Liberty Lake including rainbow trout, brown trout, largemouth bass, smallmouth bass, bluegill sunfish, black crappie, yellow perch, yellow bullhead, brown bullhead, pumpkinseed sunfish and walleye. Currently, no threatened or endangered species inhabit Liberty Lake or Liberty Creek. In 1996, Liberty Lake received an initial stocking of 100 adult walleye and approximately 25,000 fingerlings as a means to enhance fishing opportunity and diversity (Phillips, Divens, and Donley, 1999). In 2000 and 2001, Liberty Lake received 2,500 triploid rainbow trout each year as part of a new program passed by the state legislature in 2000. These trout, purchased by the Department, are sterile rainbows averaging 1½ pounds each. Because they are sterile,



and are voracious feeders, they have the potential to grow to trophy size if not harvested the first season after stocking. The Washington Department of Fish and Wildlife 2002 and 2003 stocking plans for Liberty Lake are listed below in Tables 1.1 and 1.2. Previous stocking records from 1980 to 2001 are included in Appendix B.

*HATCHERY TROUT STOCKING PLAN FOR  
LIBERTY LAKE 2002*

<b>Size</b>	<b>Species</b>	<b>Number</b>
8-12 inches	Rainbow Trout	10,000
Number 14" or larger	Rainbow Trout	500
2 to 4-inch Fry	Brown Trout	17,000

**Table 1.1** 2002 Washington Department of Fish and Wildlife Hatchery Trout Stocking Plan for Liberty Lake

*HATCHERY TROUT STOCKING PLAN FOR  
LIBERTY LAKE 2003*

<b>Size</b>	<b>Species</b>	<b>Number</b>
8-12 inches	Rainbow Trout	10,000
2 to 4-inch Fry	Brown Trout	20,116
2 to 4-inch Fry	Rainbow Trout	20,010

**Table 1.2** 2003 Washington Department of Fish and Wildlife Hatchery Trout Stocking Plan for Liberty Lake



## 2.1 BENEFICIAL AND RECREATIONAL USES

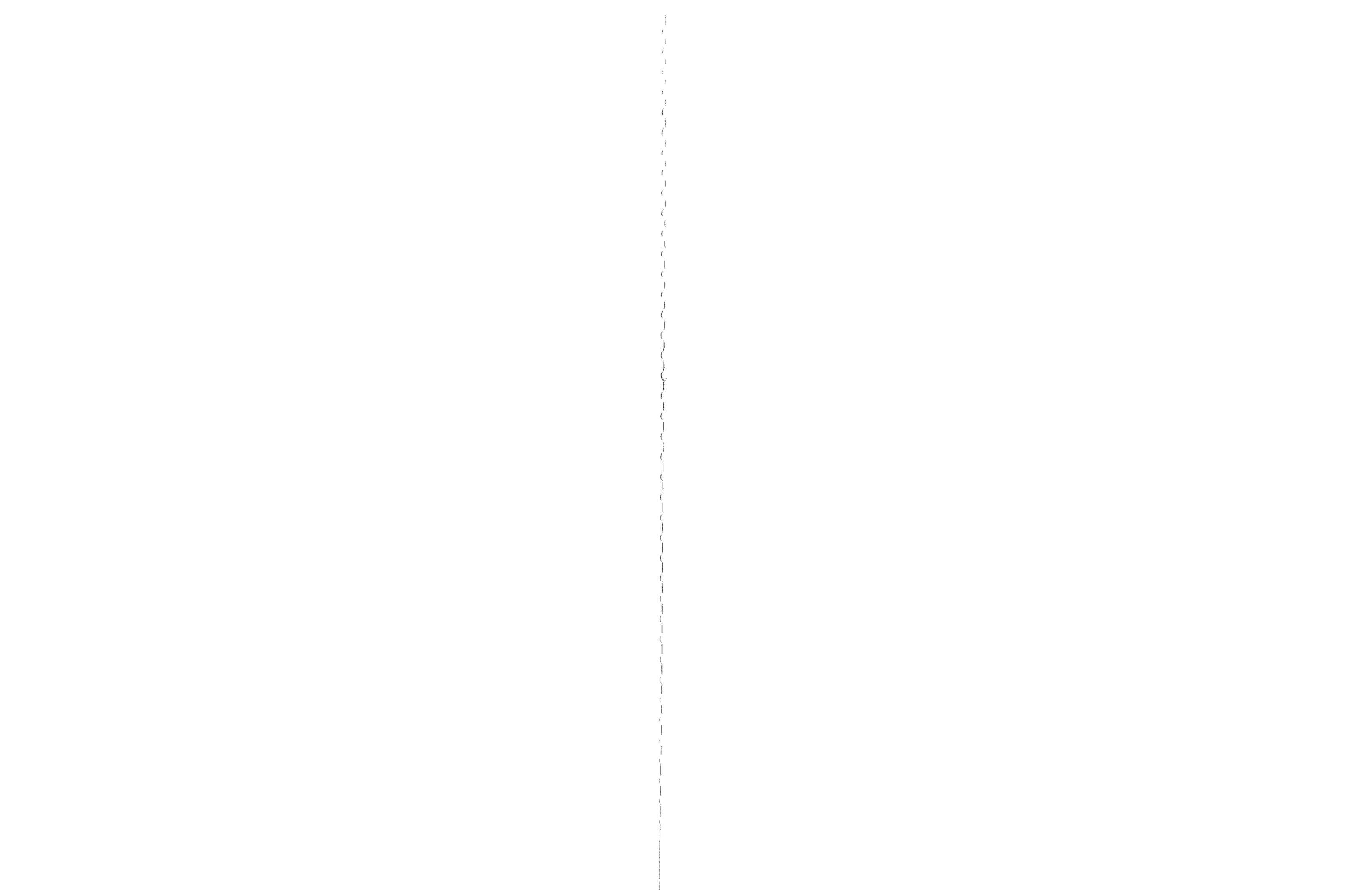
The lake and incorporated area of Liberty Lake are known for their real estate and recreational value; they are heavily utilized by 80,000 to 100,000 visits per season (EPA, 1982). Recreational activities on the lake include fishing, swimming, boating, water-skiing (with a Slalom course), and jet skiing. A large percentage of the lake shoreline is privately owned with two public access points for recreation. These include a County Park beach (situated in the southeast) and a Washington State Department of Fish and Wildlife boat launch (situated in the north). However, private docks also provide boaters and swimmers access to the water.

As mentioned previously, Liberty Lake has no natural outlet, but simply a fabricated outlet structure and channel with infiltration basins. The only outlet or disposal for flows from the lake and runoff is through infiltration of permeable rock and soil into the Spokane-Rathdrum Prairie Aquifer, an aquifer discovered in 1895 that currently supplies drinking water to over 400,000 people in the Spokane area. Not only is lake water quality important to Liberty Lake, but drinking water is also an important commodity to protect. Studies indicate that Liberty Lake donates 11.6 thousand acre-feet of water per year to the aquifer (Moore *et. al.*, 2001).

Four water right holders within WRIA 57 use Liberty Lake as a source of water (see Figure 2.1). These water rights have old priority dates and are active according to the *Water Rights Application Tracking System*. The list includes John W. Hatch, Mackenzie Bay Properties, Christian Church Conference, Inc., and J. Aukett. The *Water Rights Application Tracking System* indicates that the primary purpose(s) for withdrawal from the lake is for General Domestic use and Irrigation (as shown in Figure 2.1).



Figure 2.1 Liberty Lake water right holders



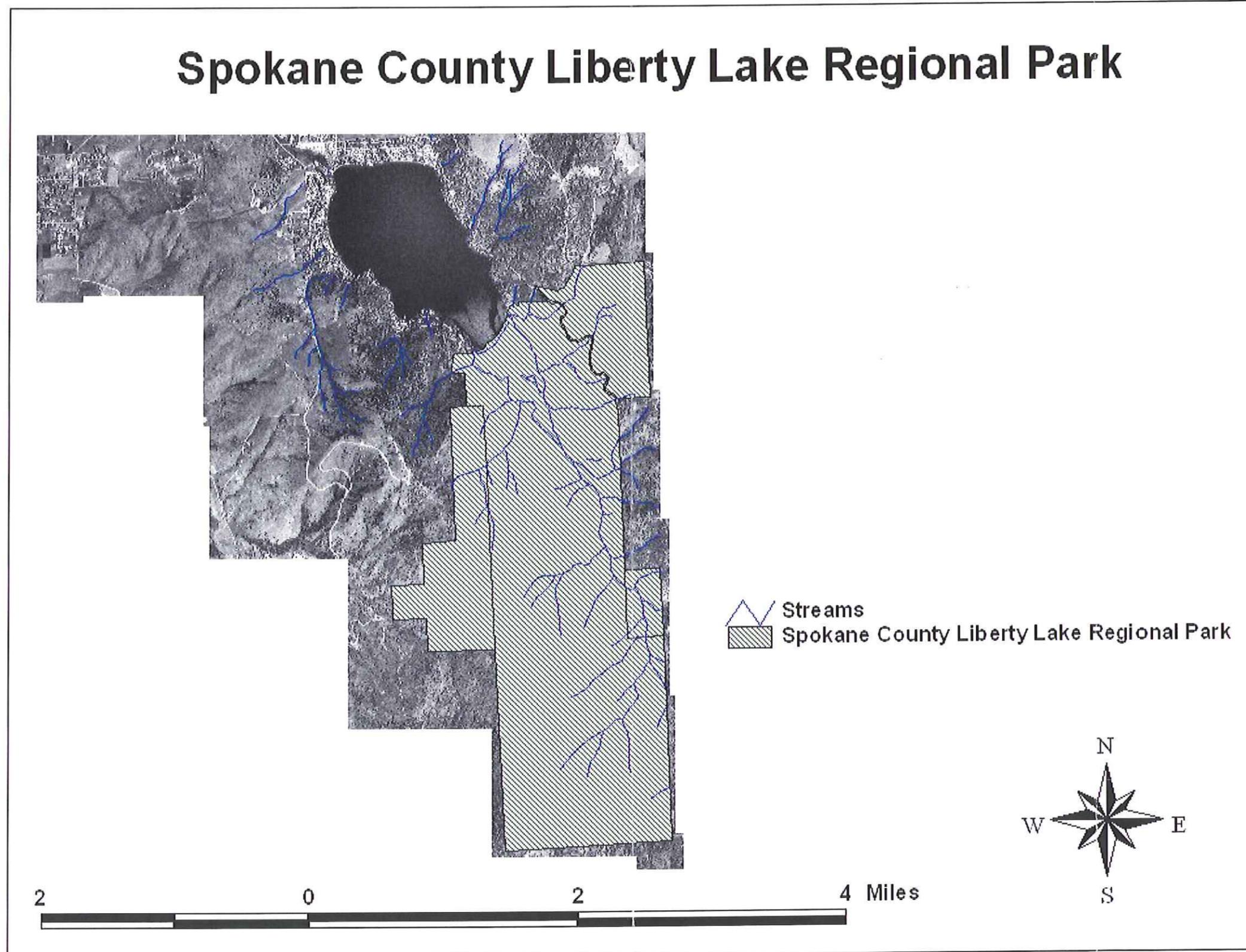
As mentioned previously, Spokane County's Liberty Lake Regional Park encompasses approximately 3,600 acres of this mountainous watershed, and is the largest county park in the state (Figure 2.3). It brings numerous visitors from the Spokane/Coeur d'Alene area for tent and RV camping, hiking, horseback riding, and picnicking. A public dock and swimming area with lifeguards are maintained by the park (Figure 2.2). Trail bikers and horseback riders can also ride within 350 acres of Spokane County land (a designated ORV Park) along the Idaho border and adjacent to the Regional Park (Figure 2.4). Throughout the Spokane County Liberty Lake Regional Park, 25 miles of hiking and horseback trails exist for year around use. The Liberty Lake Regional Park is open during the summer beginning Memorial Day weekend.



Figure 2.2 Liberty Lake County Park swimming area



Figure 2.3 Spokane County Liberty Lake Regional Park





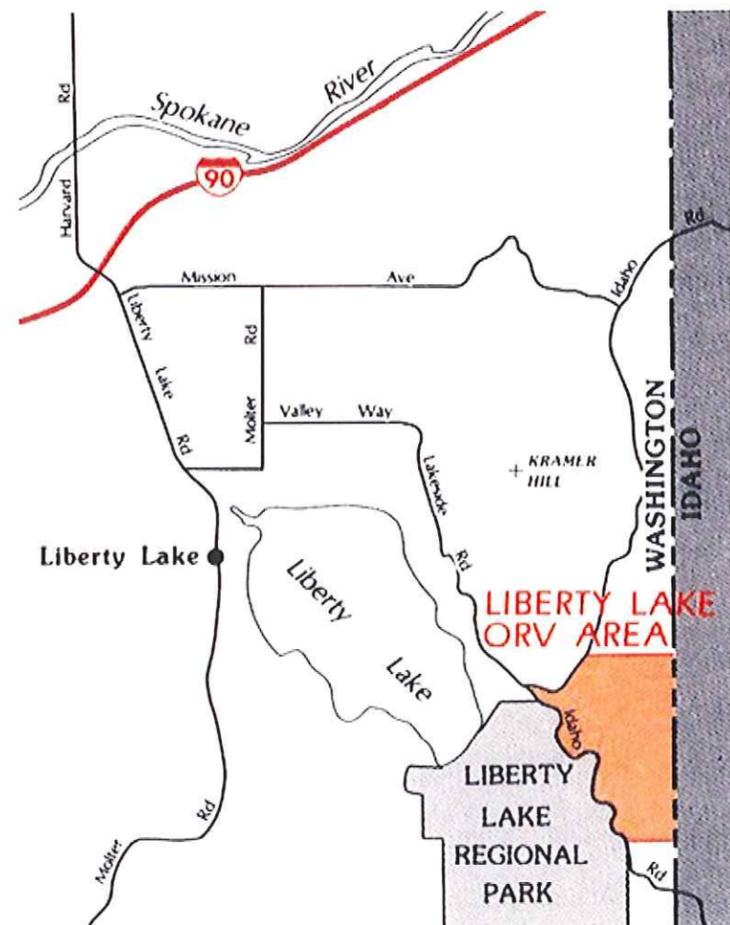


Figure 2.4 County Park ORV Park

During the summer, Boy Scout and Girl Scout troops camp in the park and learn the fundamentals of the great outdoors. In addition, each year the Central Valley School District puts on their annual environmental education program in the County Park to teach four fields of study; forestry, geology, streams, and a team building rope course. Each of the thirteen elementary schools in the Central Valley School District sends all its fifth graders for one day. The Environment Education Program was started in 1988, and since its beginning, has taught over ten thousand students (<http://www.cvsd.org/libertylake/env5/Information.htm>).

Zephyr Christian Conference Grounds on the southeast end of Liberty Lake offers 50 acres for various church groups, camps, retreats and conferences, providing settings that enable people to relate with each other, grow and learn. Zephyr keeps busy with retreats throughout the year, renting its space to various Christian groups. To accommodate those groups as well as its camp sessions, Zephyr has improved its facility over the years with new carpeting, paint and landscaping to maintain its lodge. Built in 1902 as a resort, it became a church camp in 1946.



If you enjoy golfing, discover some of the Northwest's best golfing at Liberty Lake's municipal golf courses. There are three courses located in the Liberty Lake area, one of which is within the watershed. They are; *Liberty Lake Golf Course*, public 18 hole, 6373 yards, Par 70, *Trailhead Golf Course*, public 9 hole, 4095 yards, Par 62, and *MeadowWood Golf Course*, public, 18 hole, 6874 yards, Par 72. MeadowWood is one of Spokane's premier public golf courses. Golf Digest rates it at (4) stars out of (5) and rates it in the top 10 public courses in the state of Washington.

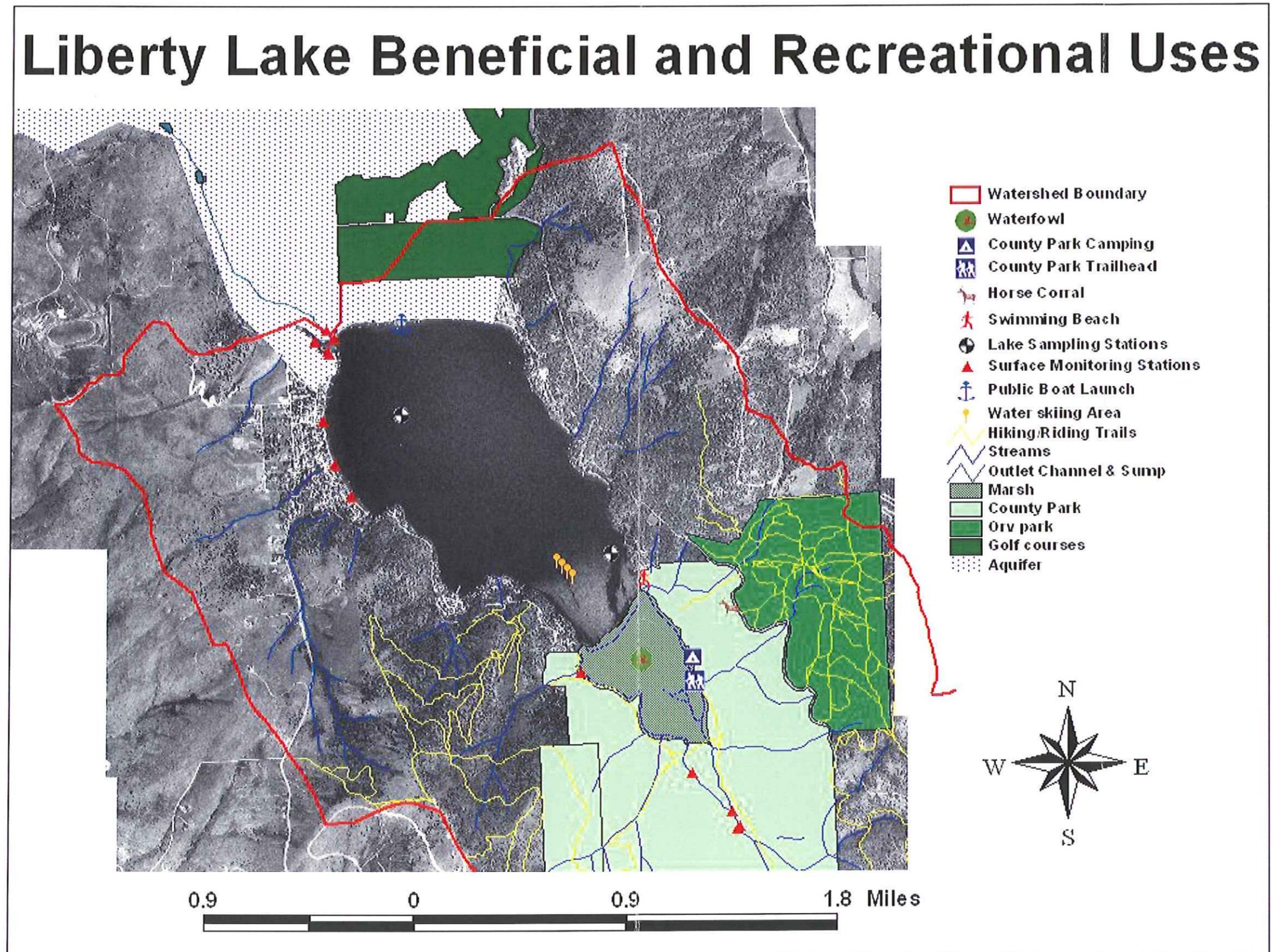
The lake supports an excellent recreational fishery. Currently a diverse fishery exists in Liberty Lake including rainbow trout, brown trout, largemouth bass, smallmouth bass, bluegill sunfish, black crappie, yellow perch, yellow bullhead, brown bullhead, pumpkinseed sunfish and walleye. In 1996, Liberty Lake received an initial stocking of 100 adult walleye as a means to enhance fishing opportunity and diversity. In 2000 and 2001, Liberty Lake received 2,500 triploid rainbow trout. These trout, purchased by the Department, are sterile rainbows averaging 1½ pounds each and have the potential to grow to trophy size.

Liberty Lake also offers residents and visitors alike a peaceful, rural environment for those who want to relax and just enjoy nature. Due to its location, the forest, wetland, range and riparian habitats, the Liberty Lake watershed supports an abundant variety of wildlife. The seasonal marsh and wetlands located at the south end of the lake is an excellent viewpoint for many of these animals. Big game to be observed in the watershed include white tailed deer, mule deer, elk, moose, black bear, and mountain lion. Small game animals include coyote, porcupine, beaver, muskrat, striped skunk, and raccoon. A variety of upland game birds exist in the watershed, these include ring necked pheasant, California quail, grey partridge, ruffed grouse, blue grouse, and wild turkey. In addition, the watershed holds a diverse amount of migratory and resident waterfowl. These include mallard duck, gadwall, great blue heron, American wigeon, teal, ring billed gull, and Canada goose. Non-game raptors include bald eagle, osprey, red-tailed hawk, short eared owl and great horned owl (Moore *et. al.*, 2001).

Fishing, boating, swimming, water skiing, hiking, camping, and nature watching are only a few of the enjoyable amenities that make Liberty Lake one of the most popular lakes in Spokane County. Figure 2.5 illustrates the beneficial uses of Liberty Lake.

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Figure 2.5 Beneficial Use map of Liberty Lake





### 3.1 PROBLEM STATEMENT

Eurasian watermilfoil (*Myriophyllum spicatum*), a non-native invasive species listed on the state noxious weed list, has been spreading throughout Liberty Lake's perimeter since it was first discovered in 1995. Milfoil removal was controlled by divers until 1997, when the infestation became too great to handle, then AquaKleen® Granular 2,4-D became the primary treatment. Each spring, aquatic weed diving surveys are conducted by Clearwater Scuba, L.L.C. to evaluate potential growth and effective treatment. 2,4-D treatments have occurred in 1998, 1999, 2000, 2001, and 2003 in northern and southern sections of the lake where the infestation remains in the shallow shoreline areas of approximately 1 to 3 meters in depth. For the first time since 1998, a 2,4-D treatment was not conducted in 2002. However, hand harvesting was conducted with removal of approximately 136 pounds of Eurasian watermilfoil. In July 2003, an AquaKleen® Granular 2,4-D treatment occurred on Liberty Lake treating nearly 7.5 acres of milfoil-infested areas.

It is a major concern of the district and the community that if the density of the milfoil increases it could potentially crowd out native vegetation and impede human recreation and aquatic habitat. Another concern of the district and the community is the potential for the spread of Eurasian watermilfoil to other lakes in the surrounding area. This noxious weed is easily transported to other locations on boat motors, trailers, waterfowl, and fishing gear and is well known to establish new infestations from single plant fragments. There are other waterbodies in the area that currently are not infested with Eurasian watermilfoil, and it is part of our goal to reduce the chances of infestation, or further the spread of milfoil to other lakes or waterbodies.

Liberty Lake is a popular recreational lake for the greater community and residents. Fortified by its history of active involvement, the community has a strong affinity to protect it. To support the process of Lake Protection, the Liberty Lake Watershed Advisory Committee became active in 2001. This committee is now comprised of 32 members from various backgrounds, including lakeside and watershed residents, City of Liberty Lake residents, scientific professionals, DOE personnel, WSU personnel, and LLSWD personnel. Thus in response to the numerous concerns of the community, the Liberty Lake Sewer and Water District wants to evaluate all control options and means of management for suppression and future control of milfoil within Liberty Lake.

The Liberty Lake Sewer and Water District has taken the community concerns seriously and researched the means of management for the invasive weed. In October of 2002, the Liberty Lake Sewer and Water District was awarded a grant by the Washington State Department of Ecology (DOE) to develop an Aquatic Weed Management Plan for Liberty Lake (award letter enclosed in Appendix K). The report that follows is the result of collaboration and research for a probable solution to the Eurasian watermilfoil infestation at Liberty Lake. As part of the process, the Liberty Lake Sewer and Water District encouraged representation from the community, neighboring lake communities, aquatic consultants, DOE, Washington State Department of Fish and Wildlife (WDFW),

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and the Washington State Department of Natural Resources Letters of collaboration and support are contained in the appendices; refer to Appendixes J and L for details.

The Liberty Lake Sewer and Water District, in conjunction with the Liberty Lake Watershed Advisory Committee, Clearwater Scuba, L.L.C and AquaTechnex, evaluated all currently available aquatic plant control options and decided upon a control option that would be most effective on Eurasian watermilfoil, environmentally friendly, and would meet the needs of the community. After evaluating the different control methods, it became apparent that there is no ideal management tool that is 100 percent effective and meets all the desired criteria.

For the long-term, the Liberty Lake Sewer and Water District and community favor the use of the combination of a chemical control agent (2,4-D herbicide), hand harvesting, and nutrient reduction. 2,4-D is available in a granular and liquid form and must be applied by a state-licensed applicator. It is said by the Washington State Department of Ecology that 2,4-D is a relatively fast-acting herbicide that kills the entire plant (systemic herbicide). This herbicide is considered "selective" for milfoil because it generally targets the broad-leaved plants (dicots) like milfoil. Most other aquatic plants are monocots (grass-like) and are unaffected by 2,4-D. Navigate® and AquaKleen® are granular 2,4-D products registered for aquatic use and DMA\*4IVM® is a liquid formulation ([http://www.ecy.wa.gov/programs/wq/plants/management/2,4D\\_strategies.html](http://www.ecy.wa.gov/programs/wq/plants/management/2,4D_strategies.html)).

DOE suggests that sites suitable for treatment include lakes or ponds partially infested with Eurasian watermilfoil, but where the extent of the infestation is beyond control by hand harvesting. Given this scenario, 2,4-D is the best option for Liberty Lake. 2,4-D is not an eradication tool. Some plants survive the treatment and regrow, so these plants must be removed by other means. For that reason, hand pulling will continue in Liberty Lake in order to remove any milfoil plants that are not killed by the treatment, or where infestations are too diffuse for a treatment to be applicable. 2,4-D is suitable for spot treatment because it is a fast-acting herbicide that only needs a 48-hour contact time with the plant. ([http://www.ecy.wa.gov/programs/wq/plants/management/2,4D\\_strategies.html](http://www.ecy.wa.gov/programs/wq/plants/management/2,4D_strategies.html)).

Public education is an important element in the control of aquatic nuisance plants. Signs have been developed by DOE to bring attention to the Eurasian watermilfoil infestation in lakes and to show anglers and other lake users how to avoid transporting aquatic plants from one lake to another. These signs have been installed at the Washington State Department of Fish and Wildlife boat launch at Liberty Lake (Figure 3.1). Educational flyers are available at the Sewer District administrative building and have been distributed to residents and concerned citizens. The District Newsletter, mailed to all Liberty Lake residents, and newspaper articles (see Appendix O) are also used to inform residents of the infestation and best management practices that can be applied to limit the spread and future degree of infestation. In addition, Lake Books (put together by the Newman Watershed Plan Committee and DOE) are distributed to every lakeside property owner. These books have been developed to help property owners understand how our actions affect the water quality of our lakes (Department of Ecology, 1992).

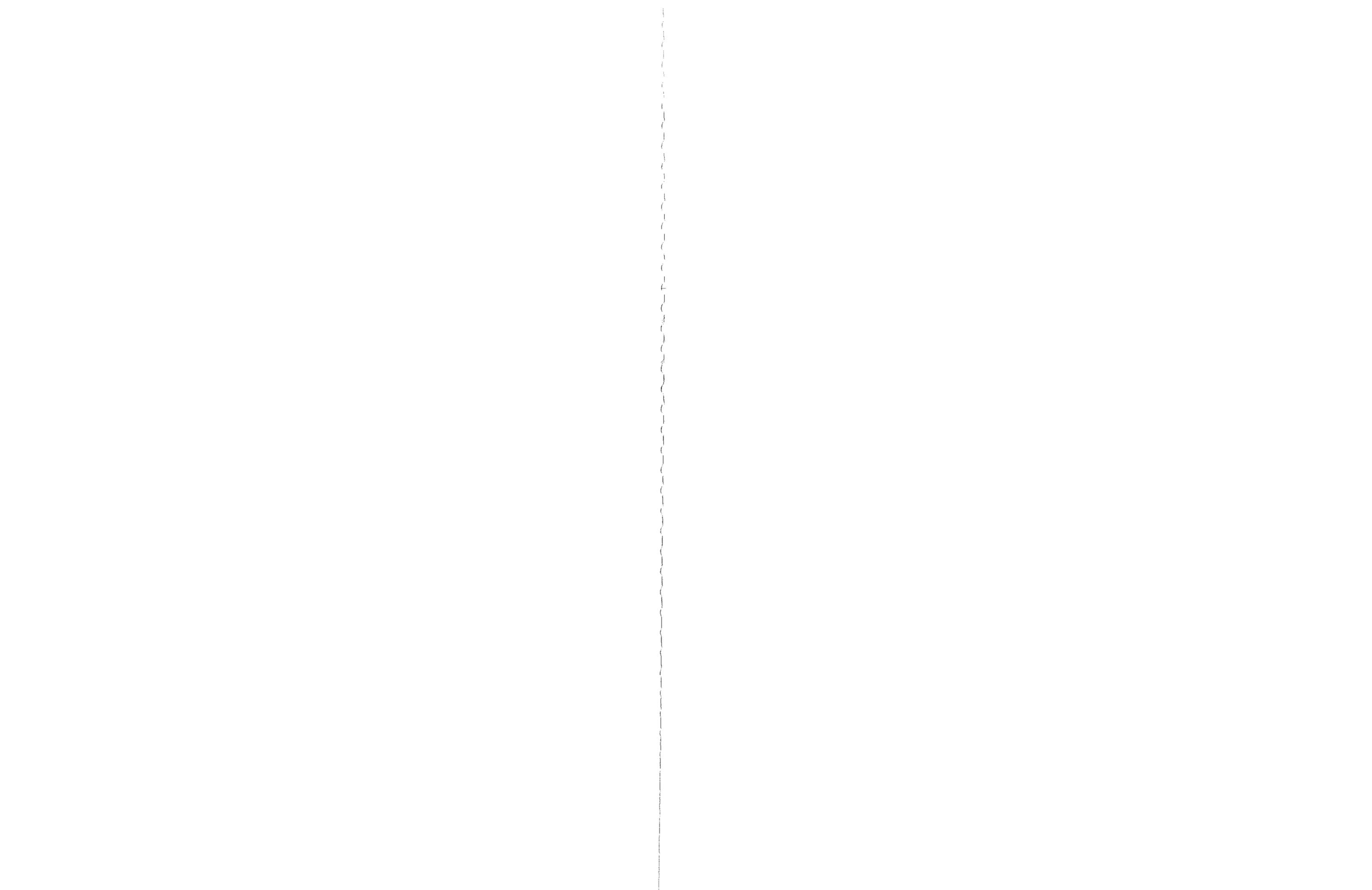
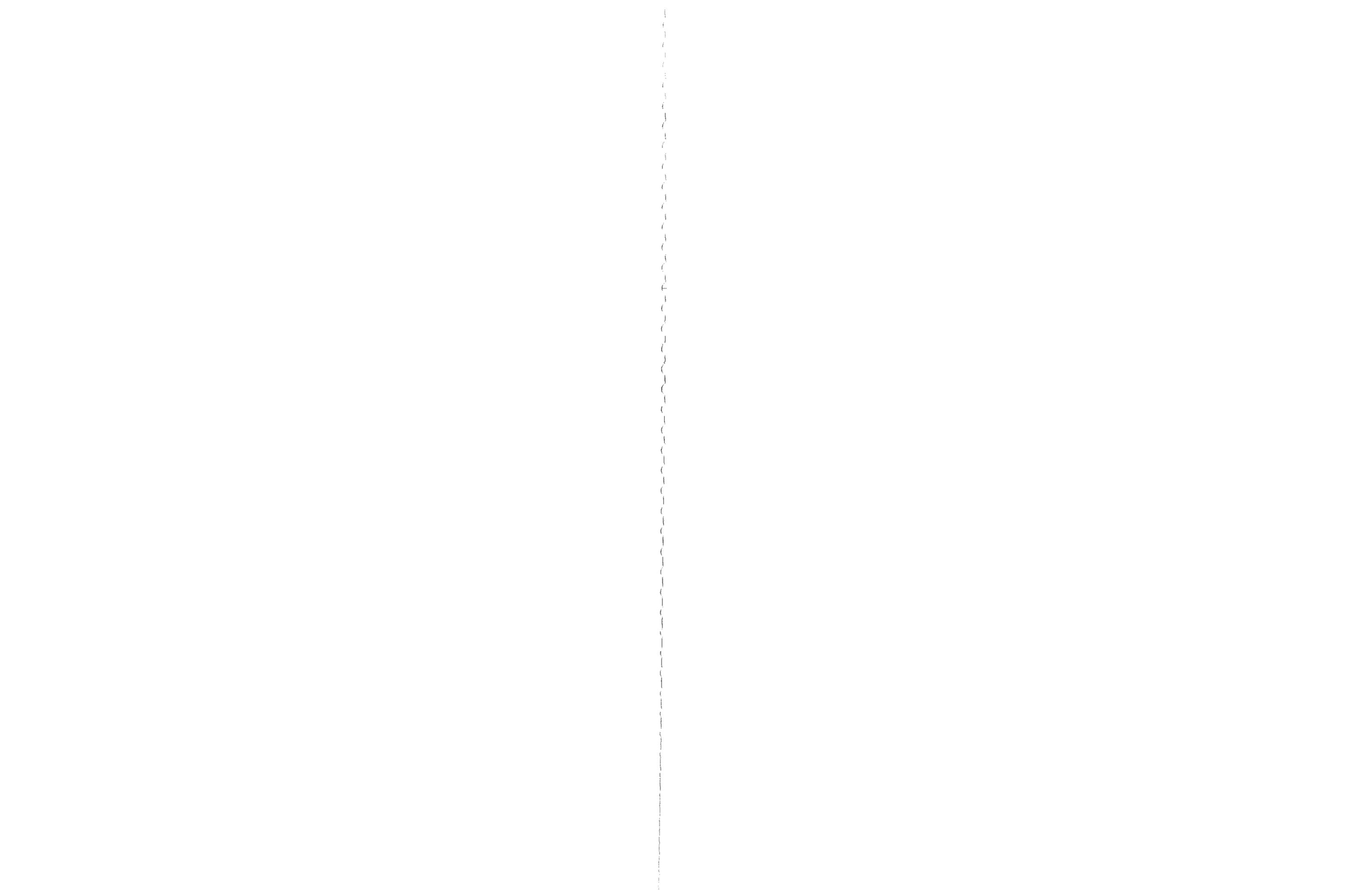




Figure 3.1 Milfoil signage at the Fish and Wildlife boat launch

The Sewer and Water District recognizes that the effective management will be an ongoing concern and will require a long-term commitment. The Liberty Lake Sewer and Water District is willing to fund the follow-up activities necessary to ensure continued milfoil management and control. Monitoring of the plant community and maintaining the best management practices to protect beneficial uses such as recreational use, the fishery, and wildlife habitat needs to be continued. This aquatic weed management plan, however, is not definite and may possibly change as conditions change.

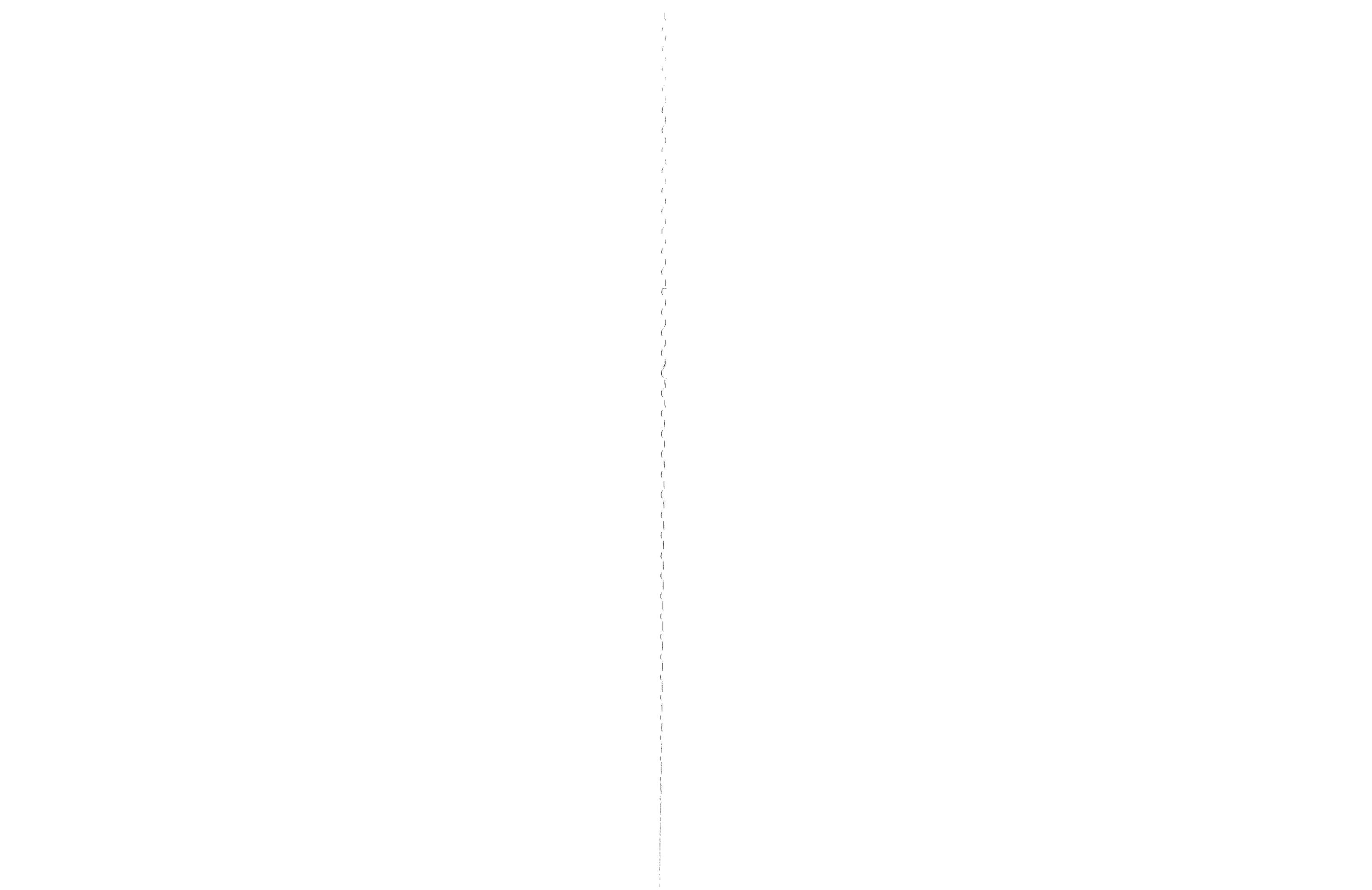


#### 4.1 AQUATIC PLANT MANAGEMENT GOALS

Each spring, aquatic weed diving surveys are conducted by Clearwater Scuba, L.L.C. and boat surveys are conducted by the Liberty Lake Sewer and Water District to evaluate potential growth and effective treatment. Although the milfoil has been contained to low levels since it was first discovered 1995, it is a major concern of the district and the community that if the milfoil density increases it could potentially crowd out native vegetation, impede human recreation, and degrade aquatic habitat.

The Liberty Lake Sewer and Water District values a lake's health, water quality, and its associated community concerns. For that reason, the Liberty Lake Sewer and Water District has developed a set of goals for the Liberty Lake Aquatic Weed Management Plan. These goals were established based on the lake and its characteristics, the community, and all associated costs. The goals are outlined as follows:

1. Suppress and control Eurasian watermilfoil at as low a density as is environmentally and economically feasible.
2. Seek a balanced approach for treatments and diver harvests, while targeting prevalent milfoil growth areas.
3. Take into consideration all beneficial uses including, recreational use, the fishery, and wildlife habitat.
4. Continue long-term nutrient reduction efforts.
5. Continue educational approach to reduce the chances of Eurasian watermilfoil spreading to other lakes.
6. Continue lake water quality monitoring and data collection for baseline information.
7. Continue Advisory Committee activity.
8. Seek funding mechanisms in order to continue long-term control of invasive aquatic plants.

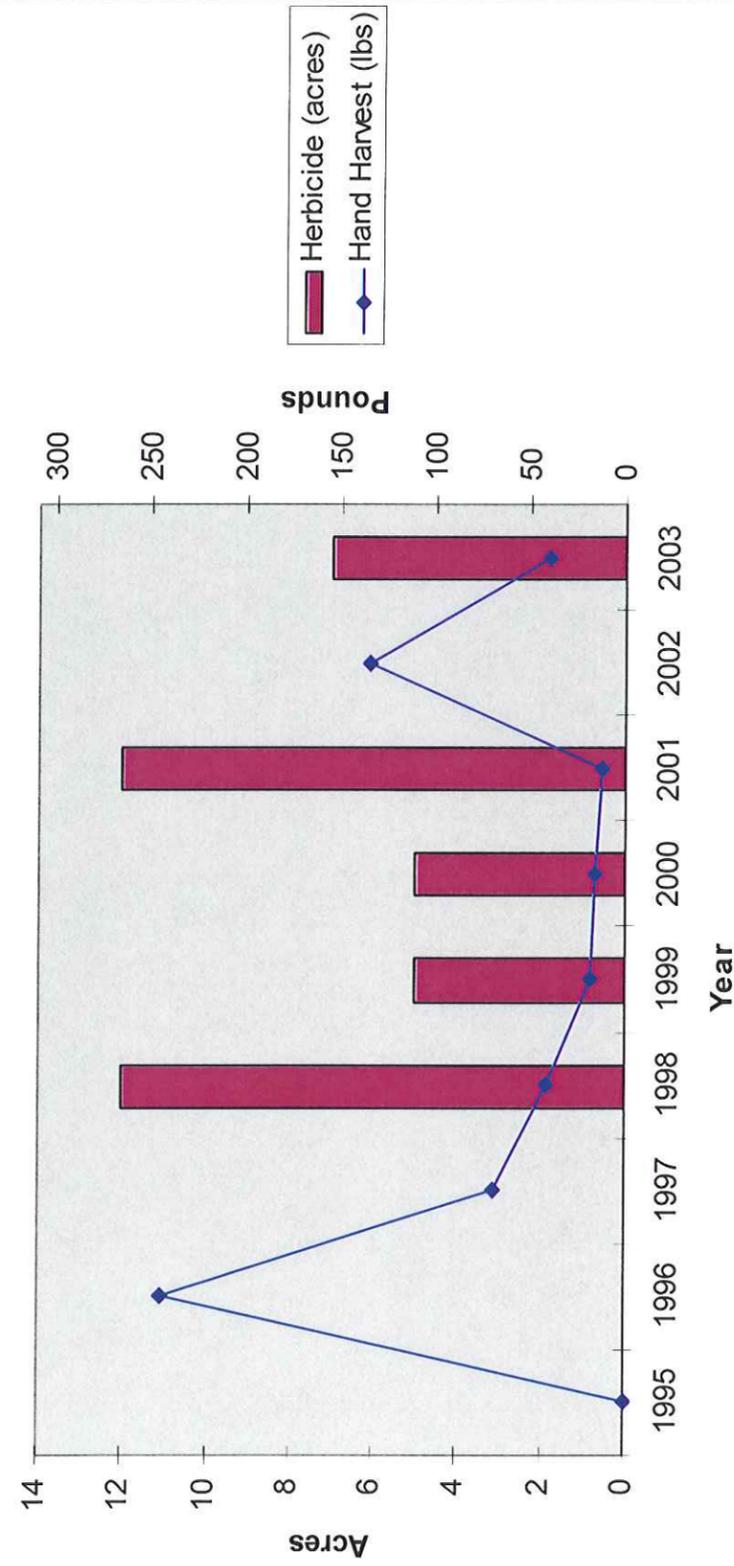


## 5.1 PAST MANAGEMENT EFFORTS

Three large Eurasian watermilfoil plants were first discovered in the fall of 1995 along Liberty Lake's southeast shoreline, near the county park swimming beach. At that time, a comprehensive diving survey was conducted to determine the extent of Eurasian watermilfoil infestation; the results of the survey are reported in Moore (1995). The same year, the LLSWD commissioners considered various options to deal with this serious threat to lake health, and successfully applied for a grant from the Washington Department of Ecology to provide financial assistance in their actions. Effective March 1, 1996, the LLSWD was awarded an *Early Infestation Grant* of \$12,000 for an early intervention project. This grant yielded another comprehensive diving survey to be conducted in the summer of 1996. That year, divers hand harvested nearly 250 pounds of wet milfoil from the lake. The results of the survey and hand harvesting actions are reported in the document *Liberty Lake Early Intervention Milfoil Control Project: Summer 1996*, Moore (1996). A year later in 1997, another diver survey was conducted and hand harvesting removed approximately 70 pounds of wet milfoil. The effort ended that year when high water transparency allowed rapid regrowth and the infestation became too great to handle by diver hand harvesting alone. The following year in 1998, a herbicide treatment (AquaKleen® granular 2,4-D) was initiated treating nearly 12 acres in the northern and southern sections of the lake. In addition to the treatment, diver harvests removed approximately 42 pounds of milfoil including sections in Dreamwood Bay. Control activities for 1998 are reported in the document, *Liberty Lake Milfoil Control Project 1998, Summary and Recommendations*, Moore (1998). The following three subsequent years involved combinations of herbicide treatments and diver hand harvests. In 1999, 5 acres were treated in the north, with diving harvest of 18 pounds. Control activities for that year are reported in the document, *Milfoil Control Activities at Liberty Lake, Summer 1999, Summary and Recommendations*, Moore (1999). In 2000, another 5 acres were treated, this time in the south with diver harvest of approximately 16 pounds. Control activities are reported in the document, *Milfoil Control Activities at Liberty Lake, Summer 2000, Summary and Recommendations*, Moore (2000). Continuing the pattern, in 2001, treatment was conducted on 12 acres in the north, with diver harvest of 12 pounds. Control activities for 2001 are reported in the document *Milfoil Control Activities at Liberty Lake, Spring/Summer 2001, Summary and Recommendations*, Moore (2001). After four consecutive years of treatments and hand harvesting regimes, a 2,4-D treatment was not conducted in 2002. This particular year yielded slow growth patterns in the early summer, but as summer progressed, high water transparency allowed rapid growth and population expansion. This was comparable to the summer of 1997 when hand-harvesting efforts were ceased due to high water transparency and rapid regrowth. Hand harvesting, on the other hand, was conducted in 2002 with removal of nearly 136 pounds of Eurasian watermilfoil at the south section. In July 2003, a AquaKleen® Granular 2,4-D treatment occurred on Liberty Lake treating nearly 7.5 acres of milfoil infested areas (Figure 5.2). Hand harvesting was also conducted in 2003 removing 40 pounds of wet milfoil from the lake. Figure 5.1 illustrates herbicide applications and diver milfoil removal in Liberty Lake from 1995 to 2003.



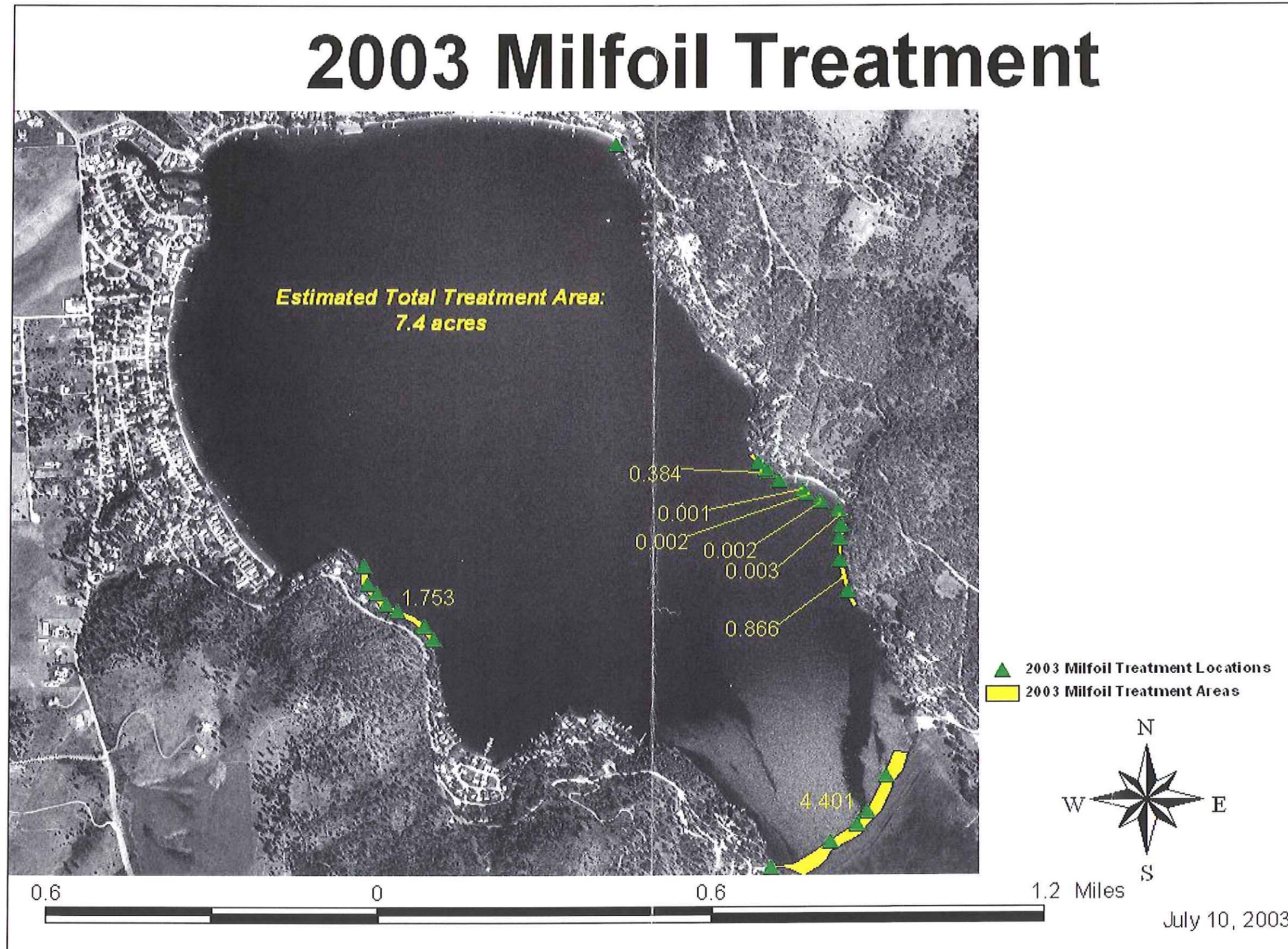
### Herbicide Applications and Diver Milfoil Removal in Liberty Lake from 1995 to 2003



**Figure 5.1** Herbicide applications (acres) and diver milfoil removal (pounds) in Liberty Lake from 1995 to 2003 (after Moore, 2003)

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Figure 5.2 2003 Eurasian watermilfoil 2,4-D treatment areas





## **APPENDICES**

**Appendix A:** Shoreline designations and recommendations

**Appendix B:** Washington State Department of Fish and Wildlife previous stocking records from 1980 to 2001

**Appendix C:** Washington State Department of Ecology 1998 macrophyte survey results

**Appendix D:** Bottom Barrier installation instructions

**Appendix E:** Herbicide labels and MSDS sheets: Navigate®, AquaKleen®, DMA\*4IVM®, and triclopyr (Renovate®)

**Appendix F:** Species controlled with Navigate® and AquaKleen® and effectiveness of control

**Appendix G:** Herbicide residential and business notification

**Appendix H:** Posting for direct aquatic applications

**Appendix I:** Public meetings on Eurasian watermilfoil and Aquatic Weed Management Plan work hours and work completed

**Appendix J:** Aquatic Weed Management Plan letters e-mails and letters

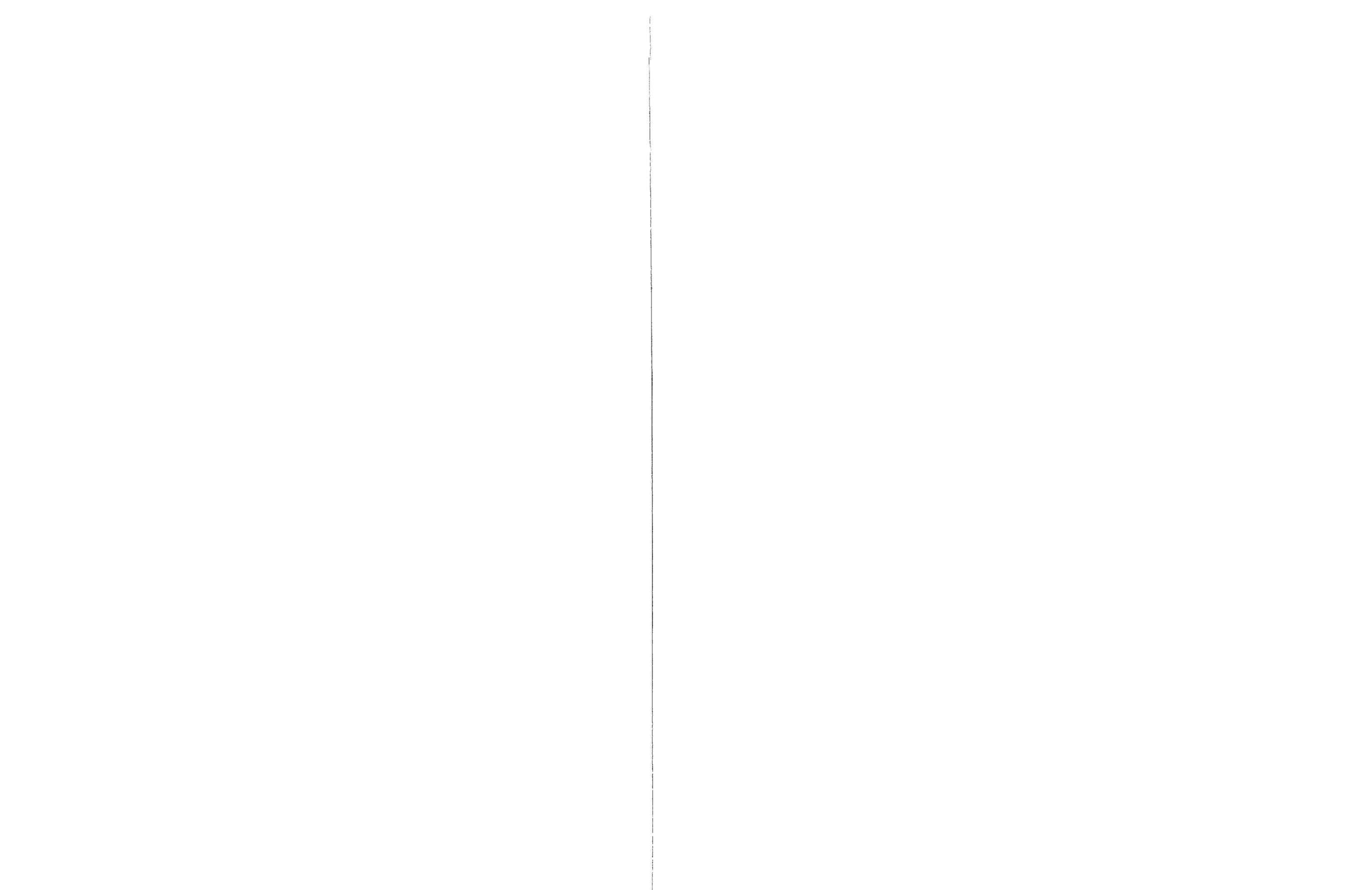
**Appendix K:** Aquatic Weed Management Plan award letter

**Appendix L:** Washington State Department of Fish and Wildlife support letter

**Appendix M:** Washington State Department of Ecology marsh categorization letter

**Appendix N:** Affidavit of Publishing Notice

**Appendix O:** Past newspaper article publications



APPENDIX A: Shoreline designations and recommendations

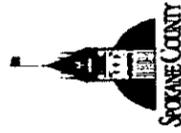
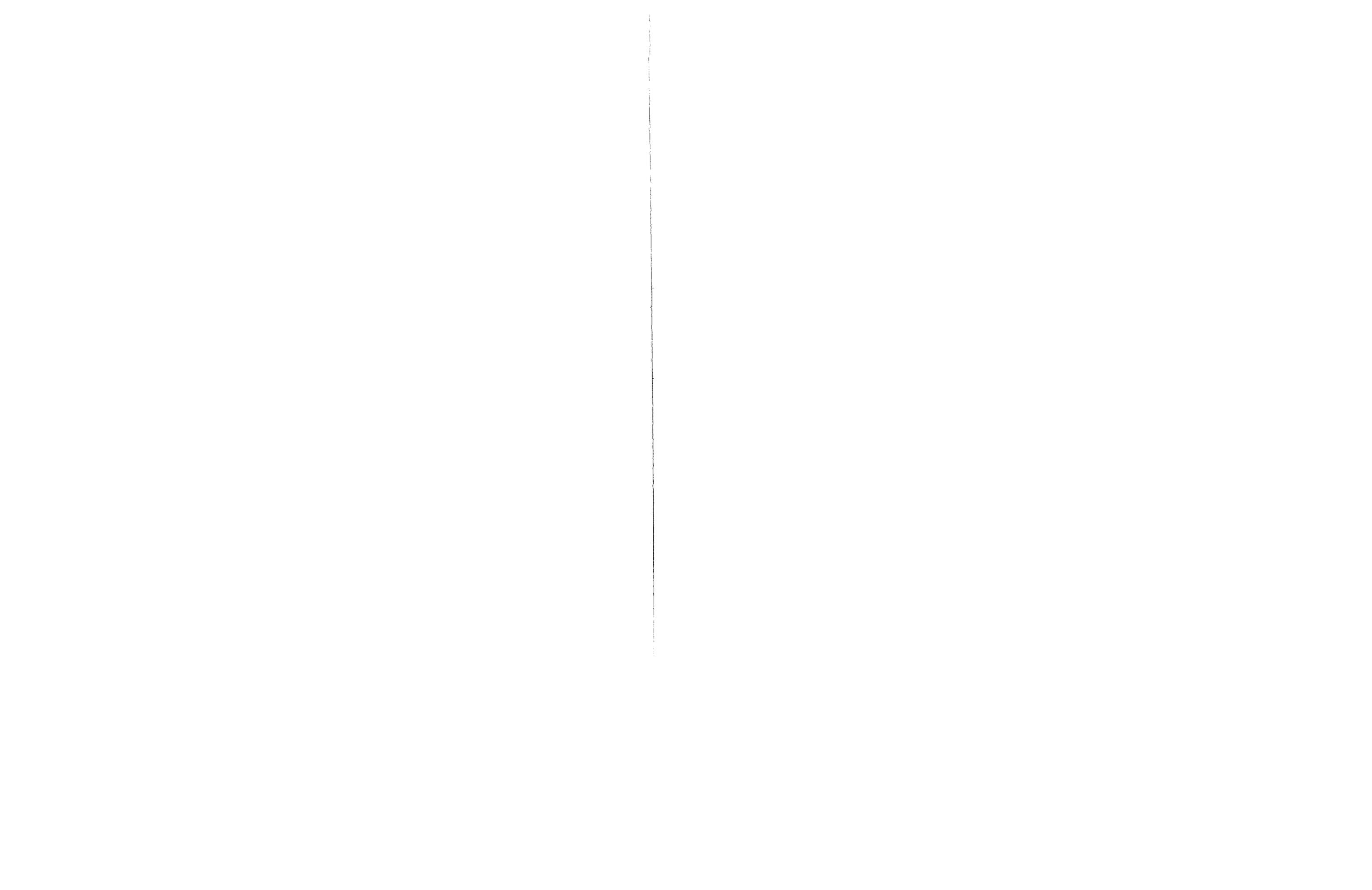


Table 4.4: Existing and Recommended Shoreline Designations for Liberty Lake

Shoreline Letter Designation	Existing Spokane County Shoreline Designation (1996)	Non-Point Source Pollution Potential for Downgradient Areas	Proper Functioning Condition (Appendix B)	Ecological Need for Restoration	Ecological Sensitivity to Development	Recommended Shoreline Designation (2002)
Shoreline A	Urban	Moderate	Functional At Risk/Downward	High	Low	A - Urban (no change)
Shoreline B	Rural	Moderate	Functional At Risk/Downward	Moderate	High	B - Conservancy
Shoreline C	Conservation	Moderate	Functional At Risk/Downward	Low (good condition)	High	C - Pastoral
Shoreline D	Rural	Moderate	Functional At Risk/Downward	Moderate (Public access/recreation)	Moderate	D - Rural (no change)





**Existing Shoreline Designation**

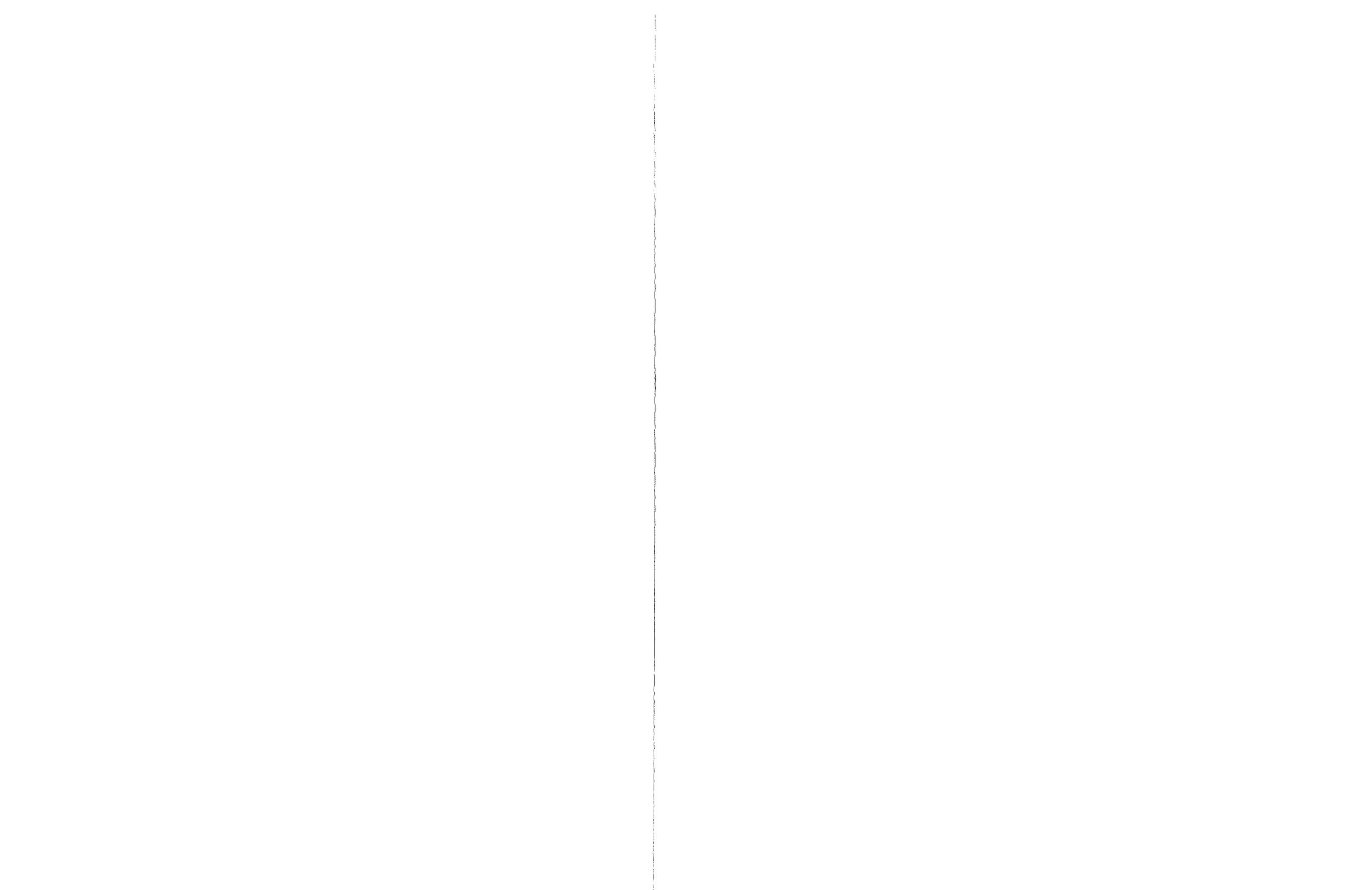
*Liberty Lake*  
*Spokane County, Washington*

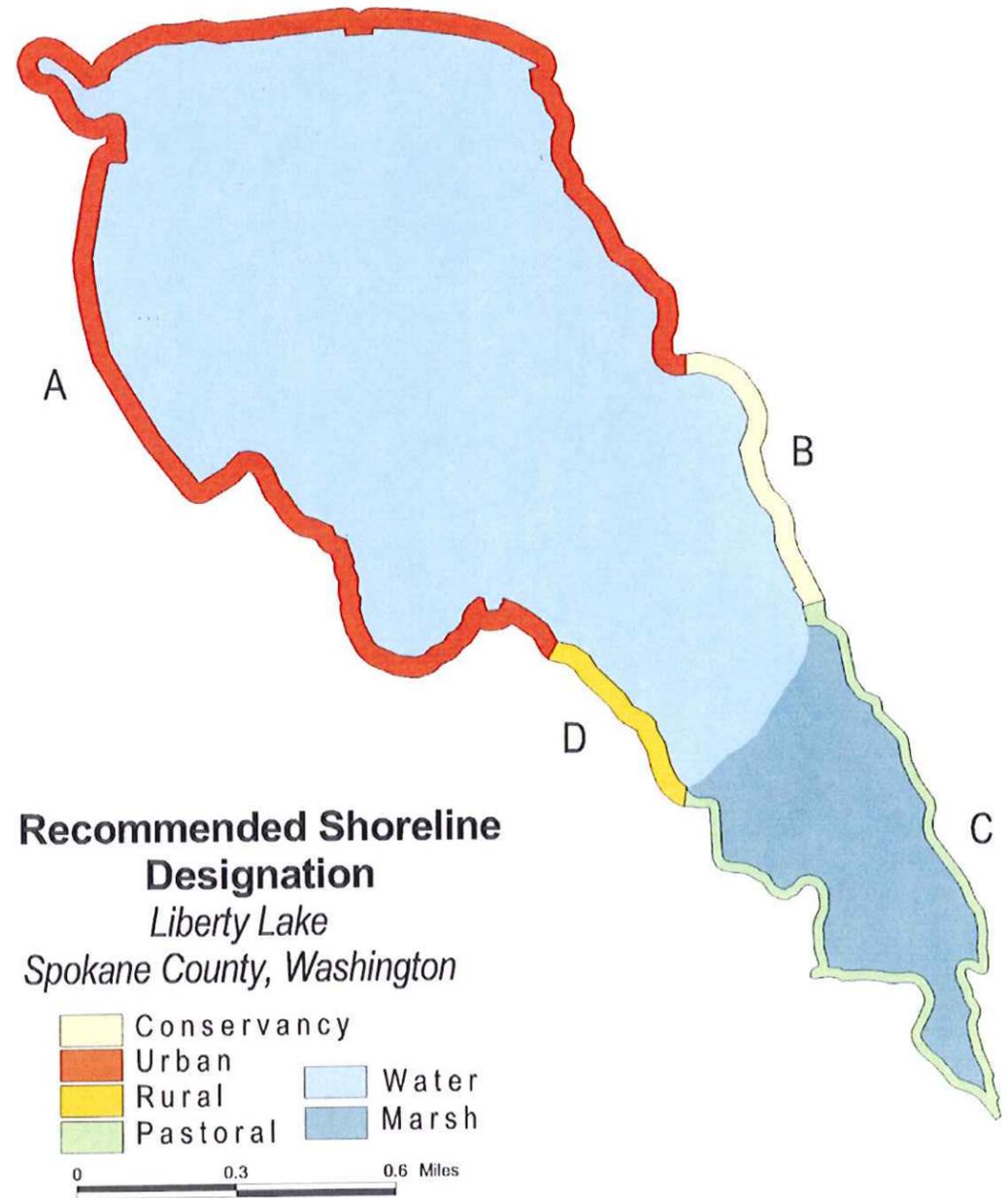
- |   |   |
|---|---|
|  Conservancy |  Water |
|  Urban       |  Marsh |
|  Rural       |   |



Refer to the preceding table for shoreline letter (ABC) designation information

Figure 4.4 A





Refer to the preceding table for shoreline letter (ABC) designation information

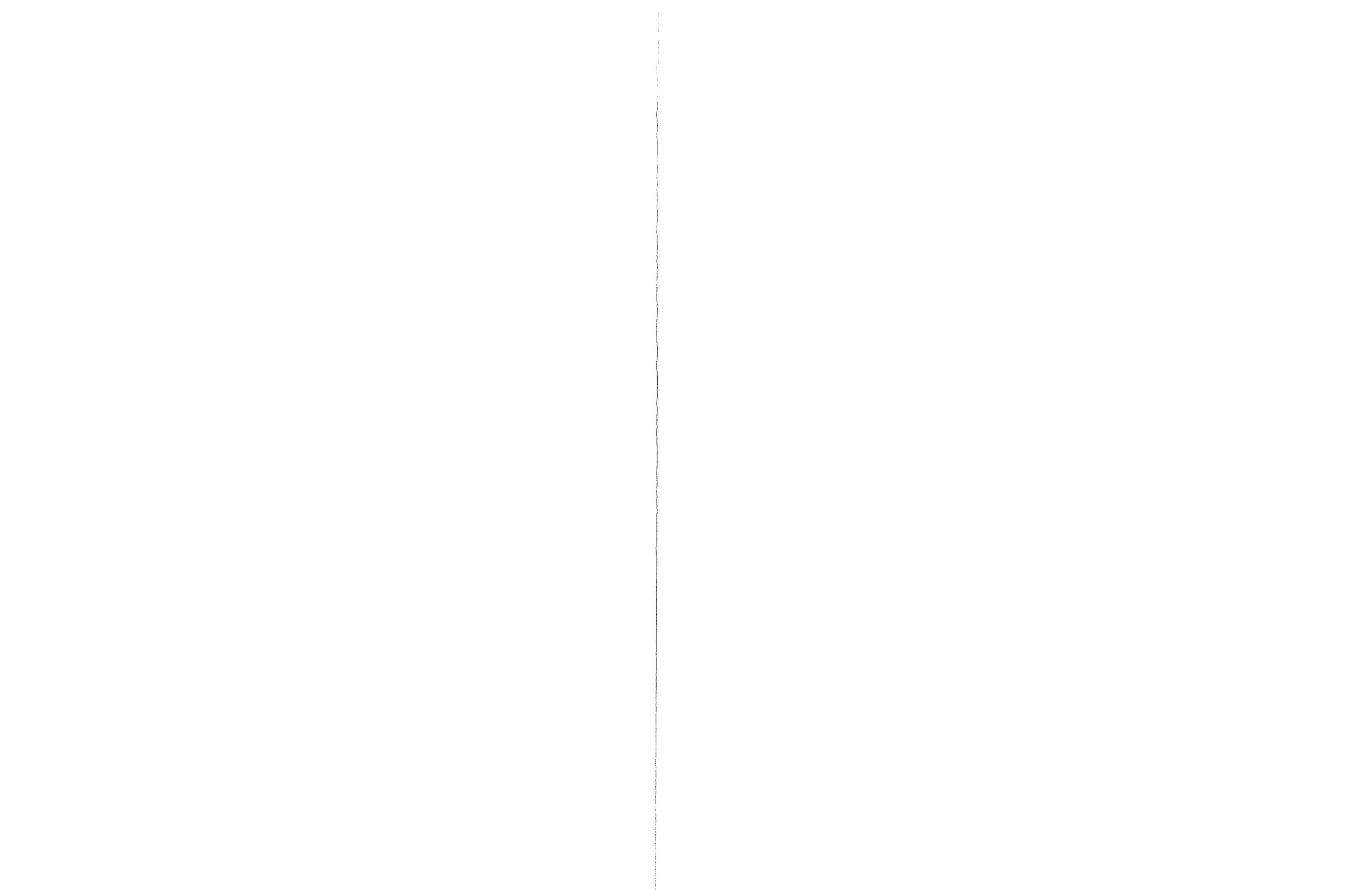
Figure 4.4 B



**APPENDIX B:** Washington State Department of Fish and Wildlife previous stocking records from 1980 to 2001

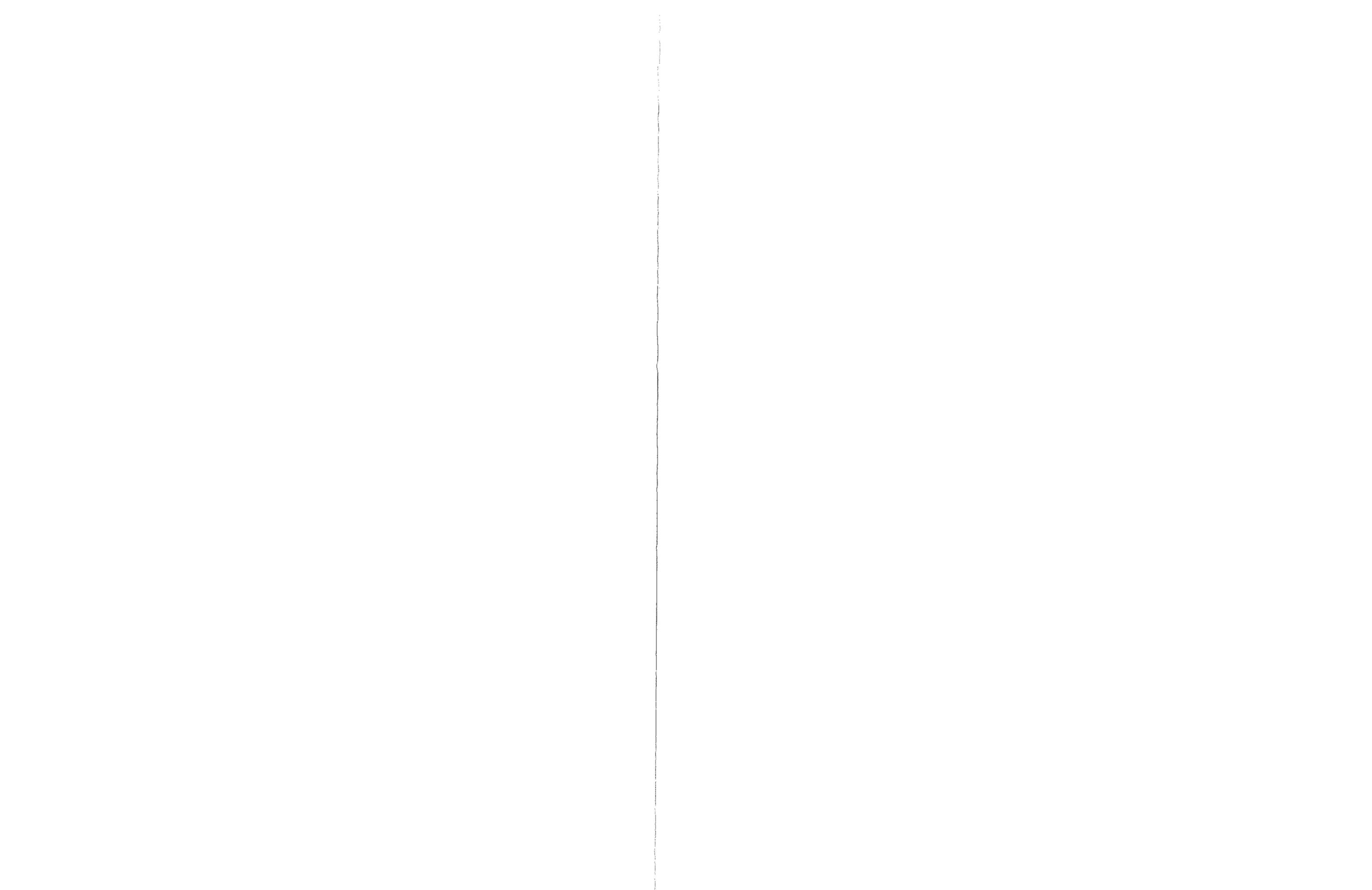
Liberty Lake fish planting records. Species are Rainbow Trout (RB), Brown Trout (BN), German Brown (GB), and Walleye (WA & WE).

Year	Species	# planted	# / lb. ( * )	Origin
1980	RB	55,200	96	Spokane--Albert
	RB	55,000	100	
	RB	55,650	105	
	RB	55,080	90	
	RB	49,500	90	
	RB	55,120	106	
	RB	9,225	5.0	Ford Trout Hatchery
	RB	9,275	5.0	
	RB	9,300	5.0	
	RB	9,000	5.0	
	RB	9,250	5.0	
	RB	10,600	5.0	
	RB	10,000	5.0	
	RB	66,080	112	Spokane--Albert
	RB	66,700	115	
	RB	69,300	105	
	RB	68,250	105	
	RB	55,620	10.3	
	RB	63,600	120	Spokane--Albert
	RB	60,000	120	"
	RB	52,500	105	"
	RB	50,470	103	"
	RB	49,470	102	"
	RB	50,600	92	Spokane--Albert
	RB	50,100	76	
	RB	50,160	88	
	RB	50,150	85	
	RB	8,975	5.0	Ford
	BN	5,005	3.5	Spokane--Albert
	RB	10,010	5.5	"
	BN	9,826	3.4	
	RB	310	0.6	
	RB	8,025	5.0	Spokane--Albert
	BN	4,200	2.8	
	RB	5,000	5.0	Ford
	BN	16,060	22.0	Spokane--Albert
	RB	30,153	13.8	"
	RB	15,400	15.4	
	BN	25,500	20.4	Ford
	BN	11,628	20.4	"
	BN	24,582	20.4	"



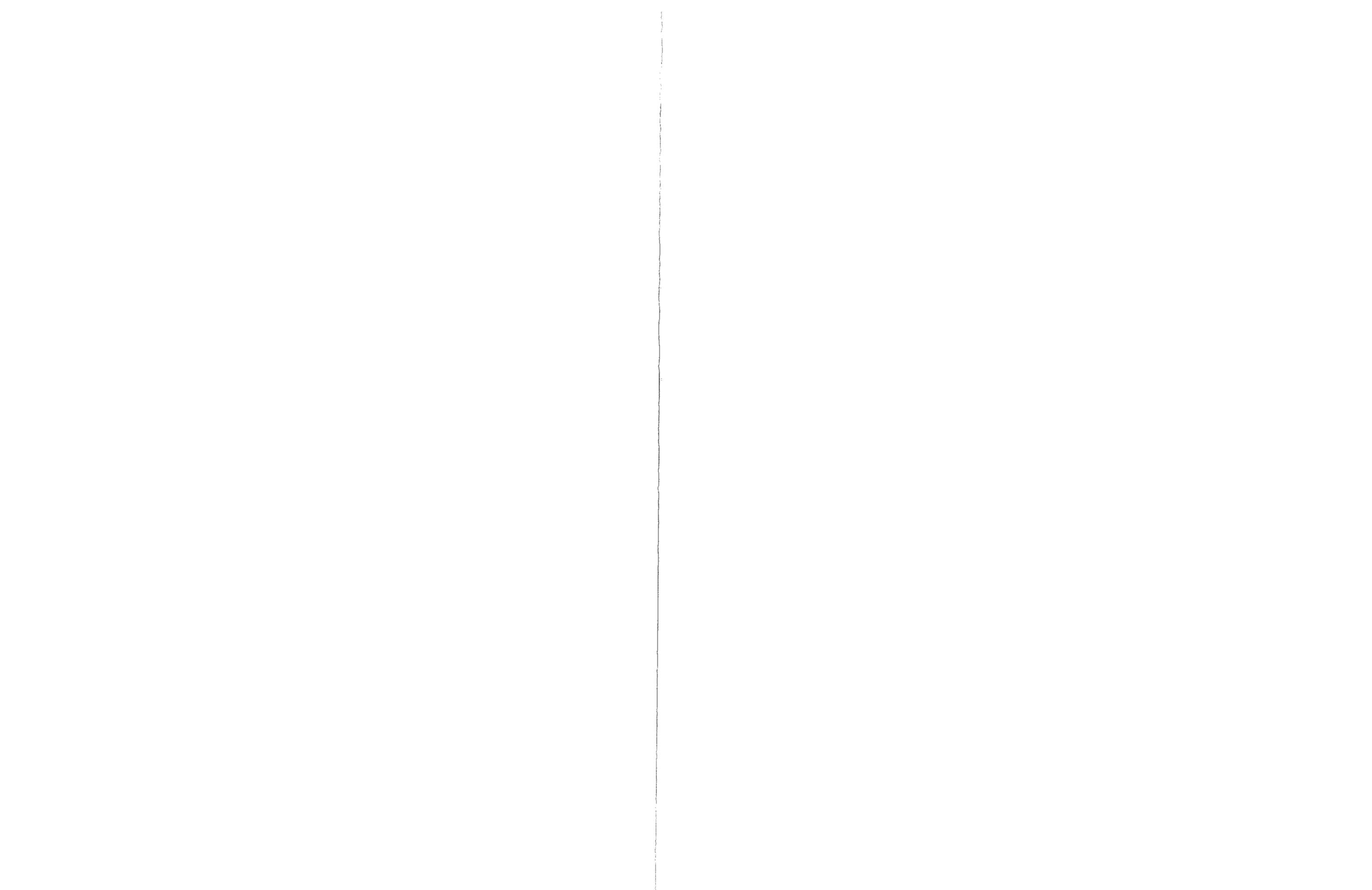
Liberty Lake fish planting records, page 2

Year	Species	# planted	# / lb.	Origin
1989	RB	3,630	5.5	Spokane--Albert
	RB	200	0.1	
	RB	200	0.1	
	RB	11,800	0.1	
	BN	12,663	12.6	
	BN	12,500	12.5	
	BN	700	0.5	
1990	RB	8,253	6.3	Spokane--Albert
	RB	7,749	6.3	
	RB	9,060	6.0	
	RB	9,900	6.6	
	RB	236	0.2	
	BN	12,954	12.7	
	RB	15,300	17.0	
	BN	13,200	13.2	
	RB	14,784	16.8	
	BN	11,084	13.6	
	BN	12,813	12.5	
	1991	RB	23,400	6.5
BN		3,504	4.3	Ford
RB		300	0.1	Spokane--Albert
RB		20,128	13.6	
BN		10,508	14.2	
BN		16,088	14.3	
BN		15,600	15.6	
BN		7,823	14.9	
1992	RB	500	0.3	Spokane--Albert
	RB	8,302	4.5	Ford
	RB	8,235	4.5	"
	RB	10,047	5.1	
	RB	3,440	4.3	
	BN	5,017	4.5	
	RB	4,218	3.5	Spokane--Albert
	RB	1,873	3.5	"
	BN	15,200	15.2	
	BN	14,880	12.4	
	RB	20,825	17.0	
	RB	19,200	20.0	
	RB	5,022	9.3	
	RB	21,320	18.3	Spokane--Albert
	BN	350	0.3	Ford



Liberty Lake fish planting records, page 3

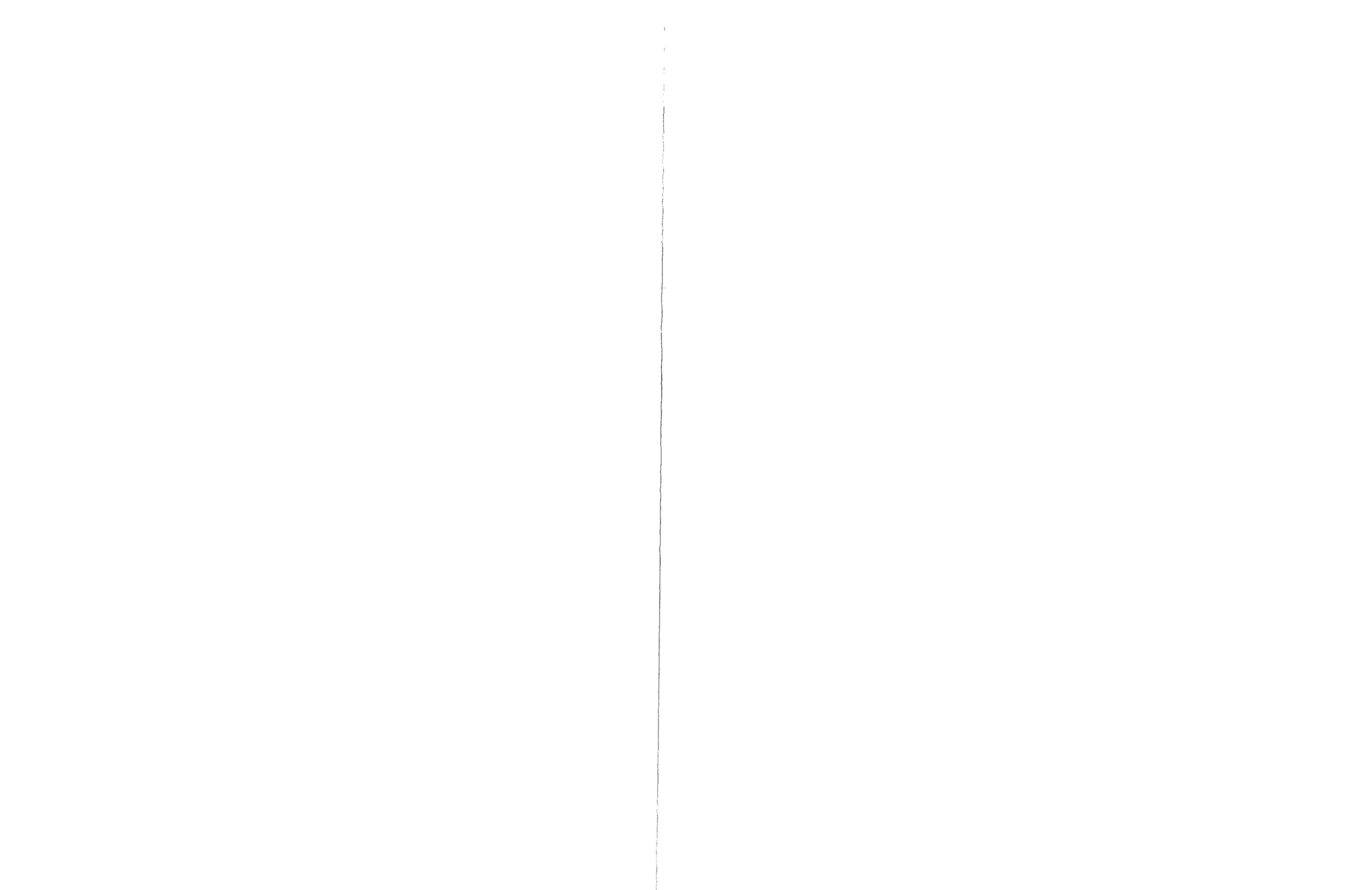
Year	Species	# planted	# / lb.	Origin
1993	RB	7,749	5.4	Spokane--Albert
	RB	5,843	5.7	"
	RB	250	0.2	"
	RB	200	0.2	"
	BN	16,422	20.4	"
	BN	15,440	19.3	"
	BN	16,100	17.5	"
	RB	16,000	20	Ford
	RB	16,997	13.3	Moses Lake
	RB	7,650	18	Ford
	BN	400	0.3	"
	RB	7,650	5.1	Spokane--Albert
	RB	5,100	5.1	"
	BN	4,914	4.2	Ford
	RB	250	0.2	Spokane--Albert
	BN	5,117	4.3	Ford
	BN	9,325	25	Spokane--Albert
	BN	20,292	17.8	"
	RB	14,472	14.4	"
	RB	15,540	14	"
	BN	10,125	13.5	"
	BN	415	0.5	Ford
	RB	10,098	5.2	Spokane--Albert
	GB	6,552	4.2	Ford
	RB	150	0.1	Spokane--Albert
	BN	18,038	17	"
	BN	17,446	18.5	"
	BN	8,708	12.3	"
	GB	5,017	4.5	Ford
	WE	100	46	Moses Lake
	RB	6,640	5.1	Spokane--Albert
	RB	6,185	5.3	"
	RB	7,079	5.4	"
	RB	45,588	87	"
	BN	17,680	85	"
	RB	42,000	70	"
	BN	21,690	18	"
	WA	27,500	5.0	"
	BN	9,585	4.5	Ford
	RB	5,200	5.2	Spokane--Albert
	RB	15,066	5.4	"
	WA	82,453	3000	Columbia Basin
	RB	53,253	97	Spokane--Albert
	BN	19,800	24.75	"
	RB	18,988	15.77	"



Liberty Lake fish planting records, page 4

Year	Species	# planted	# / lb.	Origin
1997	RB	14,184	35.11	Spokane--Albert
	RB	21,297	16.6	"
	BN	10,000	5.0	Ford
	RB	15,015	5.5	
	RB	300	0.2	Spokane--Albert
	RB	120,000	100	
	RB	40,000	20	
	BN	30,000	20	
	RB	15,000	5.5	Spokane--Albert
	BN	10,000	5.5	"
2000	RB	20,000	5.5	Spokane--Albert
	BN	20,000	20	"
	BN	2,500	5.5	
	RB	2,500	0.667	Columbia River Fish Farm
	SE	2,275	8" long	
	RB	2,500	5.5	Spokane--Albert
RB	17,500	5.5	"	

(\* ) Number of fish per pound. > 80 are spring fry, ~20 are fall fry and < 5.5 are trophy size.



**APPENDIX C:** Washington State Department of Ecology 1998 macrophyte survey results

**Aquatic Plant Data**

LIBERTY

Sampler: Parsons, O'Neal

Survey Date: 7/13/1998

Max depth of growth (M): 6.5

Comments Breezy, partly cloudy. Nice plant community. Few plants in water less than 1.5 m deep, deeper water with plants approaching surface to 3 m deep. Deep water with Elodea, P. pusillus and Chara. Mergansers, grebes, osprey. Did habitat survey for Kirk Smith.

**SPECIES LIST**

Scientific Name	Common Name	Dist <sup>a</sup>	Comments
<i>Chara sp.</i>	muskwort		in shallow to deep water
<i>Elodea canadensis</i>	common elodea		blooming
<i>Myriophyllum spicatum</i>	Eurasian water-milfoil		seen at wetland, south end, several plants (also known from north end)
<i>Nuphar polysepala</i>	spatter-dock, yellow water-lily	2	
<i>Phalaris arundinacia</i>	reed canarygrass	2	most in wetland, south end
<i>Phragmites communis</i>	common reed	1	
<i>Potamogeton amplifolius</i>	large-leaf pondweed	3	
<i>Potamogeton pusillus</i>	slender pondweed	2	
<i>Potamogeton robbinsii</i>	fern leaf pondweed	3	
<i>Potamogeton sp (thin leaved)</i>	thin leaved pondweed	2	may also be P. pusillus, in deep water
<i>Scirpus sp.</i>	bulrush	2	bulrush, south end

<sup>a</sup> 0 - value not recorded (plant may not be submersed)

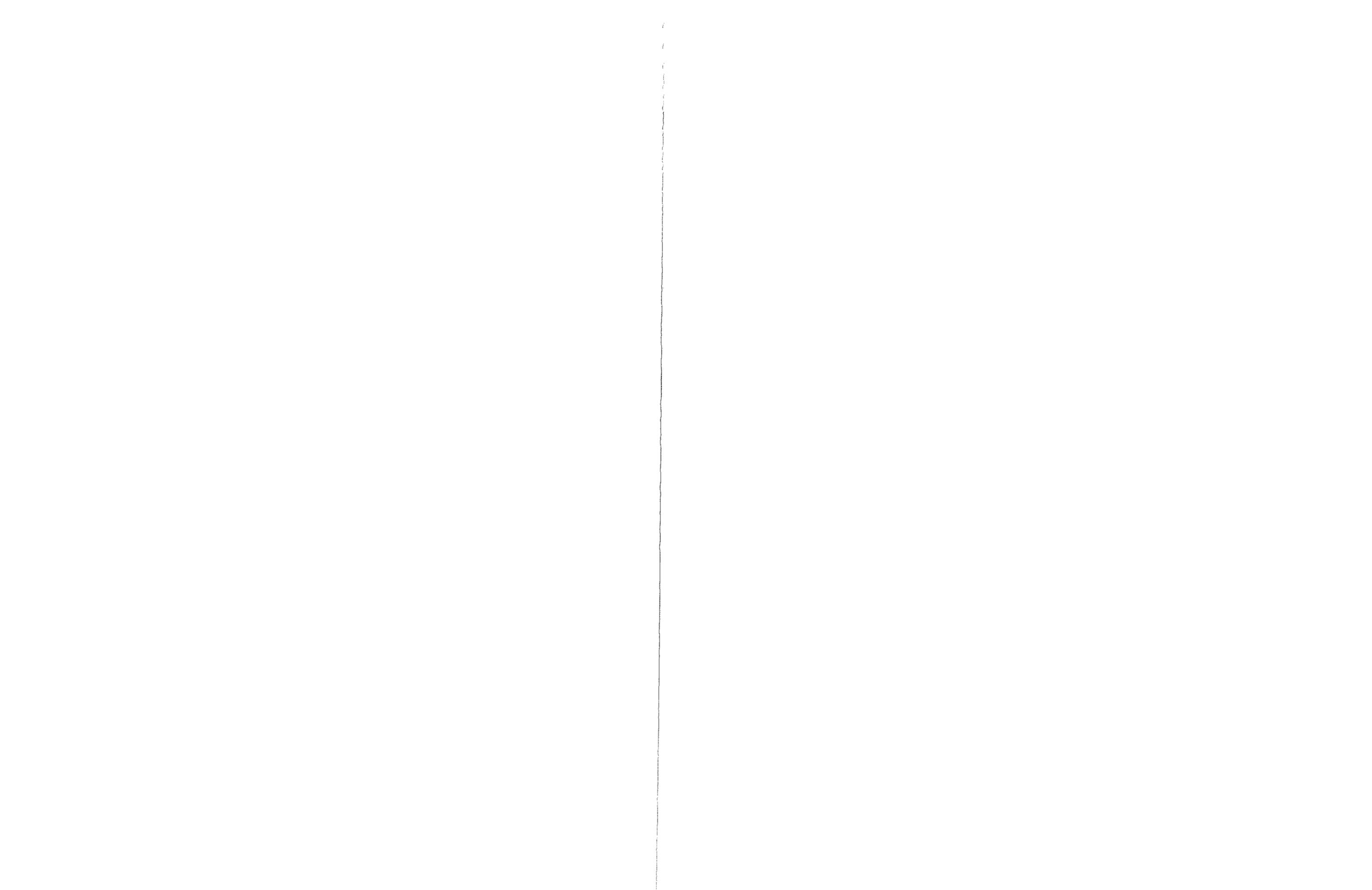
2 - few plants, but with a wide patchy distribution

4 - plants in nearly monospecific patches, dominant

1 - few plants in only 1 or a few locations

3 - plants in large patches, codominant with other plants

5 - thick growth covering substrate to exclusion of other species



## APPENDIX D: Bottom barrier installation instructions

A Department of Ecology Fact Sheet



# Instructions for Building and Installing Bottom Screens



Many lake-front residents have problems with aquatic plants growing in swimming areas or alongside docks. Bottom screening provides an inexpensive and effective means of controlling these plants. This document provides instructions for building and installing bottom screens.

A bottom screen is a cloth-like material that covers the lake bottom like a blanket. Bottom screens block light, preventing the growth of aquatic plants. Bottom screening (bottom barriers) can be an excellent method of controlling aquatic plants at swimming beaches and in boat mooring areas.

Most aquatic plants can be controlled with bottom screens. Waterlilies are controlled well, although installation and maintenance difficulties can be created by their large roots and the mucky sediments in which they sometimes grow. Plants such as coontail and bladderwort that do not root in the sediment, can not be controlled by bottom screening.

Bottom screens can be installed by the home owner. The material may be placed directly on the lake bottom or attached to frames to facilitate handling under water. The use of bottom screens is usually confined to shallow water, unless diving gear is available.

### Materials Required for Three 12'x12' Bottom Screen Frames

- ❖ Fifteen 2" x 2"s, each twelve feet long.  
*Note: Fir and cedar 2" x 2"s are suitable and may be more readily available, in twelve foot lengths, than pine.*
- ❖ Nails (#6 Spiral) or screws, 2" long.

- ❖ Marine plywood, 1/4" for making gussets. Forty-eight gussets are required for bracing, top and bottom of each of the three 12'x12' frames (*see sketch below*). Approximately twelve square feet of plywood is required.
- ❖ Lath (if nails instead of staples are used for securing material to the frames). About 165 lineal feet required.
- ❖ Screening material, allowing for some selvage, about 440 square feet required.
- ❖ Twelve polypropylene bags 2'x2' for use as sandbags.
- ❖ Clean sand or gravel to fill twelve bags approximately 3/4 full, about 1 cubic yard.

### Tools Required



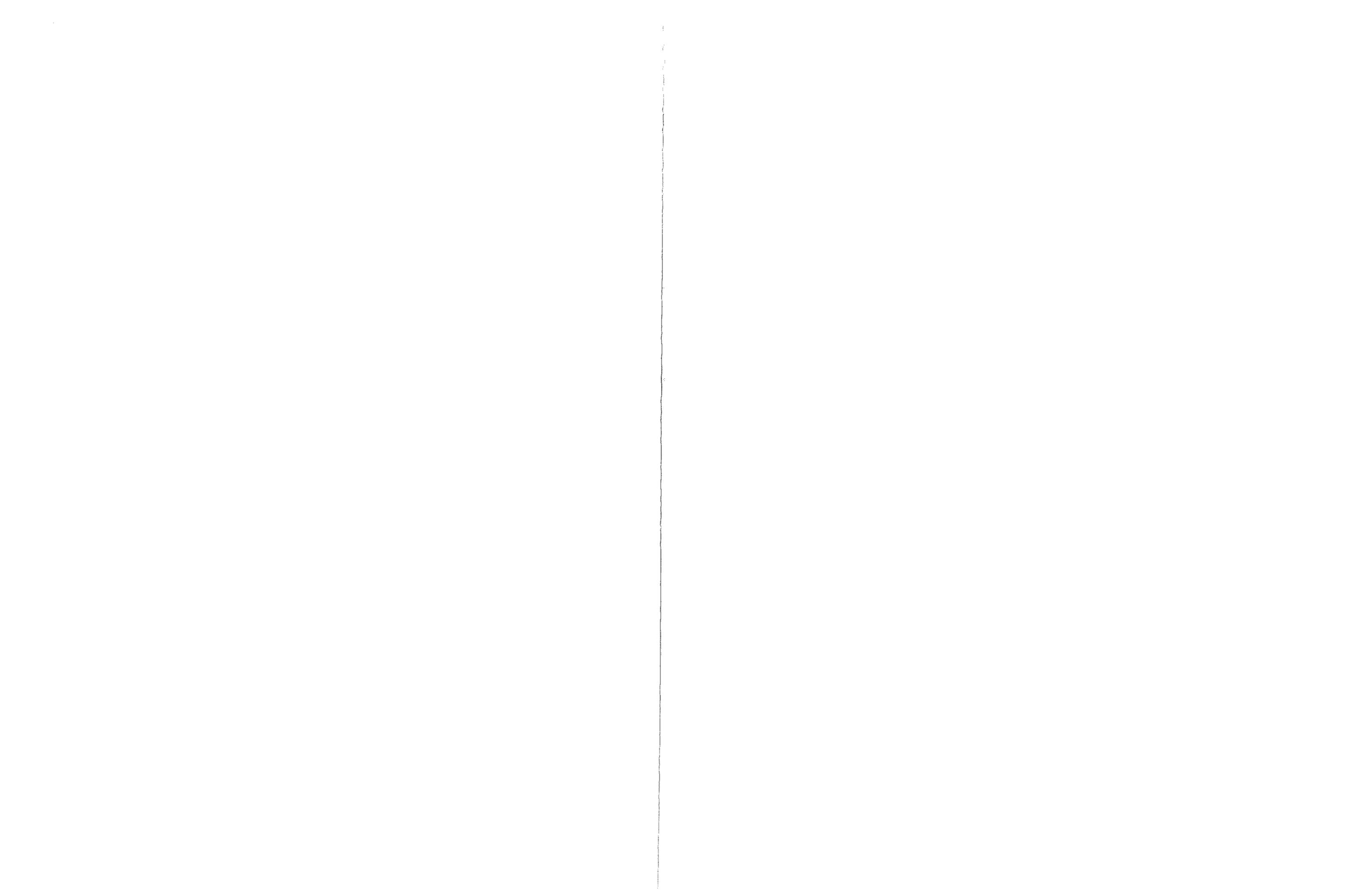
- ❖ Hammer
- ❖ Saw
- ❖ Utility knife or heavy scissors for cutting material.
- ❖ Staple gun (if staples are used instead of lath for securing material to the frames).

### Building Instructions

#### A. Screening Materials

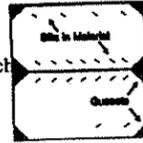
Screening materials should be opaque and of a sturdy material that doesn't tear easily. Ideally these materials should be heavier than water and permeable to the gases that will be generated by rotting vegetation.

Materials suitable for screening include burlap, woven synthetics, perforated black mylar, landscaping fabric (sold in hardware stores and at plant nurseries), and geotextiles used in road construction. Keep in mind that some fabrics, such as burlap, will deteriorate more rapidly than others.



### B. Screen Construction

1. Lay out the 2 x 2's for one frame - four sides, plus middle brace.
2. Measure and cut gussets from the 1/4" marine plywood. These will be triangular pieces with each side 5" long. Sixteen gussets are required for each frame.
3. Nail or use screws to secure gussets at each corner of the frame and at both ends of the center brace on the "up" or visible side of the frame.
4. Carefully turn the frame over and lay the screening material on top.



*Note: Screening material can be used in six foot widths if it is more conveniently available.*

5. Nail gussets or use screws to secure them to one end of the frame with the screening material underneath.
6. From the opposite end of the frame, pull the material tight and nail or screw down gussets.
7. Staple the screening material to each of the 2 x 2's so that it is secured along the entire length (or nail down, using the lath).
8. Trim excess material even with the outside of the frame.
9. Repeat for other frames.



### C. Sand Bags

Sand bags are used to anchor the bottom screens to the sediment. Even the most porous materials will billow due to gas buildup, sometimes causing the frame to "lift off" the bottom. Therefore, it is very important to anchor the bottom screen securely. Unsecured screens can create navigation hazards and are dangerous to swimmers. Anchors must be effective in keeping the material down and must be regularly checked.

1. Fill each bag about 3/4 full with clean sand or gravel (fill material containing dirt cloud the water as the bags are put into place). If the screen site has a soft or muck bottom try filling the bags only 1/2 full. The bags may cause the screens to sink if the sediment is very soft.
2. Tie the bags closed with string.

### D. Placing Bottom Screens

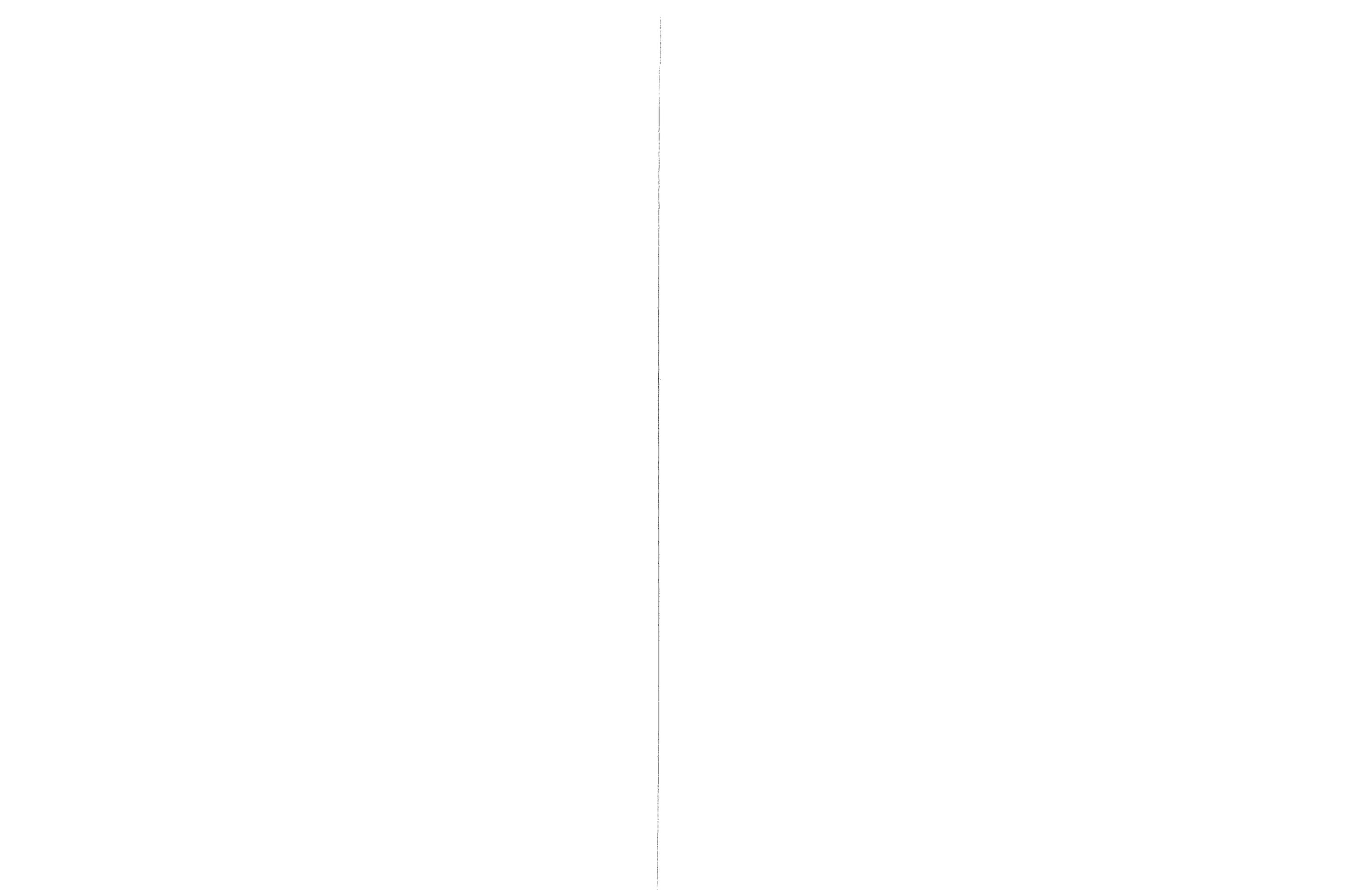
#### Site Considerations:

Installation is easier in the winter or early spring when plants have died back. In summer, it's desirable to cut or hand-pull the plants first.

Be aware that boat propellers may dislodge bottom screens in shallow areas. Also fish hooks can get caught in the material. If the screened area is to be used for boat mooring, swimming, fishing, or wading, it may be prudent to post a sign telling users that the bottom screen is in place.

1. Remove any sticks and stones from the area to be screened, especially where the edges of the frame will lie.
2. Slide the frame into the water. This can be more easily done with two people.
3. While the screens are floating on the surface, cut slits about one inch long in the material, in a pattern similar to that shown in the sketch shown above. This will allow the air trapped under the screen to escape, making it easier to lower the screen to the bottom. The slits will also allow gases generated by rotting vegetation to escape.
4. If you are installing the screen near a dock, line up the frame with the dock. Lower the frame into place by placing a sandbag on each corner and allowing the frame to slowly sink. Once it is on the bottom and in the position you want, add a sandbag to each end of the center brace.
5. Install the second and third frames adjacent to each other. If two people are working together, one can push while the other squeezes the frames together. Make sure there are no gaps between each frame and that the cross pieces are parallel with the other frames.





6. Place the remaining sand bags, concentrating the weight where the frames meet. Overlap the bags so that they rest partly on each frame. This will help to keep the frame in place.
7. Pull the aquatic weeds along the edge of the frames to keep them from growing over the screened area. Milfoil tends to "canopy" over adjacent areas.
8. If any mechanical harvesting is taking place on the lake, notify the equipment operator about the bottom screen and ask him/her not to harvest in this area.

#### D. Relocating Screens

Bottom screens installed during the growing season will suppress the plants within about four weeks. The bottom screens can then be moved to a new location or be removed for storage. If bottom screens have been in place during the growing season, plant suppression will usually be effective for the remainder of the summer.



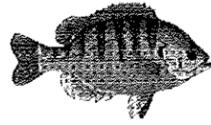
Screens are easily moved underwater by two people. They can be moved around the same dock or to an adjacent dock.

#### E. Maintenance

The duration of weed control depends on the rate that weeds can grow through or on top of the bottom screen, the rate that new sediment is deposited on the screen and the durability and longevity of the material. Regular maintenance can extend the life of most bottom screens.

1. Frequently check the bottom screen for gas bubbles. If gas bubbles are forming under the material, cut one or two additional slits on top of the bubble to release the gas.
2. If the screens are not removed from the water at the end of the season, they should be checked at the beginning of the new growing season for any accumulation of sediment. This can be removed by sweeping or up-ending the screens. Check with the Department of Fish and Wildlife to determine if you need a permit to clean the bottom screens.

*Acknowledgement: Tom Cllngman of Thurston County Lakes Program for his help in preparing this Fact Sheet.*



#### F. Fish Spawning Areas

Screens covering spawning beds should be moved in the early spring and not replaced until the spawning activity is over, usually sometime during the early summer.

#### Permits

Bottom screening requires a type of permit called a hydraulic approval, obtained free from the Washington State Department of Fish and Wildlife. In some counties, a shoreline permit may also be required. Check with your local jurisdiction to determine if a shoreline permit is required.

#### Contacts

Contacts are provided for your convenience. It is not our intention to endorse or promote specific vendors or products and this list may not be comprehensive.

The following companies install bottom screens and may sell bottom screening kits to home owners.

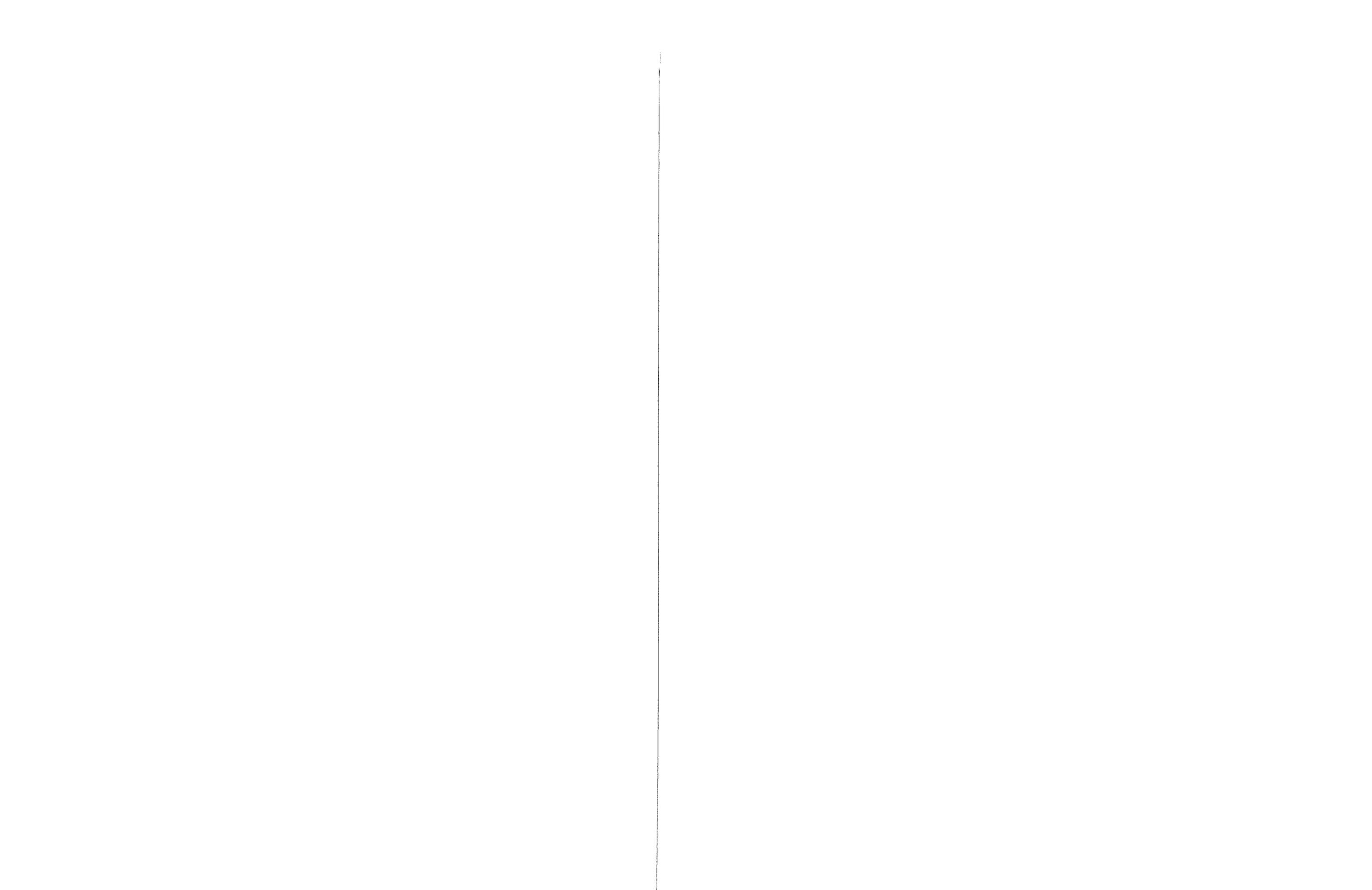
*AquaZone*  
82 Foreman Rd.  
McCleary, Washington 98557  
(206) 495-3920

*Resource Management, Inc.*  
2900B 29<sup>th</sup> Ave. SW  
Tumwater, Washington 98512  
(206) 754-3460

*Allied Aquatics*  
4426 Bush Mountain Dr. SW  
Olympia, Washington 98502  
(206) 357-3285

*Global Diving*  
2763 13<sup>th</sup> Ave. SW  
Seattle, Washington 98134  
(206) 623-0621

*If you have special accommodation needs, please contact Kathy Hamel at (206) 407-6562 or (206) 507-7155, Telecommunications Device for the Deaf (TDD).*



APPENDIX E: Herbicide labels and MSDS sheets: Navigate®, AquaKleen®, DMA\*4IVM®, and triclopyr (Renovate®)

# NAVIGATE®

GRANULAR AQUATIC HERBICIDE FOR CONTROLLING CERTAIN UNWANTED AQUATIC PLANTS

ACTIVE INGREDIENTS:	
2,4-Dichlorophenoxyacetic acid, butoxyethyl ester.....	...27.6%
INERT INGREDIENTS: .....	...72.4%
TOTAL	100.0%

\*Isomer specific by AOAC method No. 6.D01-5  
\*2,4-Dichlorophenoxyacetic acid equivalent 19% by weight

EPA Reg. No. 71368-4-8959

EPA Est. No. 407-IA-2

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

For Chemical Emergency, Spill, Leak, Fire, Exposure or Accident  
Call Chemtrec Day or Night 1-800-424-9300

#### STATEMENT OF PRACTICAL TREATMENT

**IF SWALLOWED:** Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. If person is unconscious, do not give anything by mouth and do not induce vomiting.  
**IF ON SKIN:** Wash with plenty of soap and water. Get medical attention.  
**IF INHALED:** Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.  
**IF IN EYES:** Flush eyes with plenty of water. Call a physician if irritation persists.

#### PRECAUTIONARY STATEMENTS

##### CAUTION

##### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Harmful if swallowed, absorbed through skin, or inhaled. Causes eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing dust. When handling this product, wear chemical resistant gloves. Wash thoroughly with soap and water after handling.

When mixing, loading, or applying this product or repairing or cleaning equipment used with this product, wear eye protection (face shield or safety glasses), chemical resistant gloves, long-sleeved shirt, long pants, socks and shoes. It is recommended that safety glasses include front, brow and temple protection.

Wash hands, face and arms with soap and water as soon as possible after mixing, loading, or applying this product. Wash hands, face and hands with soap and water before eating, smoking or drinking. Wash hands and arms before using toilet. After work, remove all clothing and shower using soap and water. Do not reuse clothing worn during the previous day's mixing and loading or application of this product without cleaning first. Clothing must be kept and washed separately from other household laundry. Remove saturated clothing as soon as possible and shower.

##### ENVIRONMENTAL HAZARDS

This product is toxic to fish. Drift or runoff may adversely affect fish and non-target plants. Do not apply to water except as specified on this label. Do not contaminate water when disposing of equipment washwaters. Do not apply to waters used for irrigation, agricultural sprays, watering dairy animals or domestic water supplies.

Clean sprayer equipment thoroughly before using it for any other purposes. Vapors from this product may injure susceptible plants in the immediate vicinity. Avoid drift of dust to susceptible plants.

**MIXING OR LOADING:** Most cases of ground water contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites. Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of ground water supplies. Use of closed systems for mixing or transferring this pesticide will reduce the probability of spills. Placement of the mixing/loading equipment on an impervious pad to contain spills will help prevent ground water contamination.

##### DIRECTIONS FOR USE

IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING.  
READ THIS ENTIRE LABEL BEFORE USING THIS PRODUCT

##### STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

##### STORAGE

Store in original container in a dry secured storage area.

##### PESTICIDE DISPOSAL

Pesticide wastes are toxic. Improper disposal of excess pesticide is a violation of Federal law and may contaminate ground water. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

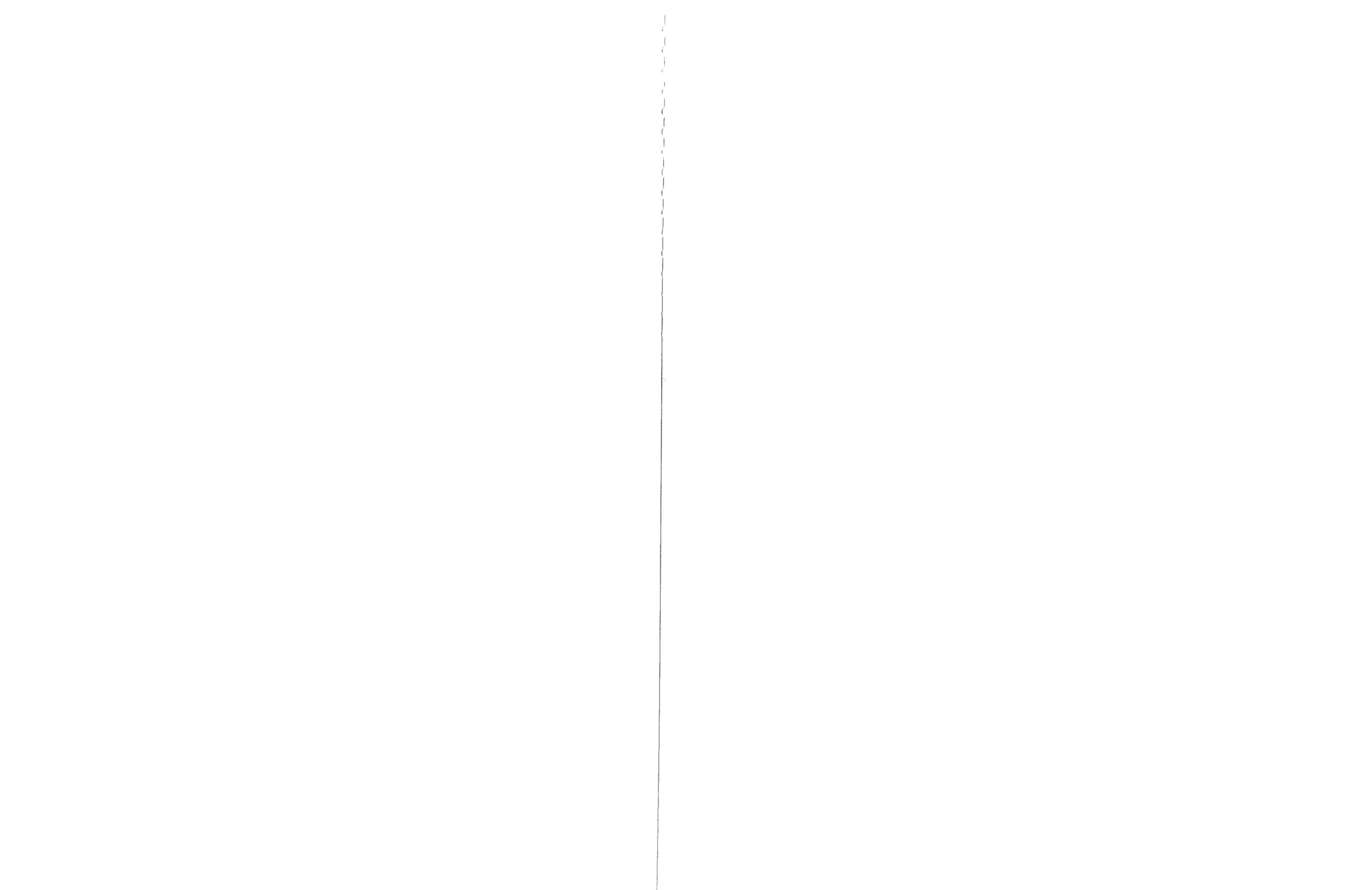
##### CONTAINER DISPOSAL

Do not reuse empty bag. Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If bag is burned, stay out of smoke.

NAVIGATE is a trademark of Applied Biochemists

NET WT. 50 LBS. (22.68 KG)

13529



#### GENERAL PRECAUTIONS AND RESTRICTIONS

Do not use in or near a greenhouse.

#### OXYGEN RATIO

Fish breathe oxygen in the water and a water-oxygen ratio must be maintained. Decaying weeds use up oxygen, but during the period when NAVIGATE® should be used, the weed mass is fairly sparse and the weed decomposition rate is slow enough so that the water-oxygen ratio is not disturbed by treating the entire area at one time.

If treatments must be applied later in the season when the weed mass is dense and repeat treatments are needed spread granules in lanes, leaving buffer strips which can then be treated when vegetation in treated lanes has disintegrated. During the growing season, weeds decompose in a 2 to 3 week period following treatment. Buffer lanes should be 50 to 100 feet wide. Treated lanes should be as wide as the buffer strips.

#### WATER pH

Best results are generally obtained if the water to be treated has a pH less than 8. A pH of 8 or higher may reduce weed control. If regrowth occurs within a period of 6 to 8 weeks, a second application may be needed.

#### PERMIT TO USE CHEMICALS IN WATER

In many states, permits are required to control weeds by chemical means in public water. If permits are required, they may be obtained from the Chief, Fish Division, State Department of Conservation or the State Department of Public Health.

#### GENERAL INFORMATION

NAVIGATE® is formulated on special heat treated attaclay granules that resist rapid decomposition in water, sink quickly to lake or pond bottoms and release the weed killing chemical in the critical root zone area.

This product is designed to selectively control the weeds listed on the label. While certain other weeds may be suppressed, control may be incomplete. Reduced control may occur in lakes where water replacement comes from bottom springs.

#### WHEN TO APPLY

For best results, spread NAVIGATE® in the spring and early summer, during the time weeds start to grow. If desired, this timing can be checked by sampling the lake bottom in areas heavily infested with weeds the year before.

If treatments are delayed until weeds form a dense mat or reach the surface, two treatments may be necessary. Make the second treatment when weeds show signs of recovery.

Treatments made after September may be less effective depending upon water temperatures and weed growth.

Occasionally, a second application will be necessary if heavy regrowth occurs or weeds reinfest from untreated areas.

#### HOW TO APPLY

**FOR LARGE AREAS:** Use a fertilizer spreader or mechanical seeder such as the Gerber or Gandy or other equipment capable of uniformly applying this product. Before spreading any chemical, calibrate your method of application to be sure of spreading the proper amount. When using boats and power equipment, you must determine the proper combination of (1) boat speed (2) rate of delivery from the spreader, and (3) width of swath covered by the granules.

**FOR SMALL AREAS:** (Around Docks or Isolated Patches of Weeds): Use a portable spreader such as the Cyclone seeder or other equipment capable of uniformly applying this product. Estimate or measure out the area you want to treat. Weight out the amount of material needed and spread this uniformly over the area. More uniform coverage is obtained by dividing the required amount in two and covering the area twice, applying the second half at right angles to the first.

Use the following formula to calibrate your spreader's delivery in pounds of NAVIGATE PER MINUTE:

$$\frac{\text{Miles per hour} \times \text{spreader width} \times \text{pounds per acre}}{495} = \text{pounds per minute}$$

Example: To apply 100 pounds of NAVIGATE per acre using a spreader that covers a 20 foot swath from a boat traveling at 4 miles per hour, set the spreader to deliver 16 pounds of NAVIGATE granules per minute.

$$\frac{4 \text{ mph} \times 20 \text{ feet} \times 100 \text{ Lbs./A}}{495} = 16 \text{ Lbs./Min.}$$

#### AMOUNTS TO USE

Rates of application vary with resistance of weed species to the chemical, density of weed mass at time of treatment, stage of growth, water depth, and rate of water flow through the treated area. Use the higher rate for dense weeds, when water is more than 8 feet deep and where there is a large volume turnover.

	NAVIGATE POUNDS PER ACRE	NAVIGATE POUNDS PER 2000 SQ. FT.
<b>SUSCEPTIBLE WEEDS</b>		
Water Milfoil (Myriophyllum spp.)	100 TO 200	5
Water stargrass (Heteranthera dubia)		
<b>SLIGHTLY TO MODERATELY RESISTANT WEEDS</b>		
Stuckwort (Utricularia spp.)	150 to 200	7-1/2 to 10
White water Lily (Nymphaea spp.)		
Yellow water lily (Nuphar spp.)		
Or spatterdock*		
Water shield (Brasenia spp.)		
Water chestnut (Trapa natans)		
Coccolai* (Ceratophyllum Demersum)		

\* Repeat treatments may be needed

#### LIMITED WARRANTY AND DISCLAIMER

The manufacturer warrants (a) that this product conforms to the chemical description on the label; (b) that this product reasonably fit for the purposes set forth in the directions for use when it is used in accordance with such directions; and (c) that the directions, warning and other statements on the label are based upon responsible experts' evaluation of reasonable tests of effectiveness, of toxicity to laboratory animals and to plants, and of residues on food crops and upon reports of field experience. Tests have not been made on all varieties or in all states or under all conditions. THE MANUFACTURER NEITHER MAKES NOR INTENDS, NOR DOES IT AUTHORIZE ANY AGENT OR REPRESENTATIVE TO MAKE, ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, AND IT EXPRESSLY EXCLUDES AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

THIS WARRANTY DOES NOT EXTEND TO, AND THE BUYER SHALL BE SOLELY RESPONSIBLE FOR, ANY AND ALL LOSS OR DAMAGE WHICH RESULTS FROM USE OF THIS PRODUCT IN ANY MANNER WHICH IS INCONSISTENT WITH THE LABEL DIRECTIONS, WARNINGS OR CAUTIONS.

BUYER'S EXCLUSIVE REMEDY AND MANUFACTURER'S OR SELLER'S EXCLUSIVE LIABILITY FOR ANY AND ALL CLAIMS, LOSSES, DAMAGES, OR INJURIES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER OR NOT BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE SHALL BE LIMITED. AT THE MANUFACTURER'S OPTION, TO REPLACEMENT OF, OR THE REPAYMENT OF THE PURCHASE PRICE FOR, THE QUANTITY OF PRODUCT WITH RESPECT TO WHICH DAMAGES ARE CLAIMED. IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

#### NOTICE TO BUYER

Purchase of this material does not confer any rights under patents governing this product or the use thereof in countries outside of the United States.

MANUFACTURED FOR:

**applied biochem**  
MILWAUKEE, WI 1-800-558-5106



## Material Safety Data Sheet

### EMERGENCY

FOR CHEMICAL EMERGENCY: SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CALL  
CHEMTREC - DAY or NIGHT - (800) 424-9300

Product Name: **AB NAVIGATE** EPA Reg. No. 71368-4-8959

### SECTION I - GENERAL INFORMATION

Manufacturer's Name: APPLIED BIOCHEMISTS  
W 175 N11163 Stonewood Drive  
Suite 234  
Germantown, WI 53022-4799  
(800) 558-5106

Trade Name & Synonyms: AB NAVIGATE  
Chemical Name & Synonyms: 2,4-D; 2,4-DICHLOROPHENOXYACETIC ACID, BUTOXYETHYL ESTER

Generic Description: AQUATIC HERBICIDE  
Formula:  $C_{12}H_{14}Cl_2O_4$

D.O.T. Proper Shipping Name: Not Regulated  
U.N. or N.A. Identification #: Not Regulated  
D.O.T. Hazard Class: Not Applicable  
D.O.T. Emergency Response Guide: Not Assigned

Hazardous Material ID System Values (HMIS): Health -1 Flammability -1 Reactivity -0 Personal Protection -F  
NFPA Fire Protection Assn. (NFPA 704M): Health -1 Flammability -1 Reactivity -0 Specific Hazard: None

### SECTION II - HAZARDOUS INGREDIENTS

Hazardous Component(s)	CAS#	PEL	TLV
2,4-Dichlorophenoxyacetate	1929-73-3	10 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
Acid, Butoxyethyl Ester	14808-60-7	0.1 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>
Crystalline Silica			

Ingredients listed in this section have been determined to be hazardous as defined in 29 CFR 1910.1200. Materials determined to be health hazards are listed if they comprise 1% or more of the composition. Materials identified as carcinogens are listed if they comprise 0.1% or more of the composition. Information on proprietary materials is available as provided in 29 CFR 1910.1200 (f) (1).

### SECTION III - PHYSICAL DATA

Boiling Point (F): NOT KNOWN Specific Gravity (water = 1): NOT KNOWN  
Vapor Pressure (mm Hg): NOT KNOWN % Volatile (by Volume): NOT DETERMINED  
Vapor Density (air = 1): NOT KNOWN Evaporation Rate: (Ether = 1) < 1  
Melting Point (F): NOT KNOWN  
Solubility in Water: INSOLUBLE  
Appearance & Odor: GRAY/TAN GRANULES WITH MILD PHENOLIC ODOR.

### SECTION IV - FIRE & EXPLOSION DATA

Flash Point (F): NOT FLAMMABLE Method:  
Extinguishing Media: CO<sub>2</sub>, WATER, DRY CHEMICAL OR FOAM TO FIGHT FIRES IN WHICH THIS PRODUCT IS INVOLVED.  
Special Fire Fighting Procedures: WEAR APPROVED SELF-CONTAINED BREATHING APPARATUS. DIKE TO PREVENT CONTAMINATION OF WATER SOURCES.  
Unusual Fire & Explosion Hazards: THERMAL DECOMPOSITION PRODUCTS INCLUDE OXIDES OF CARBON, SULFUR DIOXIDES AND HYDROCHLORIC ACID.

### SECTION V - REACTIVITY DATA

Stability -  Unstable  Stable  
Conditions to Avoid: NONE KNOWN  
Incompatibility (Materials to Avoid): ACIDS, BASES, OXIDIZERS.  
Hazardous Decomposition Products: THERMAL DECOMPOSITION PRODUCTS INCLUDE OXIDES OF CARBON, SULFUR DIOXIDES AND HYDROCHLORIC ACID.  
Hazardous Polymerization:  Will Occur  Will Not Occur  
Conditions to Avoid: NONE



**AB NAVIGATE**
 =====  
**SECTION VI - HEALTH HAZARD DATA**  
 =====

Acute Health Hazards: LD<sub>50(Rat)</sub> >2000 mg/Kg  
 Chronic Health Hazards: THIS PRODUCT CONTAINS CLAY. IARC HAS CLASSIFIED CRYSTALLINE SILICA (A COMPONENT OF CLAY) AS A PROBABLE HUMAN CARCINOGEN. PROLONGED CONTACT MAY CAUSE LIVER DAMAGE, KIDNEY DAMAGE, CHRONIC MUSCLE DAMAGE.

Signs & Symptoms of Exposure: EYE CONTACT MAY CAUSE TEARING AND REDNESS. MAY CAUSE SLIGHT SKIN IRRITATION. INHALATION OF DUST MAY CAUSE IRRITATION TO RESPIRATORY TRACT. INGESTION MAY CAUSE NAUSEA, VOMITING, ABDOMINAL PAIN, MUSCLE WEAKNESS MYOTONIA, AND A FALL IN BLOOD PRESSURE.

Medical Conditions Generally Aggravated by Exposure: MAY AGGRAVATE EXISTING CHRONIC RESPIRATORY PROBLEMS SUCH AS ASTHMA, EMPHYSEMA, OR BRONCHITIS; CONTACT MAY IRRITATE SKIN DISEASE.

Chemical Listed as Carcinogen or Potential Carcinogen by:

National Toxicology Program:	Yes:	No:	✓
I.A.R.C. Monographs:	Yes:	No:	✓
O.S.H.A.:	Yes:	No:	✓

Emergency & First Aid Procedures: FOR PRINCIPLE ROUTE OF ENTRY, SEE APPROPRIATE EMERGENCY PROCEDURES BELOW.  
 NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

Route of Entry: Inhalation: REMOVE TO FRESH AIR, CONTACT A PHYSICIAN IF NECESSARY.  
 Eyes: FLUSH WITH FRESH WATER FOR AT LEAST 15 MINUTES.  
 CALL A PHYSICIAN.  
 Skin: WASH SKIN WITH PLENTY OF SOAP AND WATER.  
 WASH CLOTHES THOROUGHLY BEFORE REUSE.  
 Ingestion: DRINK 2-3 GLASSES OF MILK OR WATER, INDUCE VOMITING.  
 CALL A PHYSICIAN.

 =====  
**SECTION VII - SPILL OR LEAK PROCEDURES**  
 =====

Steps to be Taken in Case Material is Released or Spilled: SWEEP UP AND PLACE IN APPROVED CONTAINERS. DO NOT FLUSH AREA WITH WATER AS IT CAN CAUSE CONTAMINATION OF SEWER SYSTEM.

Waste Disposal Methods: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. 100 LBS. RESULTS IN A REPORTABLE QUANTITY AS SPECIFIED BY D.O.T.

 =====  
**SECTION VIII - SPECIAL PROTECTION AND CONTROL MEASURES**  
 =====

Respiratory Protection (Specify Type): NOT REQUIRED  
 Ventilation - Local Exhaust: MECHANICAL Special Exhaust: STAND DOWN WIND WHEN USING.  
 Mechanical Exhaust: Other Exhaust:

Protective Equipment - Gloves: PLASTIC OR CHEMICAL RESISTANT  
 Eye Protection: SAFETY GLASSES OR CHEMICAL GOGGLES  
 Other Protective Equipment: PROTECTIVE CLOTHING  
 Work or Hygienic Practices: USE SAFE CHEMICAL HANDLING PROCEDURES SUITABLE FOR THE HAZARDS PRESENTED BY THIS MATERIAL.

 =====  
**SECTION IX - SPECIAL PRECAUTIONS**  
 =====

Precautions to be Taken in Handling and Storage: DO NOT SWALLOW, BREATHE DUST, STORE NEAR FOOD, CONTAMINATE WATER FOOD OR FEED. APPLY TO WATERS USED FOR IRRIGATION, AGRICULTURAL SPRAYS, WATERING DAIRY ANIMALS OR DOMESTIC WATER SUPPLIES.

Other Precautions: AVOID DRIFT TO SUSCEPTIBLE PLANTS. AVOID GETTING INTO EYES, ON SKIN OR CLOTHING. **KEEP OUT OF REACH OF CHILDREN**

THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS HEREBY MADE. THE RECOMMENDED INDUSTRIAL HYGIENE AND SAFE HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE AND DETERMINE WHETHER THEY ARE APPROPRIATE.

DJK  
 Date of Last Revision: 9/30/99





cerexagri

# AQUA-KLEEN®

## A SELECTIVE HERBICIDE For Controlling Certain Unwanted Aquatic Plants

ACTIVE INGREDIENT:	
Butoxyethyl Ester of 2,4-Dichlorophenoxyacetic Acid*	27.6%
OTHER INGREDIENTS:	72.4%
TOTAL	100.0%

\*Isomer Specific AOAC Method,  
Equivalent to 2,4-Dichlorophenoxyacetic Acid 19.0%

EPA Registration No. 228-378-4581      EPA Establishment No. 228-IL-1

**KEEP OUT OF REACH OF CHILDREN**

### CAUTION

#### FIRST AID:

**IF SWALLOWED:** Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. If person is unconscious, do not give anything by mouth and do not induce vomiting.

**IF ON SKIN:** Wash with plenty of soap and water. Get medical attention.

**IF INHALED:** Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

**IF IN EYES:** Flush eyes with plenty of water. Call a physician if irritation persists.

#### PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

### CAUTION

Harmful if swallowed, absorbed through skin, or inhaled. Causes eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing dust. When handling this product, wear chemical resistant gloves. Wash thoroughly with soap and water after handling. When mixing, loading, or applying this product or repairing or cleaning equipment used with this product, wear eye protection (face shield or safety glasses), chemical-resistant gloves, long-sleeved shirt, long pants, socks and shoes. It is recommended that safety glasses include front, brow and temple protection. Wash hands, face and arms with soap and water as soon as possible after mixing, loading, or applying this product. Wash hands, face and arms with soap and water before eating, smoking or drinking. Wash hands and arms before using toilet. After work, remove all clothing and shower using soap and water. Do not reuse clothing worn during the previous day's mixing and loading or application of this product without cleaning first. Clothing must be kept and washed separately from other household laundry. Remove saturated clothing as soon as possible and shower.

#### ENVIRONMENTAL HAZARDS

This product is toxic to fish. Drift or runoff may adversely affect fish and non-target plants. Do not apply to water except as specified on this label. Do not contaminate water when disposing of equipment washwaters. Unless an approved assay indicates the 2,4-D concentration is 100 ppb (0.1 ppm) or less, or, only growing crops and noncrop areas labeled for direct treatment with 2,4-D will be affected, do not use water from treated areas for irrigating plants or mixing sprays for agricultural or ornamental plants.

Unless an approved assay indicates the 2,4-D concentration is 70 ppb (0.07 ppm) or less, do not use water from treated areas for potable water (drinking water).

Clean spreader equipment thoroughly before using it for any other purposes. Vapors from this product may injure susceptible plants.

Most cases of groundwater contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites. Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of groundwater supplies. Use of closed systems for mixing or transferring this pesticide will reduce the probability of spills. Placement of the mixing/loading equipment on an impervious pad to contain spills will help prevent groundwater contamination.

#### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. **READ ENTIRE LABEL BEFORE USING THIS PRODUCT. USE STRICTLY IN ACCORDANCE WITH LABEL PRECAUTIONARY STATEMENTS AND DIRECTIONS.**

#### GENERAL PRECAUTIONS AND RESTRICTIONS

Do not use in or near a greenhouse.

#### OXYGEN RATIO

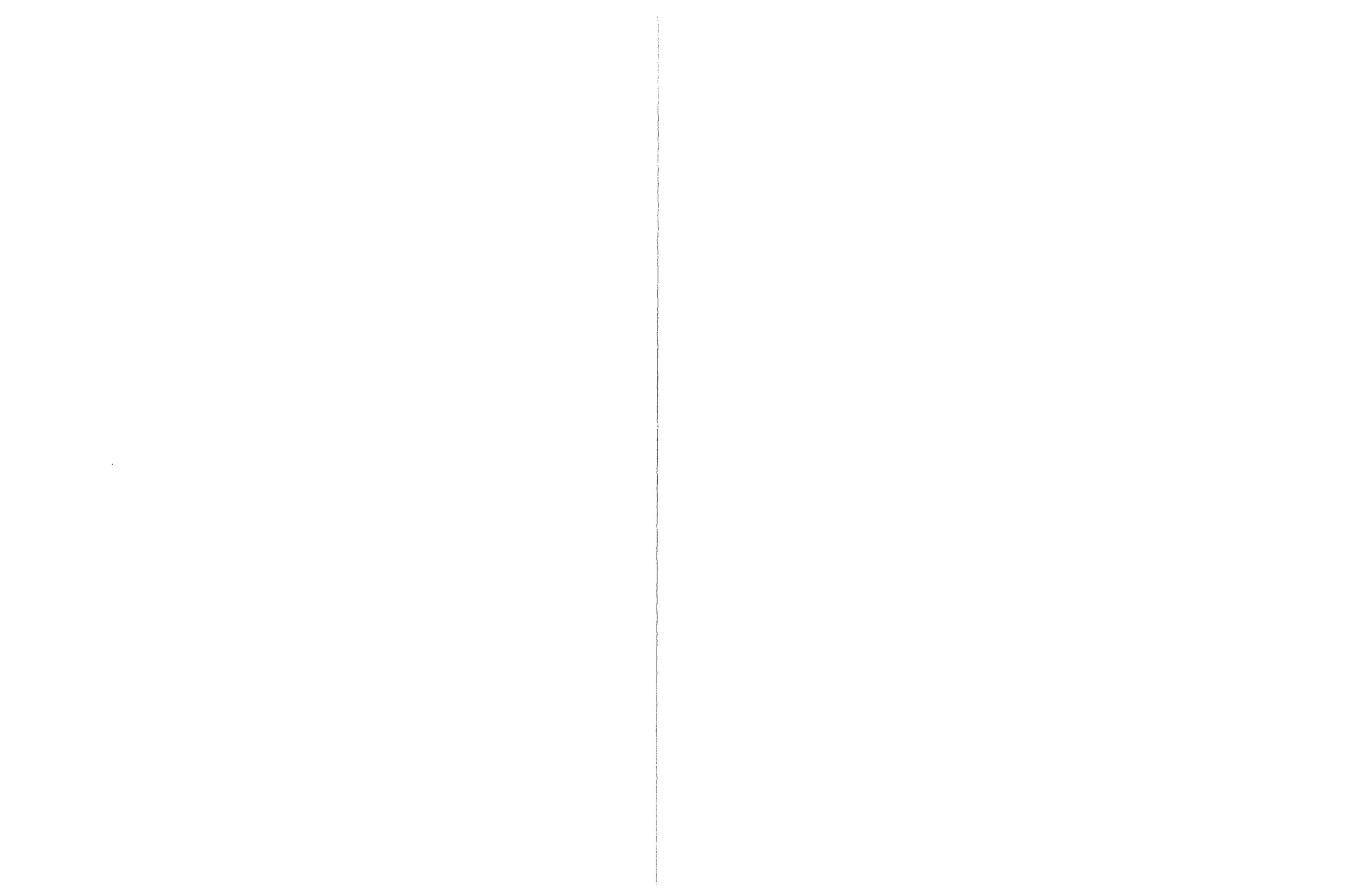
Fish breathe oxygen in the water and a water-oxygen ratio must be maintained. Decaying weeds use up oxygen, but during the period when this product should be used, the weed mass is fairly sparse and the weed decomposition rate is slow enough so that the water oxygen ratio is not disturbed by treating the entire area at one time. If treatments must be applied later in the season when the weed mass is dense and repeat treatments are needed, spread granules in lanes, leaving buffer strips which can then be treated when vegetation in treated lanes has disintegrated. During the growing season, weeds decompose in a 2 to 3 week period following treatment. Buffer lanes should be 50 to 100 feet wide. Treated lanes should be as wide as the buffer strips (See illustration below).

#### WATER pH

Best results are generally obtained if the water to be treated has a pH less than 8. A pH of 8 or higher may reduce weed control. If regrowth occurs within a period of 6 to 8 weeks, a second application may be needed.

#### PERMIT TO USE CHEMICALS IN WATER

In many states, permits are required to control weeds by chemical means in public water. If permits are required, they may be obtained from the Chief, Fish Division, State Department of Conservation or the State Department of Public Health.



**GENERAL INFORMATION**

This product is formulated on special heat treated attaclay granules that resist rapid decomposition in water, sink quickly to lake or pond bottoms and release the weed killing chemical into the critical root zone area.

This product is designed to selectively control the weeds listed on the label. While certain other weeds may be suppressed, control may be incomplete. Reduced control may occur in lakes where water replacement comes from bottom springs.

**WHEN TO APPLY**

For best results, spread this product in the Spring and early Summer, during the time weeds start to grow. If desired, this timing can be checked by sampling the lake bottom in areas heavily infested with weeds the year before.

If treatments are delayed until weeds form a dense mat or reach the surface, two treatments may be necessary. Make the second treatment when weeds show signs of recovery. Treatments made after September may be less effective depending upon water temperatures and weed growth.

Occasionally, a second application will be necessary if heavy regrowth occurs or weeds reinfest from untreated areas.

**HOW TO APPLY**

**FOR LARGE AREAS:** Use a fertilizer spreader or mechanical seeder such as the Gerber or Gandy or other equipment capable of uniformly applying this product. Before spreading any chemical, calibrate your method of application to be sure of spreading the proper amount. When using boats and power equipment, you must determine the proper combination of (1) boat speed (2) rate of delivery from the spreader, and (3) width of swath covered by the granules.

**FOR SMALL AREAS (Around Docks or Isolated Patches of Weeds):** Use a portable spreader such as the Cyclone seeder or other equipment capable of uniformly applying this product. Estimate or measure out the area you want to treat. Weigh out the amount of material needed and spread this uniformly over the area. More uniform coverage is obtained by dividing the required amount in two and covering the area twice, applying the second half at right angles to the first.

Use the following formula to calibrate your spreader's delivery in pounds of this product per minute.

$$\frac{\text{Miles per hour} \times \text{spreader width} \times \text{pounds per acre}}{495}$$

**Example:** To apply 100 pounds of this product per acre using a spreader that covers a 20 foot swath from a boat traveling at 4 miles per hour, set the spreader to deliver 16 pounds of this product per minute.

$$\frac{4 \text{ mph} \times 20 \text{ feet} \times 100 \text{ lbs./A}}{495}$$

**AMOUNTS TO USE**

Rates of application vary with resistance of weed species to the chemical, density of weed mass at time of treatment, stage of growth, water depth, and rate of water flow through the treated area. Use the higher rate for dense weeds, when water is more than 8 feet deep and where there is a large volume turnover.

	POUNDS PER ACRE	POUNDS PER 2000 SQ. FT.
<b>SUSCEPTIBLE WEEDS</b> Water hyacinth ( <i>Myriophyllum</i> spp.) Water stargrass ( <i>Heteranthera dubia</i> )	100 to 200	5
<b>SLIGHTLY TO MODERATELY RESISTANT WEEDS</b> Bedderwort ( <i>Atracilia</i> spp.) White water lily ( <i>Nymphaea</i> spp.) Yellow water lily or (Nuphar spp.) Spatterdock* Water shield ( <i>Brastonia</i> spp.) Water chestnut ( <i>Trogon</i> spp.) Cocoalae* ( <i>Ceratophyllum demersum</i> )	150 to 200	7 1/2 to 10

\*Repeat treatments may be needed.

**STORAGE AND DISPOSAL**

**STORAGE:** Always use original container to store pesticides in a secured warehouse or storage building. Do not store near seeds, fertilizers, insecticides or fungicides. Do not stack more than two pallets high. Do not contaminate water, food or feed by storage or disposal. It is recommended that a SARA Title III emergency response plan be created for storage facilities. Do not transport in the passenger compartment of any vehicle.

**PESTICIDE DISPOSAL:** Pesticide wastes are toxic. If container is damaged or if pesticide has leaked, clean up all spilled material. Improper disposal or excess pesticide, spray mixtures or rinsate is a violation of Federal law and may contaminate groundwater. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**CONTAINER DISPOSAL:** Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or if allowed by State and local authorities, by burning. If burned, stay away from smoke.

**EMERGENCY TELEPHONE NUMBERS:**

**CHEMTREC: (800) 424-9300**

**MEDICAL: (303) 623-5716**

Rocky Mountain Poison Control Center

**WARRANTY AND DISCLAIMER**

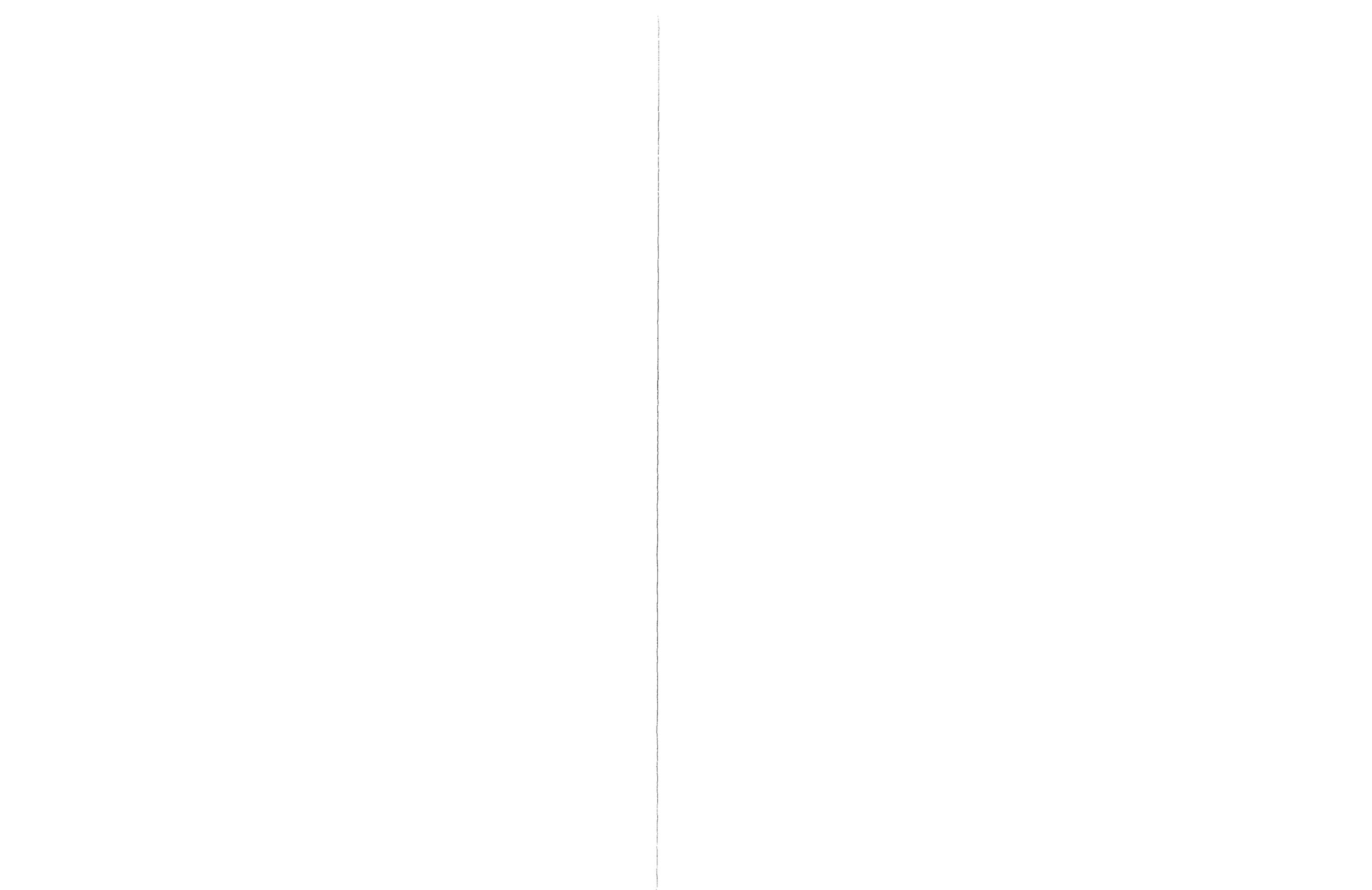
Cerexagri, Inc. warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the Directions for Use, subject to the risks referred to therein. CEREXAGRI MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY. IN NO CASE SHALL CEREXAGRI OR SELLER BE LIABLE FOR CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, BUSINESS REPUTATION, OR CUSTOMERS; LABOR COST; OR OTHER EXPENSES INCURRED IN PLANTING OR HARVESTING.

Cerexagri and seller offer this product and the buyer and user accept it subject to the foregoing conditions of sale and warranty which may be varied only by agreement in writing signed by a duly authorized representative of Cerexagri.

Aqua-Kleen® is a registered trademark of Nufarm, Inc.

5-F106S-01 A1 (1/01)

Made and Printed in U.S.A.





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**Aqua-Kleen Aquatic Herbicide**

Material Safety Data Sheet

Ceresagri, Inc.

**1 PRODUCT AND COMPANY IDENTIFICATION**

**Agrichemicals Group**  
Ceresagri, Inc.  
630 Freedom Business Center, Suite 402  
King of Prussia, PA 19406

**EMERGENCY PHONE NUMBERS:**  
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887  
Medical: Rocky Mountain Poison Control Center  
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
R&D Technical Service	610-878-6100	8:00am to 5:00pm EST
Customer Service	1-800-438-6071	8:00am - 5:00 pm EST

Product Name Aqua-Kleen Aquatic Herbicide  
Product Synonym(s)

Chemical Family 2,4-Dichlorophenoxyacetic acid, butoxyethyl ester  
Chemical Formula NA  
Chemical Name Acetic acid, (2,4-dichlorophenoxy)-, 2-butoxyethyl ester  
EPA Reg Num 228-378-4581  
Product Use Aquatic herbicide for controlling unwanted aquatic plants

**2 COMPOSITION / INFORMATION ON INGREDIENTS**

Ingredient Name	CAS RegistryNumber	Typical Wt. %	OSHA
2-Butoxyethyl 2,4-dichlorophenoxy acetate	1929-73-3	27.6	Y
Quartz	14808-60-7	<15	Y

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

**3 HAZARDS IDENTIFICATION****Emergency Overview**

Tan granules, solid, phenolic odor.

**CAUTION!**

KEEP OUT OF REACH OF CHILDREN.

HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.

CAUSES EYE IRRITATION.

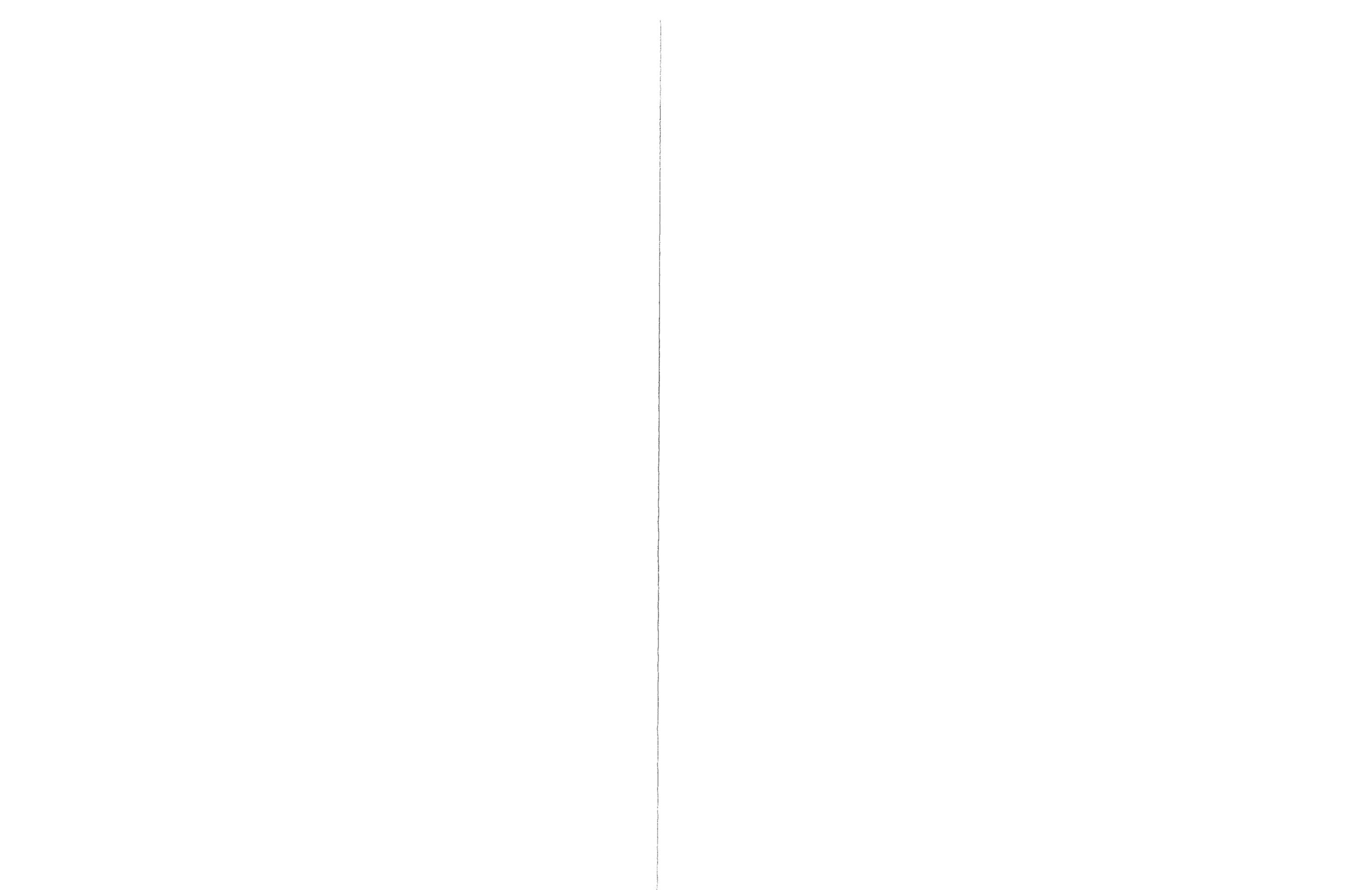
Avoid contact with eyes, skin and clothing. Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of material from eyes, skin and clothing. Avoid breathing dust. Wash thoroughly after handling.

**CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER.**

Repeated and prolonged inhalation of respirable particles can cause lung cancer and delayed lung damage (silicosis)

**Potential Health Effects**

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Based on its composition, it is anticipated to be slightly to moderately toxic if swallowed and slightly toxic if inhaled. Direct contact may be irritating to the eyes and skin. Inhalation may be irritating to the respiratory tract. Repeated and prolonged inhalation of crystalline silica may cause a form of disabling lung disease (commonly known as silicosis). Clinical signs and symptoms of silicosis include cough, shortness of breath, wheezing and impairment of lung function. Impairment of lung function may be progressive. In the usual case of silicosis, there is a slow deterioration of capacity for physical





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### Aqua-Kleen Aquatic Herbicide

Material Safety Data Sheet

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effort, decreased chest expansion, and an increased susceptibility to tuberculosis and other respiratory infections. This material inhaled in the form of quartz is classified as "carcinogenic to humans" by the International Agency for Research on Cancer (IARC) and respirable forms of this material are listed as substances that "may reasonably be anticipated to be carcinogens" by the National Toxicology Program.

Short term, extremely heavy exposures to dust of this material (particularly small-sized particles) can result in acute silicosis. This disease is rapidly progressive with diffuse pulmonary involvement, which may develop within months of initial exposure. Individuals with acute silicosis may suffer an abrupt onset of violent coughing, labored breathing, and weight loss; death has been known to occur within one to two years.

#### 4 FIRST AID MEASURES

**IF IN EYES,**  
-Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.  
-Call a poison control center or doctor for treatment advice.

**IF ON SKIN,** Wash with plenty of soap and water. Get medical attention if irritation persists.

**IN CASE OF CONTACT,** flush the area with plenty of water. Remove material from clothing. Wash clothing before reuse.

**IF SWALLOWED,**  
-Call a poison control center or doctor immediately for treatment advice.  
-Have person sip a glass of water if able to swallow.  
-Do not induce vomiting unless told to do so by a poison control center or doctor.  
-Do not give anything by mouth to an unconscious person.

**IF INHALED,**  
-Move person to fresh air.  
-If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.  
-Call a poison control center or doctor for further treatment advice.

#### 5 FIRE FIGHTING MEASURES

##### Fire and Explosive Properties

Auto-Ignition Temperature	NA	
Flash Point	NA	Flash Point Method
Flammable Limits- Upper	NA	
Lower	NA	

##### Extinguishing Media

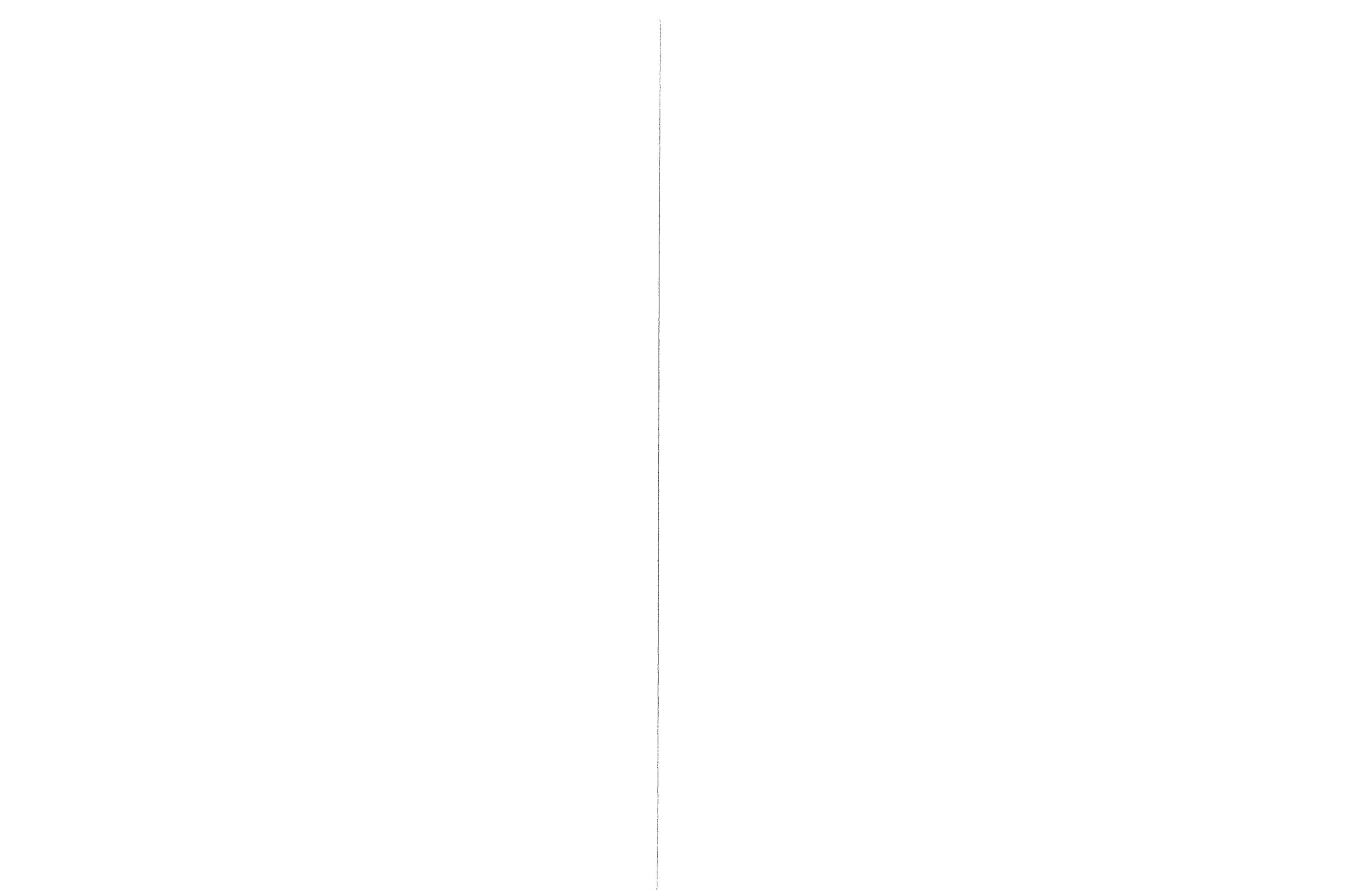
dry chemical, carbon dioxide, foam, water spray

##### Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

##### Fire and Explosion Hazards

Avoid breathing fumes from fire exposed material. Irritating or toxic vapors





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## Aqua-Kleen Aquatic Herbicide

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### 6 ACCIDENTAL RELEASE MEASURES

#### In Case of Spill or Leak

Contain spill. Sweep or scoop up and remove to suitable container. Flush with water. Prevent spilled product from entering sewers or natural water. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

### 7 HANDLING AND STORAGE

#### Handling

Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of material from eyes, skin and clothing. Avoid breathing dust.

#### Storage

Store away from food and feed. Do not store in a manner where cross-contamination with pesticides, fertilizers, food or feed could occur. Store in a cool, dry place.

### 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

#### Eye / Face Protection

Use good industrial practice to avoid eye contact.

#### Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Gloves should be worn when handling this material. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

#### Respiratory Protection

Avoid breathing dust. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

#### Airborne Exposure Guidelines for Ingredients

Exposure Limit	Value
<b>Quartz</b>	
ACGIH TWA	Respirable particle 0.05 mg/m <sup>3</sup>
<b>2-Butoxyethyl 2,4-dichlorophenoxy acetate</b>	
ACGIH TWA	-For 2,4-D 10 mg/m <sup>3</sup>
OSHA TWA PEL	-For 2,4-D 10 mg/m <sup>3</sup>

-Only those components with exposure limits are printed in this section.

-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantify exposure. Measures to prevent significant cutaneous absorption may be required.

-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.

-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.





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### 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Tan granules, solid, phenolic odor.
pH	NA
Specific Gravity	NA
Vapor Pressure	2.4 X 10 <sup>-6</sup> mm Hg(for ester)
Vapor Density	NA
Melting Point	NA
Freezing Point	NA
Boiling Point	156-162C@1 mmHg (ester)
Solubility in Water	Insoluble
Molecular Weight	321.2 (ester)

### 10 STABILITY AND REACTIVITY

#### Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

#### Hazardous Polymerization

Does not occur.

#### Incompatibility

Strong oxidizing agents: bases, acids.

#### Hazardous Decomposition Products

Upon thermal decomposition may produce hydrogen chloride, oxides of sulfur

### 11 TOXICOLOGICAL INFORMATION

#### Toxicological Information

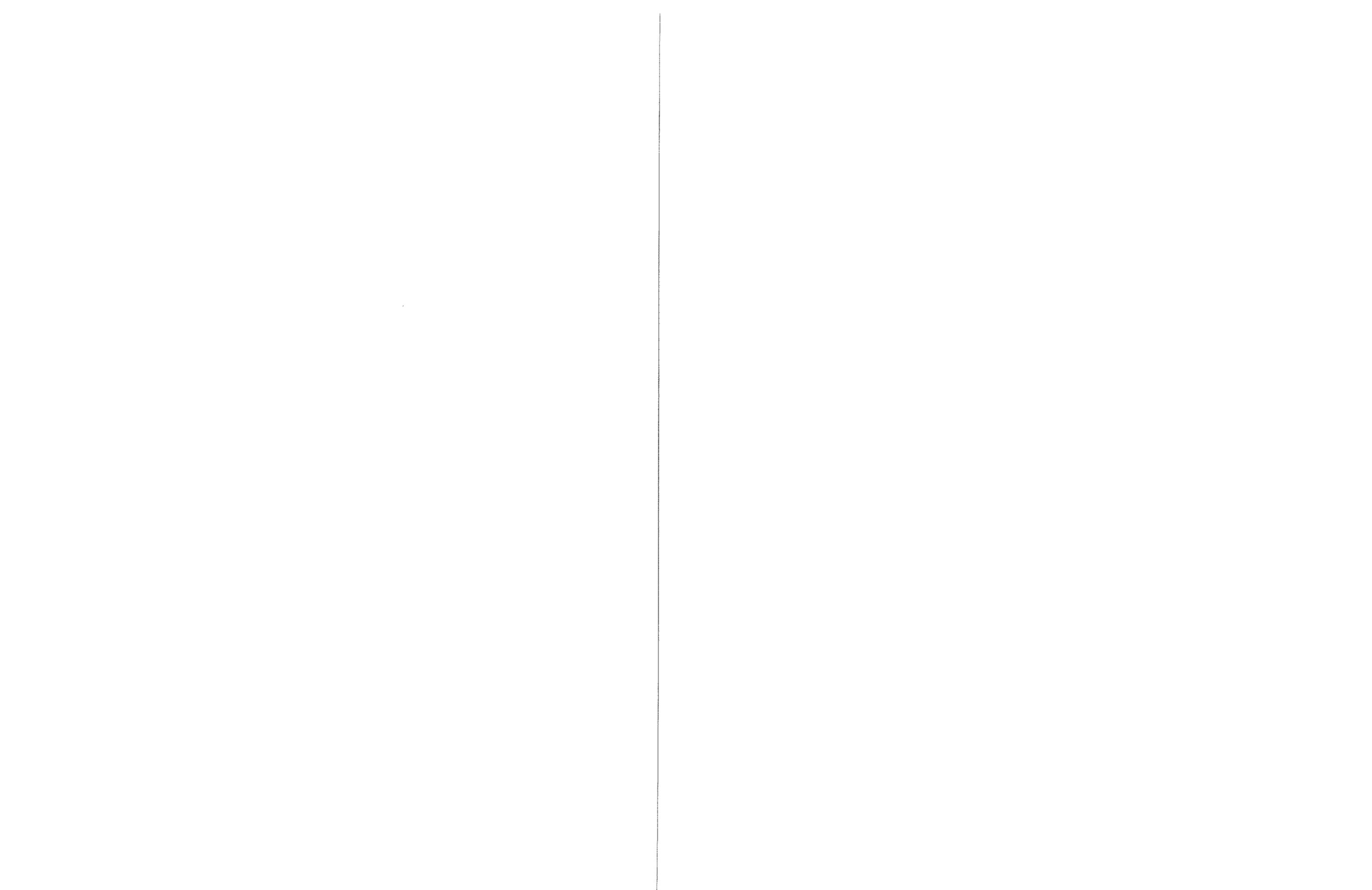
Data on this material and/or its components are summarized below.

Single exposure (acute) studies indicate:

Inhalation - Slightly Toxic to Rats (4-hr LC50 4.6 mg/l) 2-Butoxyethyl 2,4-dichlorophenoxy acetate  
Birth defects have been observed in the offspring of rats exposed orally during pregnancy.

2,4-Dichlorophenoxyacetic acid

Single exposure (acute) studies indicate that this material is slightly to moderately toxic if swallowed (rat LD50 320-4,050 mg/kg), no more than slightly toxic if absorbed through skin (rabbit LD50 >2,000 mg/kg) and slightly irritating to rabbit eyes and skin. 2,4-Dichlorophenoxyacetic acid  
Kidney effects were observed in rats and mice following repeated oral exposure. This material is classified as a Category D carcinogen (unclassifiable as to carcinogenicity) by the U.S. Environmental Protection Agency and chlorophenoxy herbicides are classified as "possibly carcinogenic to humans" (Group 2B) by the International Agency for Research on Cancer (IARC). The IARC listing is based on epidemiological studies suggesting an association between the development of certain types of cancer (soft-tissue sarcoma and non-Hodgkin's lymphoma) and exposure to chlorophenoxy herbicides. Two long-term oral studies in rats produced no evidence of tumors, although kidney effects were observed. No birth defects were observed in the offspring of rabbits exposed orally during pregnancy. Birth defects were observed in the offspring of rats exposed orally during pregnancy, but only at dosages which produced adverse effects on the mothers. Genetic changes were observed in tests using human cells, but not in tests using bacteria or animals. Both positive and negative





## 11 TOXICOLOGICAL INFORMATION

results were observed in tests using animal cells.

The acid data are considered to be more representative for the granular formulation because the ester is essentially insoluble in water, it releases gradually from the granules and it is hydrolyzed rapidly to the acid. Thus, exposure of aquatic organisms is predominantly to the acid.

### Quartz

Chronic inhalation of crystalline silica may cause a progressive pneumoconiosis (silicosis), a form of disabling lung disease (pulmonary fibrosis). Data from animal studies on crystalline forms of silica confirm the capacity of free crystalline silica to induce a fibrinogenic response in lungs. Studies on a variety of laboratory animals (rats, guinea pigs, rabbits, and monkeys) using inhalation as well as intratracheal routes of exposure indicate the ability of crystalline silica to produce silicosis similar to that seen in man. In addition, experiments in animals have confirmed human experience that the presence of crystalline silica in the lung increased susceptibility to tuberculosis and other lung infections. Crystalline silica inhaled in the form of quartz is classified as "carcinogenic to humans" by the International Agency for Research on Cancer (IARC), and respirable forms of crystalline silica are listed as substances that "may reasonably be anticipated to be carcinogens" by the National Toxicology Program. The IARC listing is based on the determination that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz from occupational exposures. Epidemiology studies cited by IARC give indications of increased risk for lung cancer from inhaled crystalline silica (quartz) resulting from occupational exposure. Studies involving heavy industrial exposure to silica in granite and foundry workers, brick factories and sandblasting produced increased levels of protein and enzymes in urine, which is indicative of kidney damage.

## 12 ECOLOGICAL INFORMATION

### Ecotoxicological Information

Data on this material and/or its components are summarized below.

#### 2,4-Dichlorophenoxyacetic acid

This material is slightly toxic to *Daphnia* (48-hr EC50 36.4 mg/l). It is practically non-toxic to trout (96-hr LC50 358 mg/l) and bluegill (96-hr LC50 263 mg/l).

#### 2-Butoxyethyl 2,4-dichlorophenoxy acetate

This material is moderately toxic to bleak (96-hr LC50 3.2-3.7 mg/l), *Daphnia magna* (48-hr EC50 7.2 mg/l) and coho salmon (96-hr LC50 1.5 mg/l). It is highly toxic to bluegill (96-hr LC50 0.81 mg/l), Chinook salmon (96-hr LC50 0.315 mg/l) and pink salmon (96-hr LC50 0.8 mg/l). It is moderately to highly toxic to rainbow trout (96-hr LC50 0.518-2.0 mg/l) and fathead minnow (96-hr LC50 0.95-2.5 mg/l). The oral LC50 for bobwhite quail, Japanese quail, ring-necked pheasant and mallard duck is >5,000 ppm.

#### Aqua-Kleen

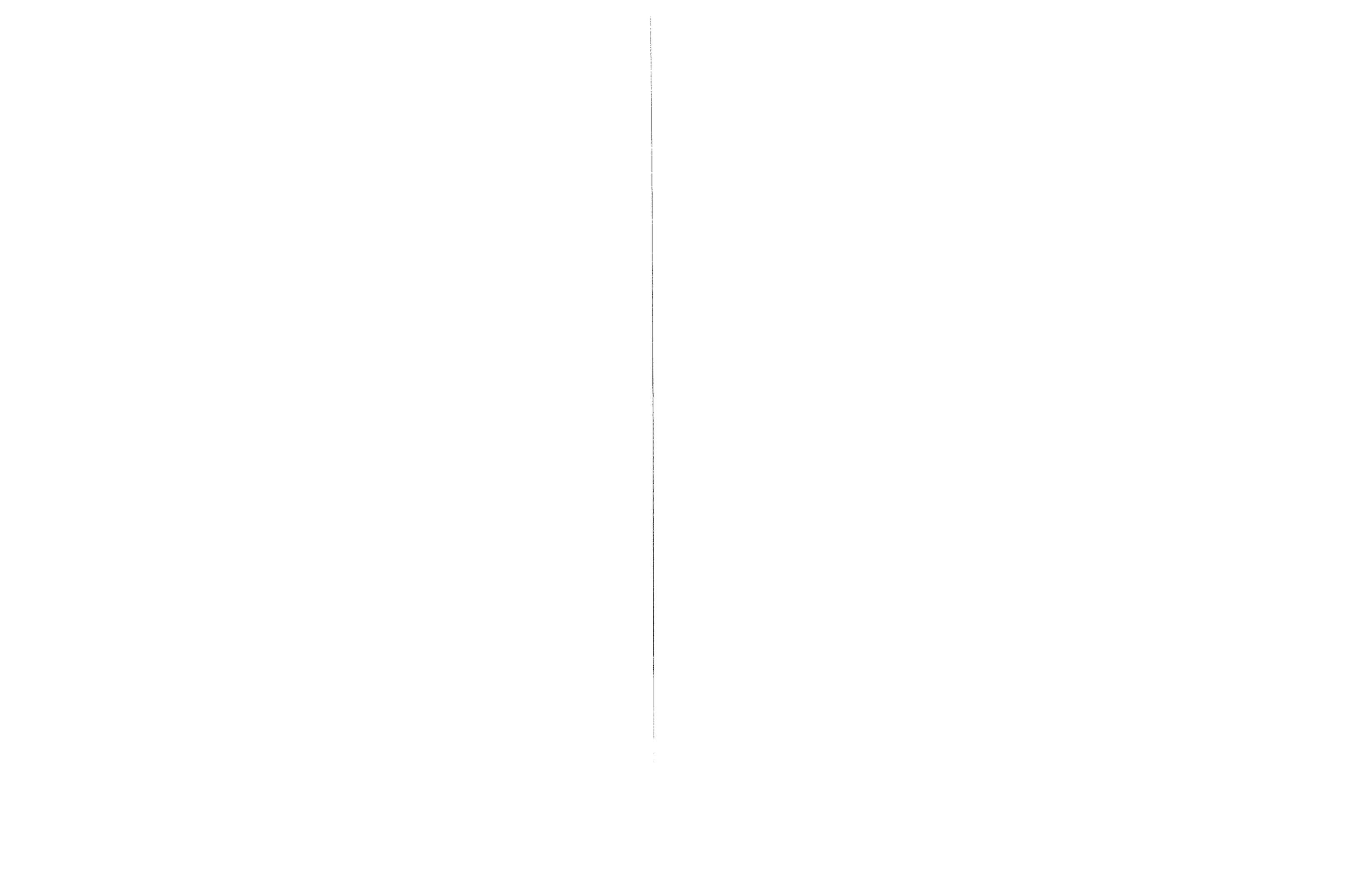
The acid data are considered to be more representative for the granular formulation because the ester is essentially insoluble in water, it releases gradually from the granules and it is hydrolyzed rapidly to the acid. Thus, exposure of aquatic organisms is predominantly to the acid.

### Chemical Fate Information

Data on this material and/or its components are summarized below.

#### Aqua-Kleen

In water, hydrolysis of the ester to the acid occurred with hours of release from granules (nondetectable later than 1 day after application). The typical half-life of the resultant acid ranged from a few days to a few weeks.





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### Aqua-Kleen Aquatic Herbicide

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#### 13 DISPOSAL CONSIDERATIONS

##### Waste Disposal

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Dispose of solid waste at properly permitted landfills observing all local, state and federal regulations. Contaminated liquids should be concentrated and incinerated at a properly permitted disposal site again observing all local, state and federal regulations.

#### 14 TRANSPORT INFORMATION

DOT Name	NOT REGULATED
DOT Technical Name	Not regulated
DOT Hazard Class	NA
UN Number	NA
DOT Packing Group	PG NA
RQ	NA

#### 15 REGULATORY INFORMATION

##### Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	N
Delayed (Chronic) Health	Y	Reactive	N
		Sudden Release of Pressure	N

##### Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
Quartz		
2-Butoxyethyl 2,4-dichlorophenoxy acetate		NE

##### SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

2-Butoxyethyl 2,4-dichlorophenoxy acetate

##### SARA Title III, Section 302

This product does contain chemical(s), as indicated below, currently on the Extremely Hazardous Substance List, Section 302, SARA Title III. See Section 2 for further details regarding concentrations and registry numbers.

2-Butoxyethyl 2,4-dichlorophenoxy acetate

##### California Prop 65 - Carcinogen

This product does contain the following chemical(s), as indicated below, currently on the California list of Known Carcinogens.

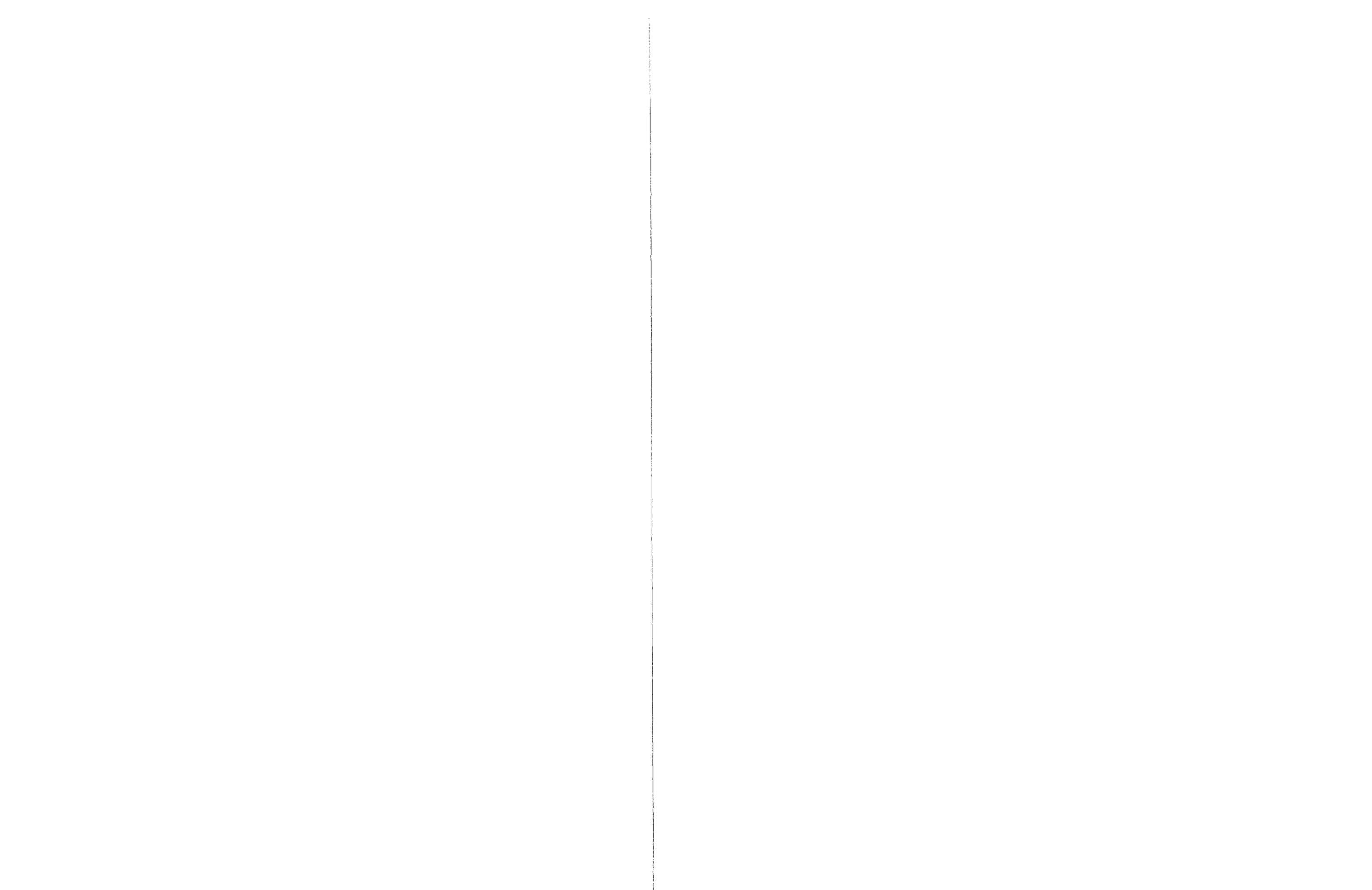
Quartz

##### Massachusetts Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

2-Butoxyethyl 2,4-dichlorophenoxy acetate

Quartz





**Aqua-Kleen Aquatic Herbicide**  
Material Safety Data Sheet  
*Cerexagri, Inc.*

**New Jersey Right to Know**

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

2-Butoxyethyl 2,4-dichlorophenoxy acetate  
Quartz

**Pennsylvania Environmental Hazard**

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

2-Butoxyethyl 2,4-dichlorophenoxy acetate

**Pennsylvania Right to Know**

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

2-Butoxyethyl 2,4-dichlorophenoxy acetate  
Quartz

**16 OTHER INFORMATION**

**Revision Information**

Revision Date 09 JUL 2003 Revision Number 8  
Supersedes Revision Dated 02-DEC-2002

**Revision Summary**

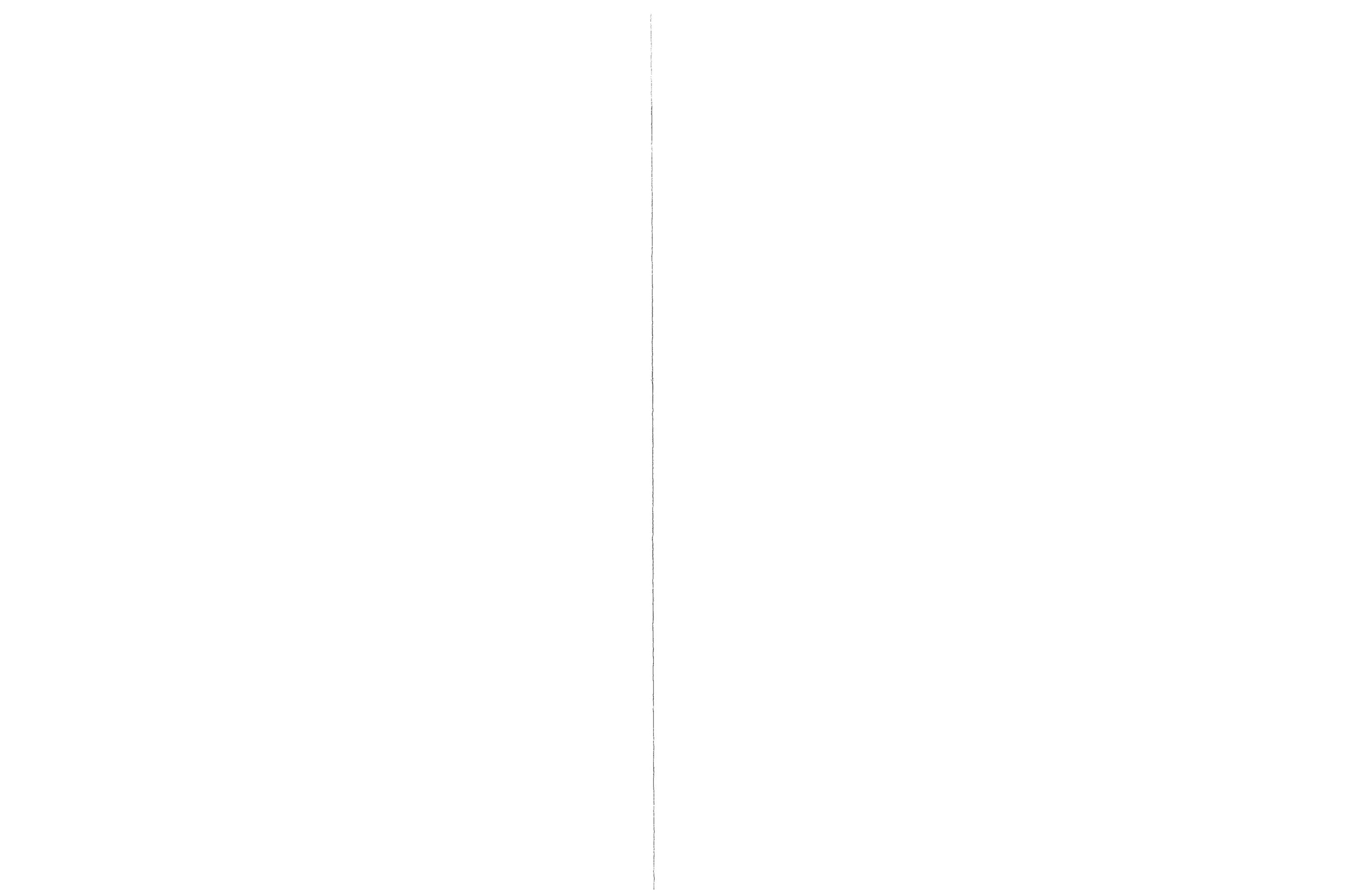
Updated to remove restriction relating to California

**Key**

NE= Not Established NA= Not Applicable (R) = Registered Trademark

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Cerexagri, Inc. is a wholly owned subsidiary of ATOFINA Chemicals, Inc.



# Supplemental Labeling



Dow AgroSciences LLC

9330 Zionsville Road

Indianapolis, IN 46268-1054 USA

## DMA\* 4 IVM

(EPA Reg. No. 62719-3)

EPA 24(c) Special Local Need Registration SLN WA-020025  
(For Distribution and Use Only in the State of Washington)

### Control of Eurasian Water Milfoil in Slowly Moving Waters Using Drip Application

For Distribution and Use Only by Applicants Approved under Aquatic Noxious Weed Control National Pollutant Discharge Elimination System Waste Discharge General Permit (NPDES Permit No. WAG-993000) Issued by the Washington State Department of Ecology and Made Available to the Washington State Department of Agriculture. All Applicators Must Secure Coverage Under NPDES Permit No. WAG-993000 with the Washington State Department of Agriculture prior to making any applications.

#### ATTENTION

- It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
- This labeling must be in the possession of the user at the time of application.
- Read the label affixed to the container for DMA\* 4 herbicide before applying. Carefully follow all precautionary statements and applicable use directions.
- Use of DMA 4 according to this supplemental labeling is subject to all use precautions and limitations imposed by the labels affixed to product containers and this supplemental labeling.

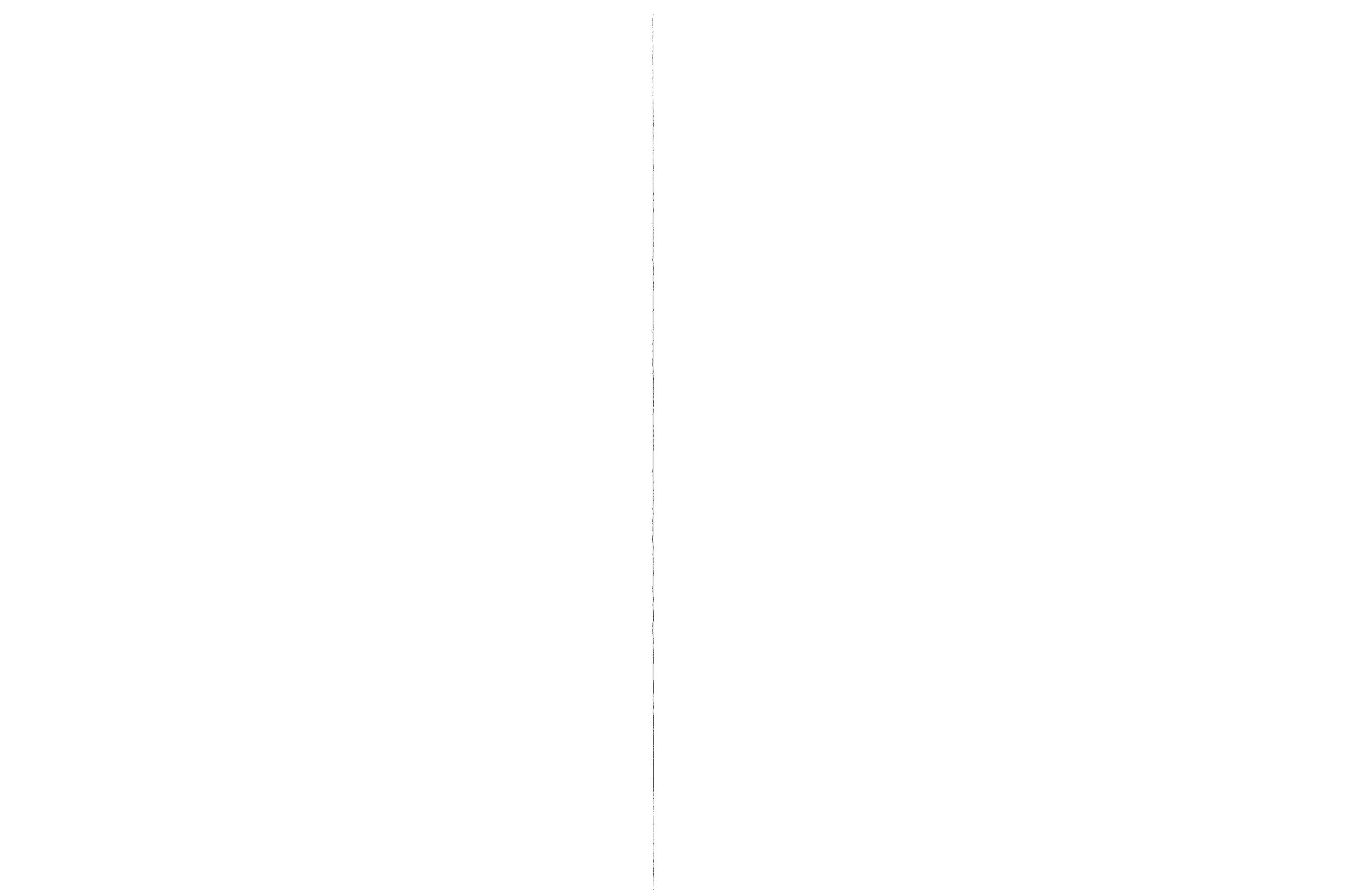
#### Directions for Use

DMA\* 4 IVM herbicide is labeled for aquatic weed control in the following use sites: ponds, lakes, reservoirs, marshes, bayous, drainage ditches, canals, rivers and streams that are quiescent or slow moving, including programs of the Tennessee Valley Authority. Prior to application, coordination and approval of local and state authorities may be required, either by letter or agreement or issuance of special permits for such use.

The Dow AgroSciences product DMA 4 IVM herbicide, containing 48.3% 2,4-D dimethylamine salt, is registered in the state of Washington and is labeled for use in sub-surface applications to quiescent or slow moving waters at the rate of 2 to 4 parts per million (1.42 to 2.84 gallons per acre-foot). The Washington State Department Of Ecology, via a state-approved integrated aquatic vegetation management plan, proposes to apply DMA 4 IVM herbicide to control infestations of Eurasian Water Milfoil in slowly moving water using a drip system to maintain a minimum concentration of 1 ppm over a period of 48 hours.

Except as described below, all applicable label directions, precautions and restrictions must be followed:

- Application is to be conducted during a period of time when Eurasian Water Milfoil is actively growing and stream flow is expected to remain stable.
- Drip system is to be located a sufficient distance upstream from infested area to allow for mixing of the herbicide with the stream flow prior to entering infested area. Alternatively, the herbicide mixture may be introduced through multiple openings across the width of the stream in order to achieve uniform distribution of the herbicide in the flowing water.



Drip system is to be located and operated in a manner that ensures the drip application will be delivered uniformly over the duration of the treatment and equipment is reasonably secure from tampering.

Maximum application rate must not exceed 0.71 gallons of DMA 4 IVM per acre-foot of water (1.0 ppm) and duration of drip application must not exceed 48 hours.

**Measurement of Stream Flow:** Accurate measurement of stream flow in treatment area and calculation of estimated treatment volume in acre-feet is to be determined prior to application.

**Objective:** To maintain 1.0 ppm of 2,4-D active ingredient for 48 hours in Milfoil infested area

**Rate Calculation:** Calibrate application equipment to uniformly deliver 0.71 gallons (1.0 ppm) of DMA 4 IVM per acre foot of water volume.

**Example of Rate Calculation:**

- Assuming a flow rate of 3.4 cubic ft per second, the total flow in 48 hours = 3.4 cu ft/sec X 3600 sec/hr X 48 hr = 587520 cu ft. 587,520, cu ft / 43560 cu ft/acre = 13.5 acre ft.
- 13.5 acre ft X 0.71 gallons of DMA 4 IVM per acre ft = 9.585 gallons of DMA 4 IVM
- 9.59 gal / 48 hr = 0.2 gal/hr = 25.6 oz/hr = 0.43 oz/min

**Note:** Product may be diluted 50% or more with water if a larger volume of herbicide mixture is needed for accurate calibration of injection equipment.

**Environmental Hazards:** This product is toxic to aquatic invertebrates. Drift or runoff may adversely affect aquatic invertebrates and non-target plants.

**Restrictions:**

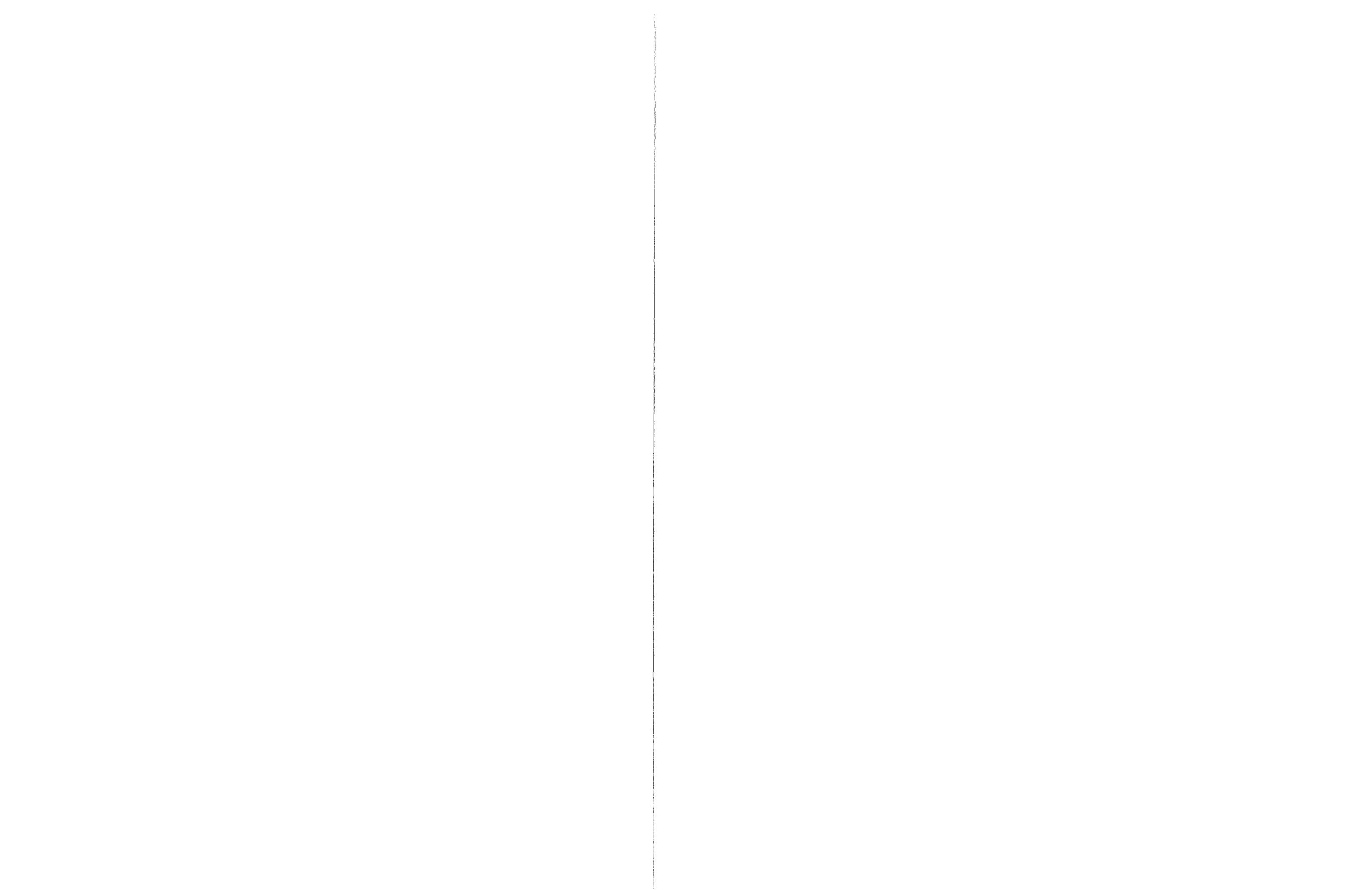
- Do not apply within 1,500 feet of an active potable or irrigation water intake.
- **Irrigation:** Unless an approved assay indicates that the 2,4-D concentration is 100 ppb (0.1 ppm) acid or less, do not use water from treated areas for; (1) irrigation or other than non-crop areas or those crops or plants labeled for direct application of 2,4-D; or (2) mixing spray for agricultural or ornamental plants.
- **Potable water:** Unless an approved assay indicates that the 2,4-D concentration is 70 ppb (0.07 ppm) acid or less, do not use water from treated areas for potable water (drinking water).

**SLN Expiration:** This label for DMA 4 IVM expires and must not be distributed or used in accordance with this SLN registration after December 31, 2003.

\*Trademark of Dow AgroSciences LLC

Revisions: Addition of restrictions required by EPA.

D06-141-002  
Accepted: 09/03/2002  
Replaces D06-141-001



## Specimen Label



### Herbicide

**Aquatic Sites:** For control of emerged, submersed and floating aquatic plants in aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals and ditches which have little or no continuous outflow, marshes and wetlands, including broadleaf and woody vegetation on banks and shores within or adjacent to these and other aquatic sites.

#### Active Ingredient:

triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, triethylamine salt.....44.4%

Inert Ingredients.....55.6%

Total.....100.0%

Acid equivalent: triclopyr - 31.8% - 3 lb/gal

### Keep Out of Reach of Children

## DANGER PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

### Precautionary Statements

#### Hazards to Humans and Domestic Animals

**Corrosive** • Causes irreversible eye damage • Harmful if swallowed or absorbed through skin • Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals

Do not get in eyes or on skin or clothing.

#### Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks • Protective eyewear
- Chemical resistant gloves ( > 14 mils ) such as butyl rubber, natural rubber, neoprene rubber or nitrile rubber

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

#### FIRST AID

**In the eyes** • Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.  
• Call poison control center or doctor for treatment advice.

**If on skin or clothing** • Take off contaminated clothing.  
• Rinse skin immediately with plenty of water for 15 - 20 minutes.  
• Call a poison control center or doctor for treatment advice.

**If swallowed** • Call a poison control center or doctor for treatment advice.  
• Have person sip a glass of water if able to swallow.  
• Do not induce vomiting unless told to do so by a poison control center or doctor.  
• Do not give anything by mouth to a unconscious person.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

**Note to Applicator:** Allergic skin reaction is not expected from exposure to spray mixtures of Renovate 3 herbicide when used as directed.

**Note to Physician:** Probable mucosal damage may contraindicate the use of gastric lavage.

Refer to inside of label booklet for additional precautionary information including Personal Protective Equipment (PPE), User Safety Recommendations and Directions for Use including Storage and Disposal.

**Notice:** Read the entire label. Use only according to label directions. Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies at end of label booklet. If terms are unacceptable, return at once unopened.

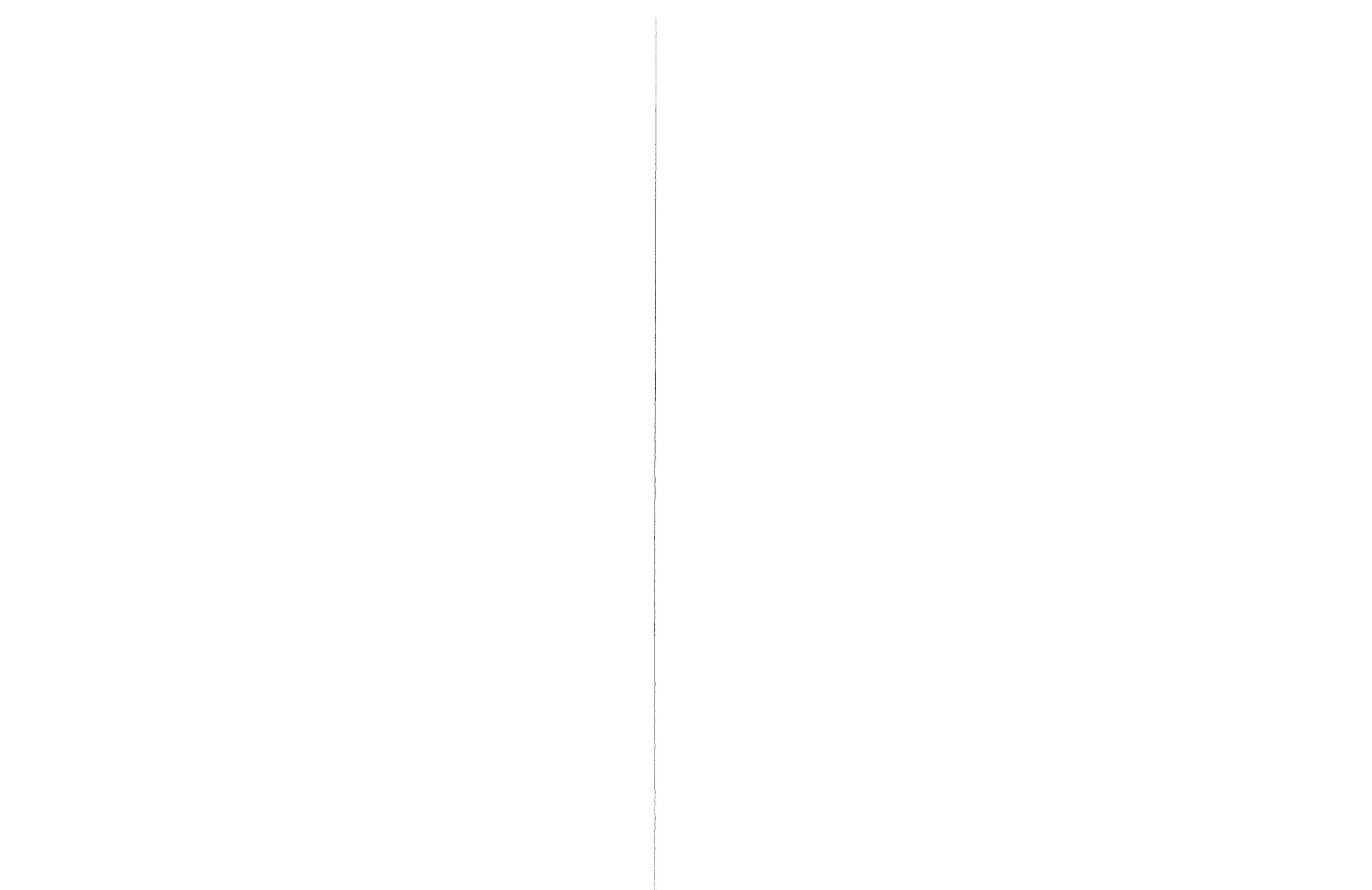
In case of emergency endangering health or the environment involving this product, call INFOTRAC at 1-800-535-5053. If you wish to obtain additional product information, visit our web site at [www.sepro.com](http://www.sepro.com).

**Agricultural Chemical:** Do not ship or store with food, feeds, drugs or clothing.

EPA Reg. No. 62719-37-67690 EPA Est. No. 464-MI-1  
FPL 012203 SPC - 381116

\*Trademark of Dow AgroSciences LLC manufactured for: SePRO Corporation, Camel, IN 46032, U.S.A.

# Renovate 3 Herbicide



## Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the WPS (40 CFR 170.240(d)(4-6)), the handler PPE requirements may be reduced or modified as specified in the WPS.

### USER SAFETY RECOMMENDATIONS

#### Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

## Environmental Hazards

Under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may contribute to fish suffocation. This loss can cause fish suffocation. Therefore, to minimize this hazard, do not treat more than one-third to one-half of the water area in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State agency for fish and game before applying to public water to determine if a permit is needed.

## Physical or Chemical Hazards

Combustible. Do not use or store the product near heat or open flame.

### Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Protective eyewear
- Chemical-resistant gloves (≥ 14 mils) such as butyl rubber, natural rubber, neoprene rubber or nitrile rubber

### NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

**Entry Restrictions for Non-WPS Uses:** For applications to non-cropland areas, do not allow entry into areas until sprays have dried, unless applicator and other handler PPE is worn.

### STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal. Open dumping is prohibited.

**Pesticide Storage:** Store above 28° F or agitate before use.

**Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Disposal for Refillable Containers:** Seal all openings which have been opened during use. Return the empty container to a collection site designated by SePRO Corporation. If the container has been damaged and cannot be returned according to the recommended procedures, contact SePRO Corporation at 1-800-419-7779 to obtain proper handling instructions.

**Container Disposal (Metal):** Do not reuse container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Container Disposal (Plastic):** Do not reuse container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**General:** Consult federal, state, or local disposal authorities for approved alternative procedures.

### General Information

#### For Aquatic and Wetland Sites

Renovate® 3 herbicide is recommended for control of emergent, submersed and floating aquatic plants in aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals, and ditches which have little or no continuous outflow, marshes and wetlands, including broadleaf and woody vegetation on banks and shores within or adjacent to these and other aquatic sites.

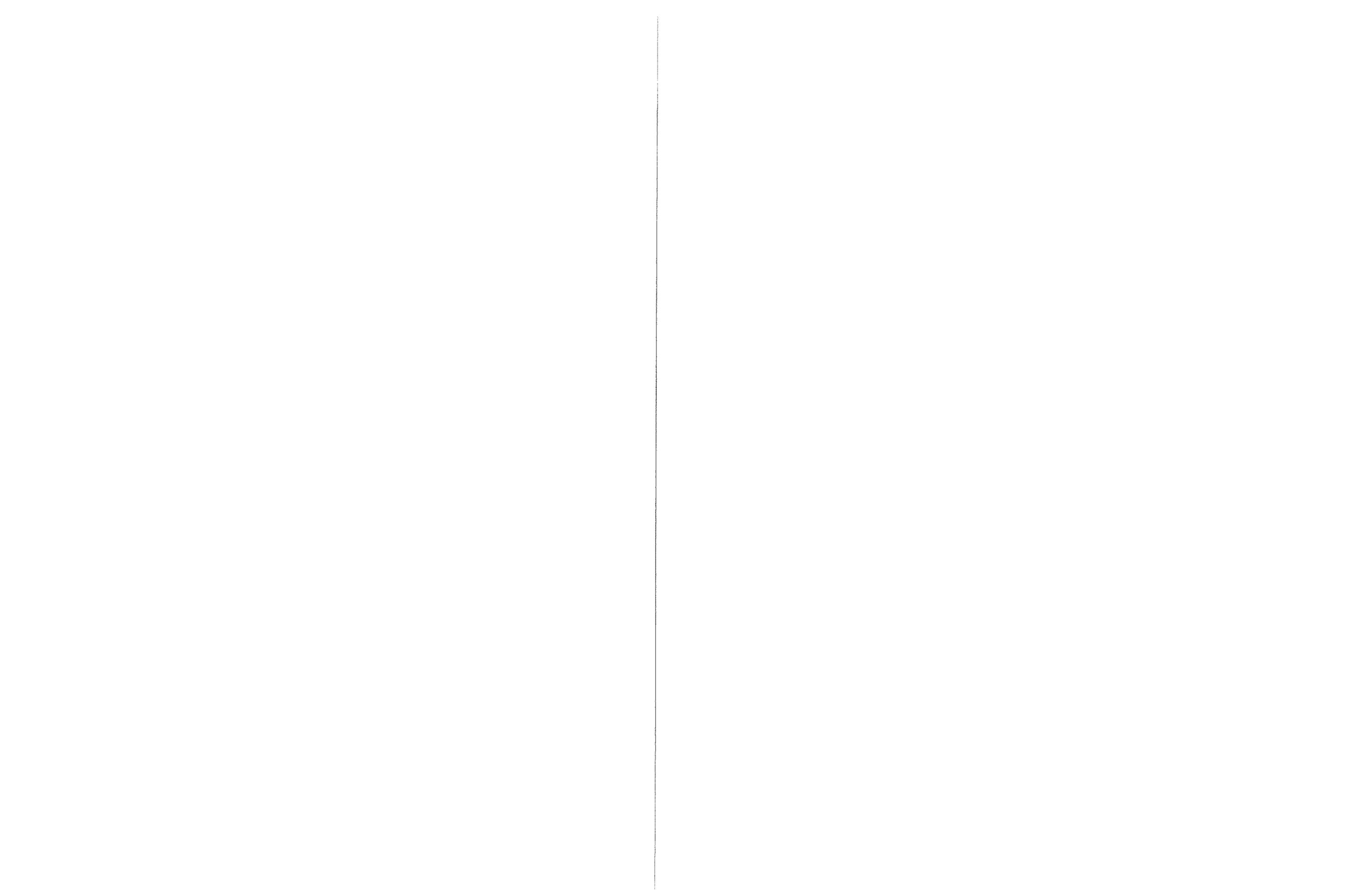
**Obtain Required Permits:** Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.

#### General Use Precautions and Restrictions

**In Arizona:** The state of Arizona has not approved Renovate® 3 for use on plants grown for commercial production, specifically forests grown for commercial timber production, or on designated grazing areas.

When applying this product in tank mix combination, follow all applicable use directions, precautions and limitations on each manufacturer's label.

**Chemigation:** Do not apply this product through any type of irrigation system.



**Irrigation:** Do not use treated water for irrigation for 120 days following application. As an alternative to waiting 120 days, treated water may be used for irrigation once the triopyr level in the intake water is determined to be non-detectable by laboratory analysis (immunoassay). There is no restriction on use of water from the treatment area to irrigate established grasses.

Do not apply Renovate 3 directly to, or otherwise permit it to come into direct contact with grapes, tobacco, vegetable crops, flowers, or other desirable broadleaf plants, and do not permit spray mists containing it to drift into them.

- Do not apply to salt water bays or estuaries.
- Do not apply directly to un-impounded rivers or streams.
- Do not apply on ditches or canals used to transport irrigation water. It is permissible to treat non-irrigation ditch banks.
- Do not apply where runoff water may flow onto agricultural land as injury to crops may result.
- When making applications to control unwanted plants on banks or shorelines of moving water sites, minimize overspray to open water.
- The use of a mistblower is not recommended.

#### **Grazing and Haying Restrictions**

Except for lactating dairy animals, there are no grazing restrictions following application of this product.

- **Grazing Lactating Dairy Animals:** Do not allow lactating dairy animals to graze treated areas until the next growing season following application of this product.
- Do not harvest hay for 14 days after application.
- Grazed areas of non-cropland and forestry sites may be spot treated if they comprise no more than 10% of the total grazable area.

**Slaughter Restrictions:** During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.

#### **Avoiding Injurious Spray Drift**

Applications should be made only when there is little or no hazard from spray drift. Very small quantities of spray, which may not be visible, may seriously injure susceptible plants. Do not spray when wind is blowing toward susceptible crops or ornamental plants near enough to be injured. It is suggested that a continuous smoke column at or near the spray site or a smoke generator on the spray equipment be used to detect air movement, lapse conditions, or temperature inversions (stable air). If the smoke layers or indicates a potential of hazardous spray drift, do not spray.

**Aerial Application:** For aerial application near susceptible crops, apply through a Microfoil<sup>1</sup> or Thru-Valve boom<sup>1</sup>, or use a drift control additive labeled for aquatic use. Other drift reducing systems or thickened sprays prepared by using high viscosity inverting systems may be used if they are made as drift-free as mixtures containing thickening agents labeled for use in aquatics or applications made with the Microfoil or Thru-Valve boom. Keep spray pressures low enough to provide coarse spray droplets. Spray boom should be no longer than 3/4 of the rotor length. Do not use a thickening agent with the Microfoil or Thru-Valve booms, or other systems that cannot accommodate thick sprays. Spray only when the wind velocity is low (follow state regulations). Avoid application during air inversions. If a spray thickening agent is used, follow all use recommendations and precautions on the product label.

<sup>1</sup>Reference within this label to a particular piece of equipment produced by or available from other parties is provided without consideration for use by the reader at its discretion and subject to the reader's independent circumstances, evaluation, and expertise. Such reference by SePRO Corporation is not intended as an endorsement of such equipment, shall not constitute a warranty (express or implied) of such equipment, and is not intended to imply that other equipment is not available and equally suitable. Any discussion of methods of use of such equipment does not imply that the reader should use the equipment other than as advised in directions available from the equipment's manufacturer. The reader is responsible for exercising its own judgment and expertise, or consulting with sources other than SePRO Corporation, in selecting and determining how to use its equipment.

#### **Spray Drift Management**

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they should be observed.

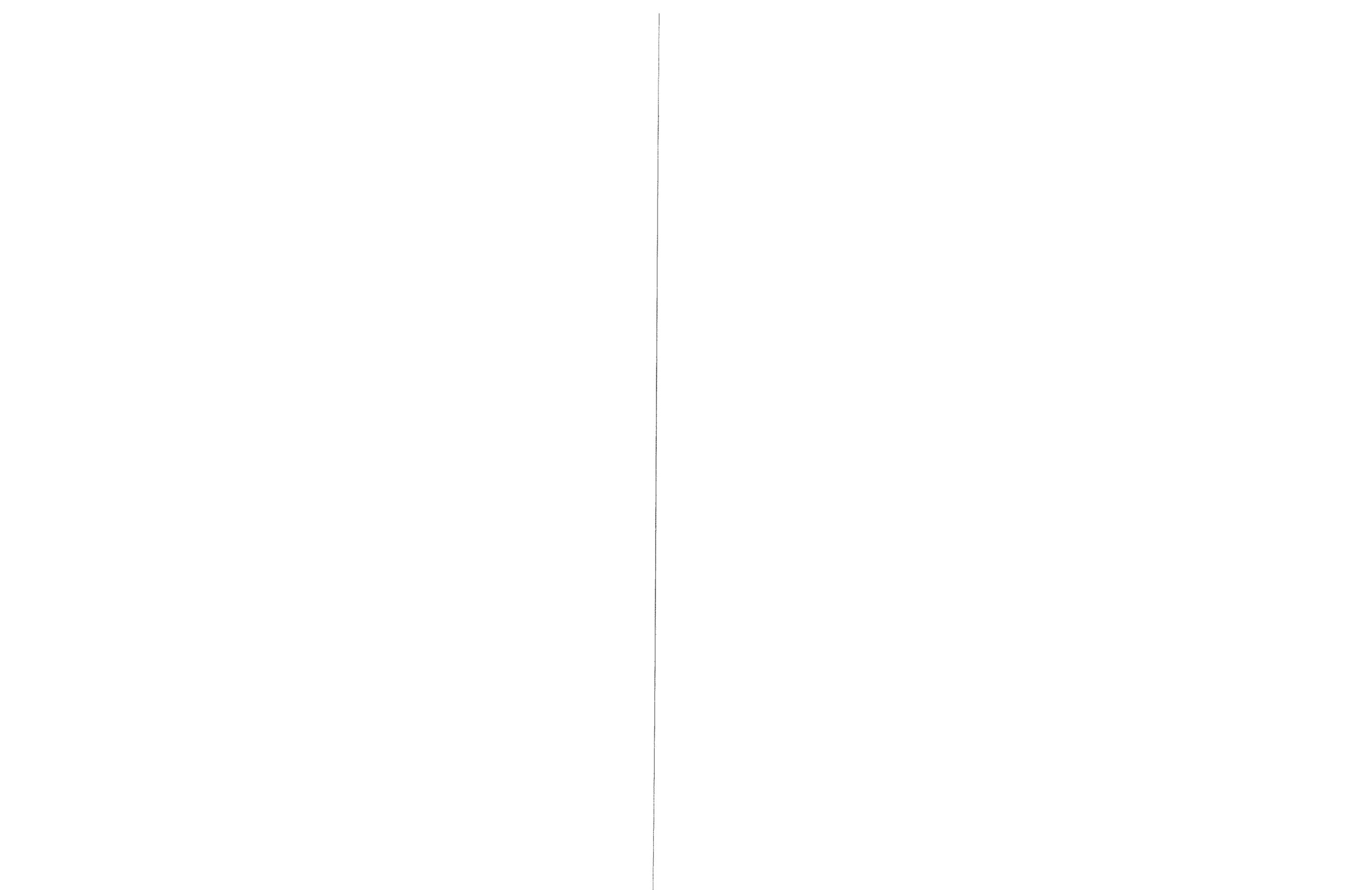
The applicator should be familiar with and take into account the information covered in the following Aerial Drift Reduction Advisory. [This information is advisory in nature and does not supersede mandatory label requirements.]

#### **Aerial Drift Reduction Advisory**

**Information on Droplet Size:** The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

#### **Controlling Droplet Size:**

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.



**Boom Length:** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

**Application Height:** Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

**Swath Adjustment:** When applications are made with a cross-wind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

**Wind:** Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

**Temperature and Humidity:** When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

**Temperature Inversions:** Applications should not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

**Sensitive Areas:** The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

**Ground Equipment:** To aid in reducing spray drift, Renovate 3 should be used in thickened (high viscosity) spray mixtures using a labeled drift control additive, high viscosity invert system, or equivalent as directed by the manufacturer. With ground equipment, spray drift can be reduced by keeping the spray boom as low as possible; by applying 20 gallons or more of spray per acre; by keeping the operating spray pressures at the lower end of the manufacturer's recommended pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when wind velocity is low (follow state regulations). In hand-gun applications, select the minimum spray pressure that will provide adequate plant

coverage (without forming a mist). Do not apply with nozzles that produce a fine-droplet spray.

**High Volume Leaf-Stem Treatment:** To minimize spray drift, do not use pressure exceeding 50 psi at the spray nozzle and keep sprays no higher than brush tops. A labeled thickening agent may be used to reduce drift.

### Plants Controlled by Renovate 3

#### Woody Plant Species

alder	casacara	maples
arrowwood	ceanothus	mulberry
ash	cherry	oaks
aspen	Chinese Tallow	poison ivy
bear clover (bearmat)	chinquapin	poison oak
beech	choke cherry	poplar
birch	cottonwood	salt-bush ( <i>Baccharis</i> spp.)
blackberry	crataegus (hawthorn)	sweetgum
blackgum	locust	waxmyrtle
Brazilian pepper	Maleleuca (seedlings)	willow

#### Annual and Perennial Broadleaf Weeds

burdock	ligodinium	tropical sodaapple
Canada thistle	plantain	vetch
curly dock	smartweed	wild lettuce
elephant ear	tansy ragwort	

#### Aquatic Weeds

alligatorweed	milfoil species	purple loosestrife
American lotus	nuphar (spatterdock)	waterhyacinth
American frogbit	parrotfeather*	waterlily
Aquatic sodaapple	pickerelweed	waterprimrose
Eurasian watermilfoil	pennywort	

\*Retreatment may be needed to achieve desired level of control.

## Application Methods

### Floating and Emerged Weeds

For control of waterhyacinth, alligatorweed (see specific directions below), and other susceptible emerged and floating herbaceous weeds and woody plants, apply 1 1/2 to 6 lb ae triclopyr (2 to 8 quarts of Renovate 3) per acre as a foliar application using surface or aerial equipment. Use higher rates in the rate range when plants are mature, when the weed mass is dense, or for difficult to control species. Repeat as necessary to control regrowth and plants missed in the previous operation, but do not exceed a total of 6 lb ae triclopyr (8 quarts of Renovate 3) per acre per annual growing season.

Use of a non-ionic surfactant in the spray mixture is recommended to improve control. Follow all directions and use precautions on the aquatic surfactant label.

Apply when plants are actively growing.

### Surface Application

Use a spray boom, handgun or other similar suitable equipment mounted on a boat or vehicle. Thorough wetting of foliage is essential for maximum effectiveness. Use 20 to 200 gallons per acre of spray mixture. Special precautions such as the use of low spray pressure, large droplet producing nozzles or addition of a labeled thickening agent may minimize spray drift in areas near sensitive crops.



**Aerial Application**

Apply with a helicopter using a Microfoil or Thru-Valve boom, or a drift control additive in the spray solution. Apply in a minimum of 10 gallons of total spray mix per acre. Do not apply when weather conditions favor drift to sensitive areas. See label section on aerial application directions and precautions.

**Waterhyacinth (*Eichhornia crassipes*)**

Apply Renovate 3 at 1 1/2 to 6 lb ae triclopyr (2 to 8 quarts of Renovate 3) per acre to control waterhyacinth. Apply when plants are actively growing. Use the higher rate in the rate range when the weed mass is dense. It is important to thoroughly wet all foliage with the spray mixture. Use of a non-ionic surfactant in the spray mixture is recommended. A repeat treatment may be needed to control regrowth or plants missed in the previous treatment.

**Alligatorweed (*Aalternanthera philoxeroides*)**

Apply Renovate 3 at 2 to 6 lb ae triclopyr (3 to 8 quarts of Renovate 3) per acre to control alligatorweed. It is important to thoroughly wet all foliage with the spray mixture. For best results, it is recommended that an approved non-ionic aquatic surfactant be added to the spray mixture. Alligatorweed growing outside the margins of a body of water can be controlled with this treatment. However, alligatorweed growing in water will only be partially controlled. Top growth above the water will be controlled, but the plant will likely regrow from tissue below the water surface.

**Precautions for Potable Water Intakes - Lakes, Reservoirs, Ponds:**

For applications of Renovate 3 to control floating and emerged weeds in lakes, reservoirs or ponds that contain a functioning potable water intake for human consumption, see chart below to determine the minimum setback distances of the application from the functioning potable water intakes.

Area Treated (acres)	Setback Distance (ft)			
	2 quarts	4 quarts	6 quarts	8 quarts
< 4	0	200	400	500
> 4 - 8	0	200	700	900
> 8 - 16	0	200	700	1000
> 16	0	200	900	1300

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

To apply Renovate 3 around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

• **Recreational Use of Water in Treatment Area:** There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.

• **Livestock Use of Water from Treatment Area:** There are no restrictions on livestock consumption of water from the treatment area.

**Submerged Weeds**

For control of Eurasian watermilfoil (*Myriophyllum spicatum*) and other susceptible submerged weeds in ponds, lakes, reservoirs, and in non-irrigation canals or ditches that have little or no continuous outflow, apply Renovate 3 as either a surface or subsurface application. Rates should be selected according to the rate chart below to provide a triclopyr concentration of 0.75 to 2.5 ppm ae in treated water. Higher rates in the rate range are recommended in areas of greater water exchange. These areas may require a repeat application. However, total application of Renovate 3 must not exceed an application rate of 2.5 ppm triclopyr for the treatment area per annual growing season.

Apply in spring or early summer when Eurasian watermilfoil or other submerged weeds are actively growing.

Areas near susceptible crops or other desirable broadleaf plants may be treated by subsurface injection applied by boat to avoid spray drift.

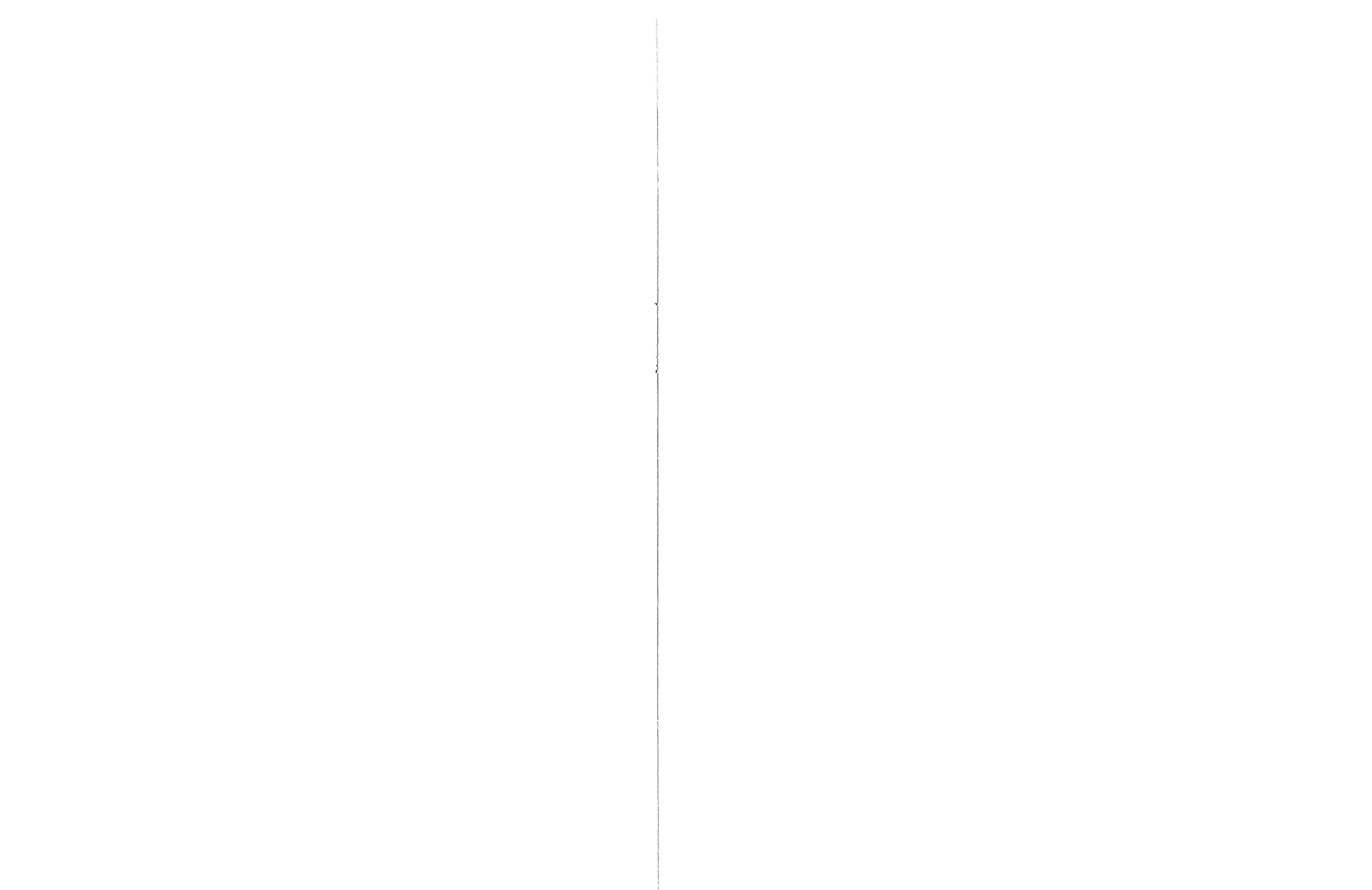
**Subsurface Application**

Apply desired amount of Renovate 3 per acre directly into the water through boat-mounted distribution systems.

**Surface Application**

Apply the desired amount of Renovate 3 as either a concentrate or a spray mixture in water. However, use a minimum spray volume of 5 gallons per acre. Do not apply when weather conditions favor drift to sensitive areas.

Water Depth (feet)	Gallons of Renovate 3 per surface acre at specified depth				
	0.75 ppm	1.0 ppm	1.5 ppm	2.0 ppm	2.5 ppm
1	0.7	0.9	1.4	1.8	2.3
2	1.4	1.8	3.3	3.6	4.6
3	2.1	2.9	4.1	6.4	6.6
4	2.7	3.6	5.4	7.2	9.1
5	3.4	4.5	6.8	9.0	11.3
6	4.1	5.4	8.1	10.9	13.6
7	4.8	6.3	9.5	12.7	15.8
8	5.5	7.2	10.9	14.5	18.1
9	6.1	8.1	12.2	16.3	20.4
10	6.8	9.0	13.6	18.1	22.6
15	10.2	13.6	20.4	27.2	33.9
20	13.6	18.1	27.2	36.2	45.3



**Precautions for Potable Water Intakes - Lakes, Reservoirs, Ponds:**

For applications of Renovate 3 to control submerged weeds in lakes, reservoirs or ponds that contain a functioning potable water intake for human consumption, see the chart below to determine the minimum setback distances of the application from the functioning potable water intakes.

Concentration of Triclopyr Acid in Water (ppm as)					
Area Treated (acres)	Required setback distance (ft) from potable water intake				
	0.75 ppm	1.0 ppm	1.5 ppm	2.0 ppm	2.5 ppm
< 4	300	400	600	800	1000
> 4 - 8	420	560	840	1120	1400
> 8 - 16	600	800	1200	1600	2000
> 16 - 32	780	1040	1560	2080	2600
32 acres, calculate a setback using the formula for the appropriate rate	Setback (ft) = $\frac{(800^2 \text{ in}^2 (\text{acre}) - 160)/3.33}{100}$	Setback (ft) = $\frac{(800^2 \text{ in}^2 (\text{acre}) - 180)/2.50}{100}$	Setback (ft) = $\frac{(800^2 \text{ in}^2 (\text{acre}) - 180)/1.67}{100}$	Setback (ft) = $\frac{(800^2 \text{ in}^2 (\text{acre}) - 160)/1.25}{100}$	Setback (ft) = $\frac{(800^2 \text{ in}^2 (\text{acre}) - 160)}{100}$

Example Calculation 1: to apply 2.5 ppm Renovate 3 to 50 acres:

$$\begin{aligned} \text{Setback in feet} &= (800 \times \ln(50 \text{ acres})) - 160 \\ &= (800 \times 3.912) - 160 \\ &= 2970 \text{ feet} \end{aligned}$$

Example Calculation 2: to apply 0.75 ppm Renovate 3 to 50 acres:

$$\begin{aligned} \text{Setback in feet} &= \frac{(800 \times \ln(50 \text{ acres})) - 160}{3.33} \\ &= \frac{(800 \times 3.912) - 160}{3.33} \\ &= 892 \text{ feet} \end{aligned}$$

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

To apply Renovate 3 around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

• **Recreational Use of Water in Treatment Area:** There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.

• **Livestock Use of Water from Treatment Area:** There are no restrictions on livestock consumption of water from the treatment area.

**Wetland Sites**

Wetlands include flood plains, deltas, marshes, swamps, bogs, and transitional areas between upland and lowland sites. Wetlands may occur within forests, wildlife habitat restoration and management areas and similar sites as well as areas adjacent to or surrounding domestic water supply reservoirs, lakes and ponds.

For control of woody plants and broadleaf weeds in these sites, follow use directions and application methods on this label for terrestrial sites associated with wetland areas.

**Use Precautions**

Minimize overspray to open water when treating target vegetation in and around non-flowing, quiescent or transient water. When making applications to control unwanted plants on banks or shorelines of flowing water, minimize overspray to open water. Note: Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat such areas.

**Purple Loosestrife (Lythrum salicaria)**

Purple loosestrife can be controlled with foliar applications of Renovate 3. For broadcast applications, a minimum of 4 1/2 to 6 lb ae triclopyr (6 to 8 quarts of Renovate 3) per acre is recommended. Apply Renovate 3 when purple loosestrife is at the bud to mid-flowering stage of growth. Follow-up applications for control of regrowth should be made the following year in order to achieve increased control of this weed species. For all applications, a non-ionic surfactant labeled for aquatics should be added to the spray mixture. Follow all directions and use precautions on the label of the surfactant. Thorough wetting of the foliage and stems is necessary to achieve satisfactory control. A minimum spray volume of 50 gallons per acre is recommended for ground broadcast applications.

If using a backpack sprayer, a spray mixture containing 1% to 1.5% Renovate 3 or 5 to 7.8 fl oz of Renovate 3 per 4 gallons of water should be used. All purple loosestrife plants should be thoroughly wetted.

Aerial application by helicopter may be needed when treating restoration sites that are inaccessible, remote, difficult to traverse, isolated, or otherwise unsuited to ground application, or in circumstances where invasive exotic weeds dominate native plant populations over extensive areas and efforts to restore native plant diversity are being conducted. By air, apply in a minimum spray volume of 30 gallons per acre using Thru-Valve or Microfoam boom only.

• **Recreational Use of Water in Treatment Area:** There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.

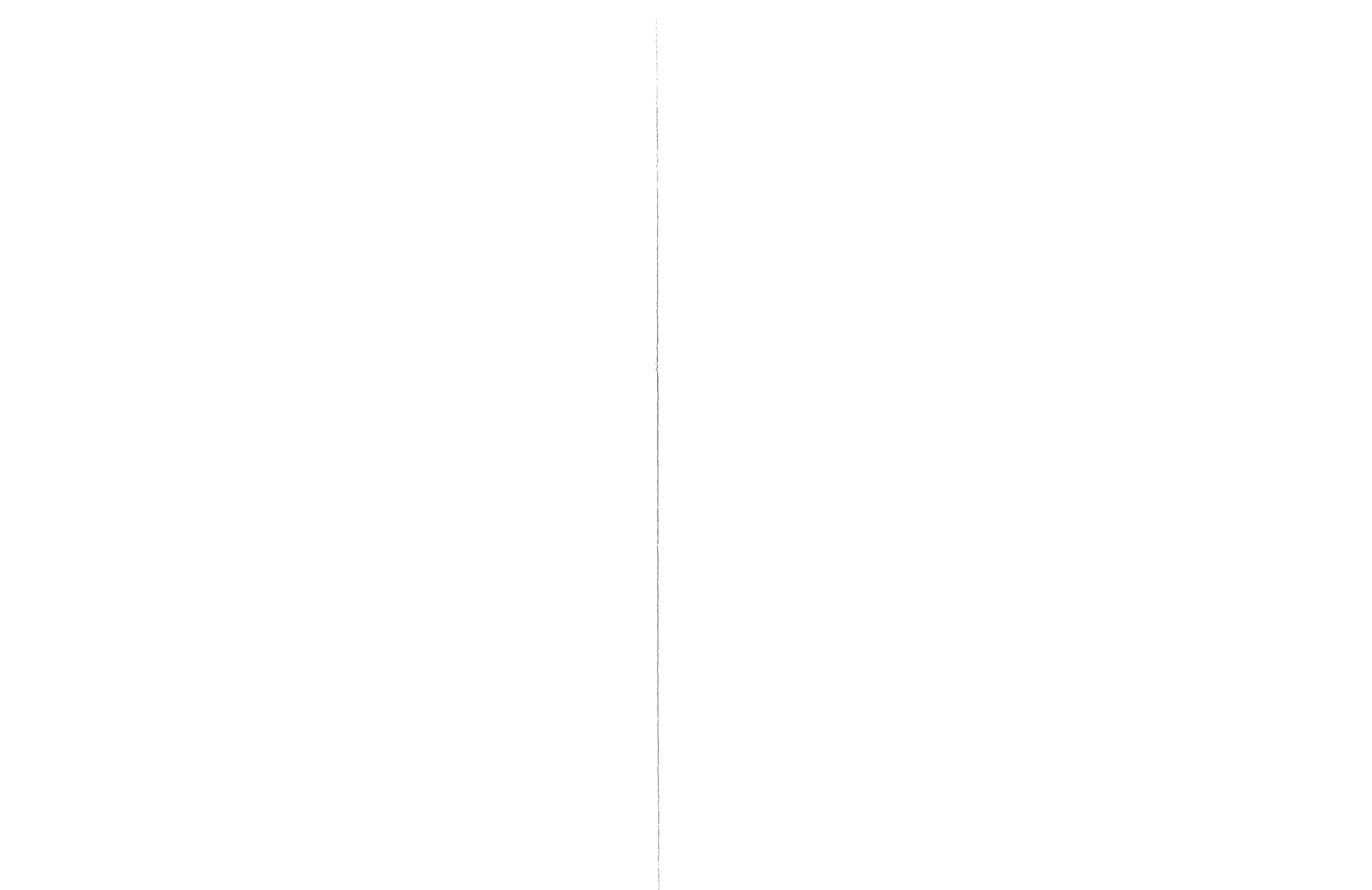
• **Livestock Use of Water from Treatment Area:** There are no restrictions on livestock consumption of water from the treatment area.

**Terrestrial Sites Associated with Wetland Areas**

• Apply no more than 2 lb ae triclopyr (2/3 gallon of Renovate 3) per acre per growing season on range and pasture sites, including rights-of-way, fence rows or any area where grazing or harvesting is allowed.

• On forestry sites, Renovate 3 may be used at rates up to 6 lb ae of triclopyr (2 gallons of Renovate 3) per acre per year.

Use Renovate 3 at rates of 3/4 to 6 lb ae triclopyr (1/4 to 2 gallons of Renovate 3) per acre to control broadleaf weeds and woody plants. In all cases use the amount specified in enough water to give uniform and complete coverage of the plants to be controlled. Use only water suitable for spraying. Use of a labeled non-ionic surfactant is recommended for all foliar applications. When using surfactants, follow the use directions and precautions listed on



the surfactant manufacturer's label. Use the higher recommended concentrations of surfactant in the spray mixture when applying lower spray volumes per acre. The recommended order of addition to the spray tank is water, spray thickening agent (if used), additional herbicide (if used), and Renovate 3. A labeled aquatic surfactant should be added to the spray tank last or as recommended on the product label. If combined with emulsifiable concentrate herbicides, moderate continuous adequate agitation is required.

Before using any recommended tank mixtures, read the directions and all use precautions on both labels.

For best results, applications should be made when woody plants and weeds are actively growing. When hard to control species such as ash, blackgum, choke cherry, maples, or oaks are prevalent and during applications made in late summer when the plants are mature and during drought conditions, use the higher rates of Renovate 3.

When using Renovate 3 in combination with a 2,4-D herbicide approved for aquatic use, such as DMA 4 IVM, generally the higher rates should be used for satisfactory brush control.

Use the higher dosage rates when brush approaches an average of 15 feet in height or when the brush covers more than 60% of the area to be treated. If lower rates are used on hard to control species, resprouting may occur the year following treatment.

#### High Volume Foliage Treatment

For control of woody plants, use Renovate 3 at the rate of 3 to 6 lb ae tricopyr (1 to 2 gallons of Renovate 3) per 100 gallons of spray solution, or Renovate 3 at 3/4 to 3 lb ae tricopyr (1 to 4 quarts of Renovate 3) may be tank mixed with 1/4 to 1/2 gallons of 2,4-D 3.8 lb amine, like DMA 4 IVM, diluted to make 100 gallons of spray solution. Apply at a volume of 100 to 400 gallons of total spray per acre depending on size and density of woody plants. Coverage should be thorough to wet all leaves, stems, and root collars. (See General Use Precautions and Restrictions.) Do not exceed the maximum allowable use rate of 6 lb ae of tricopyr (2 gallons of Renovate 3) per acre per growing season.

#### Low Volume Foliage Treatment

To control susceptible woody plants, apply up to 15 lb ae tricopyr (5 gallons of Renovate 3) in 10 to 100 gallons of finished spray. The spray concentration of Renovate 3 and total spray volume per acre may be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (see General Use Precautions and Restrictions). For best results, a labeled aquatic surfactant should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

#### Cut Surface Treatments (Woody Plants)

To control unwanted trees and other listed woody plants, apply Renovate 3, either undiluted or diluted in a 1 to 1 ratio with water as directed below.

##### With Tree Injector Method

Applications should be made by injecting 1/2 milliliter of undiluted Renovate 3 or 1 milliliter of the diluted solution through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. **Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.**

##### With Hack and Squirt Method

Make cuts with a hatchet or similar equipment at intervals of 3 to 4 inches between centers at a convenient height around the tree trunk. Spray 1/2 milliliter of undiluted Renovate 3 or 1 milliliter of the diluted solution into each cut.

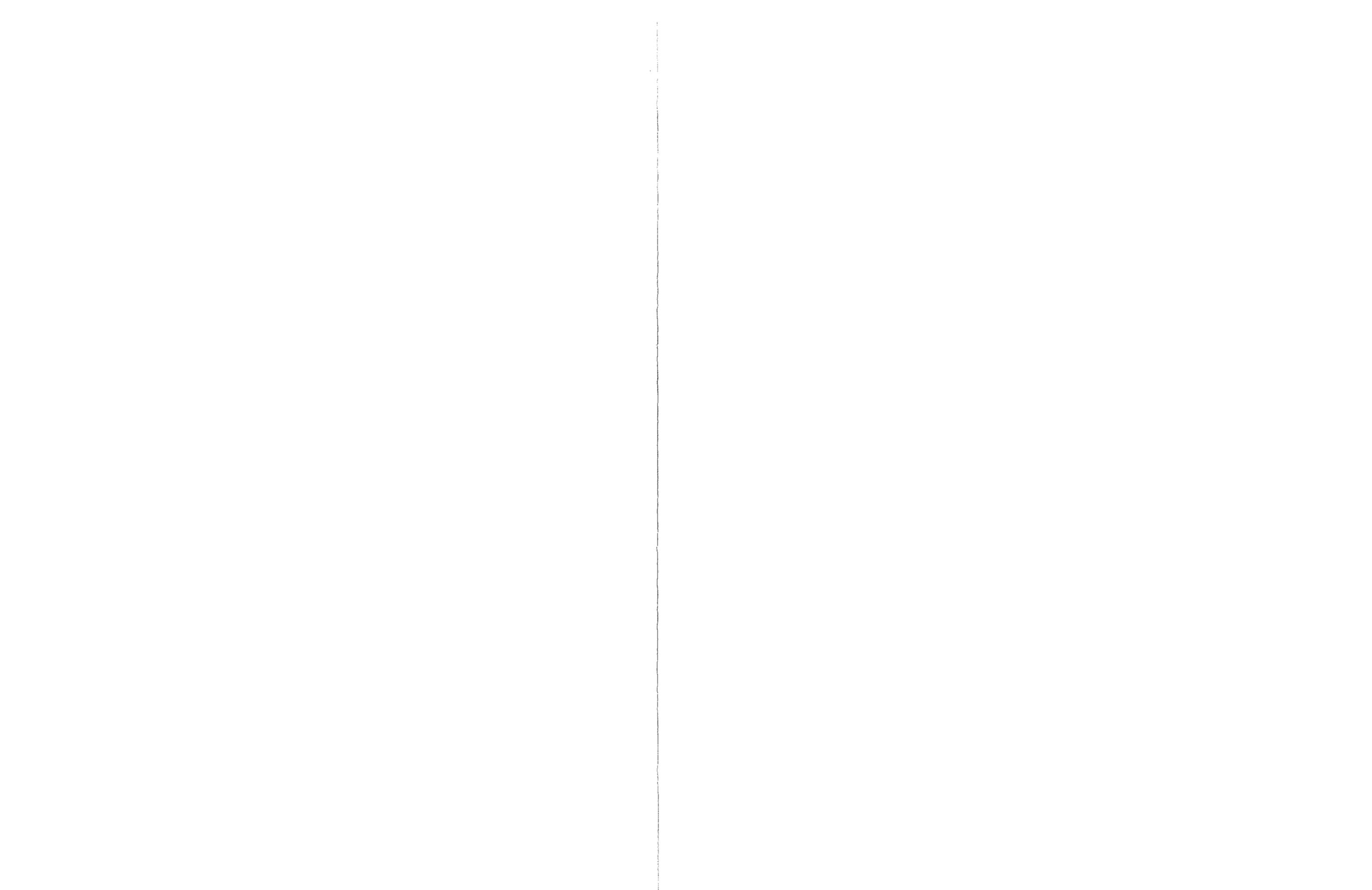
##### With Frill or Girdle Method

Make a single girdle through the bark completely around the tree at a convenient height. Wet the cut surface with undiluted or diluted solution.

Both of the above methods may be used successfully at any season except during periods of heavy sap flow of certain species—for example, maples.

#### Stump Treatment

Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted Renovate 3. The cambium area next to the bark is the most vital area to wet.



## Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitations of Remedies.

## Warranty Disclaimer

SePRO Corporation warrants that the product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. SEPRO CORPORATION MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

## Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner or application, or other factors, all of which are beyond the control of SePRO Corporation as the seller. All such risks shall be assumed by buyer.

## Limitation of Remedies

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories) shall be limited to, at SePRO Corporation's election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer above and this Limitation of Remedies can not be varied by any written or verbal statements or agreements. No employee or sales agent of SePRO Corporation or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or Limitations of Remedies in any manner.

Form No. A-60-PG-0103

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# Material Safety Data Sheet



Transportation and Medical Emergency Phone: 1-800-535-6053  
(INFOTRAC)  
General Phone: 317-580-8282

EPA Reg. Number: 62719-37-67690  
Effective Date: 01/22/03

## Renovate<sup>†</sup> 3 Herbicide

SePRO Corporation Carmel, IN 46032

### 1. PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT:** Renovate<sup>†</sup> 3 Herbicide

#### COMPANY IDENTIFICATION:

SePRO Corporation  
11550 North Meridian Street, Suite 600  
Carmel, IN 46032  
www.sepro.com

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

Triclopyr ((3,5,6-trichloro-2-pyridinyl)oxy)acetic acid), triethylamine salt	CAS # 057213-69-1	44.4%
Inert Ingredients, Total, Including Ethanol	CAS # 000064-17-5	55.6%
Triethylamine (N,N-Diethylethanamine)	CAS # 000121-44-8	
Ethylenediaminetetraacetic Acid (EDTA)	CAS # 000060-00-4	

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not "Hazardous" per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

### 3. HAZARDOUS IDENTIFICATIONS

#### EMERGENCY OVERVIEW

Hazardous Chemical. Light purple-pink liquid, ammonia-like odor. May cause severe eye irritation with corneal injury, which may result in permanent impairment of vision, even blindness. Prolonged or repeated exposure may cause skin irritation, even a burn. LD<sub>50</sub> for skin absorption in rabbits is >5000 mg/kg; oral LD<sub>50</sub> for male rats is 2574 mg/kg and 1847 mg/kg for female rats. Toxic and irritating gases may be formed during fire conditions.

EMERGENCY PHONE NUMBER: 1-800-892-5994

**POTENTIAL HEALTH EFFECTS:** This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

**EYE:** May cause severe irritation with corneal injury, which may result in permanent impairment of vision, even blindness. Vapors of amines may cause swelling of the cornea resulting in visual disturbances such as blurred,

smoky or halo vision. When tested on animals, dilutions of this material were less irritating to eyes than the undiluted product.

**SKIN:** Prolonged or repeated exposure may cause skin irritation, even a burn. When tested on animals, dilutions of this material were less irritating to skin than the undiluted product. Prolonged or frequently repeated skin contact may cause allergic skin reactions in some individuals. With the dilute mix, no allergic skin reaction is expected. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts. The LD<sub>50</sub> for skin absorption in rabbits is >5000 mg/kg.

**INGESTION:** Single dose oral toxicity is low. The oral LD<sub>50</sub> was 2574 mg/kg for male rats and 1847 mg/kg for female rats. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Ingestion may cause gastrointestinal irritation or ulceration.

**INHALATION:** A single brief (minutes) inhalation exposure is not likely to cause adverse effects.

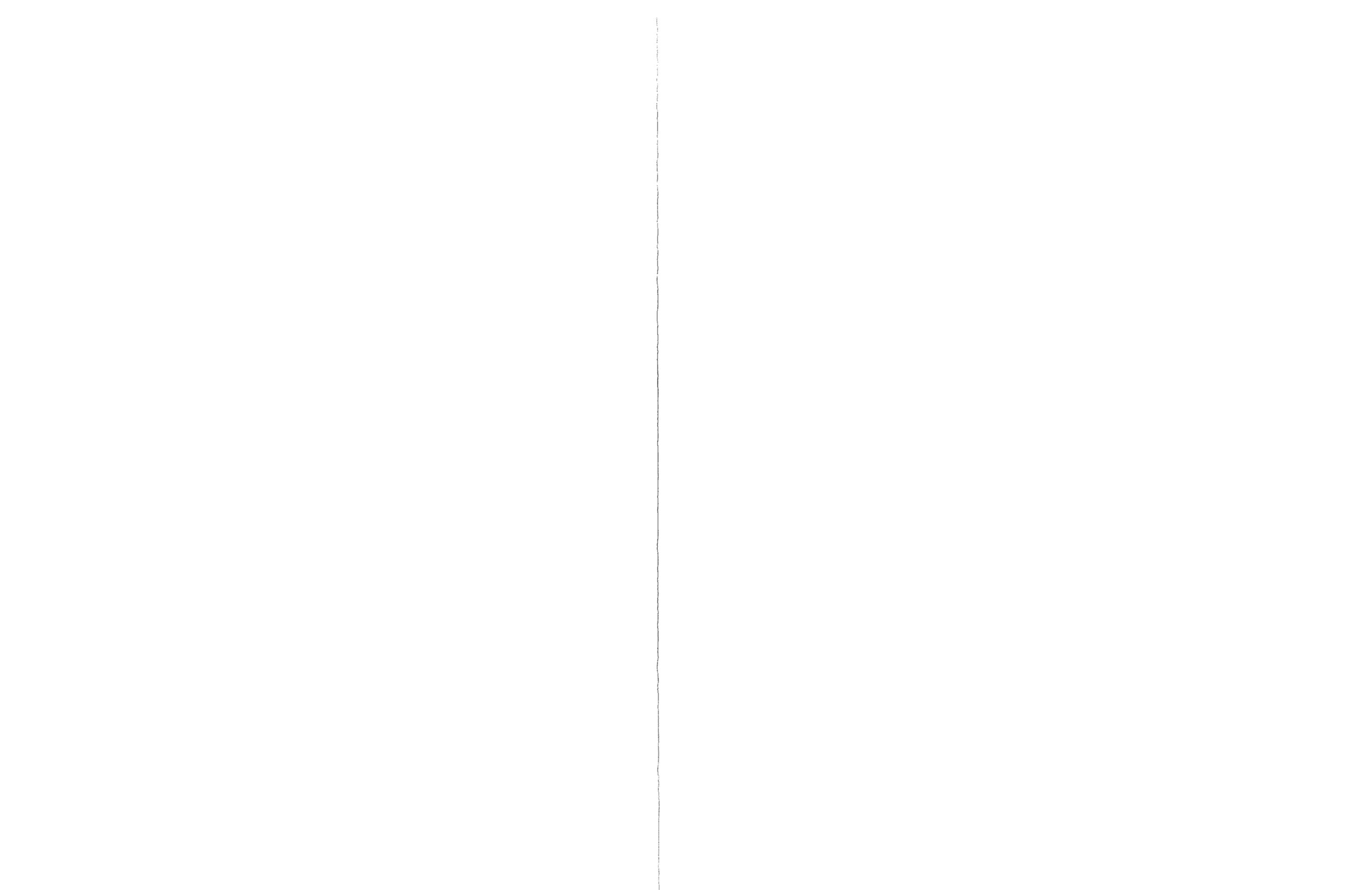
**SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:** Excessive exposure may cause liver or kidney effects.

**CANCER INFORMATION:** Triclopyr did not cause cancer in laboratory animal studies. This material contains ethanol. Epidemiology studies provide evidence that drinking of alcoholic beverages (containing ethanol) is associated with cancer, and IARC has classified alcoholic beverages as carcinogenic to humans.

**TERATOLOGY (BIRTH DEFECTS):** For triclopyr, birth defects are unlikely. Even exposures having an adverse effect on the mother should have no effect on the fetus. Ethanol has been shown to cause birth defects and toxicity to the fetus in laboratory animal tests. It has also been shown to cause human fetotoxicity and/or birth defects when ingested during pregnancy.

**REPRODUCTIVE EFFECTS:** For triclopyr, in laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. Ingestion of large amounts of ethanol has been shown to interfere with fertility in human males.

<sup>†</sup> Renovate is a registered trademark of Dow Agrosciences LLC manufactured for SePRO Corporation.



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# Renovate<sup>†</sup> 3 Herbicide

### 4. FIRST AID

**EYE:** Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.

**SKIN:** Wash skin with plenty of water.

**INGESTION:** Do not induce vomiting. Give one cup (8 ounces or 240 ml) of water or milk if available and transport to a medical facility. Do not give anything by mouth to an unconscious person.

**INHALATION:** No emergency medical treatment necessary.

**NOTE TO PHYSICIAN:** Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower GI tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. If burn is present treat as any thermal burn, after decontamination. Exposure to amine vapors may cause minor transient edema of the corneal epithelium (glaucomata) with blurred vision, blue haze, and halos around bright objects. Effects disappear in a few hours and temporarily reduce ability to drive vehicles. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

### 5. FIRE FIGHTING MEASURES

**FLASH POINT:** 110° F (43° C)

**METHOD USED:** TCC

**FLAMMABLE LIMITS:** LFL: Not determined  
UFL: Not determined

**EXTINGUISHING MEDIA:** Alcohol foam and CO<sub>2</sub>.

**FIRE AND EXPLOSION HAZARDS:** Toxic, irritating vapors may be formed or given off if product is involved in fire. Although product is water-based, it has a flash point due to the presence of small amounts of ethanol and triethylamine.

**FIRE-FIGHTING EQUIPMENT:** Use positive-pressure, self-contained breathing apparatus and full protective clothing.

### 6. ACCIDENTAL RELEASE MEASURES

**ACTION TO TAKE FOR SPILLS/LEAKS:** Contain small spills and absorb with an inert material such as clay or dry sand. Report large spills to InfoTrac at 1-800-535-5053.

### 7. HANDLING AND STORAGE

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: HANDLING:** Keep out of reach of children. Causes irreversible eye damage. Harmful if inhaled or absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic skin reaction in some individuals. Avoid contact with eyes, skin, clothing, breathing vapor, or spray mist. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

**STORAGE:** Store above 28°F or agitate before use. Store in original container. See product label for handling/storage precautions relative to the end use of this product.

### 8. EXPOSURE CONTROL/PERSONAL PROTECTION

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

#### EXPOSURE GUIDELINE(S):

Ethanol (ethyl alcohol): ACGIH TLV and OSHA PEL are 1000 ppm. ACGIH classification is A4.  
3,5,6-Trichloro-2-pyridyloxyacetic acid (Triclopyr), triethylamine salt: SePRO Corporation Industrial Hygiene Guideline is 2 mg/m<sup>3</sup> as acid equivalent; Skin.  
Triethylamine: ACGIH TLV is 1 ppm TWA, 3 ppm STEL, Skin. OSHA PEL is 10 ppm TWA, 15 ppm STEL.

PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

A "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material. It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

**ENGINEERING CONTROLS:** Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.



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EPA Reg. Number: 62719-37-67690  
Effective Date: 01/22/03

SePRO Corporation Carmel, IN 46032

## RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

**RESPIRATORY PROTECTION:** Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use a NIOSH approved air-purifying respirator.

**SKIN PROTECTION:** When prolonged or frequently repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron or full-body suit will depend on operation.

**EYE PROTECTION:** Use chemical goggles. Eye wash fountain should be located in immediate work area. If vapor exposure causes eye discomfort, use a NIOSH approved full-face respirator.

**APPLICATORS AND ALL OTHER HANDLERS:** Refer to the product label for personal protective clothing and equipment.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**BOILING POINT:** Not determined  
**VAPOR PRESSURE:** Not determined  
**VAPOR DENSITY:** Not applicable  
**SOLUBILITY IN WATER:** Miscible  
**SPECIFIC GRAVITY:** 1.135 (68/68°F)  
**APPEARANCE:** Light purple/pink liquid  
**ODOR:** Ammonia-like odor

## 10. STABILITY AND REACTIVITY

**STABILITY: (CONDITIONS TO AVOID)** Avoid sources of ignition if temperature is near or above flash point.

**INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)** Any oxidizing agent. Consult manufacturer for specific cases.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Nitrogen oxides and hydrogen chloride may be formed under fire conditions.

**HAZARDOUS POLYMERIZATION:** Not known to occur.

## 11. TOXICOLOGICAL INFORMATION

**MUTAGENICITY:** For triclopyr and ethanol: in-vitro mutagenicity studies were negative. For triclopyr: animal mutagenicity studies were negative. For ethanol: animal mutagenicity studies were negative in some cases and positive in other cases.

## 12. ECOLOGICAL INFORMATION

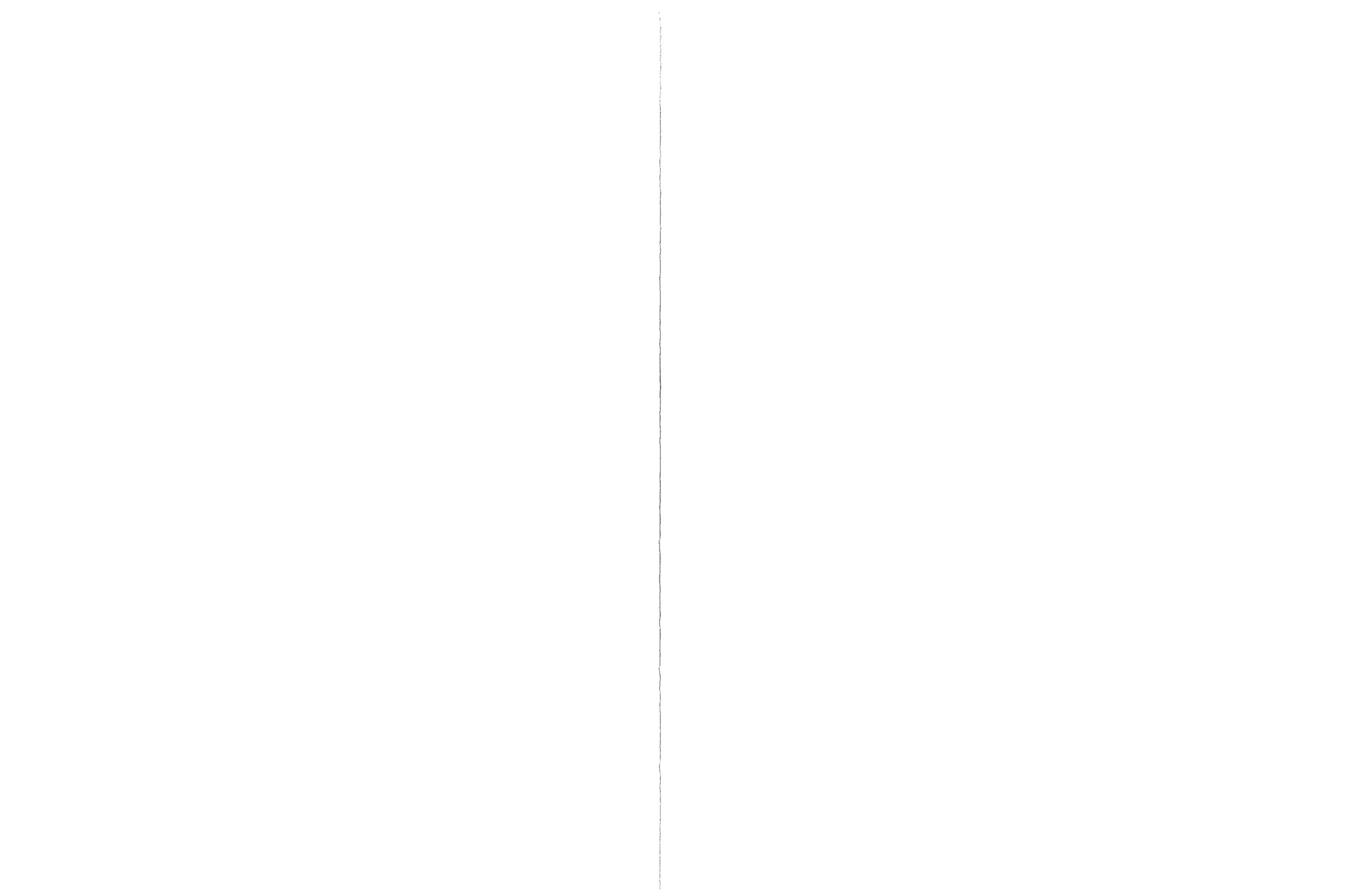
**ENVIRONMENTAL FATE:**  
**MOVEMENT & PARTITIONING:** Based largely or completely on information for triclopyr. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**DEGRADATION & PERSISTENCE:** Biodegradation under aerobic static laboratory conditions is high (BOD<sub>20</sub> or BOD<sub>28</sub>/ThOD > 40%). 20-Day biochemical oxygen demand (BOD<sub>20</sub>) is 0.30 p/p. Theoretical oxygen demand (ThOD) is calculated to be 0.75 p/p.

**ECOTOXICOLOGY:** Material is slightly toxic to aquatic organisms on an acute basis (LC<sub>50</sub>/EC<sub>50</sub> is between 10 and 100 mg/L in most sensitive species). Acute EC<sub>50</sub> for shell deposition inhibition in Eastern oyster (*Crassostrea virginica*) is 56-87 mg/L. Acute LC<sub>50</sub> for rainbow trout (*Oncorhynchus mykiss*) is 400 mg/L. Acute LC<sub>50</sub> for channel catfish (*Ictalurus punctatus*) is 448 mg/L. Acute LC<sub>50</sub> for pink shrimp (*Penaeus duorarum*) is 895 mg/L. Growth inhibition EC<sub>50</sub> for green alga (*Selenastrum capricornutum*) is 45 mg/L.

## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHOD:** Do not contaminate food, feed, or water by storage or disposal. Excess wastes are toxic. Improper disposal or excess wastes are a violation of federal law. If wastes resulting from the use of this product cannot be disposed of according to label instructions, dispose of these wastes at an approved facility. Contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.



# Material Safety Data Sheet



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### 14. TRANSPORT INFORMATION

For DOT regulatory information, if required, consult transportation regulations, product-shipping papers, or contact your SePRO Corporation representative.

### 15. REGULATORY INFORMATION

**NOTICE:** The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

#### U.S. REGULATIONS

**SARA 313 INFORMATION:** This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
N,N-Diethylethanamine	000121-44-8	3%

**SARA HAZARD CATEGORY:** This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

- An immediate health hazard
- A delayed health hazard
- A fire hazard

**TOXIC SUBSTANCES CONTROL ACT (TSCA):** All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

**STATE RIGHT-TO-KNOW:** The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
Ethylenediamine		
Tetraacetic Acid	000060-00-4	NJ3 PA1 PA3
Ethanol	000064-17-5	NJ1 NJ3 PA1
N,N-Diethylethanamine	000121-44-8	NJ1 NJ3 PA1 PA3

NJ1 = New Jersey Special Health Hazard Substance (present at > or = to 0.1%).

PA1 = Pennsylvania Hazardous Substance (present at > or = to 1.0%).

PA3 = Pennsylvania Environmental Hazardous Substance (present at > or = to 1.0%).

#### OSHA HAZARD COMMUNICATION STANDARD:

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

#### NATIONAL FIRE PROTECTION ASSOCIATION

##### (NFPA) RATINGS:

CATEGORY	RATING
Health	3
Flammability	2
Reactivity	0

#### COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):

This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA which may require reporting of releases:

Chemical Name	CAS Number	RQ	% in Product
Triethylamine	000121-44-8	5000	3%
Ethylenediaminetetraacetic Acid (ETDA)	000060-00-4	5000	2.3%

#### RCRA Categorization Hazardous Code:

Triethylamine = U404

### 16. OTHER INFORMATION

MSDS STATUS: New 01/22/03

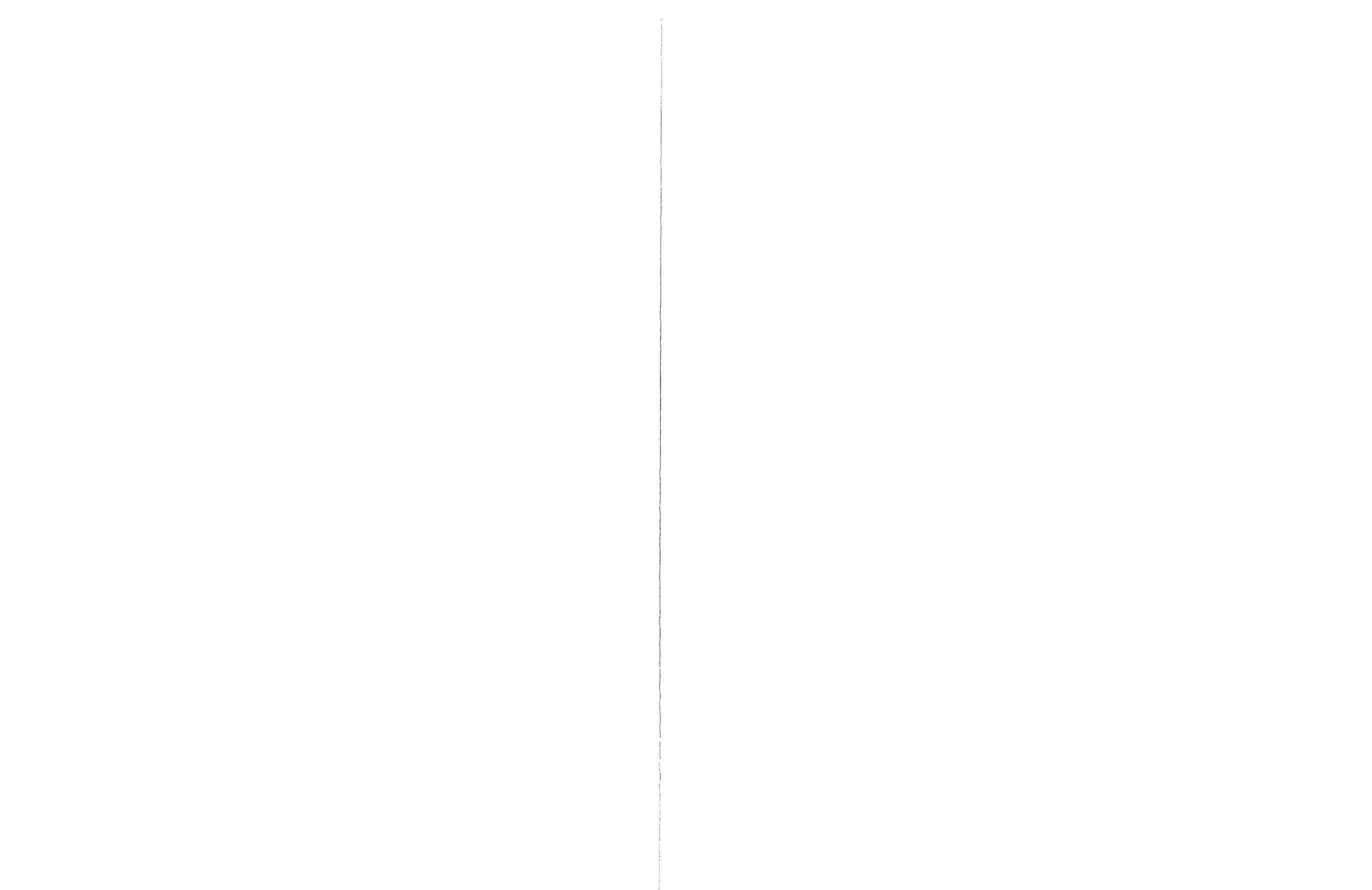
The information herein is given in good faith, but no warranty, express or implied, is made. Consult SePRO Corporation for further information.



**APPENDIX F:** Species controlled with Navigat® and AquaKleen® and effectiveness of control

**Table 2: Species Controlled with Aqua-Kleen® and Navigat®, Effectiveness of Control and Registration Status for Control of Listed Species**

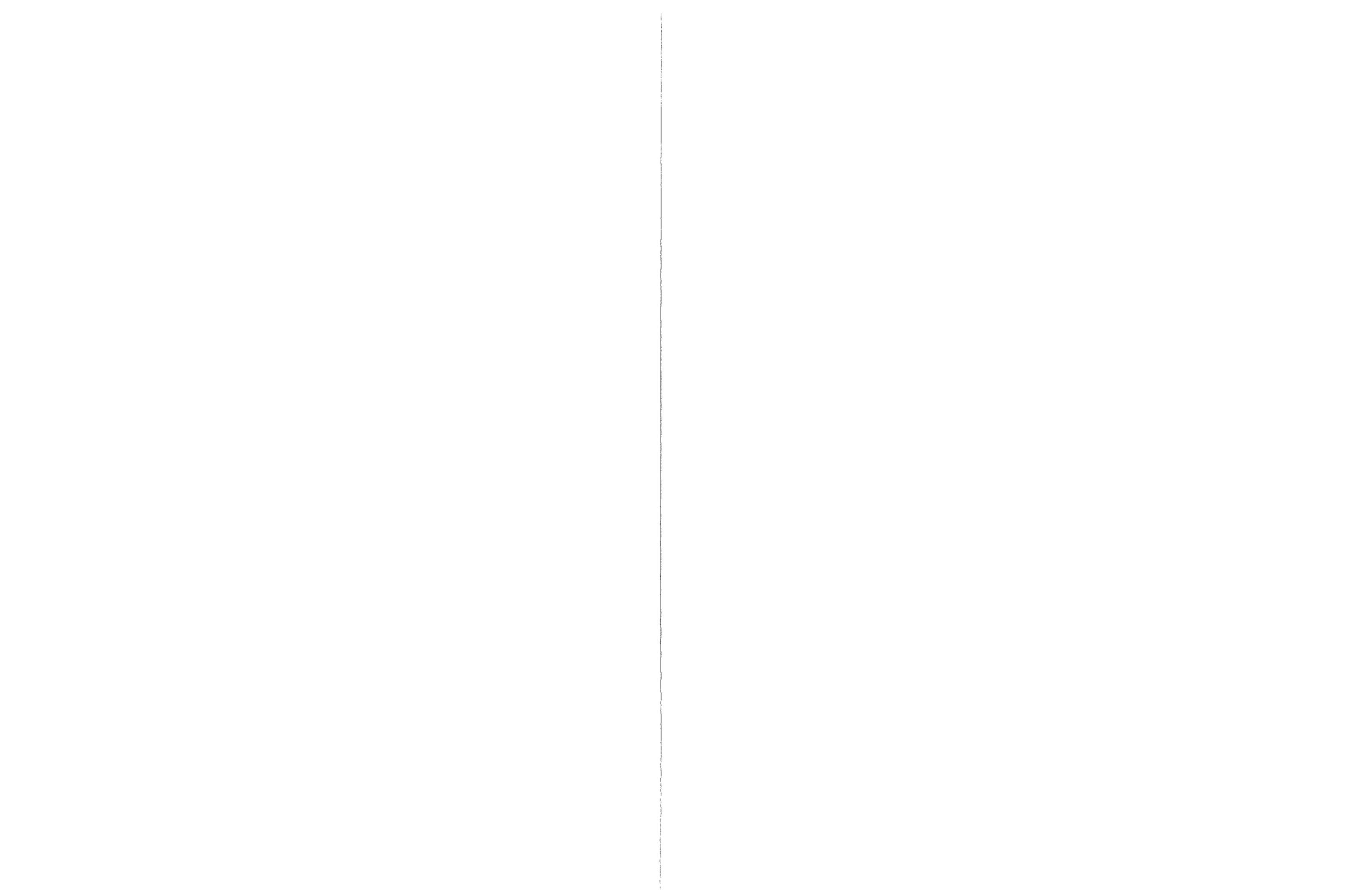
Species Controlled	Effectiveness of Control or Labeled Use	
	Aqua-Kleen®	Navigat®
<i>Potamogeton spp.</i> Pondweed	No Efficacy Claimed <sup>7</sup>	No Efficacy Claimed
<i>Ceratophyllum spp.</i> Coontail	Labeled Use Fair Control <sup>2</sup>	Labeled Use Fair Control <sup>2</sup>
<i>Hydrilla verticillata</i> Hydrilla	No Efficacy Claimed	No Efficacy Claimed
<i>Myriophyllum spicatum</i> Eurasian watermilfoil	Labeled Use Excellent Control <sup>2</sup>	Labeled Use Excellent Control <sup>2</sup>
<i>Myriophyllum spp.</i> Milfoil	Labeled Use Excellent Control <sup>1</sup>	Labeled Use Excellent Control <sup>1</sup>
<i>Myriophyllum heterophyllum</i> Variable leaf milfoil	Labeled Use Excellent Control <sup>1</sup>	Labeled Use Excellent Control <sup>1</sup>
<i>Brasenia spp.</i> Watershield	Labeled Use Excellent Control <sup>2</sup>	Labeled Use Excellent Control <sup>2</sup>
<i>Utricularia spp.</i> Bladderwort	Labeled Use Fair Control <sup>6</sup> Good Control <sup>3</sup>	Labeled Use Fair Control <sup>6</sup> Good Control <sup>3</sup>
<i>Heteranthera spp.</i> Water stargrass	Labeled Use	Labeled Use
<i>Sparganium spp.</i> Bur reed	No Efficacy Claimed	No Efficacy Claimed
<i>Hygrophilla polysperma</i> Hygrophila	No Efficacy Claimed	No Efficacy Claimed
<i>Lythrum salicaria</i> Purple loosestrife	No Efficacy Claimed	No Efficacy Claimed
<i>Egeria densa</i> Brazilian elodea	No Efficacy Claimed	No Efficacy Claimed
<i>Myriophyllum aquaticum</i> Parrotfeather	Labeled Use Excellent Control <sup>1,2</sup>	Labeled Use Excellent Control <sup>1,2</sup>
<i>Cabomba caroliniana</i> Fanwort	Fair Control <sup>4</sup> No Efficacy Claimed	Fair Control <sup>4</sup> No Efficacy claimed
<i>Tamarix ramosissima</i> Saltcedar	No Efficacy Claimed	No Efficacy Claimed
<i>Amorpha fruticosa</i> Indigobush	No Efficacy Claimed	No Efficacy Claimed
<i>Polygonum sacalinense</i> Giant knotweed	No Efficacy Claimed	No Efficacy Claimed
<i>Polygonum cuspidatum</i> Japanese knotweed	No Efficacy Claimed	No Efficacy Claimed



**Table 2: Species Controlled, Effectiveness of Control and Registration Status for Control of Listed Species (Continued)**

Species Controlled	Effectiveness of Control or Labeled Use	
	Aqua-Kleen®	Navigate®
<i>Lysimachia vulgaris</i> Garden loosestrife	No Efficacy Claimed	No Efficacy Claimed
<i>Phalaris arundinacea</i> Reed canarygrass	No Efficacy Claimed	No Efficacy Claimed Labeled Use
<i>Typha</i> Spp. Cattail	Labeled Use Fair Control <sup>5</sup> Good Control <sup>4</sup>	Fair Control <sup>5</sup> Good Control <sup>4</sup>
<i>Elodea canadensis</i> American waterweed	No Efficacy Claimed	No Efficacy Claimed
<i>Nuphar</i> spp. Spatterdock	Labeled Use Fair Control <sup>5</sup> Excellent Control <sup>2</sup>	Labeled Use Fair Control <sup>5</sup> Excellent Control <sup>2</sup>
<i>Nymphaea</i> spp. Fragrant water lilies	Labeled Use Good Control <sup>3</sup> Excellent Control <sup>2</sup>	Labeled Use Good Control <sup>3</sup> Excellent Control <sup>2</sup>
<i>Hydrilla</i>	No Efficacy Claimed	No Efficacy Claimed
<i>Spartina</i> Smooth cordgrass	No Efficacy Claimed	No Efficacy Claimed
<i>Phragmites australis</i> . Common reed	No Efficacy Claimed	No Efficacy Claimed
<i>Trapa natans</i> Water chestnut	Labeled Use Good Control <sup>4</sup>	Labeled Use Good Control <sup>4</sup>
Algae species	No Efficacy Claimed	No Efficacy Claimed

- 1 (Robinette, 1998-1999)
- 2 (Westerdahl et al., 1988)
- 3 (Robinette, 1998-1999)
- 4 (Westerdahl et al., 1988)
- 5 (Robinette, 1998-1999)
- 6 (Westerdahl et al., 1988)
- 7 No Efficacy Claimed = The indicated formulation has not been shown to control this species. Not listed as a controlled species on the label.



## **HERBICIDE APPLICATION**

### **RESIDENTIAL AND BUSINESS NOTICE**

**Liberty Lake will be treated with aquatic herbicide(s) on/or between July 3<sup>rd</sup> and July 14<sup>th</sup> of 2003.**

**Attached is a map of the area(s) to receive treatment. Notices will be posted at the shoreline just prior to treatment. They will also be posted at all boat launches on the waterbody within 1.5 mile of the herbicide treatment area.**

**The herbicide(s) and active ingredient(s) to be used are: AquaKleen or similar 2,4-D based product (active ingredient 2,4-D)**

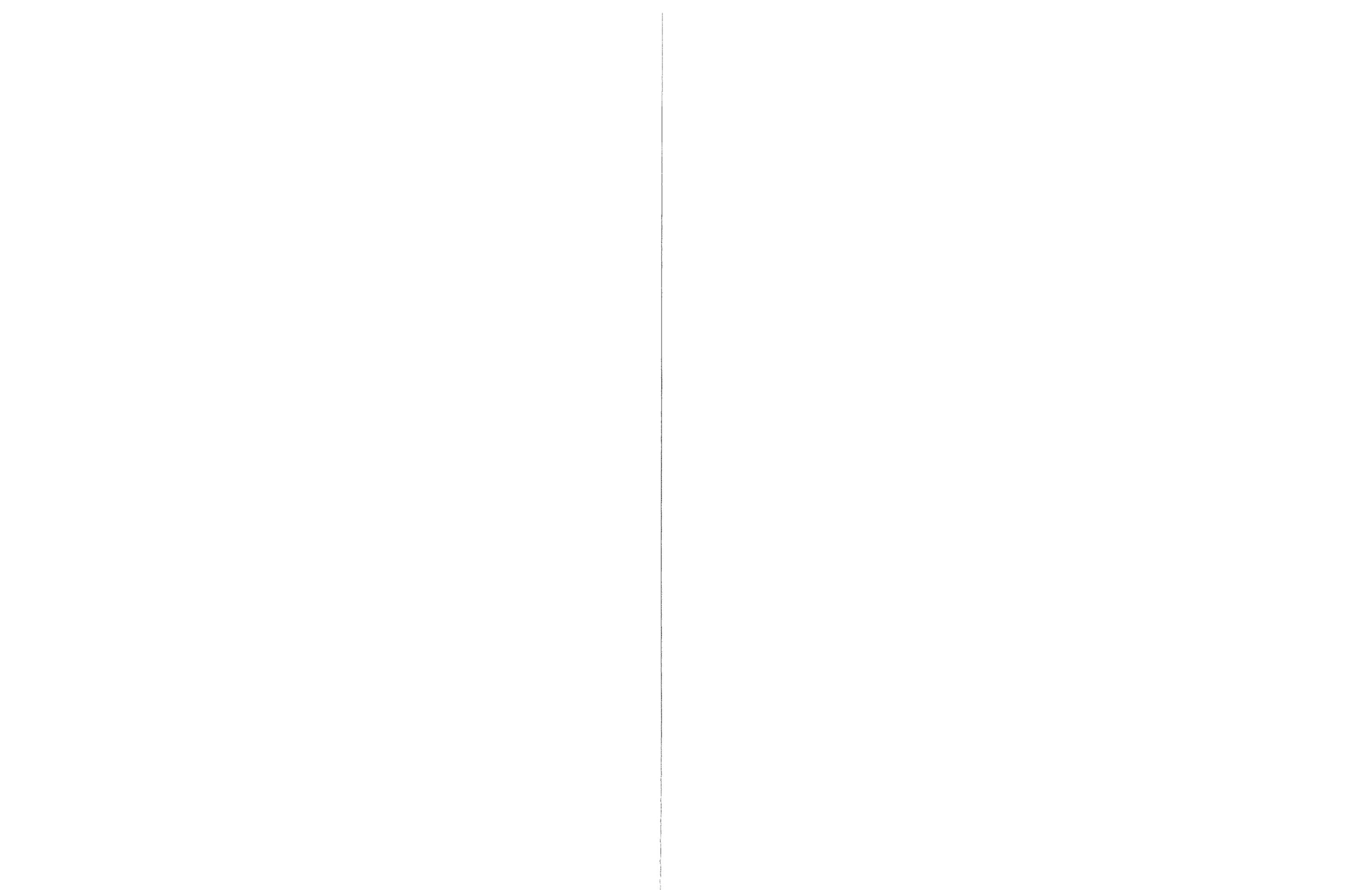
**Please obey the following use restrictions within the marked treatment areas: Do not use treated water for irrigation or agricultural purposes until herbicide levels drop below 0.1 ppm . Do not use treated water for domestic purposes until the herbicide levels drop below 0.07 ppm. This generally occurs within 72 hours or sooner. The lake will be sampled. If you wish to know when this level has been reached you can email us at [terry@aquatechnex.com](mailto:terry@aquatechnex.com).**

**Herbicides to be used, their water restrictions, and the dates and locations of treatment(s) scheduled for the remainder of the season are: AquaKleen or similar product: Do not use treated water for irrigation or agricultural purposes until herbicide levels drop below 0.1 ppm . Do not use treated water for domestic purposes until the herbicide levels drop below 0.07 ppm. This generally occurs within 72 hours or sooner. The lake will be sampled. If you wish to know when this level has been reached you can email us at [terry@aquatechnex.com](mailto:terry@aquatechnex.com).**

**Additional treatments may be made, as necessary, every two weeks after the initial treatment within the treatment area(s) until the permit expires.**

**For more information contact the Applicator at:  
AquaTechnex, LLC.  
[www.aquatechnex.com](http://www.aquatechnex.com)  
360-330-0152**

**This herbicide treatment is regulated under a permit issued by the Department of Ecology, Water Quality Program and administered by the Washington Department of Agriculture. These herbicides have been approved for this purpose by EPA and the State Department of Agriculture.**



# NOTICE

AquaKleen (2,4-D) will be applied under permit to these waters on Thursday, July 10th to control Eurasian Milfoil.

There are NO swimming restrictions

For your safety, please obey the following restrictions in this area marked with signs:

Do not use treated water for irrigation or agricultural purposes until herbicide levels drop below 0.1 ppm. Do not use treated water for domestic purposes until the herbicide levels drop below 0.07 ppm. This generally occurs within 72 hours or sooner.

The herbicides in use are AquaKleen (2,4-D)

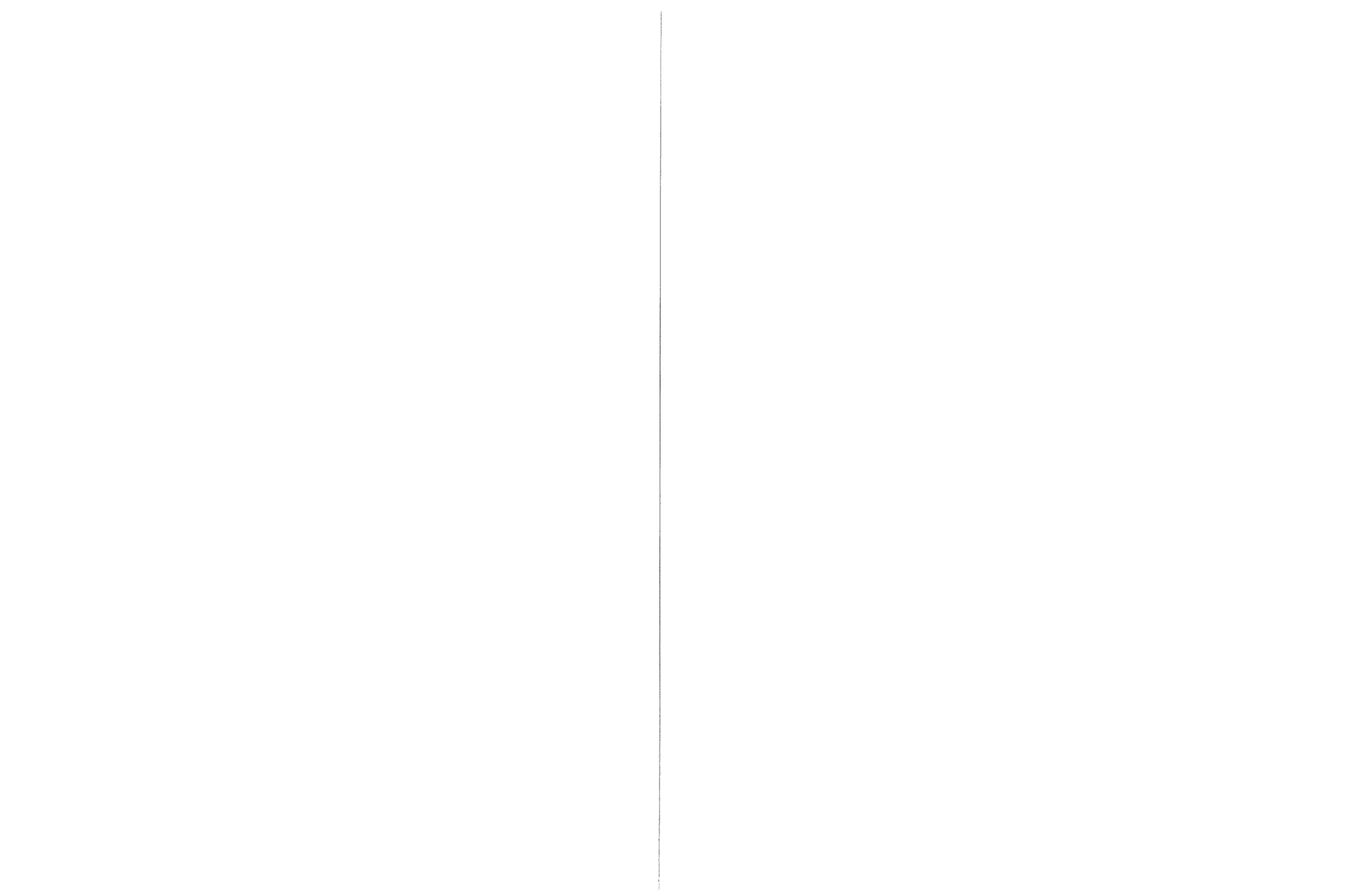
For more information contact the Applicator:

AquaTechnex, Inc.

Phone no.: 360-330-0152

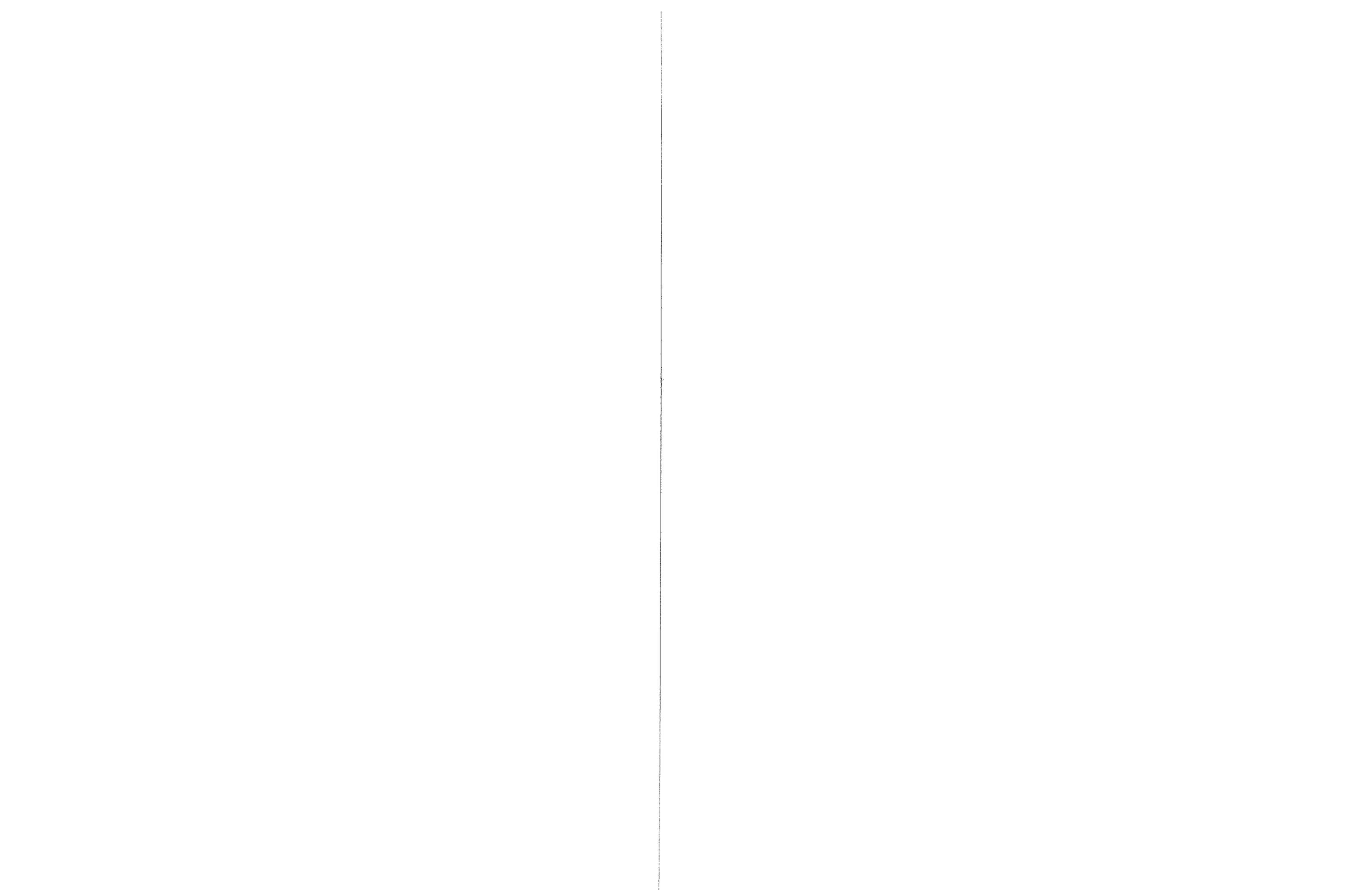
[www.aquatechnex.com](http://www.aquatechnex.com)  
[info@aquatechnex.com](mailto:info@aquatechnex.com)

PLEASE DO NOT REMOVE THIS SIGN UNTIL 2 days after application.

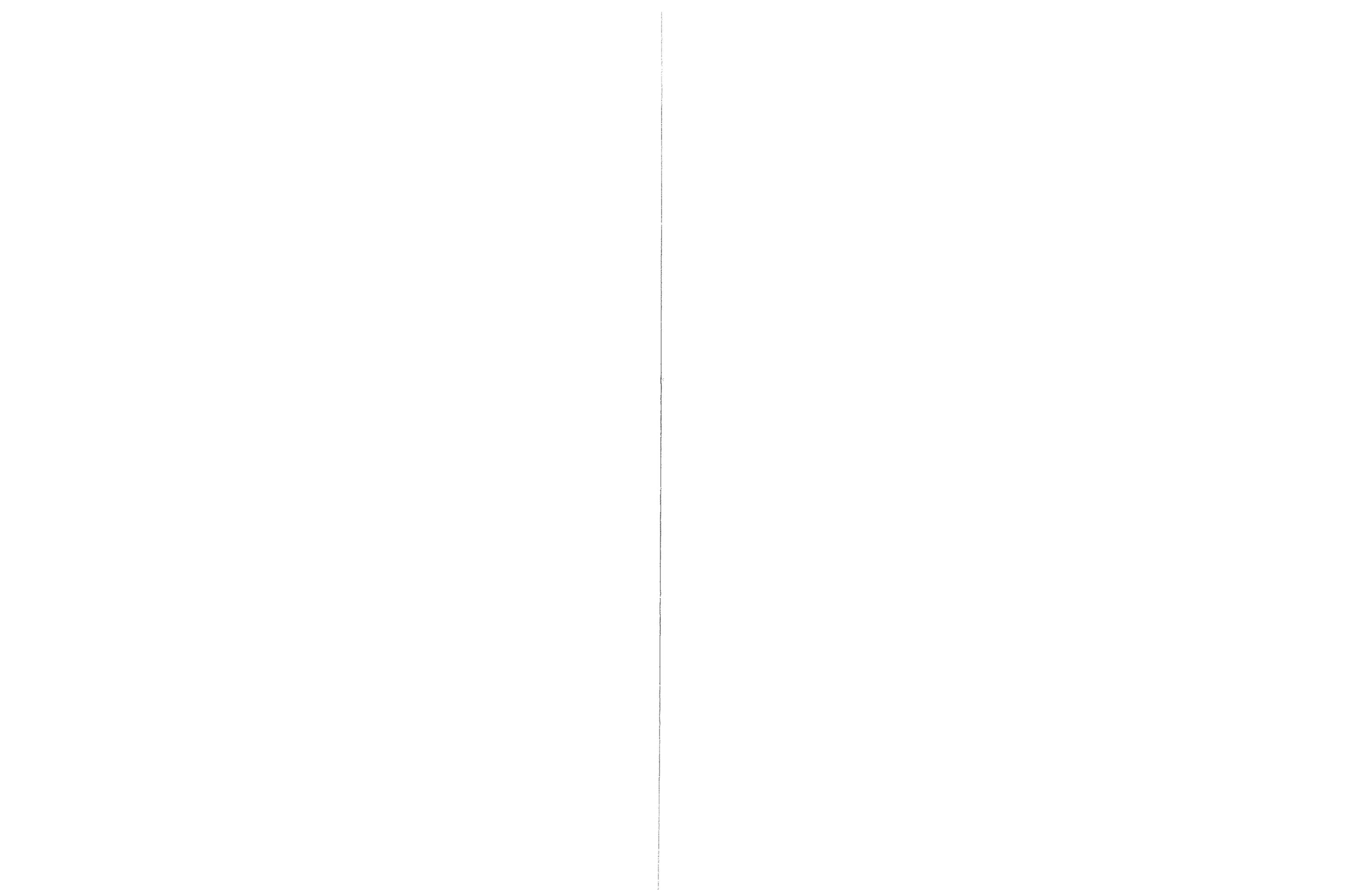


**APPENDIX I: Public meetings on Eurasian watermilfoil and Aquatic Weed Management**  
 Plan work hours and work completed

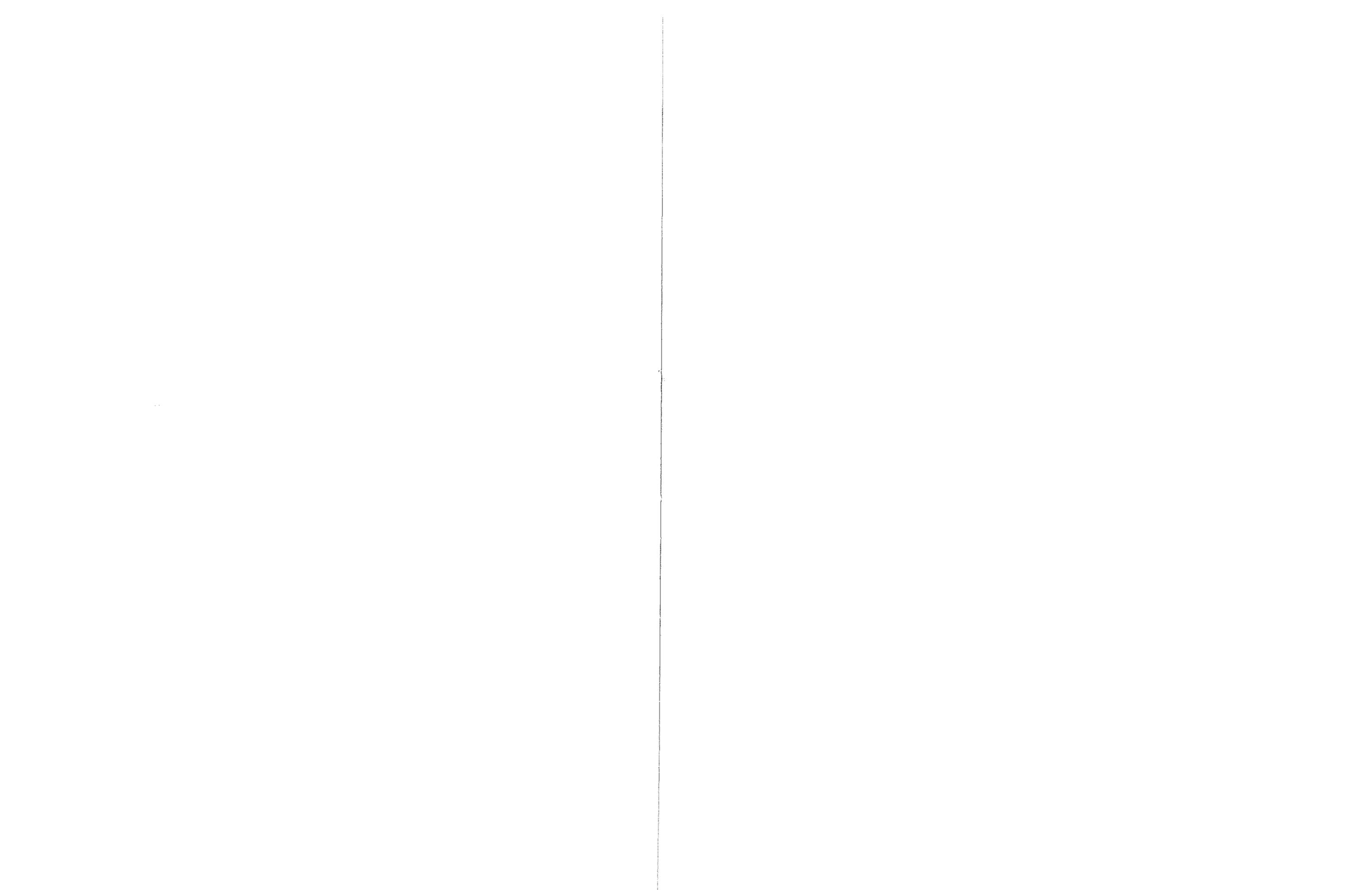
<u>Public Meetings/Information on Eurasian watermilfoil for AWMP</u>			
Date	Type	# People	Notes
May-02	Newsletter	3500	Milfoil status
5/15/2002	Watershed	10	Milfoil status and survey
6/18/2002	Watershed	10	Report on milfoil survey (early survey results and next survey to be conducted)
6/20/2002	Board	9	Report on Lake activities and Milfoil status (early survey result and next survey to be conducted)
7/24/2002	Watershed	15	Lake tour, aquatic plant ID, P.E., milfoil survey and ID
9/10/2002	Staff	8	Conference with Dr. Moore on hand harvesting in the south
Oct-02	Newsletter	3500	Milfoil status
10/2/2002	Watershed	9	Milfoil update (1st hand harvest of 100 lbs wet, 2nd hand harvest 30 lbs wet, possible 3rd hand harvest)
11/5/2002	Staff	10	Milfoil survey last one before winter
12/10/2002	Staff	9	Milfoil locations map
1/8/2003	Watershed	10	02 Survey result discussion, AWMP discussion, Milfoil signs at county park, notification of residents of milfoil on their property, Splash write-up
2/4/2003	Staff	9	AWMP updates/work
3/26/2003	Watershed	10	Kids in the Creek



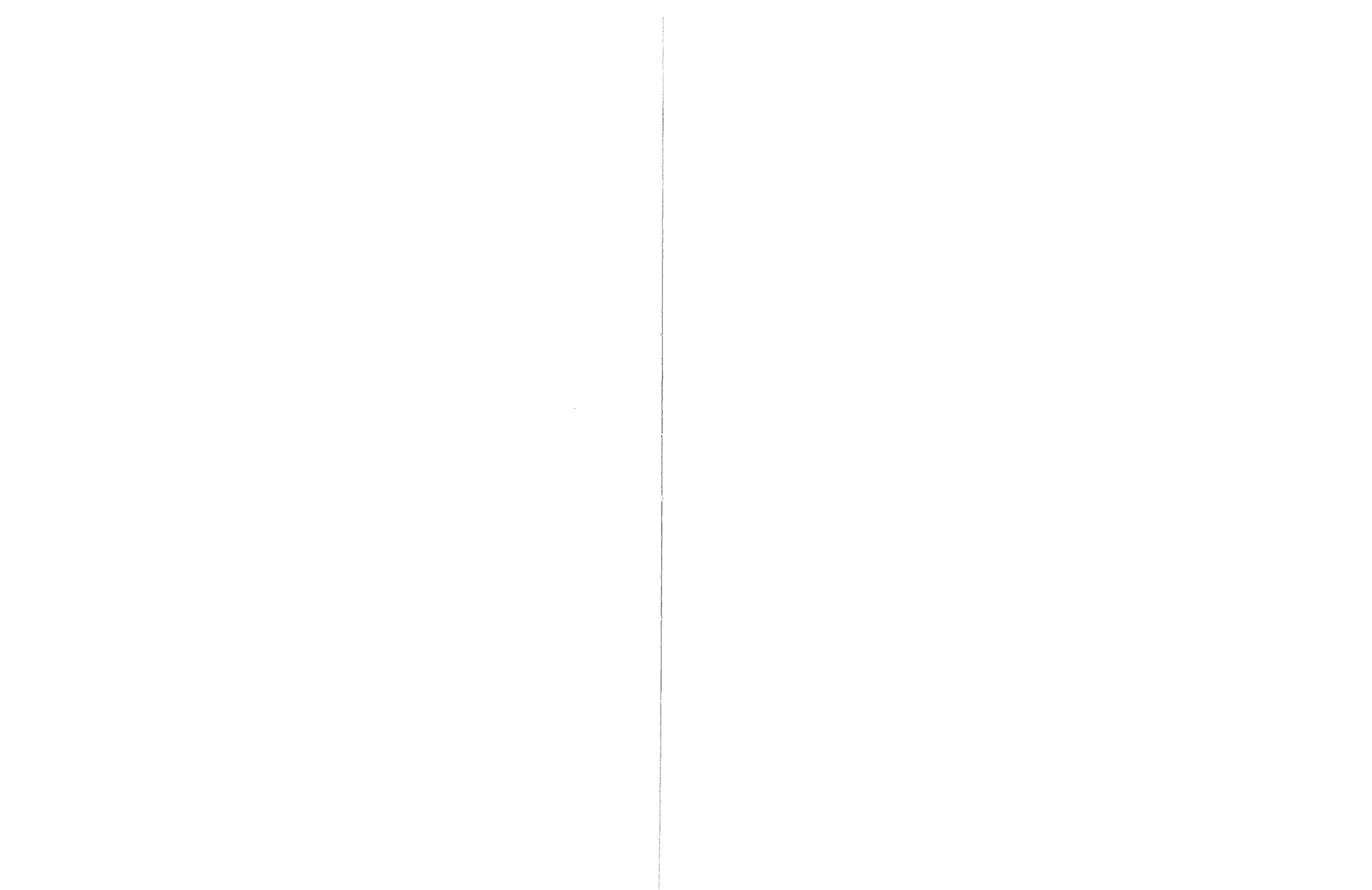
4/30/2003	Watershed	10	Kids in the Creek/WALPA, milfoil survey, treatment schedule, work with Newman
May-03	Newsletter	3500	Milfoil status
5/29/2003	Staff	7	Early survey results
6/4/2003	Watershed	10	Milfoil status (meeting with Terry M and treatment schedule
6/17/2003	Staff	7	Survey for treatment
8/12/2003	Staff	7	AWMP status, Status of milfoil and treatment, new survey results of additional plants, treatment plan and schedule
8/26/2003	Staff	8	AWMP status, Status of milfoil and treatment, new survey results, additional treatment plan
9/23/03	Staff	8	AWMP status, milfoil status
9/24/03	Watershed	9	AWMP status, milfoil treatment status, survey results, public review process of AWMP
11/5/03	Regional Lakes Conference Society of Inland Northwest Environmental Scientists (SINES)	21	Public presentation on Aquatic Weed Management Plan
1/14/04		25	Public presentation on Aquatic Weed Management Plan and funding



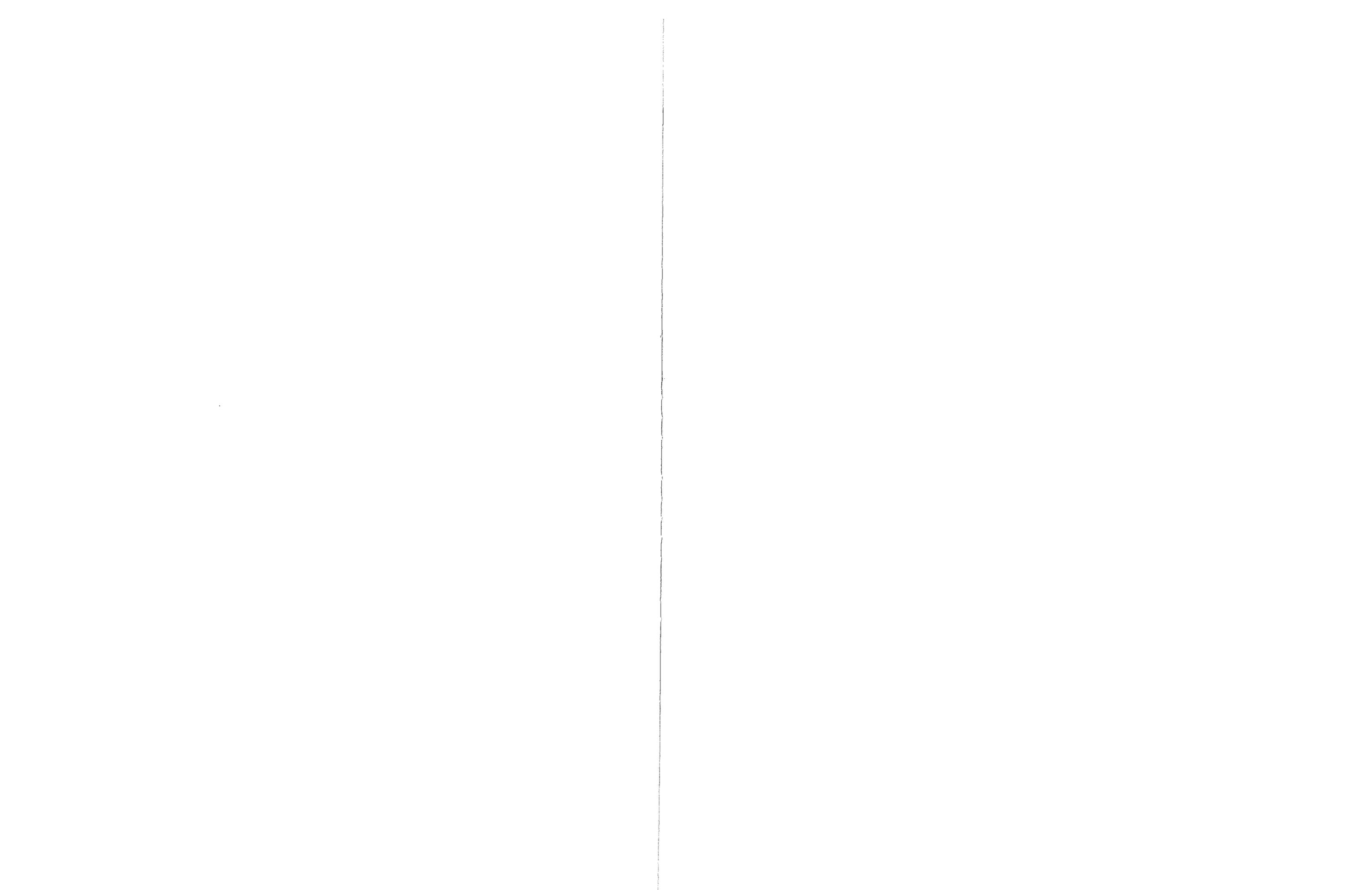
<u>Aquatic Weed Management Plan Hours and Work Completed</u>			
<u>Date</u>	<u># of People</u>	<u>Time Spent (Hours)</u>	<u>Work Completed</u>
09/20/02	1 (Lake Manager Report to LLSWD Manager and Commission)	1	Report
10/01/02	2 (1 Lake Manager, 1 WSU grad student)	2	Survey
10/02/02	11 (Lake Manager, 1 LLSWD Manager, 9 WAG Members)	0.5	Meeting
10/03/02	2 (1 Lake Manager, 1 LLSWD Manager)	2	Meeting
10/08/02	2 (1 Lake Manager, 1 Dr. Moore)	0.5	Meeting
10/10/02	1 (Lake Manager)	1	Newsletter Articles
10/17/02	3 (1 Lake Manager, 1 Dr. Moore, 1 WSU Grad student)	3	Survey
10/21/02	1 (Lake Manager)	1	Info handouts at admin bld.
10/22/02	2 (1 Lake Manager, 1 Newman Lake Rep)	0.5	Meeting
10/24/02	2 (1 Lake Manager, 1 LLSWD Commissioner)	0.5	Meeting
11/01/02	4 (1 Lake Manager, 3 WSU grad students)	1	Survey
11/01/02	1 (Lake Manager Report to LLSWD Manager and Commission)	1	Report
11/04/02	2 (1 Lake Manager, 1 LLSWD Commissioner)	0.5	Meeting
11/05/02	9 (LLSWD employee meeting)	0.5	Meeting
11/06/02	2 (1 Lake Manager, 1 Dr. Moore)	0.5	Meeting
11/13/02	10 (Lake Manager, 1 LLSWD Manager, 8 WAG Members)	0.5	Meeting
11/20/02	3 (2 LLSWD Operators Mike/John and 1 Lake Manager)	3	GPS Survey (25 points collected)
11/20/02	1 (Lake Manager)	3	GPS/GIS mapping
11/22/02	1 (Lake Manager)	2	Letters and Maps to WAG members (12 Letters)
12/10/02	9 (LLSWD employee meeting)	0.5	Meeting
12/19/02	1 (Lake Manager)	2	Map
12/23/02	1 (Lake Manager)	1	Map
01/08/03	10 (Lake Manager, 1 LLSWD Manager, 8 WAG Members)	0.5	Meeting
01/08/03	1 (Lake Manager)	2	Education-Documentation
01/08/03	11 (Lake Manager, 1 LLSWD Manager, 9 WAG Members)	0.5	Meeting
01/14/03	1 (Lake Manager)	2	Milfoil status map (Splash)
01/15/03	1 (Lake Manager)	1	Milfoil status map (Splash)
01/21/03	3 (1 Lake Manager, 1 LLSWD Manager, 1 AquaTechnex Rep.)	2	Meeting and constructed map
01/22/03	2 (1 Lake Manager, 1 Dr. Moore)	0.5	Meeting



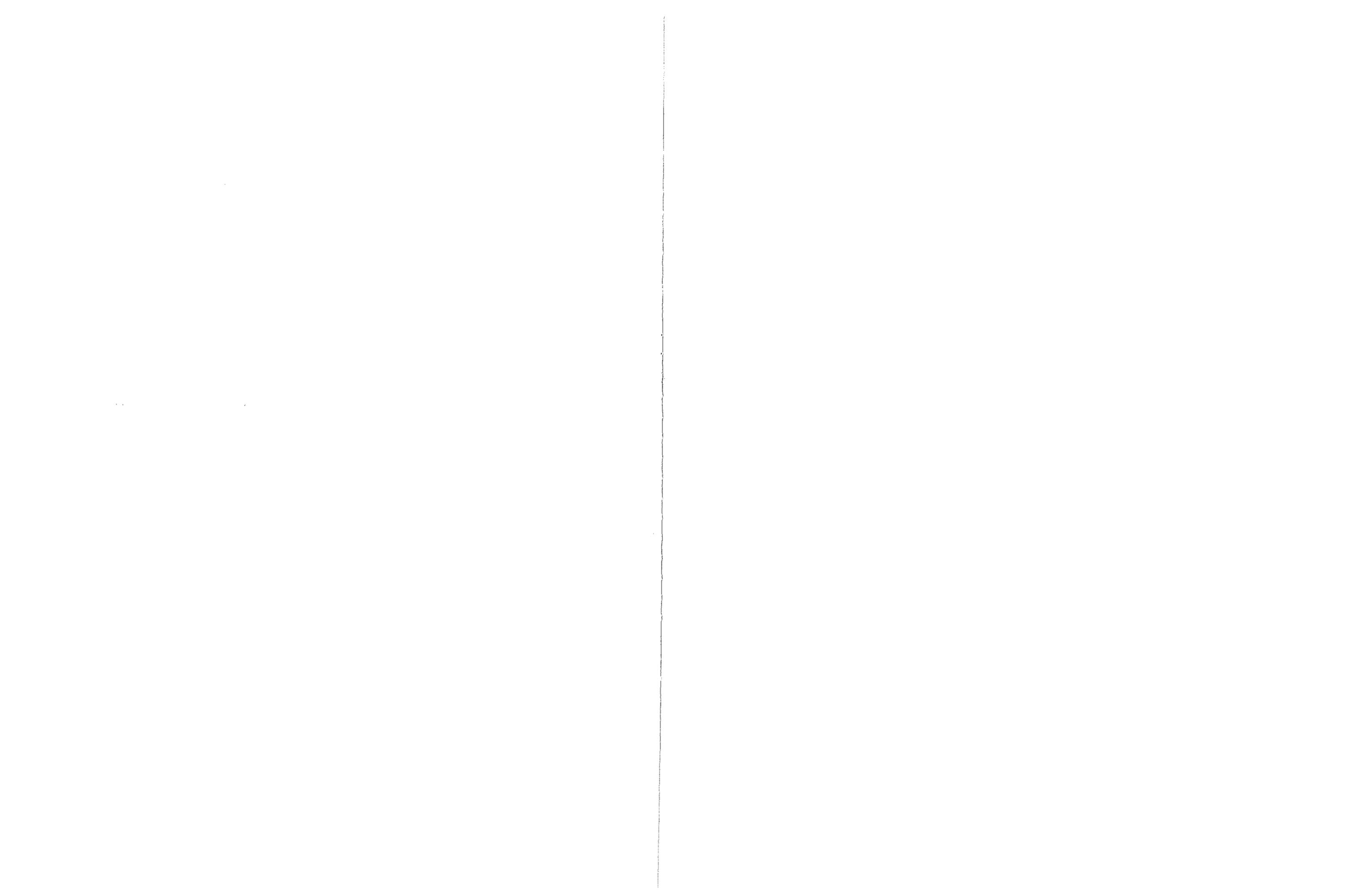
01/23/03	1 (Lake Manager)		0.5	Meeting
01/23/03	1 (Lake Manager)		0.5	Milfoil status map (Splash) published
02/04/03	9 (LLSWD employee meeting)		0.5	Meeting
02/19/03	10 (Lake Manager, 1 LLSWD Manager, 8 WAG Members)		0.5	Meeting
03/26/03	10 (Lake Manager, 1 LLSWD Manager, 8 WAG Members)		0.5	Meeting
04/01/03	2 (1 Lake Manager, 1 concerned citizen)		0.5	Meeting
04/04/03	1 (Lake Manager)		1	WALPA Presentation
04/11/03	8 (1 Lake Manager, DR. Funk, Dr. Strand, 6 CE 495 students)		1	Tour
4/21/03 - 5/21/03	870 5th graders + 1 Lake Manager		7.5	Education
04/28/03	2 (1 Lake Manager, 1 citizen)		0.5	Education
04/30/03	12 (Lake Manager, 1 LLSWD Manager, 10 WAG Members)		0.5	Meeting
04/30/03	2 (1 Lake Manager, 1 Dr. Moore)		0.5	Meeting
05/06/03	2 (1 Lake Manager, 1 Dr. Moore)		0.5	Meeting
05/20/03	2 (1 Lake Manager, 1 citizen-Don Limmer)		2	Survey
05/21/03	1 (Lake Manager)		1	Education-Newsletter
05/22/03	2 (1 Lake Manager, 1 Newman Lake Rep)		1	Meeting
05/23/03	2 (1 Lake Manager, 1 concerned citizen)		0.5	Meeting
05/28/03	2 (1 Lake Manager, 1 AquaTechnex Rep.)		1	Meeting
06/04/03	12 (Lake Manager, 1 LLSWD Manager, 10 WAG Members)		0.5	Meeting
06/10/03	1 (Lake Manager)		7	Report
06/11/03	2 (1 Lake Manager, 1 AquaTechnex Rep.)		0.5	Meeting
06/11/03	1 (Lake Manager)		4	Report
06/12/03	1 (Lake Manager)		1	Report
06/13/03	1 (Lake Manager)		1	Report
06/13/03	2 (1 Lake Manager, 1 Dr. Moore)		1	Report
06/16/03	2 (1 Lake Manager, 1 Dr. Moore)		4	Survey
06/18/03	9 (1 Lake Manager, 3 Commissioners, 1 LLSWD Manager, 4 Public attendees)		0.5	Meeting
06/19/03	1 (Lake Manager)		1	Report
06/20/03	2 (1 Lake Manager, 1 AquaTechnex Rep.)		0.5	Meeting
06/24/03	1 (Lake Manager)		1	Report
06/24/03	2 (1 Lake Manager, 1 Dr. Moore)		3	Survey



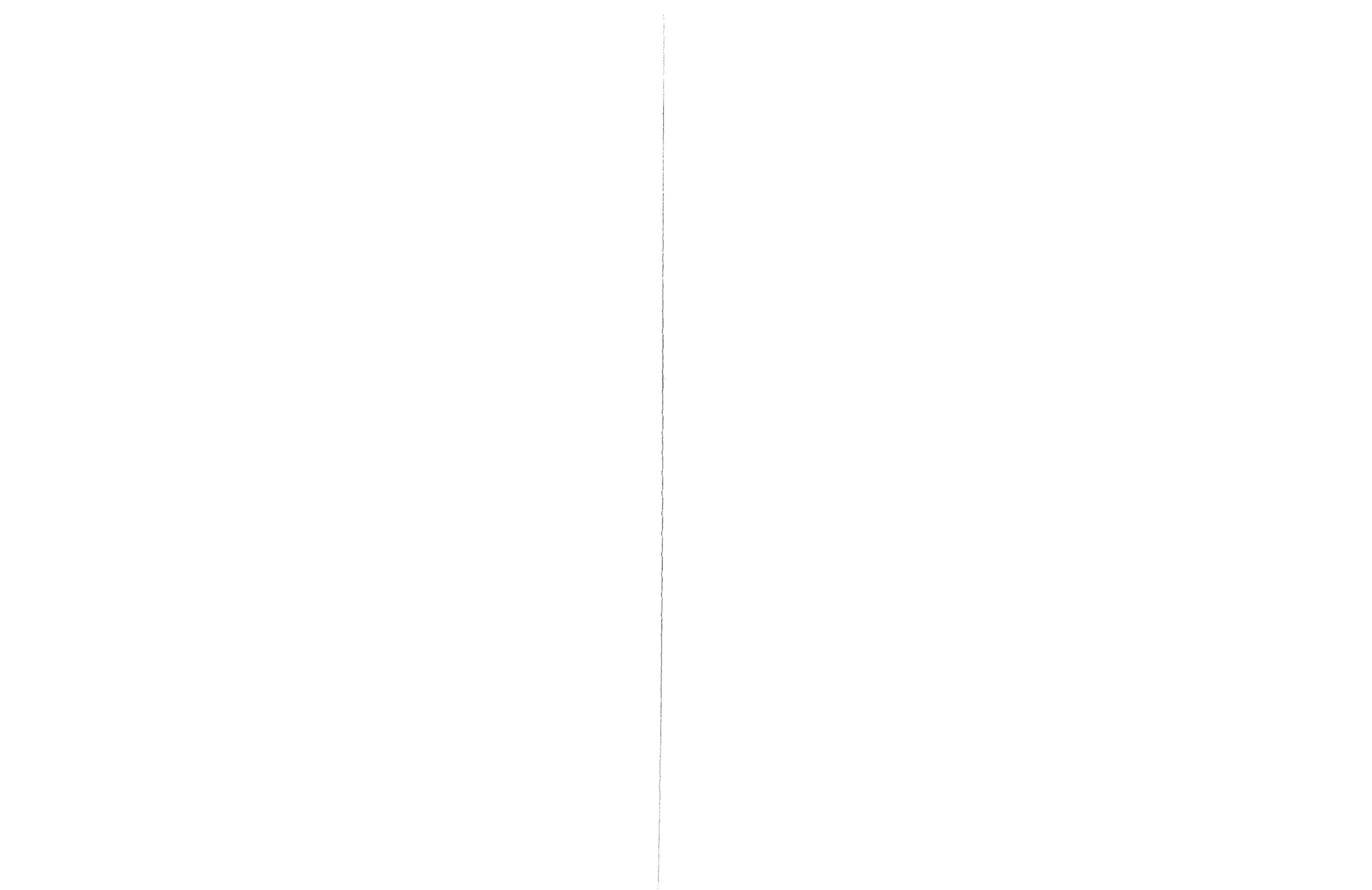
06/26/03	1 (Lake Manager)		6	Report
06/27/03	1 (Lake Manager)		8	Report
06/30/03	1 (Lake Manager)		6	Report
06/30/03	1 (Lake Manager Report to LLSWD Manager and Commission)		1	Report
07/10/03	3 (Lake Manager, 2 Aqua Technex Employees		2.5	Survey/Treatment
07/10/03	1 (Lake Manager)		2	Survey
07/11/03	1 (Lake Manager)		6	Report
07/11/03	1 (Lake Manager Report to LLSWD Manager and Commission)		1	Mapping
07/14/03	1 (Lake Manager)		0.5	Report
07/15/03	1 (Lake Manager)		2	Report
07/16/03	2 (1 LLSWD Operator Larry and 1 Lake Manager)		1	Survey
07/16/03	1 (Lake Manager)		3.5	Report
07/16/03	1 (Lake Manager Report to LLSWD Manager and Commission)		1	Report
07/17/03	1 (Lake Manager)		4	Report
07/18/03	1 (Lake Manager)		2	Report
07/21/03	1 (Lake Manager)		6	Report
07/22/03	1 (Lake Manager)		6	Report
07/22/03	2 (1 LLSWD Employee Ty and 1 Lake Manager)		1	Survey
07/25/03	1 (Lake Manager)		3	Report
07/28/03	1 (Lake Manager)		6	Report
07/29/03	1 (Lake Manager)		5	Report
07/30/03	1 (Lake Manager)		3	Report
07/30/03	3 (Lake Manager, 2 WSU grad students		1	Survey
07/31/03	1 (Lake Manager)		5	Report
07/31/03	1 (Lake Manager)		1	Map
08/01/03	1 (Lake Manager)		6	Report
08/04/03	1 (Lake Manager)		4	Report
08/05/03	1 (Lake Manager)		6	Report
08/06/03	1 (Lake Manager)		3	Report
08/06/03	2 (1 LLSWD Employee Larry and 1 Lake Manager)		3	Survey
08/07/03	2 (1 Lake Manager, 1 Dr. Moore)		2	Survey
08/07/03	1 (Lake Manager)		4	Report



08/08/03	1 (Lake Manager)		4	Report
08/11/03	1 (Lake Manager)		3	Report
08/11/03	2 (1 LLSWD Employee Larry and 1 Lake Manager)		2	Survey
08/12/03	1 (Lake Manager)		2	Report
08/13/03	1 (Lake Manager)		4	Report
08/15/03	1 (Lake Manager)		4	Report
08/18/03	1 (Lake Manager)		6	Report
08/19/03	1 (Lake Manager)		5	Report
08/20/03	1 (Lake Manager)		8	Report
08/21/03	1 (Lake Manager)		3	Report
08/22/03	1 (Lake Manager)		3	Report
08/25/03	1 (Lake Manager)		3	Report
08/26/03	1 (Lake Manager)		2	Report
08/27/03	1 (Lake Manager)		4	Report
08/28/03	1 (Lake Manager)		2	Report
08/28/03	2 (1 Lake Manager, 1 Dr. Moore)		3	Treatment
08/29/03	1 (Lake Manager)		1	Report
09/04/03	1 (Lake Manager)		2	Report
09/05/03	1 (Lake Manager)		6	Report
09/08/03	1 (Lake Manager)		6	Report
09/09/03	1 (Lake Manager)		6	Report
9/10/03	1 (Lake Manager)		4	Report
9/11/03	1 (Lake Manager)		8	Aquatic Weed School
9/11/03	1 (Dr. Moore)		4	Milfoil Hand Harvest
9/12/03	1 (Lake Manager)		8	Aquatic Weed School
9/15/03	1 (Lake Manager)		3	Report
9/16/03	1 (Lake Manager)		5	Report
9/18/03	1 (Lake Manager)		3	Report
9/19/03	1 (Lake Manager)		3	Report
9/23/03	1 (Lake Manager)		3	Report
9/24/03	1 (Lake Manager)		9	Report
9/25/03	1 (Lake Manager)		6	Report



9/26/03	1 (Lake Manager)		6	Report
9/29/03	1 (Lake Manager)		5	Report
9/30/03	1 (Lake Manager)		5	Report
9/30/03	1 (Lake Manager)		1	Public Notice of Publication to Valley Herald
10/1/03	1 (Lake Manager)		3	Report (Draft Final-Copies made)
10/2/03	1 (Lake Manager)		1	Report (Draft copies mailed to DOE - Spokane and Olympia)
10/14/03	1 (Lake Manager)		1	Report
10/30/03	1 (Lake Manager)		2	Report
11/6/03	1 (Lake Manager)		2	Report
11/7/03	1 (Lake Manager)		6	Report
11/10/03	1 (Lake Manager)		4	Report
11/11/03	1 (Lake Manager)		3	Report
11/12/03	1 (Lake Manager)		2	Report
11/13/03	1 (Lake Manager)		2	Report
12/4/03	1 (Lake Manager)		1	Report
12/5/03	1 (Lake Manager)		4	Report
12/19/03	1 (Lake Manager)		1	Report
12/31/03	1 (Lake Manager)		2	Report
1/20/04	1 (Lake Manager)		1	Report
1/23/04	1 (Lake Manager)		2	Report
1/26/04	1 (Lake Manager)		3	Report
1/27/04	1 (Lake Manager)		1	Report
1/28/04	1 (Lake Manager)		2	Report
1/29/04	1 (Lake Manager)		1	Report
2/2/04	1 (Lake Manager)		2	Report
2/3/04	1 (Lake Manager)		2	Report
2/4/04	1 (Lake Manager)		1	Report
2/6/04	1 (Lake Manager)		2	Report
2/9/04	1 (Lake Manager)		1	Report
2/11/04	1 (Lake Manager)		2	Report
2/20/04	1 (Lake Manager)		2	Report



**APPENDIX J: Aquatic Weed Management Plan e-mails and letters**

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From: bijay adams [bijay@libertylake.org]  
Sent: Monday, August 26, 2002 8:20 AM  
To: Barry Moore (bcmoore@mail.wsu.edu)

Barry,

Good morning. Friday, before I removed the boat from Sandy Beach, I decided to take a tour around the lake parameter to look for milfoil. As I did, I found two smaller fragments floating in the water at the south end of the lake near the outlet of Liberty Creek. I collected one of the fragments (approximately 3in long) but lost the other in the water before collecting it. I was unable to locate any plants off the lake bottom from the boat, but maybe you would have better luck with diving. Anyway, just to let you know. I hope your weekend was well.

Take care,

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

---

From: Barry Moore [bcmoore@mail.wsu.edu]  
Sent: Monday, August 26, 2002 8:58 AM  
To: bijay adams

Bijay-

Thanks for letting me know about the milfoil. I have been planning to get up for a season-end check; given your finding, I want to get up sooner. If I can schedule it, I will come up on Thursday and/or Friday. Could you have the boat over at Sandy Beach for the end of the week?

Barry

---

From: Barry Moore [mailto:bcmoore@mail.wsu.edu]  
Sent: Tuesday, September 17, 2002 9:07 AM  
To: bijay adams

Bijay-

We were able to get out on Saturday to remove milfoil. It took about 5.5 hrs to cover the southern shoreline. There were quite a few plants, as I had seen a few weeks ago. Total removal was over about 100 lbs (wet); haven't finished weighing yet.  
Talk to you soon,



Barry

---

From: bijay adams [bijay@libertylake.org]  
Sent: Tuesday, September 17, 2002 9:29 AM  
To: 'Barry Moore'

Barry,

Thank you for the update, I will forward the information to the commissioners. Please let me know of the total removal when you finish weighing. Thanks again. Take care.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

---

From: bijay adams [bijay@libertylake.org]  
Sent: Tuesday, October 01, 2002 4:25 PM  
To: Barry Moore (bcmoore@mail.wsu.edu)

Barry,

Good afternoon. I just wanted to drop you a line to update you on our latest milfoil situation. Lisa and I found some more milfoil plants at the south-end of the lake today. Their relative location is approximately 10-15 feet out from those two large Pond Lilly crops (a beached dock on the marsh also marks the spot). Just driving by, we observed approximately 8 to 10 plants growing near the water surface. In addition, we also observed three small plants near the outlet of Liberty Creek just off the shore. Let me know what you think. Thanks Barry. Take care.

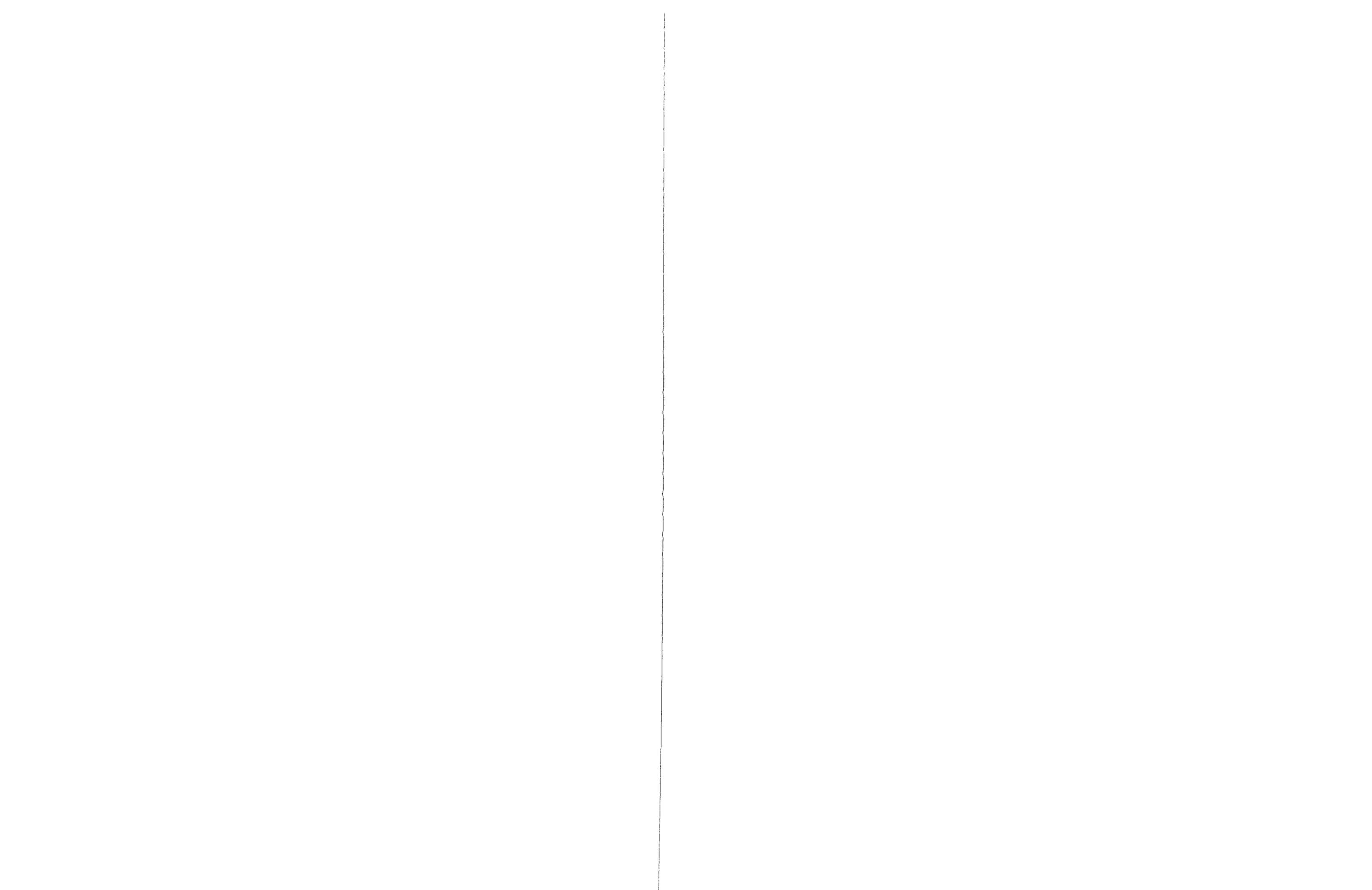
BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

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From: Barry Moore [bcmoore@mail.wsu.edu]  
Sent: Wednesday, October 02, 2002 10:37 AM  
To: bijay adams

Bijay-

Sounds like we have had some continuing growth in those areas with the continued sunshine and seasonably warmer temps. If you think the amount is removable by hand, I can get out next week. Also



would suggest that we plan on herbicide application next June, and make final decision based on May survey. Still think we have a good chance of at least minimizing treatment area if we can get most of the larger plants out this year.

Thanks,  
Barry

---

From: bijay adams [bijay@libertylake.org]  
Sent: Monday, October 21, 2002 3:18 PM  
To: Barry Moore (bcmoore@mail.wsu.edu)  
Subject: Milfoil

Barry,

Tom Agnew just stopped by and brought to me a bag of milfoil. He has indicated that he moved his dock and found a few plants growing up around that vicinity. I am not sure if you know where he lives, but he is near the bottom of Starr Ln, approximately half way between the County Park beach and Sandy Beach on the East side of the lake. I believe this is in a location where we have not found milfoil before. I just thought I would fill you in on the latest news. Thanks Barry. If you have any questions let me know. Talk to you later.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

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From: Barry Moore [bcmoore@mail.wsu.edu]  
Sent: Tuesday, October 22, 2002 1:39 PM  
To: bijay adams

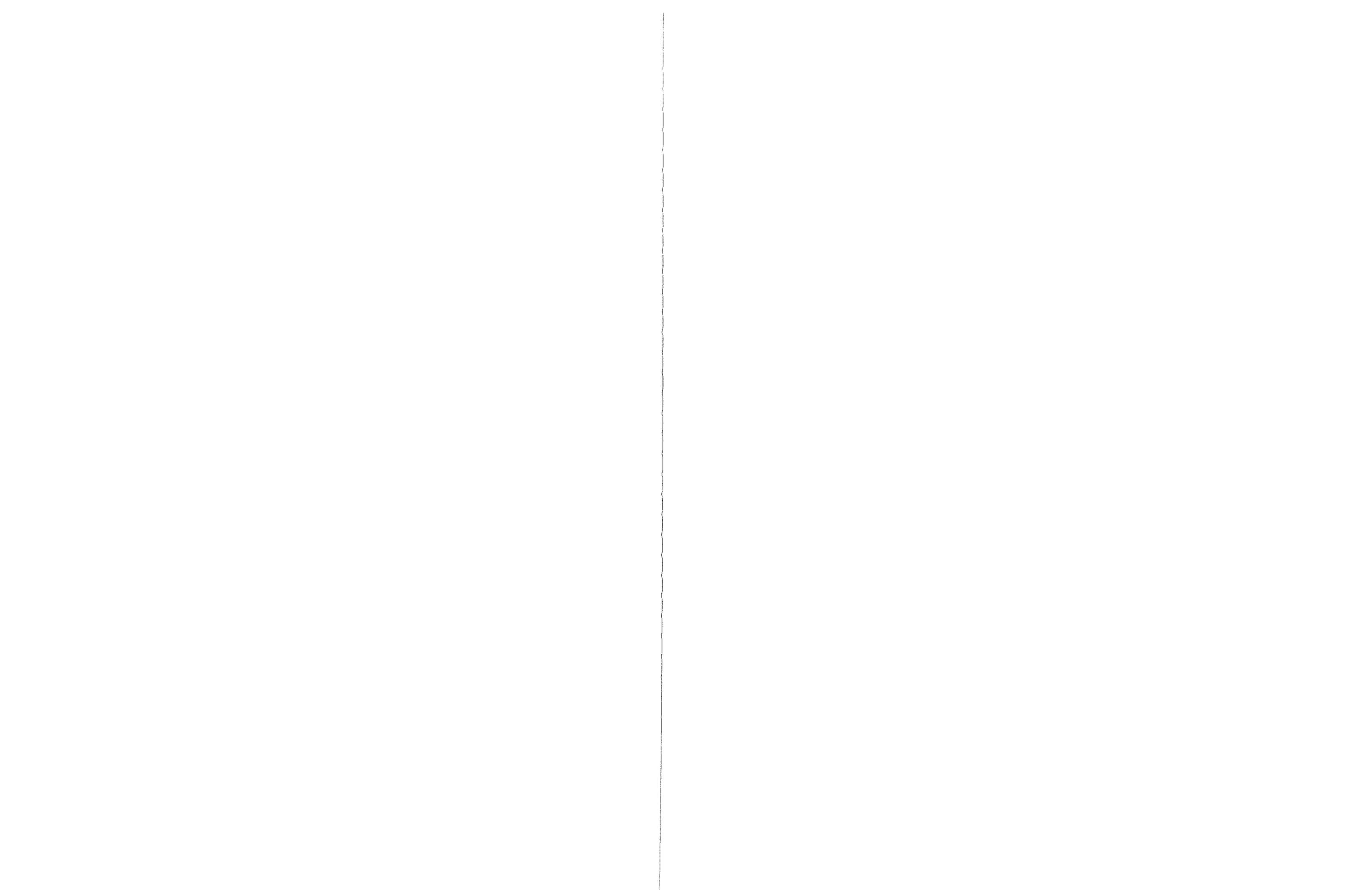
Bijay-

Well, more great news. Yes, this is completely new area. Could you tell how large the plants were? I want to get over and look around at these new plants before the winter sets in, Thanks for the update, and I'll talk to you soon,

Barry

---

From: bijay adams [bijay@libertylake.org]  
Sent: Tuesday, October 22, 2002 2:35 PM  
To: 'Barry Moore'  
Subject: RE: Milfoil



Barry,

To answer your question about how large the plants were, Tom indicated that they were large enough to be near the surface and he reached in off the dock and picked a sample. I was going to take a trip around and locate them here in the near future. I will keep you posted. Thanks

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: [bijay@libertylake.org](mailto:bijay@libertylake.org)

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From: [bijay adams \[bijay@libertylake.org\]](mailto:bijay@libertylake.org)  
Sent: Wednesday, November 20, 2002 4:30 PM  
To: Barry Moore ([bcmoore@mail.wsu.edu](mailto:bcmoore@mail.wsu.edu))

Barry,

Today I did a real comprehensive survey from the boat with help from two other co-workers. We found extensive milfoil locations. Here is a map indicating the milfoil locations to date. Please call me when you have a chance and we can go through it. Thanks. Take care. I hope you are feeling better.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: [bijay@libertylake.org](mailto:bijay@libertylake.org)

---

From: [beth cocch \[mailto:liberty4@earthlink.net\]](mailto:bethcocch@earthlink.net)  
Sent: Wednesday, November 27, 2002 7:35 AM  
To: BiJay Adams

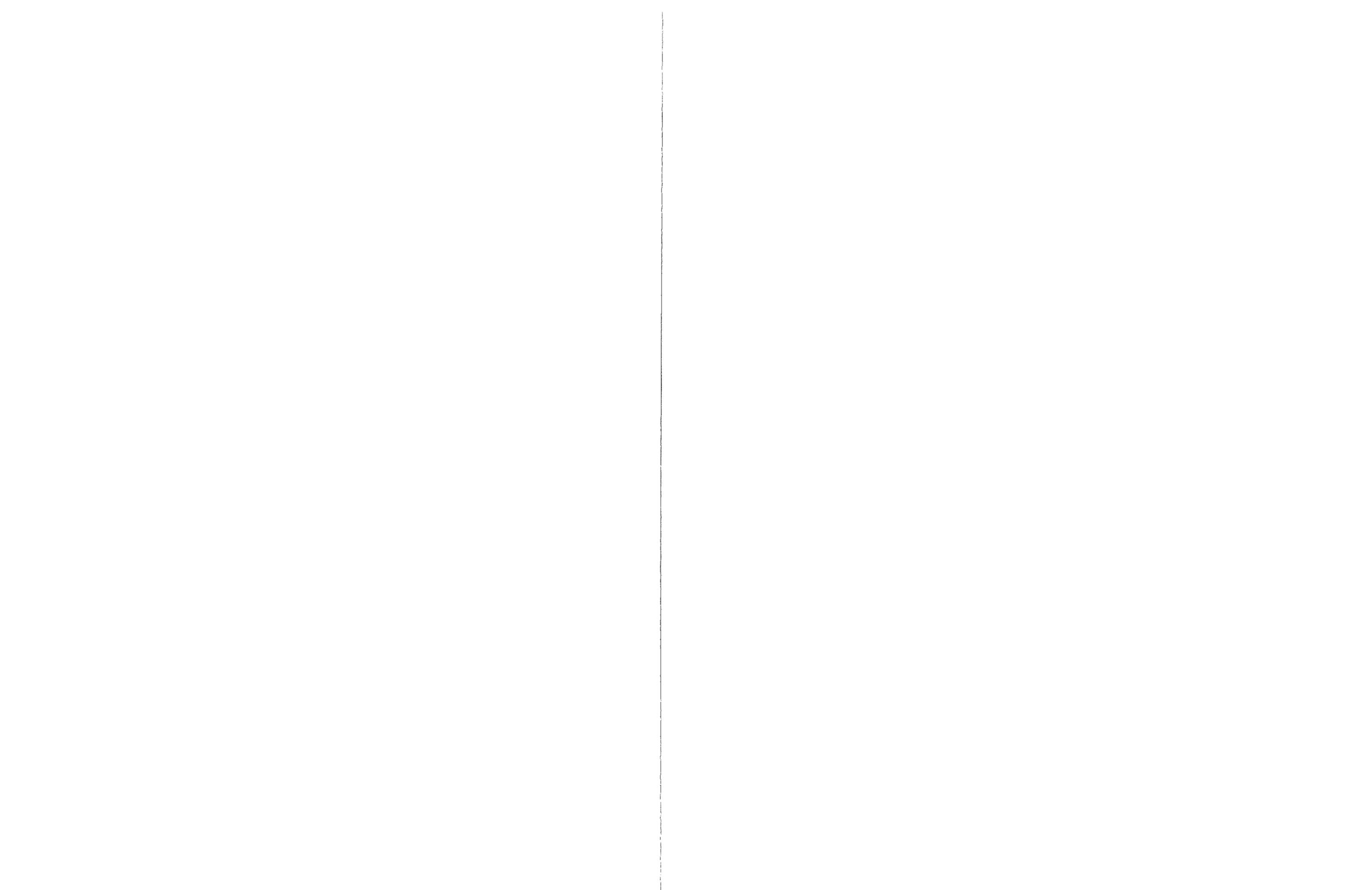
BiJay; thanks for the map with the locations of milfoil- we the general public can see the problem- and the huge range of the problem-and this is after years of treatment- would be interesting to overlay in a different color the history of the treatment to see if you have gained- Barry should be able to show where the hand harvesting was done and then where the chemicals were applied- does that info give a clue about any milfoil deterrent that works-

I cannot believe the water clarity at this point- I can see frogs and turtles through the still clear water- what a year!

Happy Thanksgiving Beth

---

From: [KLiberty@aol.com \[mailto:KLiberty@aol.com\]](mailto:KLiberty@aol.com)  
Sent: Wednesday, November 27, 2002 8:37 AM  
To: [bijay@libertylake.org](mailto:bijay@libertylake.org)



BiJay,  
Thank you for the information on watermilfoil throughout the lake....Yikes...  
it looks like a big problem. When will the treatment with 2-4D begin? Is  
there any plan to share this information with the residents?

Thanks again.  
Karen

---

From: bijay adams [bijay@libertylake.org]  
Sent: Thursday, December 05, 2002 7:44 AM  
To: 'liberty4@abac.com'

Beth,

Your welcome for the information. In GIS, I have already overlain the areas that received treatment in the past. From the coverage, and based on the surveys I conducted this year, it does appear that where there was treatment with 2-4D there was a drastic improvement. Hand harvesting, on the other hand, is also an effective means of removing the plant, but it is usually only effective on areas with just a few plants. The downfall with hand harvesting is that when you pluck the plant, fragments may fall off the plant, float somewhere else, and regain growth. This year, especially with the high growth, we noticed in areas around Sandy Beach and Dreamwood Bay the plants are relatively in absence. These both are locations where the Milfoil was first found in the lake and where the removing effort was highly concentrated (treatment and chemical). However, I did find plants in these two areas (as located on the map), but there is just about one or two plants in the entire area. Our plan is to hand harvest the thin areas and treat the more abundant growth areas with 2-4D. We will assess this in detail early next spring. Thank you for your suggestions and let me know if you have any additional questions. Take care.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

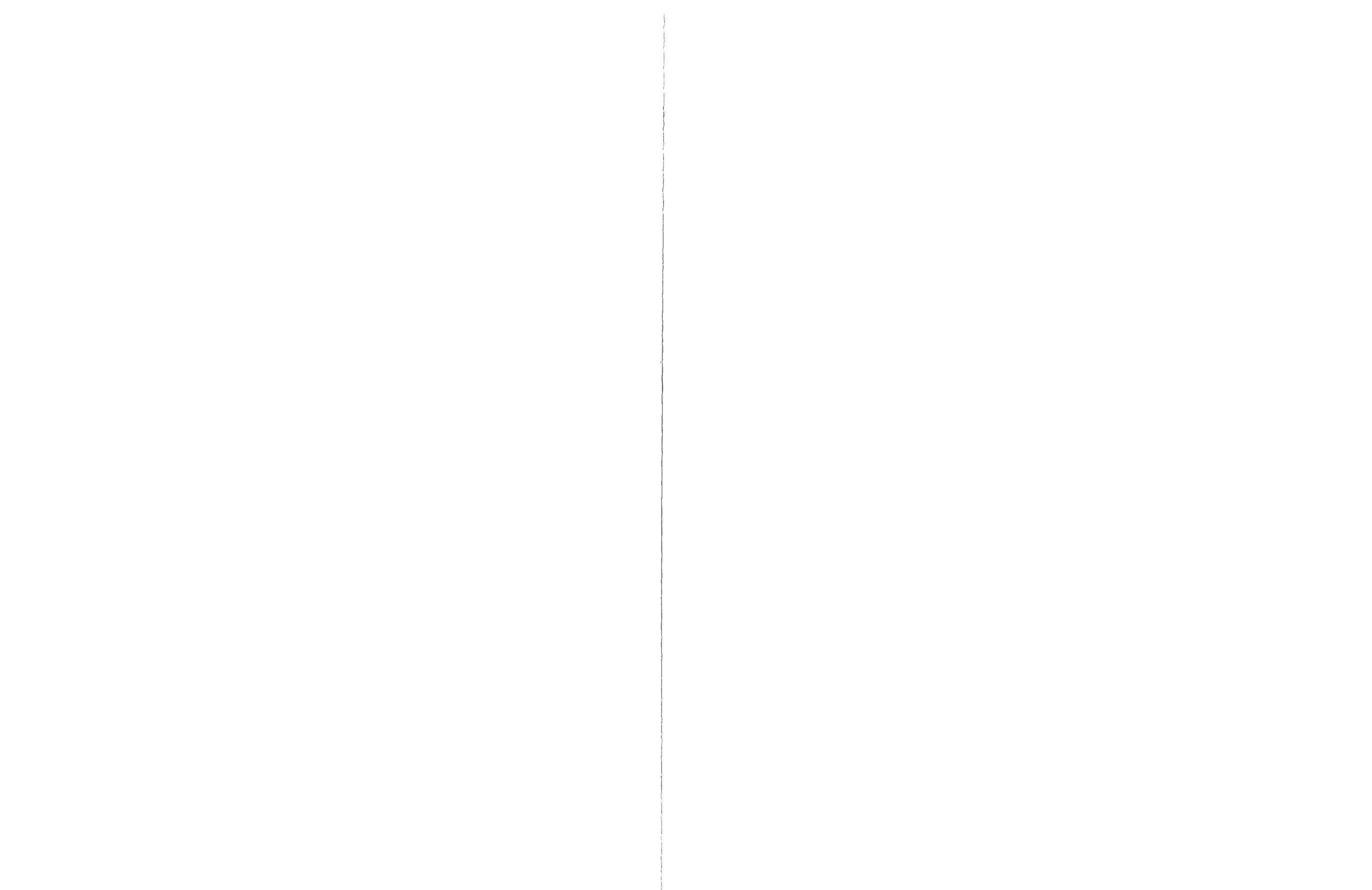
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From: bijay adams [bijay@libertylake.org]  
Sent: Monday, December 02, 2002 7:50 AM  
To: 'KLiberty@aol.com'

Karen,

Your welcome for the information. Early next spring we will do some assessments and determine when and where to treat. According to regulation, we will notify all residents in the area of treatment within ten days of application. Thanks and let me know if you have any additional questions or concerns.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30



Fax #: (509) 926-7691  
e-mail: [bijay@libertylake.org](mailto:bijay@libertylake.org)

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From: bijay adams [[bijay@libertylake.org](mailto:bijay@libertylake.org)]  
Sent: Wednesday, January 22, 2003 3:21 PM  
To: Barry Moore ([bcmoore@mail.wsu.edu](mailto:bcmoore@mail.wsu.edu))

Barry,

Here are my recommendations for the milfoil treatment areas for 2003 (blue dots and green polygons). I based these sites on plant density and the critical areas for possible spreading. The remaining locations (red dots), are merely single plants or what we may control by hand harvesting. I also included the spreadsheet of acre calculations of each treatment site. Please understand that these suggested treatment areas are only estimations, and much may be skipped using a spot treatment method. Of course, we will know more this coming spring and early summer. Please let me know what you think. Thanks Barry.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: [bijay@libertylake.org](mailto:bijay@libertylake.org)

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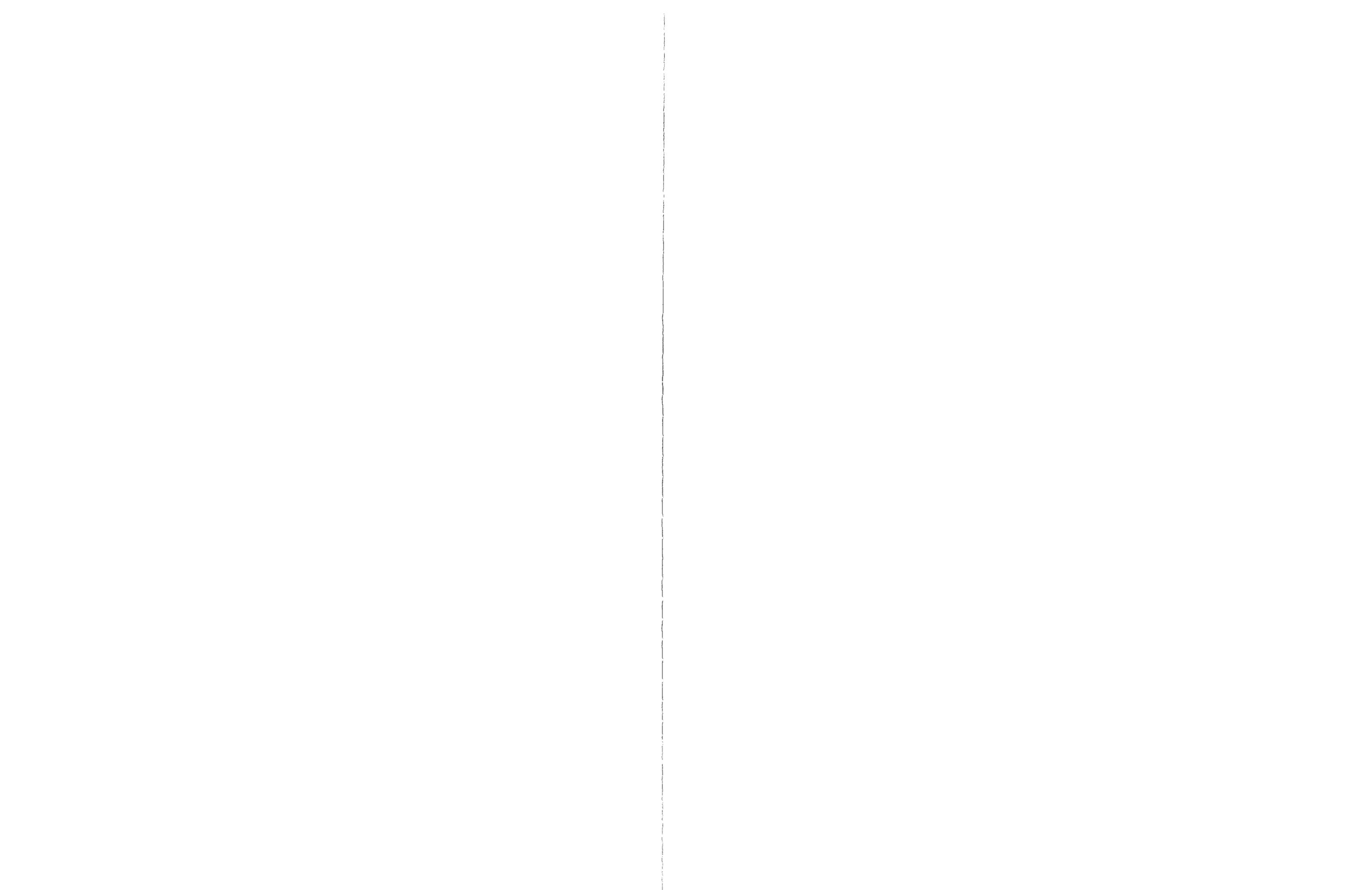
From: [KLiberty@aol.com](mailto:KLiberty@aol.com) [<mailto:KLiberty@aol.com>]  
Sent: Friday, May 23, 2003 7:56 AM  
To: [bijay@libertylake.org](mailto:bijay@libertylake.org)

BiJay,  
I was just at an Environmental Ed meeting and a reference was made to some bug, worm, creature....that can have their diet changed from Americal milfoil to Eurasian milfoil....The person they referred to was Jennifer Parsons, DOE, Yakima. Have you ever heard about this? Thanks.  
Karen

---

From: bijay adams [[bijay@libertylake.org](mailto:bijay@libertylake.org)]  
Sent: Friday, May 23, 2003 8:21 AM  
To: 'KLiberty@aol.com'

Yes I have. Jennifer actually gave a presentation at the WALPA on that Thursday at 1:30. The creature is referred to as the Milfoil Weevil (<http://www.fw.umn.edu/research/milfoil/milfoilbc/weevil.html>). It is a pretty good creature for milfoil treatment, but unfortunately these weevils need to be in locations where the milfoil is very dense, like a small severely infested pond/lake. They are not very effective in areas where the milfoil is very sparse and spread out like Liberty. In addition, I have read many cases about introduction of species (remember the WALPA presentation on the "Beasts"; the Mysis Shrimp?) and they in turn become the problem, rather than solving a problem. We will continue to keep our eyes and ears open for other possible milfoil treatments. Let me know if you have any questions. Thank you. Take care.



BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

---

From: KLiberty@aol.com  
Sent: Saturday, May 31, 2003 4:40 AM  
To: bijay@libertylake.org

Bijay,

Thanks again for the informative stuff on milfoil. I just got back from Minnesota where there were lots of articles on lake clarity, milfoil etc. etc. Thanks for all your good work.

Karen

---

From: bijay adams [bijay@libertylake.org]  
Sent: Monday, June 16, 2003 4:24 PM  
To: Barry Moore (bcmoore@mail.wsu.edu)

Barry,

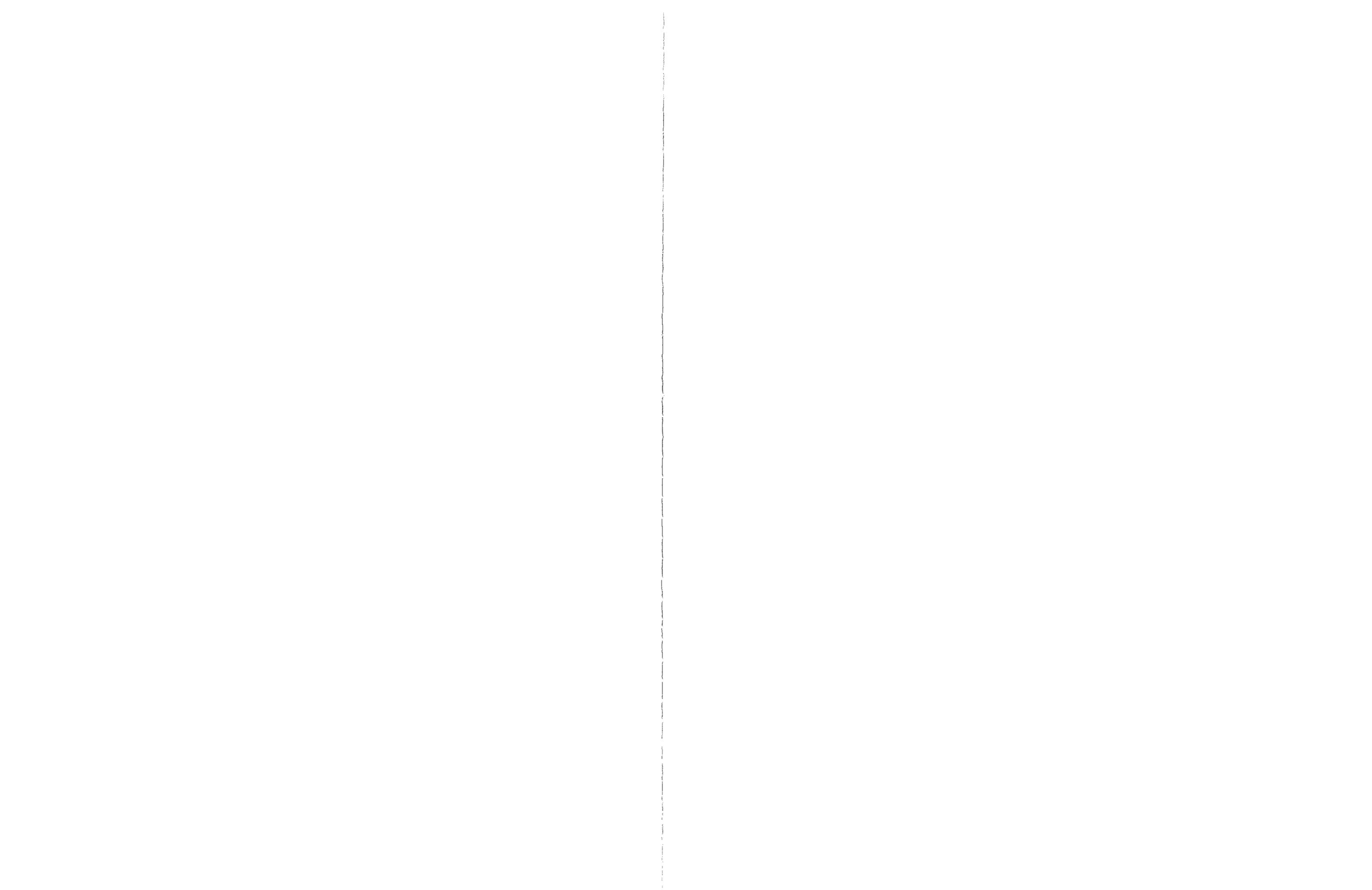
Here is an updated GIS layout after today's findings. I refined the treatment areas from last year's results (yellow polygons). These yellow areas, labeled "2003 Milfoil Treatment Areas," are just possible treatment areas for the time being. They also have area calculations to correspond. I did, however, locate and label the locations that we found milfoil today (green dots). I will continue to update as we progress and refine the treatment areas. I wanted to submit this to you to keep you updated.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

---

From: Barrentine, Marianne [MBarrentine@spokanecounty.org]  
Sent: Thursday, July 17, 2003 10:34 AM  
To: BiJay Adams (E-mail)

Bijay... this is what Kathy Hamel sent me..... on NPDES testing for your information... the monitoring is being done as a state wide group plan and DOE is only requiring those with grant funding to participate so Liberty does not need to do this.... The results from this could be of interest to you though so I've



forwarded anyway. By the way the closest currently certified lab for this 2.4D testing is Anatek labs in Moscow ID! or else they would have to be sent to Seattle area labs!

Marianne

-----Original Message-----

From: Hamel, Kathy [mailto:kham461@ECY.WA.GOV]  
Sent: Thursday, July 17, 2003 7:49 AM  
To: Barrentine, Marianne

<<Monitoring plan for Noxious NPDES permits.doc>> <<Montoring form instructions.doc>> <<Sampling form.doc>>

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From: bijay adams [mailto:bijay@libertylake.org]  
Sent: Wednesday, July 30, 2003 8:30 AM  
To: Hamel, Kathy

Kathy,

Good morning. To date, have any permits been issued in Washington for weevils as a biological control for Eurasian watermilfoil? I am going to use the information for the Liberty Lake AWMP. Thank you.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

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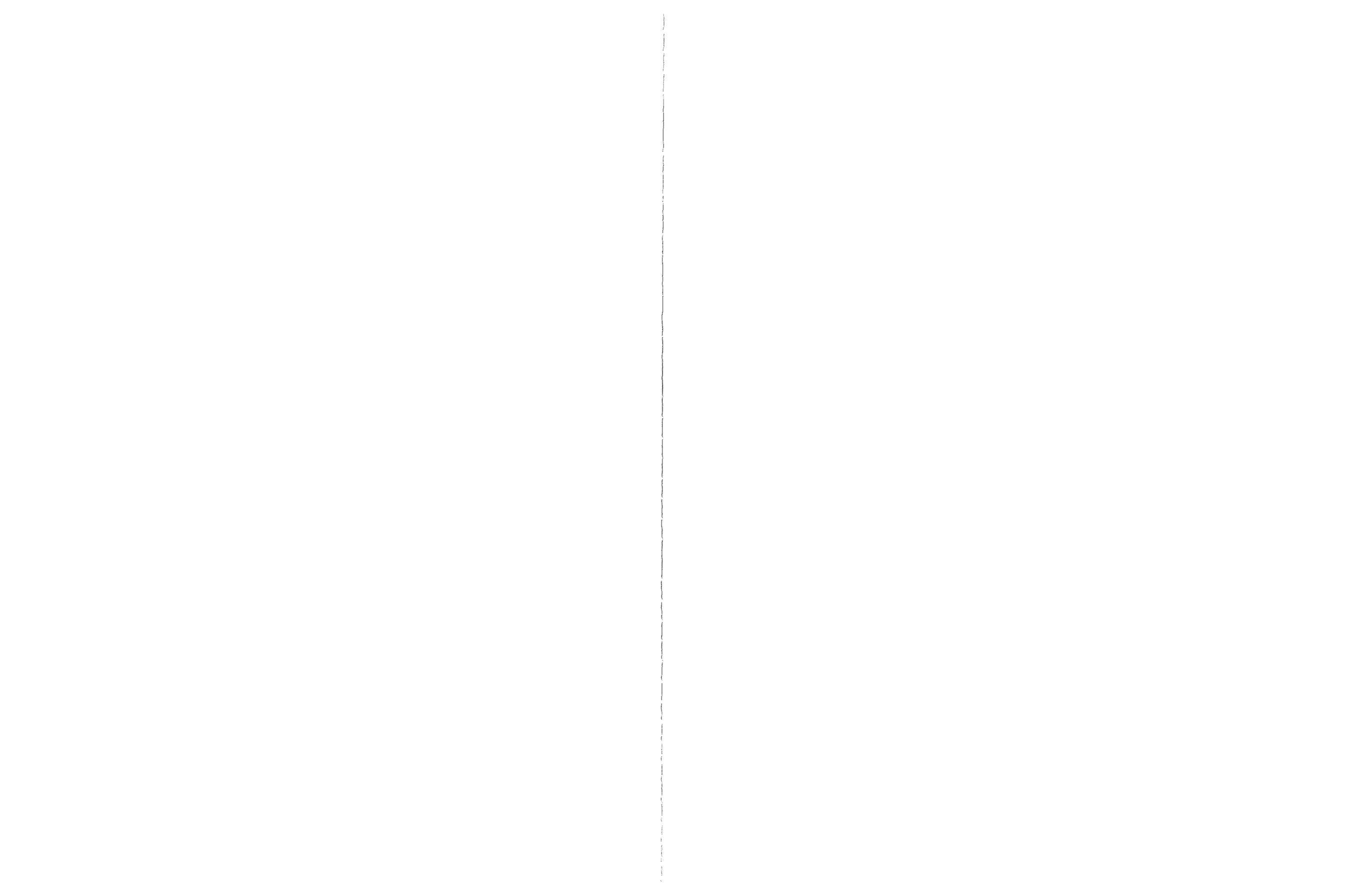
From: Hamel, Kathy [kham461@ECY.WA.GOV]  
Sent: Thursday, July 31, 2003 8:34 AM  
To: 'bijay adams'

Hi Bijay, No permits have been issued to bring in outside weevils to Washington. However there have been two test sites using weevils in Washington. In both cases, weevils were collected in Washington and reared on Washington milfoil. The offspring (larvae) were used to augment existing weevil populations or to introduce weevils to the test lake. I believe that the people in Pend Oreille concluded that their weevil augmentation study was not successful. Jenifer is doing a test lake in Yakima and it is too early to tell if that will be successful. So far (one year into the study) things do not look promising. I looks like fish populations in the waterbody may strongly prey on weevils.

Kathy

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From: bijay adams [bijay@libertylake.org]  
Sent: Thursday, July 31, 2003 8:51 AM  
To: Barry Moore (bcmoore@mail.wsu.edu)



Barry

I found 7 more plants yesterday. Maybe we can schedule a time for a dive survey and a hand harvest to get scattered plants. Let me know. Thanks Barry.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: [bijay@libertylake.org](mailto:bijay@libertylake.org)

---

From: [bijay adams \[mailto:bijay@libertylake.org\]](mailto:bijay@libertylake.org)  
Sent: Monday, August 25, 2003 10:17 AM  
To: Hamel, Kathy

Kathy,

In our conversation earlier this morning, what product did you say we should use in the event that the milfoil builds up a tolerance to the AquaKleen® 2,4-D? Thank you.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: [bijay@libertylake.org](mailto:bijay@libertylake.org)

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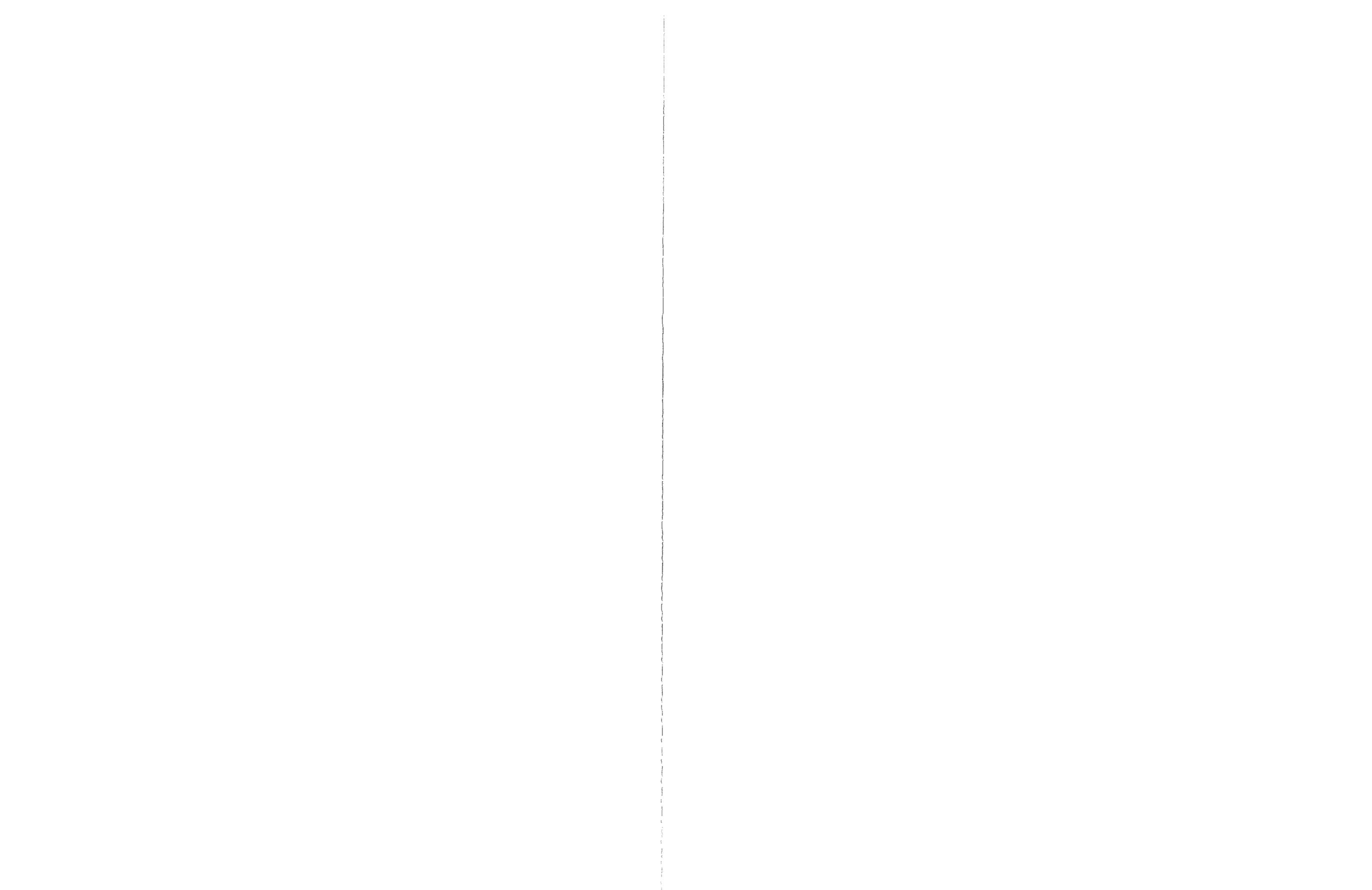
From: Hamel, Kathy [[kham461@ECY.WA.GOV](mailto:kham461@ECY.WA.GOV)]  
Sent: Monday, August 25, 2003 10:18 AM  
To: 'bijay adams'

Hi Bijay, Triclopyr has just been registered and will sold sold as Renovate. It is similar to 2,4-D in its mode of action. It is systemic and also selective. Kathy

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From: [bijay adams \[bijay@libertylake.org\]](mailto:bijay@libertylake.org)  
Sent: Monday, August 25, 2003 9:56 AM  
To: 'Barry Moore'

Ok thanks for working on the estimates for me. Yes I will be able to pick you up at Eller's, just drop me a line that morning. As for the document, Kathy H. said you wrote it in summer of 1996 and it was entitled Liberty Lake Early Intervention Milfoil Control Project. It was a product of the 1996 early infestation grant received from the DOE. I have the application, and it contains the 1995 Macrophyte survey report you wrote in it with some background information, but no Intervention report. Also, what product would



you suggest to use if the Milfoil builds a tolerance to 2,4-D? I need to consider this for the AWMP. Thanks Barry.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

---

From: Barry Moore [mailto:bcmoore@mail.wsu.edu]  
Sent: Monday, August 25, 2003 10:23 AM  
To: bijay adams

Tolerance to 2,4D is very unlikely. Guess you could say Sonar, but I would not advocate using that at all. What about just using hand-harvesting as an alternative? This should be academic anyway.

---

From: bijay adams [bijay@libertylake.org]  
Sent: Monday, August 25, 2003 10:42 AM  
To: 'Barry Moore'

As per my conversation with Kathy H this morning, she recommended that we consider Triclopyr as an alternative in the event that a tolerance happens with 2,4-D. Apparently Triclopyr has just been registered and will be sold as Renovate. It is similar to 2,4-D in its mode of action and also is systemic and selective. We do need to consider this in the plan for the long-term management of milfoil for Liberty. I was curious to what you thought. Thanks.

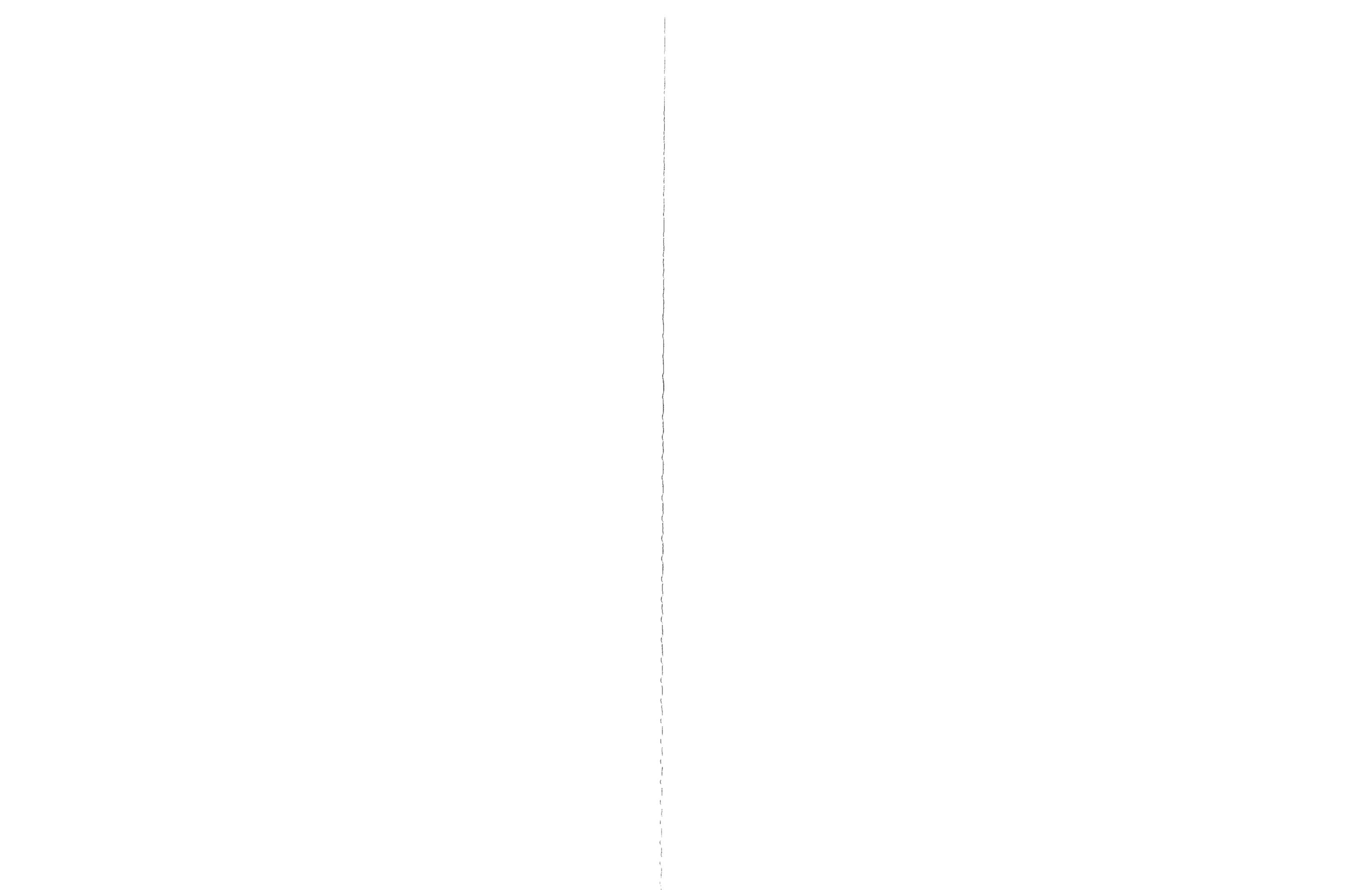
BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
Fax #: (509) 926-7691  
e-mail: bijay@libertylake.org

---

From: Barry Moore [bcmoore@mail.wsu.edu]  
Sent: Monday, August 25, 2003 1:25 PM  
To: bijay adams

I wasn't aware that triclopyr had been approved yet. Actually, I had a research project for the forest service about 15 years ago on mobility of triclopyr (Garlon) and did a pretty extensive lit review. Also have used it quite a bit. I agree with Kathy that triclopyr would certainly be the best choice as it is more selective than Sonar. Dose is pretty critical for selectivity, but again, the reality is probably pretty unlikely that you would actually have to use something else. Also, these proprietary products will be 110 to 20X as many \$!

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From: bijay adams [bijay@libertylake.org]  
Sent: Monday, November 10, 2003 3:15 PM  
To: 'sandra.moody@wadnr.gov'  
Subject: Information Request

Good afternoon. The Liberty Lake Sewer and Water District is developing an Aquatic Weed Management plan for the inclusive management of Eurasian watermilfoil in Liberty Lake. Liberty Lake is a 708-acre (1.1 square mile) mesotrophic lake situated 2.5 miles east of the City of Spokane Valley and 3 miles west of the Idaho border. The City of Liberty Lake rests ¼ mile north-northwest of the lake. At the south-end of the lake is a 150-acre seasonal marsh and wetlands. In the draft stages of the plan, the Department of Ecology is requesting information to determine if there are any rare plants associated with the lake or wetland. In the event of having these rare species, the Liberty Lake Sewer and Water District would adopt a mitigation plan to protect these plants from treatments occurring in the lake for the management of Eurasian milfoil. I would appreciate any information you may have on the rare plants associated with Liberty Lake and its wetland. As part of this information request, I have attached an aerial photo of the region, a map, and the Township/Range coordinates (T25N / R45E-Willamette Meridian Datum). Whenever it is convenient for you to process this request is appreciated. Please call if you have any questions. Thank you.

BiJay Adams  
Lake Protection Manager  
Liberty Lake Sewer and Water District  
Ph #: (509) 922-5443 Ext. 30  
F~~x~~ #: (509) 926 -7691  
e-mail: bijay@libertylake.org

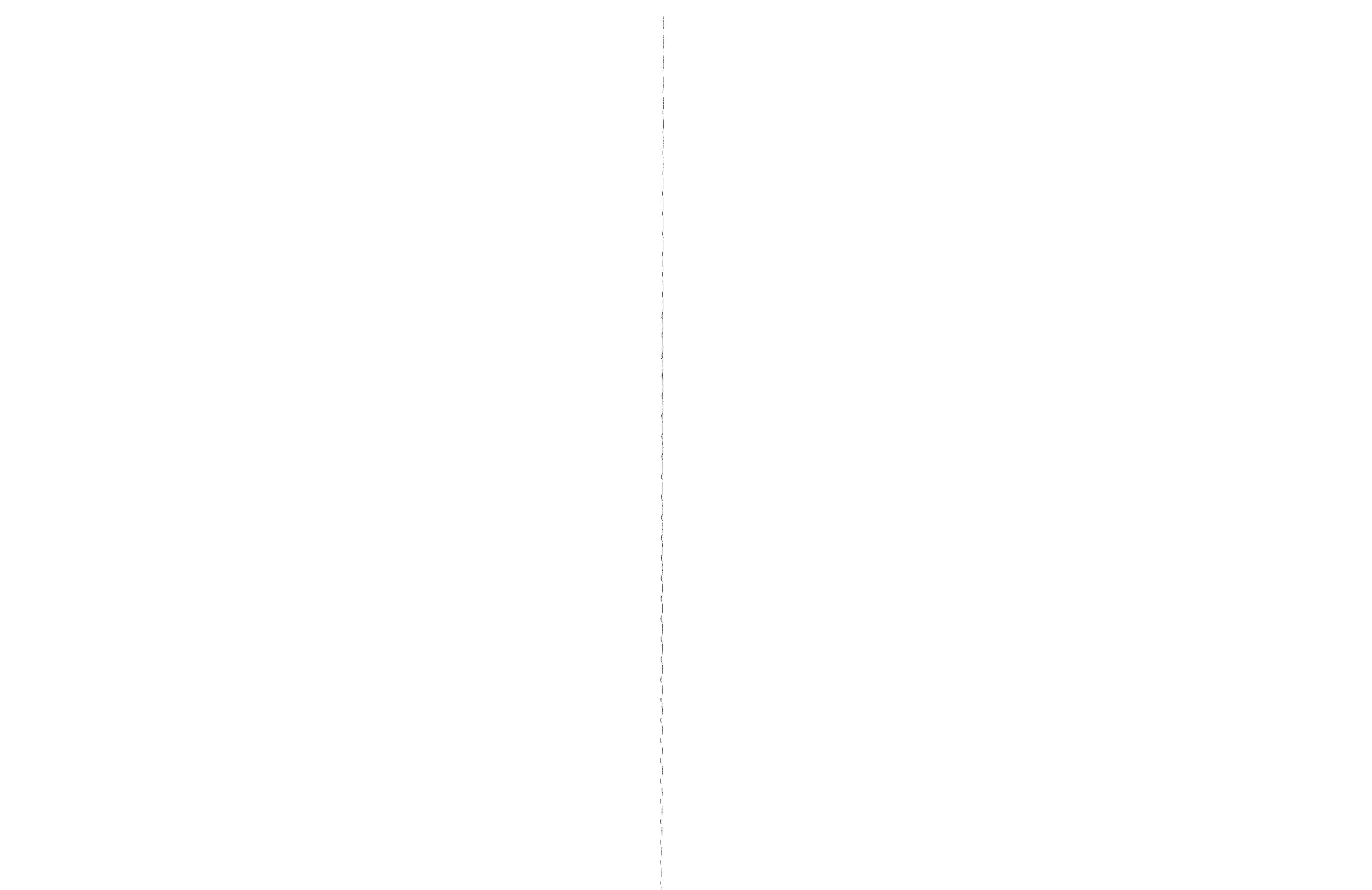
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From: Hamel, Kathy [kham461@ECY.WA.GOV]  
Sent: Thursday, October 30, 2003 8:52 AM  
To: bijay@libertylake.org  
Cc: Weller, Nancy C.  
Subject: FW: Liberty Lake IAVMP Comments

Hi Bijay,

I finally had a chance for a good review of the Liberty Lake plan. With a few minor additions, it will meet our criteria for an integrated aquatic vegetation management plan (IAVMP) and will be approved. It is very obvious that Liberty Lake is one of the best managed lakes in Washington. I enjoyed reading the history and also seeing what a great job was done to improve the water quality of this lake. Here are a few things that I would like to see added to the plan:

1. Since you have been treating with 2,4-D for several years, I assume that you have the blessing of Fish and Wildlife. I would like to see a letter or communication from them to that effect in the plan.
2. While you did a good job of keeping the watershed residents informed about the plan and milfoil treatments, did you involve any of the state agencies or tribes with this process? If not, they should have an opportunity to comment on this draft. Also I wasn't able to get a feel from the plan about how many actual waterfront residents are on the lake. I assume that you do have lots of these people on the water.



3. We like for the planning group to check with the DNR Heritage Program to determine whether there are any rare plants associated with the lake or wetland. If there are, then you need to have a mitigation plan to protect these plants from treatment included in the plan.

4. You also need to check with Fish and Wildlife for a list of threatened or endangered species. Are there bull trout for instance? Again if there are species present, a mitigation plan should be included in the IAVMP.

5. The herbicides that you are proposing to use have drinking water and irrigation restrictions. We ask that planners develop a list of water right holders or a list of people who are using the water and include this in the plan. The water users need to agree to stop using the water until herbicide concentrations have dropped to below the irrigation or drinking water standard. If you do have water users, you really should be pulling some samples so you can let them know when is safe to use the water. Also if you do get grant funding, you will be required to do some monitoring for the NPDES permit. You need to factor this in your budget.

6. I'd like to see some discussion about the extensive marsh at the end of the lake. What class is it? What efforts are being taken to prevent impacts from milfoil and from the herbicides to this wetland?

7. I am not sure that I entirely agree with your assessment of bottom barriers. Thurston County used these in an area of Long Lake where their hand pulling efforts seemed ineffective. They finally covered the area with burlap and that solved the problem for them. On the other hand, Thurston County does not allow chemical use in Long Lake so they didn't have that option.

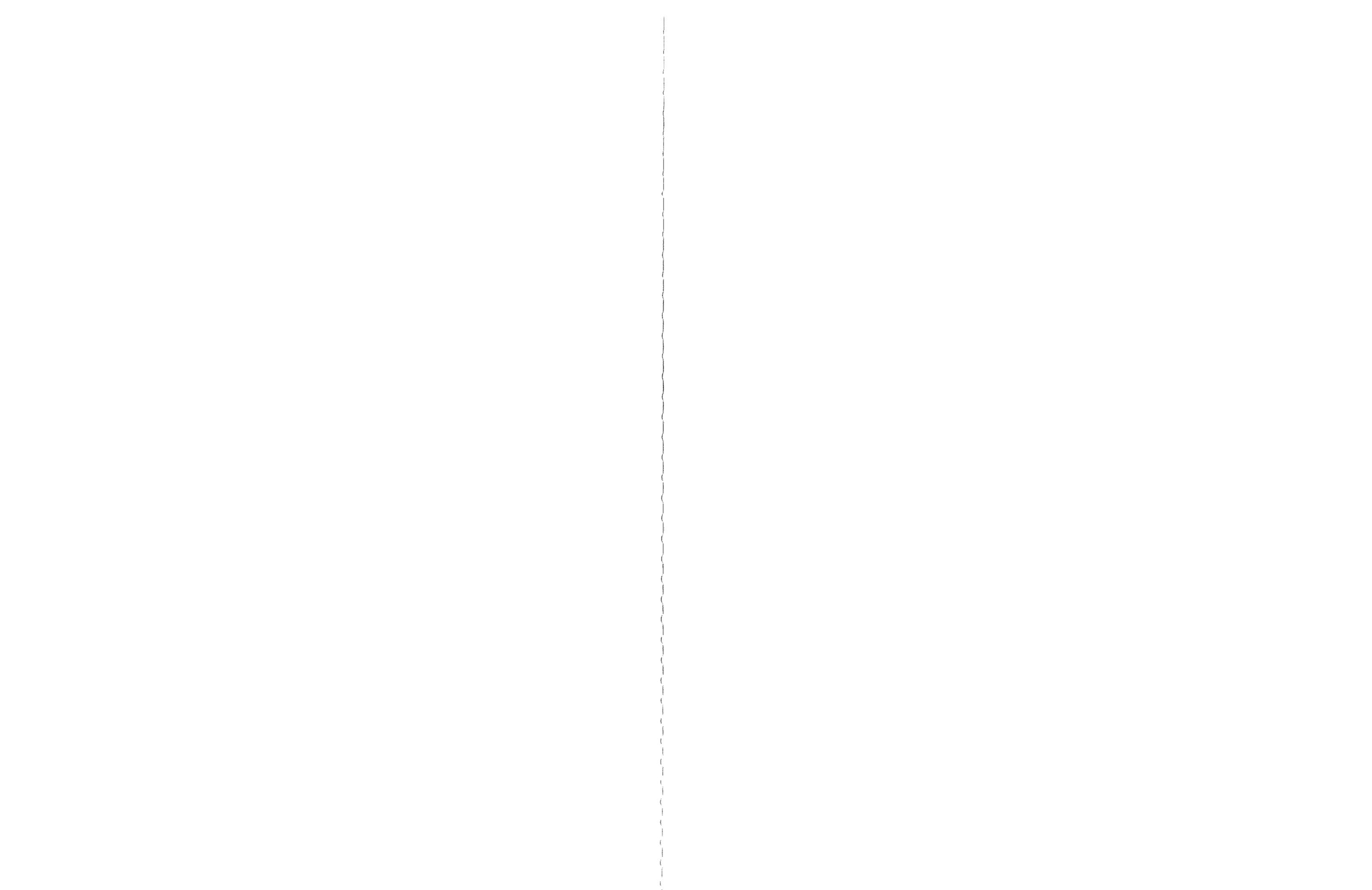
8. The liquid formulation of 2,4-D is less expensive than the granular formulation. The liquid 2,4-D costs about \$300 per acre. There may come a time when you may want to switch to this formulation. You should discuss this option more extensively in the plan. The one drawback that I foresee with the liquid formulation is that the 2,4-D water concentrations stayed high and persistent in Spring Lake after treatment. This was good because this treatment was very effective in killing milfoil. This could be bad if there are irrigation or drinking water withdrawals in the lake. I'd like to see more liquid formulation concentration data before I'd recommend dropping the treatment rates for milfoil, but based on Spring Lake, it may be possible to get an effective treatment of milfoil at lower treatment rates. Using less herbicide should reduce water concentrations and persistence and cut treatment costs. Also the notice that Terry puts out says that there are no swimming restrictions. This is true, but Ecology does advise that swimmers stay out of the treated areas for 24 hours after treatment. It is up to the swimmers to determine whether or not they feel comfortable swimming under those conditions.

9. I would also like to see a more lengthy discussion of triclopyr. There may come a time when 2,4-D may become ineffective and you will need to switch herbicides. Triclopyr could be a back up for you. Also, there is a lawsuit right now that could potentially prevent us from using 2,4-D in the future. This is another reason to look at triclopyr for Liberty Lake. If you are having some plants survive the treatments, you may be selecting for those plants that are less susceptible to 2,4-D (rather than plants developing resistance). If those less susceptible plants are missed by divers, fragment, and spread you could eventually have a population of these plants and 2,4-D would be less effective.

10. You may also want to discuss the suitability of fluridone, endothall, and diquat. If milfoil becomes widespread in Liberty Lake, you may have to consider more drastic measures like fluridone. It would be good to have some discussion about this, although since hopefully this would be years in the future. You could put a placeholder in the plan about amending the plan as new technologies become available.

This is a really good job Bijay and I consider these comments to be very minor. I know that Nancy Weller also had a few comments too that we will forward to you.

Kathy





November 22, 2002

Lake Resident  
S. 816 Neyland  
Liberty Lake, WA 99019

Dear Resident:

Over the course of the summer and fall, I have identified several locations of Eurasian Watermilfoil throughout the lake. The observations were conducted primarily by boat surveys of the lake, not diving. The majority of the milfoil consists of sporadic plants spread out over an area, rather than dense patches. However, there are two distinctive dense patches on each tip of Crown Point (central west side of lake); each patch stretching over an area approximately 75 feet long and about 15 feet wide. The milfoil observable in the lake is approximately 50-70 feet out from the shore and in water depths ranging in 2 to 10 feet deep.

Milfoil growth this year has been rapid, and unusual, given the water clarity and abundant sunlight available to the plants. Wind, boat activity in infested areas, and wave activity may have contributed to the wide spread distribution observable throughout the lake. This is critical as free-floating plant fragments, produced either by natural fragmentation or by boat activity, often develop into new plants. The enclosed map indicates the relative locations of the milfoil to date (11/20/02). Treatment with 2-4D next year will most likely occur, and we will assess the regime early in the spring. If you have any questions or concerns, please contact me at 922-5443 Ext. 30 or by e-mail at [bijay@libertylake.org](mailto:bijay@libertylake.org)

Sincerely,

A handwritten signature in blue ink, appearing to read "BiJay Adams".

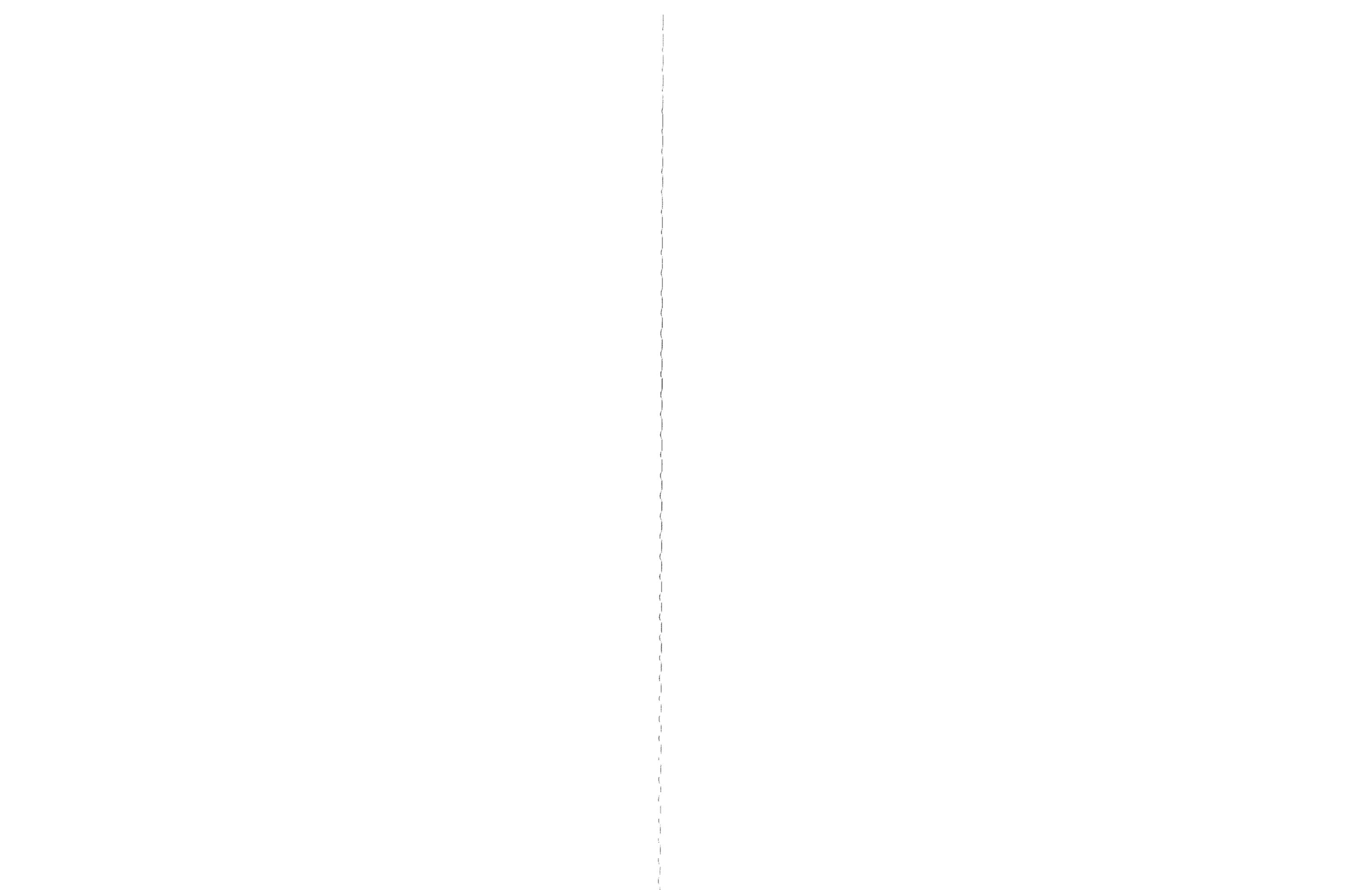
BiJay Adams  
Lake Protection Manager

encl. 2002 Milfoil Locations Map

Frank L. Boyle  
President

Harley Halverson  
Secretary

Tom Agnew  
Commissioner





Terence M. McNabb  
President

P.O. Box 118  
Centralia, WA 98531  
Tel: 360-330-0152  
Fax: 360-330-0174  
Cell: 360-239-5173  
Email: Terry@aquatechnex.com

aquatechnex.com

P.O. Box 118  
Centralia, WA 98531  
Tel: 360-330-0152  
Fax: 360-330-0174  
Web Site: [www.aquatechnex.com](http://www.aquatechnex.com)

Lee Melish  
Liberty Lake Sewer District  
PO Box 184  
Liberty Lake, WA 99019

Dear Lee,

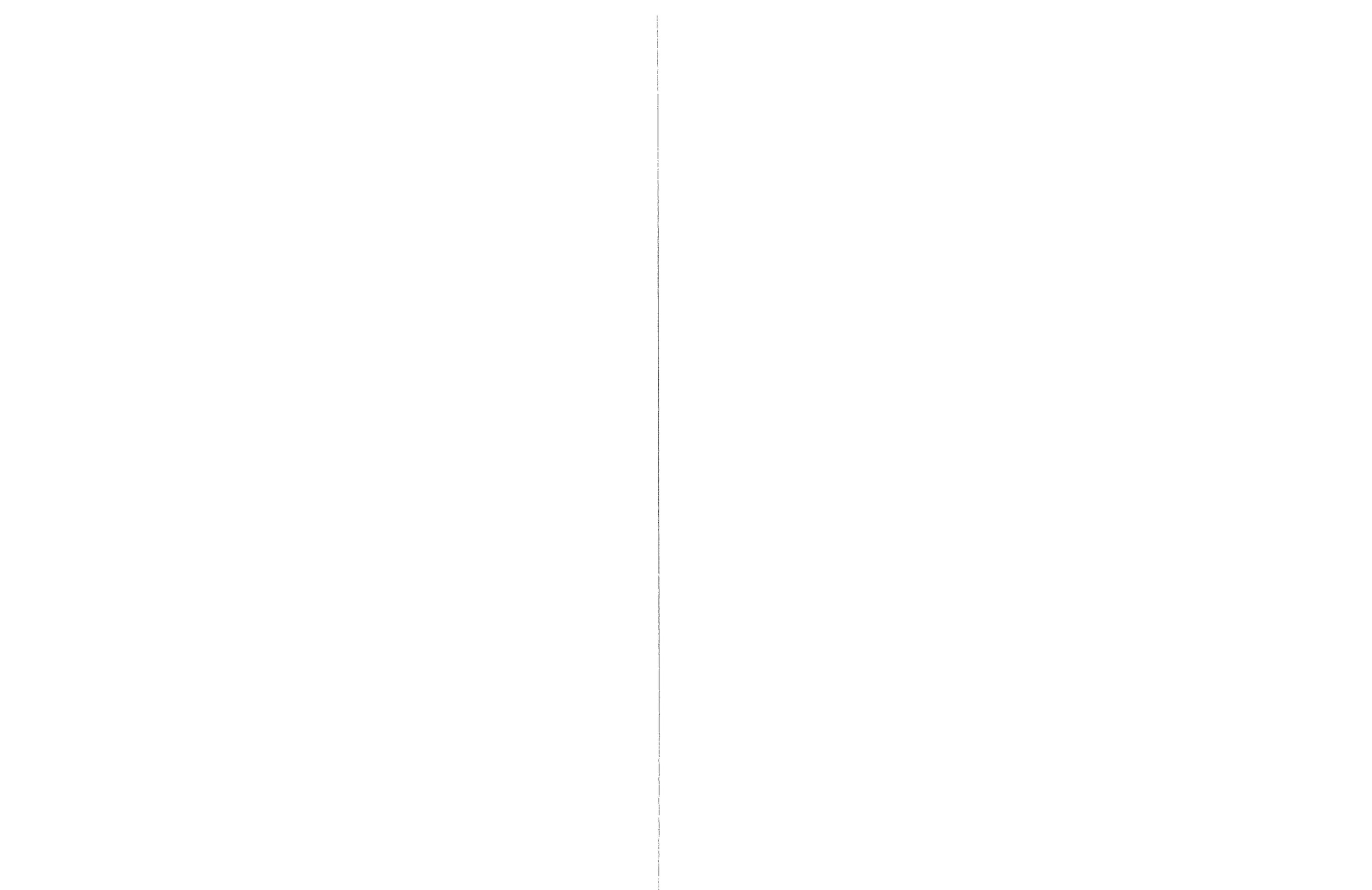
I appreciate the time you made to talk about the Eurasian Milfoil problem in Liberty Lake. I would like to offer the following ideas regarding control.

As this infestation is still fairly limited with respect to the littoral zone of the lake, the best tool for control this coming year would be a systemic herbicide treatment. In the past we have used AquaKleen (granular 2,4-D) very effectively against this weed. Under the new NPDES permit, we also have the option of using a liquid formulation of this herbicide. Granular products are normally used when we are treating small patches along a shoreline. When we are targeting larger areas, the liquid formulation is effective as well. For your information, AquaKleen and Navigate are the same product. There are two firms marketing this material for NuFarm and we have been using the AquaKleen in the last year because of their superior product support including providing free sampling.

I have reviewed the maps your group prepared. I think we are going to have to assume that some of the areas you are concerned about will expand as the plant auto fragments and disperses during the fall and winter. Conversely, some of the areas that are mapped for treatment may not be completely full of milfoil. I think it will be important to look this over in the early summer and develop a treatment map based on conditions present then. I would suggest the following approach and costs for 2003.

Our firm will file for coverage under the Noxious Aquatic Weed NPDES permit. We would then follow the direction in that document to proceed with the treatments as necessary. We would travel to the lake and provide written 10 day notification to the dwellings around the lake as required. This would be done in early June. We would also inspect the lake with your Lake Management Staff and develop a treatment map based on conditions present at that time. The cost for the printing, delivery of notices and mapping work would be \$500.00. We would then make a treatment based on our findings. The acres treated with AquaKleen granular would be billed at \$495.00 per acre. The acres treated with liquid would be billed at \$275.00 per acre. I think we could effectively use the liquid in the south end if the complete area we have mapped is treated. There may be a need for some additional work later in the summer. We would include this and propose

*"Advancing the Science of Lake Management."*



dates in our public notification so that there would be no need to re-deliver. We would use the same cost schedule as well.

We would like to get this on our calendar for planning purposes. If you have any questions, please get back to me. I'll follow up on this as well.

Sincerely,

  
Terry McNabb  
Aquatic Biologist

*P.S. Hand copy, you should have email*





December 2, 2003

BiJay Adams  
Liberty Lake Sewer and Water District  
22510 E Mission Ave  
Liberty Lake WA 99019

**SUBJECT: Aquatic Weed Management Plan for Liberty Lake  
(T25N R45E S22-26,36)**

We've searched the Natural Heritage Information System for information on significant natural features in your project area. Currently, we have no records for rare plants or high quality native ecosystems in the vicinity of your project.

The information provided by the Washington Natural Heritage Program is based solely on existing information in the database. In the absence of field inventories, we cannot state whether or not a given site contains high quality ecosystems or rare plant species; there may be significant natural features in your study area of which we are not aware. I have enclosed a list of rare plant species known from Spokane County for your information and use.

The Washington Natural Heritage Program is responsible for information on the state's rare plants as well as high quality ecosystems. For information on animal species of concern, please contact Priority Habitats and Species, Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia WA 98501-1091, or by phone (360) 902-2543.

Please visit our internet website at <http://www.dnr.wa.gov/nhp> for more information. Lists of rare plants and their status, as well as rare plant fact sheets, are available for download from the site. Please feel free to call me at (360) 902-1667 if you have any questions, or by e-mail at [sandra.moody@wadnr.gov](mailto:sandra.moody@wadnr.gov).

Sincerely,

Sandy Swope Moody, Environmental Review Coordinator  
Washington Natural Heritage Program

Enclosure

Asset Management & Protection Division, PO Box 47014, Olympia WA 98504-7014  
FAX 360-902-1789





November 14, 2003

Washington State Department of Fish and Wildlife  
8702 Division Street  
Spokane, WA 99218

To all interested parties:

The Liberty Lake Sewer and Water District has a Grant from the Washington State Department of Ecology to develop an Integrated Aquatic Weed Management Plan for Liberty Lake. The plan is the result of collaboration and research for a probable solution to the Eurasian watermilfoil (*Myriophyllum spicatum*) infestation at Liberty Lake. Eurasian watermilfoil is a non-native invasive aquatic species listed on the state noxious weed list. In summary, the plan outlines the management strategy that has occurred on Liberty Lake since 1995.

It is the request of the Department of Ecology to have review of this plan and a letter of communication from the Department of Fish and Wildlife expressing their concerns and/or support with this plan. In addition to the plan review, it is requested that a list of threatened or endangered species found within Liberty Lake and Liberty Creek be submitted to the Liberty Lake Sewer and Water District. In the event of having these the threatened or endangered species, the Liberty Lake Sewer and Water District will adopt a mitigation plan to protect these species from treatments occurring in the lake for the management of Eurasian milfoil.

The full text of the District's Integrated Aquatic Weed Management Plan is available on the Internet at the following address: <http://www.libertylake.org/Milfoil.htm>.

Please submit any comments you may have on the document in writing.

Sincerely,

BiJay Adams  
Lake Protection Manager  
[bijay@libertylake.org](mailto:bijay@libertylake.org)

encl. Liberty Lake Integrated Aquatic Weed Management Plan

Frank L. Boyle  
President

Harley Halverson  
Secretary

Tom Agnew  
Commissioner



**APPENDIX K: Aquatic Weed Management Plan award letter**



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY  
P.O. Box 47600 • Olympia, Washington 98504-7600  
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

October 16, 2002

Mr. F. Lee Mellish, Manager  
Liberty Lake Sewer and Water District #1  
22510 East Mission  
Liberty Lake, WA 99019

Re: Liberty Lake Aquatic Weed Management Plan  
Aquatic Weeds Management Fund  
Grant No.G0300068, FY 03 Funding Cycle

Dear Mr. Mellish:

I am pleased to inform you that the grant agreement for the Liberty Lake Aquatic Weed Management Plan has been signed. A signed original of the grant agreement is enclosed for your project files and future reference.

This grant provides \$15,000 for the Liberty Lake Aquatic Weed Management Plan. The total eligible project cost is \$20,000 and Ecology's share is 75 percent.

We appreciate this opportunity to provide you with financial and technical assistance. Ecology's Water Quality Program staff in Olympia and the Eastern Regional Office are available to assist you with your project.

If you have any questions or need additional information, please call Kathy Hamel, Ecology's project manager, at (360) 407-6562.

Sincerely,

A handwritten signature in cursive script, appearing to read "Megan White".

Megan White, P.E., Manager  
Water Quality Program

MW:KSH:km  
Enclosure

cc: Kathy Hamel, Ecology



**APPENDIX L: Washington State Department of Fish and Wildlife support letter**



State of Washington  
**DEPARTMENT OF FISH AND WILDLIFE**  
Region 1 Office: North 8702 Division Street - Spokane, Washington 99218-1199 - (509) 456-4082

January 22, 2004

Liberty Lake Sewer and Water District  
ATTENTION: BiJay Adams  
22510 E. Mission Avenue  
Liberty Lake, WA 99019

Dear Mr. Adams:

**SUBJECT: Liberty Lake Aquatic Weed Management Plan; Spokane County, WRIA 57.**

Enclosed is the edited version of the Draft Liberty Lake Aquatic Weed Management Plan. I reviewed the document for the Habitat Program and then passed it on to Marc Divens to review for accuracy on fish distribution, stocking, and population information. Our comments are combined in the text of the document.

The Washington Department of Fish and Wildlife (WDFW) is in support of the proactive approach that the LLWSD is taking on controlling the spread of Eurasian watermilfoil within Liberty Lake. The chosen methodology indicates that LLWSD is aware of the negative impact that intense removal, and the removal of native aquatic weeds, has on lake habitat and water quality. In addition, WDFW appreciates LLWSD attempts to continually educate the public on how they can do their part to prevent the spread of this invasive weed.

Thank you for the opportunity to provide this information. If you have any questions, please contact me at (509) 255-6103

Sincerely,

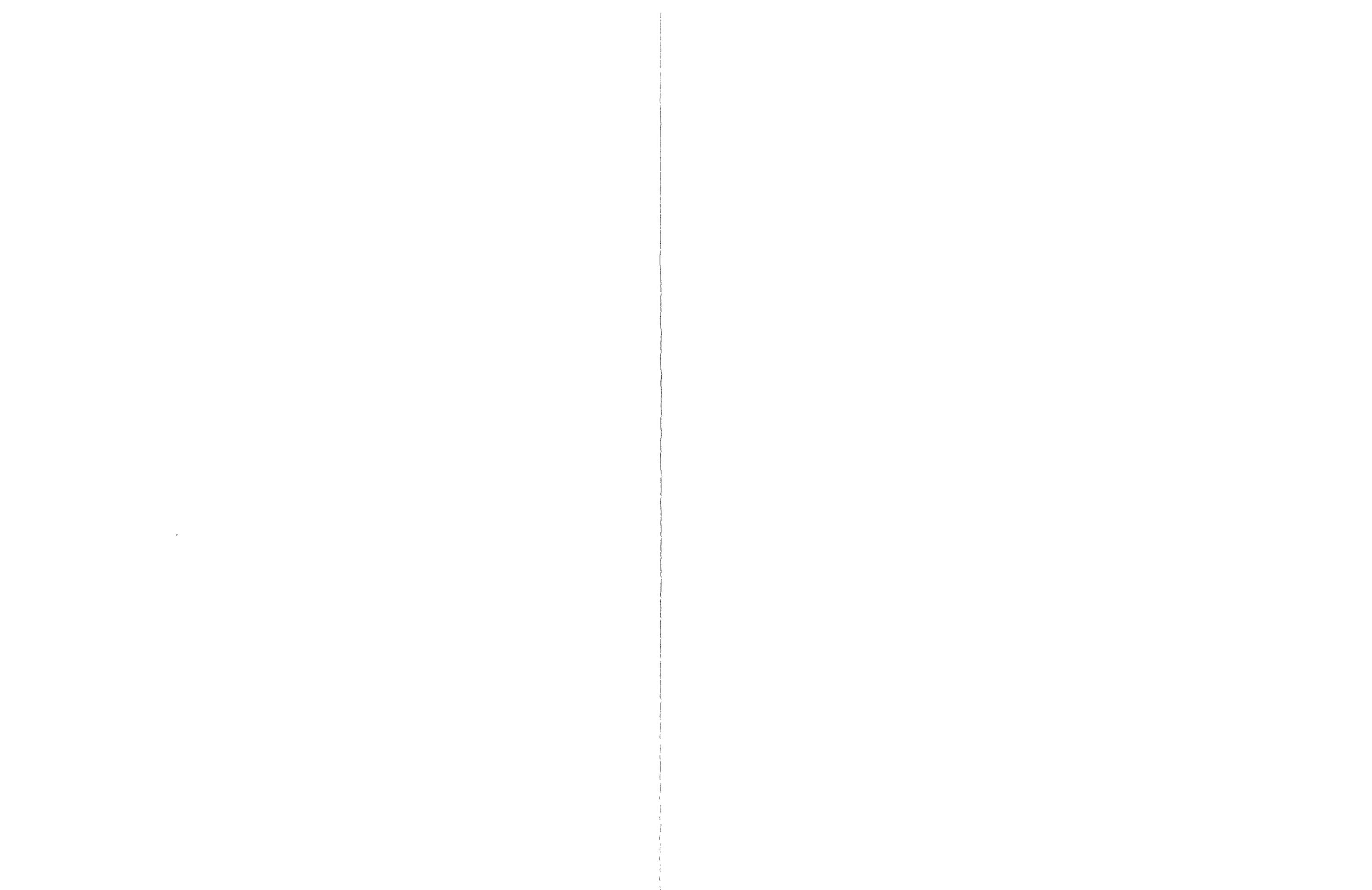
A handwritten signature in cursive script that reads "Karin A. Divens".

Karin A. Divens  
Area Habitat Biologist

KAD:kad

Enclosure(s): Edited Report  
Copy of WDFW Research Report Number H-96-05

cc Kevin Robinette, WDFW, email  
Department of Ecology, Eastern Regional Office, Water Quality Division



**APPENDIX M:** Washington State Department of Ecology marsh categorization letter



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

4601 N. Monroe Street • Spokane, Washington 99205-1295 • (509) 456-2926

February 18, 2004

Mr. Bijay Adams  
Lake Protection Manager  
22510 E. Mission Avenue  
Liberty Lake, WA 99019

Dear Bijay:

Re: Lake Wetland Category

I have now had an opportunity to write up our categorization of the headwaters wetland to Liberty Lake. You and I applied the *Washington State Wetlands Rating System for Eastern Washington* on February 3, 2004. This system "ranks" wetlands on a scale of I-IV, with I being the rarest, hardest to replace, and providing exceptional functions to society.

The large lake-associated wetland (100+ acres) has had a history of abuse through farming, ditching, draining and pumping. Liberty Creek has been "divorced" from the wetland, its former floodplain, by forcing it into a diked channel. Despite these forces, the wetland scored very high (42 points) which placed it within Category II. It could not qualify as Category I due to its past history of disturbance. It scored high due to its high fish and wildlife habitat values, and its exceptional, undisturbed watershed. If the creek, lake and wetland were reconnected, as discussed in the Watershed Committee meeting of February 4, 2004, it would then probably jump up to a Category I. I have included the field data sheets for your use.

I hope this helps you in your goal of protecting the exceptional qualities of the lake and its watershed. Please call me at 329-3528 if you need additional assistance.

Sincerely,

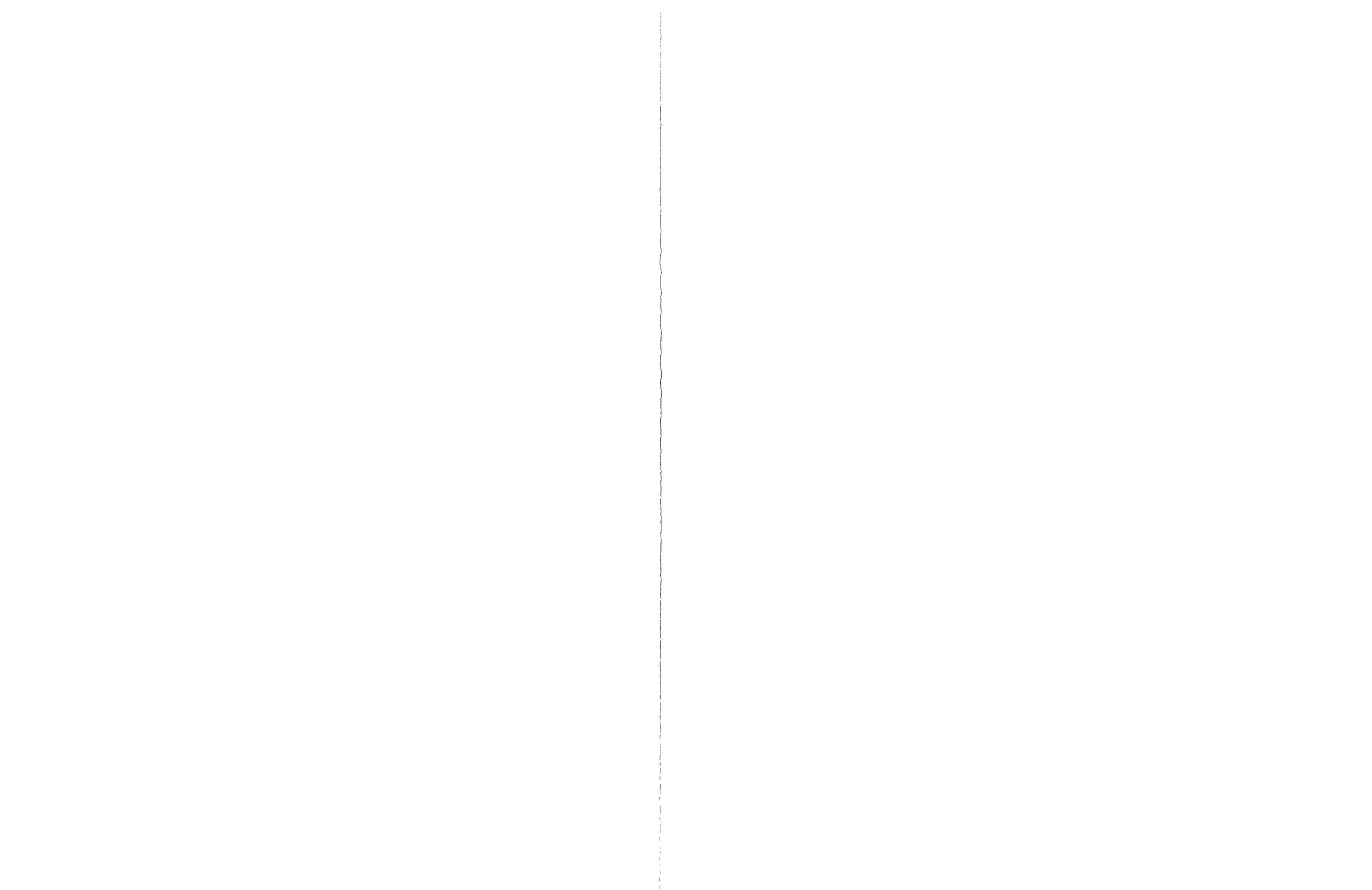
A handwritten signature in cursive script that reads "Christopher Merker".

Christopher Merker  
Wetland Biologist  
Shorelands and Environmental Assistance Program

CM:ka  
Enclosure

cc D. Allen, SEAP/ERO





APPENDIX N: Affidavit of Publishing Notice

SUPERIOR COURT OF WASHINGTON FOR SPOKANE COUNTY

In the Matter of

NOTICE OF PUBLICATION  
Re: Grant No. G0300068

)  
)  
)

No.

AFFIDAVIT OF PUBLISHING  
-NOTICE-

STATE OF WASHINGTON )

)ss.

County of Spokane

MICHAEL HUFFMAN, being first duly sworn on oath deposes and says that he is the MANAGING EDITOR, of The Spokane Valley News Herald, a weekly newspaper. That said newspaper is a legal newspaper and it is now and has been for more than six months prior to the date of the publication hereinafter referred to, published in the English language continually as a weekly newspaper in Spokane County, Washington, and it is now and during all of said time was printed in an office maintained at the aforesaid place of publication of said newspaper, which said newspaper had been approved as a legal newspaper by order of the Superior Court of the State of Washington in and for Spokane County. That the following is a true copy of a public notice as it was published in regular issues commencing on the 3rd day of October, 2003, and ending the 10th day of October, 2003, all dates inclusive, and that such newspaper was regularly distributed to its subscribers during all of said period:

NOTICE OF PUBLICATION

To All Interested Parties:  
The Liberty Lake Sewer and Water District has a Grant (Grant No. G0300068) from the Washington State Department of Ecology (DOE) to develop an Integrated Aquatic Weed Management Plan for Liberty Lake. The plan is the result of collaboration and research for a probable solution to the Eurasian water-milfoil (*Myriophyllum spicatum*) infestation at Liberty Lake. Eurasian water-milfoil is a non-native invasive aquatic species listed on the state noxious weed list.

Documents Available for Review:  
The District's Integrated Aquatic Weed Management Plan is available for review at the following location:

22510 E. Mission Avenue  
Liberty Lake, WA 99019

The full text of this document will also be made directly available on the Internet at the following address: <http://www.libertylake.org/Milfoil.htm>

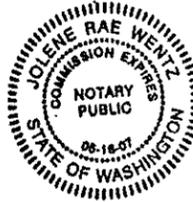
Time for Review:  
This Integrated Aquatic Weed Management Plan will undergo a public review process from October 1, 2003 to October 31, 2003. Comments on the document must be received in writing by 5:00 p.m. (Pacific Standard Time) on October 31, 2003, at the following address:

Liberty Lake Sewer  
and Water District  
Attn: BJLey Adams,  
Lake Protection Manager  
22510 E. Mission Avenue  
Liberty Lake, WA 99019  
Office: (509) 922-5443  
Fax: (509) 926-7691  
e-mail: [bjl@libertylake.org](mailto:bjl@libertylake.org)  
10-3 & 10-19

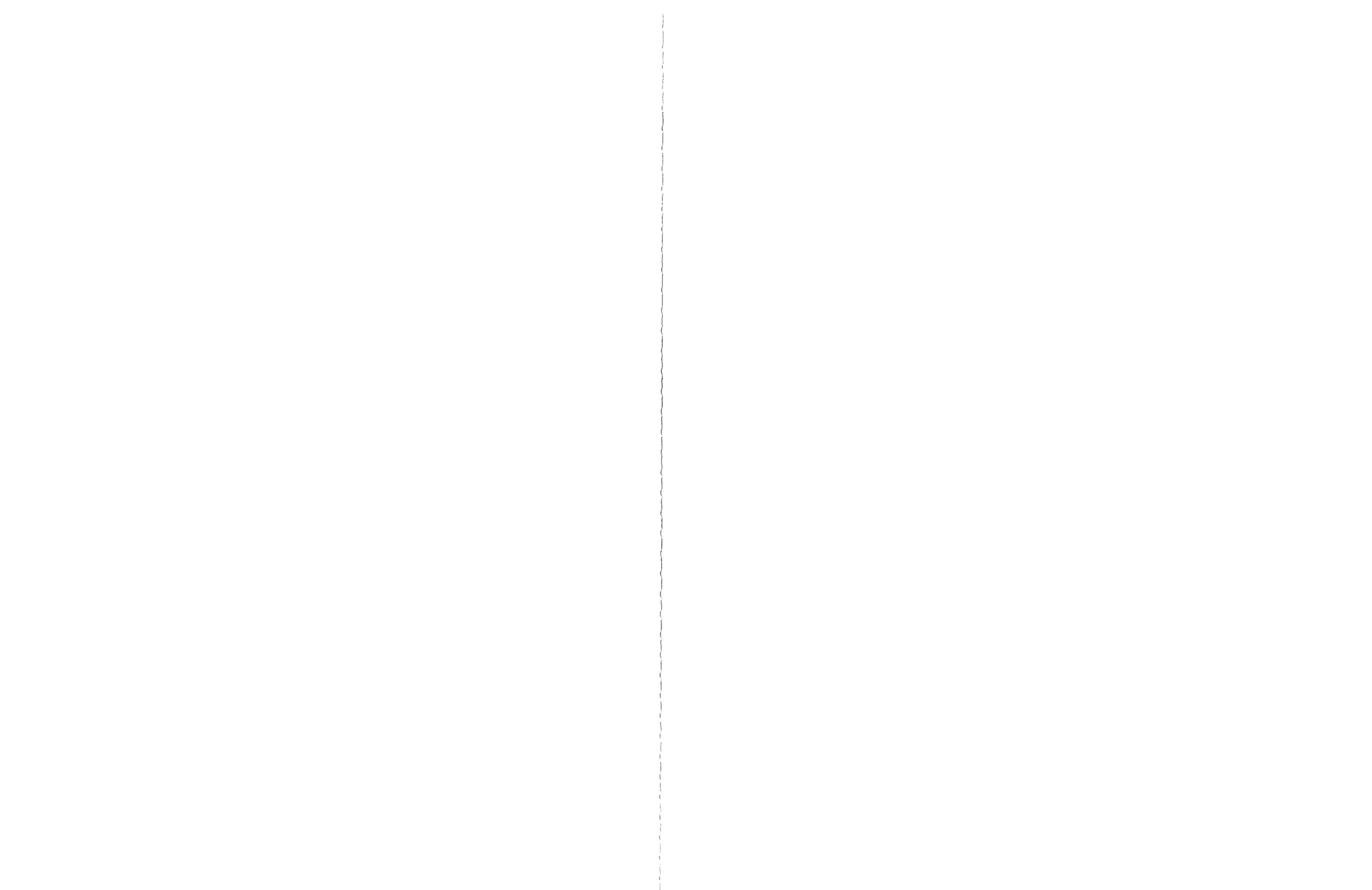
[Signature]  
SUBSCRIBED and SWORN to before me  
this 10th day of October, 2003

State of Washington  
County of Spokane

I certify that I know or have satisfactory evidence that Michael Huffman is the person who appeared before me, and said person acknowledged that he signed this instrument and acknowledged it to be his free and voluntary act for the uses and purposes mentioned in the instrument.



[Signature]  
Jolene Rae Wentz  
Title: Notary Public  
My appointment expires: 5-16-07



# Divers go deep to yank weeds, root out milfoil

## State hopes early action at Liberty Lake can stop the spread of pernicious pest

By Manny Lombard Staff writer

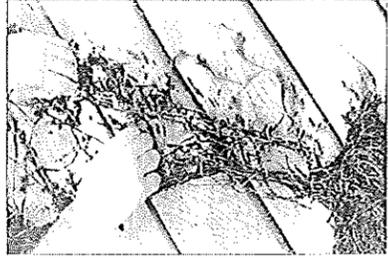
Three divers searched Liberty Lake this week in a cold, methodical hunt for a weed. Eurasian milfoil was their prey. They plucked it, stuffed its long strands into bags and brought it to the surface. And they hope that Spokane boaters will get in the habit of checking their boat trailers for the stuff.

A strand of milfoil, clinging to the frame of a boat trailer can transplant the pest to a new lake.

Left unchecked, the milfoil will quickly choke out large sections of a lake. Mats of weed on the surface can bring a power boat to a standstill and make swimming or fishing impossible.

Underwater weeding is no fun. But since the invasion is in its first few years, the low-tech method should work well, said Barry Moore.

"We think we've located the hot spots," Moore said, gesturing off the dock at Sandy Beach Mobile Home Park.



Milfoil can grow to a meter in length.

A professor of watershed management at Washington State University, Moore was the lead diver. With a \$12,000 grant from the state, he and three others from WSU spent the week working the lake. It may sound like an enormous job, but Moore knows the lake well. "I think



Divers Barry Moore and David Sancewich have been pulling milfoil from the bottom of Liberty Lake.

I've spent more hours (diving) in this lake than anybody. I did my master's thesis on this lake."

By midday Thursday, Moore looked tired and cold. The morning's haul of weeds lay in a 2½-gallon bucket. Moore said he'll take the weed to his lab, dry it and weigh it. After that he may toss it on his compost heap at home for his garden.

In August he'll come back to Liberty Lake to check for further growth. The divers have marked their "hot spots" electronically, with the satellite-directed global positioning system.

"We've caught it early enough.

"We've caught it early enough. Hand-pulling may be a low-tech approach, but it may be successful."

Barry Moore, lake specialist.

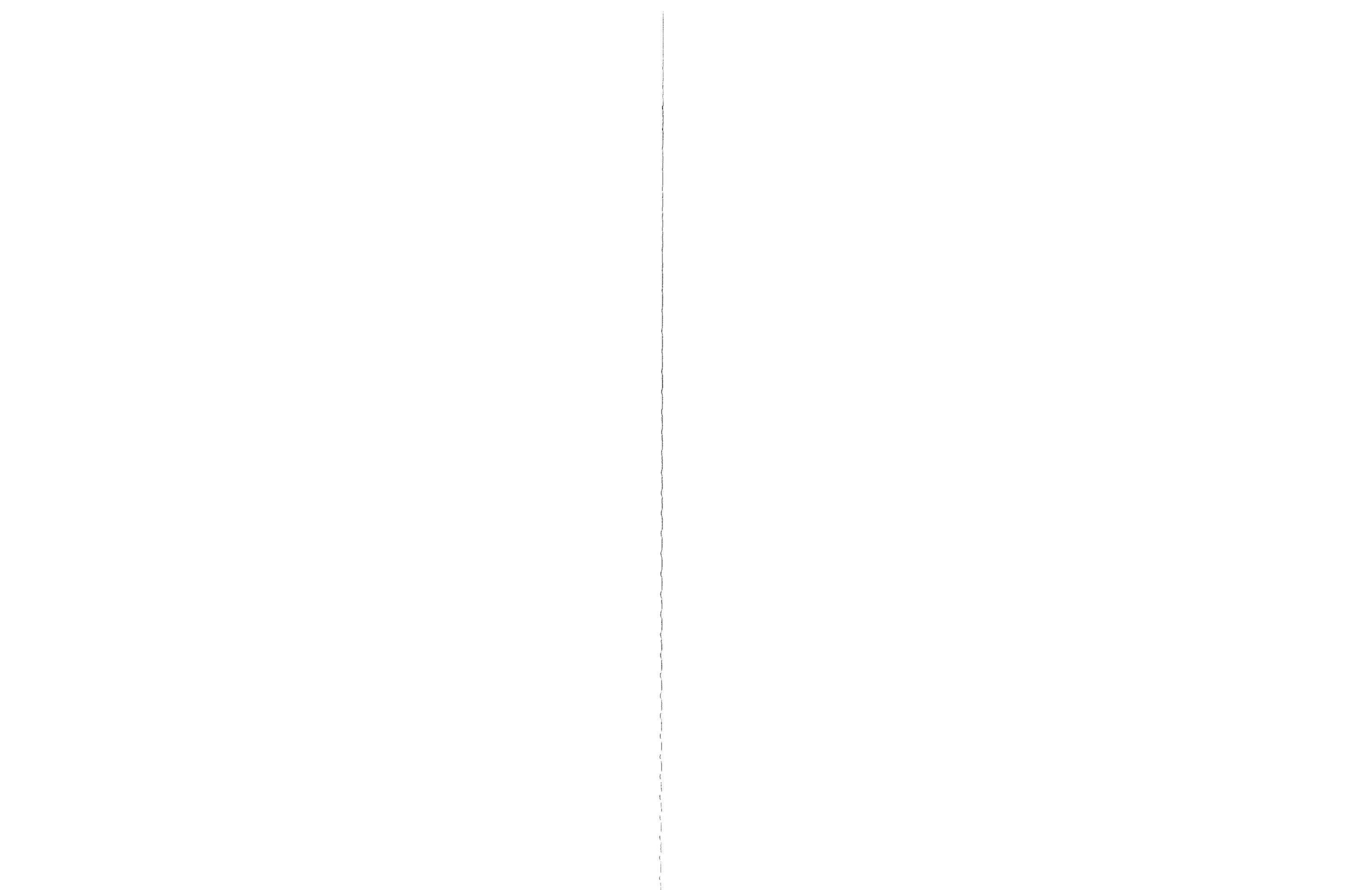
Hand-pulling may be a low-tech approach, but we may be successful," Moore said.

Stretchers of the Pend Oreille and Columbia rivers are thoroughly infested. Recreation on those stretches has come to a halt, he said.

Herbicides are another way to fight milfoil. But Moore and Jim Durfey, who's maintaining the sheets, both agreed that herbicides wipe out all weeds in a body of water. "That creates the conditions for milfoil to come back and really take over. You need a healthy plant population to compete," Durfey said.

Milfoil grows a meter or more in length. Its roots in the lake bottom, and tiny fern-like leaves are grouped in fans around the strand.

Moore said it may be coincidence, but the places his team found the weed this week aren't far from the launch and docks at the north end of the lake.



# Water district asking for limited pesticide use

## Liberty Lake officials are pushing for legislation to help with lake's milfoil infestation

By Pat Scutchetti  
Staff writer

**F**or three years, officials have been trying to kill an underwater invader in Liberty Lake.

They've sent divers down into the lake's shallow waters to search it out and destroy it. They've set up buoys — warnings to boaters — in areas it's known to lurk.

Now, they're lobbying state legislators for permission to attack it with chemical weaponry.

The enemy is Eurasian milfoil, an aquatic weed that has invaded many Northwest lakes and rivers. If left unchecked, it can overtake a body of water, leaving it a tangle of thick, stinking weeds.

Dr. William Funk, director of the State Water Research Center at Washington State University, has seen lakes so overgrown with milfoil that corridors had to be cut through the plants to allow boats to get out.

He's also seen the problem grow out of control in Liberty Lake over the past year, making it impossible for trained divers to stop its spread through hand removal alone.

Funk is now helping Liberty Lake Sewer and Water District officials

push for legislation that would allow limited use of the pesticide 2,4-D in Liberty Lake and other state water bodies with milfoil infestation problems.

The bill, sponsored by Republican Sen. Bob Morton of the 7th District, would relax the rules regarding 2,4-D treatment of milfoil. Government entities, special purpose districts and tribes could avoid the difficult and often unsuccessful permit application process now required for such projects. They also could apply for \$350,000 in grant money to pay for the chemical treatments.

Unlike some other chemical treatments, 2,4-D doesn't kill all forms of plant life.

"2,4-D is almost selective for milfoil," Funk said. "It leaves the broader leaf plants alone."

But even supporters of Senate Bill 5742 say 2,4-D, a possible carcinogen, should be used sparingly and probably only after other options have been explored.

"The key (in Liberty Lake) will be careful treatment, putting it right on the plants in limited areas," Funk said.

Funk joined Liberty Lake Sewer and Water District officials, including manager Lee Mellish, at

the bill's hearing last week in the Senate Environmental Quality and Water Resources Committee. So many people showed up to support the proposal, Funk and Mellish never got a chance to testify.

On Thursday, the committee voted 7-0 to approve the bill and send it on to the Senate Ways and Means Committee.

The proposal has a long way to go before becoming law, but supporters are encouraged because it has bipartisan support, as well as a nod from the state Department of Fish and Wildlife and the state Department of Ecology.

"This is not just a northeast Washington issue," said Sen.

Morton, the bill's prime sponsor.

It's also not just a Washington state issue.

Milfoil, once sold as a decorative plant for aquariums, has attacked lakes and rivers in more than 35 states. It showed up in Idaho, Utah and New Mexico just last year.

Morton's bill, if made into law, would provide one more option for fighting it, supporters say. It would go into effect immediately, allowing Liberty Lake officials to attack their milfoil problem early next summer, before it spreads further.

Milfoil was discovered in Liberty Lake about four years ago, Mellish said. Since then, the district has used divers to carefully remove the weed by hand — a strategy that worked for three years.

But warm weather and boating activity last summer led to significant growth. The milfoil formed two large patches — one at the north end of the lake and one at the south end — and splattered the water with small clusters in between. Combined, the patches probably would measure about one acre.

"It just kind of exploded," Mellish said.

If SB5742 becomes law, and retains its current wording, the Liberty Lake Sewer and Water District would have to provide 21 days' advance notice to

the public as well as numerous public agencies before using 2,4-D to fight the milfoil. It also would have to place informational buoys around the treatment areas to warn boaters and recreationalists.

With the current level of infestation, treating Liberty Lake with 2,4-D probably would cost between \$25,000 and \$50,000, Funk estimated.

But time — not money — is the district's primary concern.

"We have a window of opportunity," Mellish said, "to get in and get it under control."

■ Pat Scutchetti can be reached at 827-2164 or by e-mail at [pat@spokesman.com](mailto:pat@spokesman.com).





