

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ECOLOGICAL SERVICES

STAFF REPORT 40

**Control of Rooted Aquatic Vegetation,
Algae, Leeches, Swimmer's Itch, 2005**

April 2006

**A Summary of Permitted Control Work for Aquatic Vegetation,
Algae, Leeches, Swimmer's Itch, 2005**

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Division of Ecological Services

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Executive Summary 2005 Aquatic Plant Management Program

In Minnesota the state is the owner of wild rice and other aquatic vegetation growing in public waters (M.S. 84.091). The Minnesota Department of Natural Resources (DNR) regulates the harvest, transplanting and destruction of aquatic plants in public waters through a permit program. The purpose of the Aquatic Plant Management (APM) permit program is to protect the beneficial functions of aquatic vegetation while allowing riparian property owners to obtain reasonable access to public waters.

The number of public waters where aquatic plant management is permitted has increased gradually from 1953 until 2000. However from 2003 through 2005 the numbers of lakes with permitted APM activity have remained essentially the same. During this period there was an average of 896 public waters with permitted APM activity annually. While the number of lakes has remained essentially the same over the last three years the number of permits issued continues to increase. There were 232 more permits issued in 2005 than in 2004. The increase in numbers of permits issued over the past 3 years has averaged nearly 350 per year.

The Central Region which includes the seven county metropolitan area typically issues more permits for more properties than any other DNR regional office. In 2005, the Little Falls Office (Central Region 3B) at the northern part of the Central Region issued 21 more permits to 186 more properties than were issued in 2004. The St. Paul office (3A) of the Central Region issued 37 more permits but there were 61 fewer properties. The Central Region had a net increase of 125 properties in 2005.

The numbers of aquatic plant management permits increased in all other DNR Regions as well. In the Northwest Region there were 71 more permits and 43 more properties in 2005 than in 2004. The Northeast Region issued 89 more permits in 2005 than in 2004 to 112 more properties. In the South Region the number of permits only increased by 14 but the number of permitted properties increased by 361 properties. The numbers of properties involved in the APM program statewide increased by 641 in 2005. The South Region accounted for more than 50% of the increase in permitted properties statewide.

Permit revenue increased from approximately \$261,600 in 2004 to nearly \$270,500 in 2005. The average fee per property was nearly \$24.00 in 2005.

In 2005, about 40% of the permits issued allowed the use of automated aquatic plant control devices like the Crary WeedRoller, the Colman Beach Groomer, Lake Restoration Lake Sweeper and similar home made devices. The remaining 60% of the aquatic plant management permits allowed chemical and or other mechanical removal as the method of control. These numbers are nearly identical to the permit distribution among methods in 2004.

The Department first began issuing permits for Automated Untended Aquatic Plant Control Device's (AUAPCD's) in 1997. Now, permits for AUAPCD make up more than half of the active Aquatic Plant Management permits. The number of single season permits issued in 2005 is up by 127 statewide over 2004. The single year permits issued have increased annually since 1998. The 2005 total of 1081 is more than double the number of 1-year permits issued in 1998. The number of three-year duration permits issued has decreased over the last 3 years, down 48 permits from 2004. The three-year permit option is allowed for persons who limit the size of the area of AUAPCD operation to 50 feet alongshore or one half there frontage whichever is less and no more than 2,500 square feet. Persons who obtained a three-year permit in 2005 will not have to reapply again until the year 2008. Some people (135 of those reporting) were permitted to, but did not run their device in 2005.

Most AUAPCD permits are issued to a single property owner. Although AUAPCD's make up 40% of the permits issued they only account for about 14% of the total number of properties permitted in 2005. The other 86% of properties were permitted to use harvesting or herbicides for aquatic plant control.

Summary of Aquatic Plant Management permits issued in 2005 for harvesting, herbicide use and channels and all AUAPCD's.

| Region | Harvest Chemical | Channel* | Active Channel** | AUAPCD | | | | all active permits |
|--------|------------------|----------|------------------|-------------|--------|-------------|-------------|--------------------|
| | | | | Issued 2005 | | Issued 2004 | Issued 2003 | |
| | | | | 1 year | 3 year | 3 year | 3 year | |
| Reg 1 | 398 | 60 | - | 650 | 196 | 215 | 278 | 1339 |
| Reg 2A | 60 | 7 | - | 1 | 6 | 5 | 2 | 14 |
| Reg 2B | 528 | 13 | - | 211 | 166 | 175 | 223 | 775 |
| Reg 3A | 774 | 18 | - | 87 | 27 | 13 | 22 | 149 |
| Reg 3B | 311 | 3 | - | 103 | 74 | 93 | 62 | 332 |
| Reg 4 | 129 | 2 | - | 29 | 6 | 22 | 7 | 64 |
| All | 2200 | 103 | 342 | 1081 | 475 | 523 | 594 | 5318 |

*Channel permits are of unlimited duration issued to the property owner to mechanically maintain a channel no more than 16 shoreline feet wide of emergent vegetation.

** Total by Region can not be calculated because Region boundaries were changed in 2003.

Summary of all APM permits issued, fees collected, numbers of lakes properties treated and harvested in 2005.

| Region | All Permits Issued In 2005 | All Lakes* | Fees** | Properties | | All Reporting:*** | | |
|-------------|----------------------------|------------|--------------|-------------------|--------------------|-------------------|--------------------|------|
| | | | | Permitted in 2005 | Ave. Fee /Property | Harvest Work | Chemical Treatment | Both |
| Reg 1 | 1304 | 251 | \$46,005.00 | 1354 | \$33.98 | 72 | 188 | 30 |
| Reg 2A | 74 | 47 | | 285 | | 3 | 28 | 3 |
| Reg 2B | 918 | 142 | | 1397 | | 54 | 386 | 8 |
| Reg 2 total | | | \$1,946.80 | 1682 | \$1.16 | | | |
| Reg 3A | 906 | 256 | | 5344 | | 43 | 534 | 6 |
| Reg 3B | 491 | 128 | | 1952 | | 22 | 206 | 6 |
| Reg 3 total | | | \$210,301.88 | 7296 | \$28.82 | | | |
| Reg 4 | 166 | 70 | \$12,242.64 | 951 | \$12.87 | 19 | 67 | 6 |
| 2005 TOTAL | 3859 | 894 | \$270,496.32 | 11283 | \$23.97 | 213 | 1409 | 59 |
| 2004 TOTAL | 3627 | 900 | \$261,612.32 | 10642 | \$24.58 | 203 | 1327 | 51 |
| CHANGE | 232 | -6 | \$8,884.00 | 641 | -\$0.61 | 10 | 82 | 8 |

* Includes all lakes, ponds, ditches and streams listed an APM permits for 2005.

**Fee totals provided by Carol Rushenberg

***Data tabulated from 1688 surveys returned.

INTRODUCTION

Value of Aquatic Plants

Aquatic plants are essential components of most freshwater ecosystems. In many lakes, plants are the base of the aquatic food chain. The habitat aquatic plants provide in the shallow near-shore areas is important to both the aquatic and terrestrial animals. They also serve important functional roles in lakes by stabilizing the lake bottom, cycling nutrients and preventing shoreline erosion.

Many of Minnesota's most sought-after fish species depend heavily on aquatic vegetation throughout their life histories. Yellow perch, northern pike, muskellunge, pan-fish and bass all depend on aquatic vegetation to provide food, spawning habitat, and nursery areas. Juvenile fish of most species feed on small crustaceans and insects that are abundant in stands of aquatic vegetation. Even species that may not require vegetation for spawning depend on the cover and forage found in aquatic vegetation.

Many species of wildlife are dependent on aquatic plants for food and nesting sites. Ducks eat the seeds and tubers produced by various water plants. Other aquatic plants, which are not eaten directly by waterfowl, support many insects and other aquatic invertebrates that are important sources of food for migratory birds and their young. Ducks have been known to alter migration patterns in response to food availability. Emergent aquatic vegetation provides nesting cover for a variety of waterfowl, wading birds, shorebirds and songbirds. The reproductive success of ducks that nest near lakes is closely tied to available aquatic plants and the cover it provides to hide young birds from predators.

The muskrat, an important furbearer, is almost entirely dependent on aquatic vegetation for food and shelter. Minnesota's largest mammal, the moose, also relies heavily on aquatic vegetation for food.

The distribution of many amphibians and reptiles is directly linked to the vegetation structure of aquatic habitats. Species preference of particular habitat types is related to food availability, types of escape cover and specific microclimates. Emergent and submerged vegetation support invertebrate populations that provide an important food source for amphibians and reptiles. During the breeding season some species of frogs call from emergent vegetation at the water's edge and their egg masses are often attached to aquatic plants. Aquatic turtles often eat submerged vegetation, which is an important source of calcium.

Beyond providing food and shelter for fish and wildlife, aquatic vegetation is important in maintaining a stable lake environment. Aquatic vegetation helps maintain water clarity by limiting the availability of nutrients, and preventing suspension of bottom sediments. Aquatic plants limit erosion of shorelines by moderating the effects of wave and ice erosion. A healthy native plant community is also important in preventing the establishment of non-native invasive aquatic plants. In short, aquatic plants serve many important functions for lakes, fish and wildlife. Many of the things that we enjoy most about lakes are directly linked to aquatic vegetation.

The Aquatic Plant Management Program

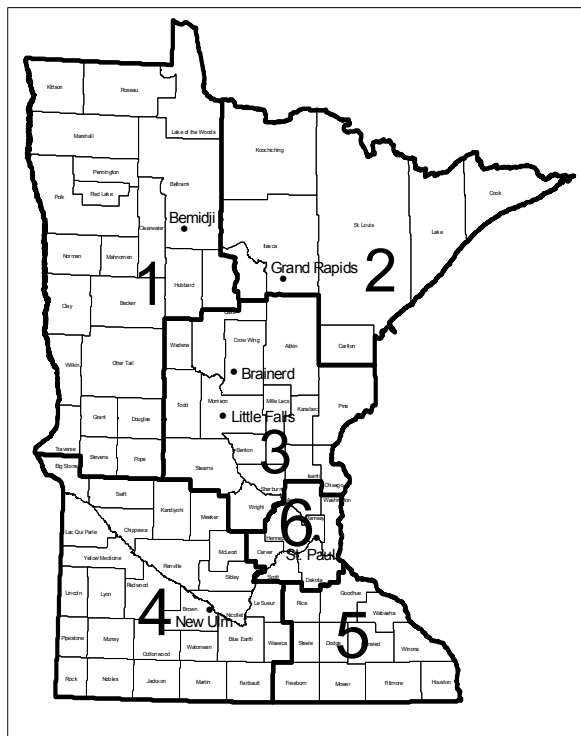
Riparian property owners (lake shore property owners) in Minnesota have a legal right to use and access the lake adjacent to their property. Aquatic vegetation may interfere with a lakeshore homeowner's ability to exercise that right. The purpose of the DNR's Aquatic Plant Management Program is to preserve the functions of aquatic vegetation while allowing the

homeowner the ability to use the lake. Other aquatic organisms can also interfere with the lakeshore property owner's enjoyment of the lake. Swimmer's itch, caused by the immature life stage of a parasite common in waterfowl, can cause significant and sometimes severe discomfort in humans depending upon a person's sensitivity to the organism. Algae (plankton and filamentous) can also create a nuisance and occasionally unhealthy conditions when they become over abundant. Relief from these nuisances may also be sought under an aquatic plant management permit.

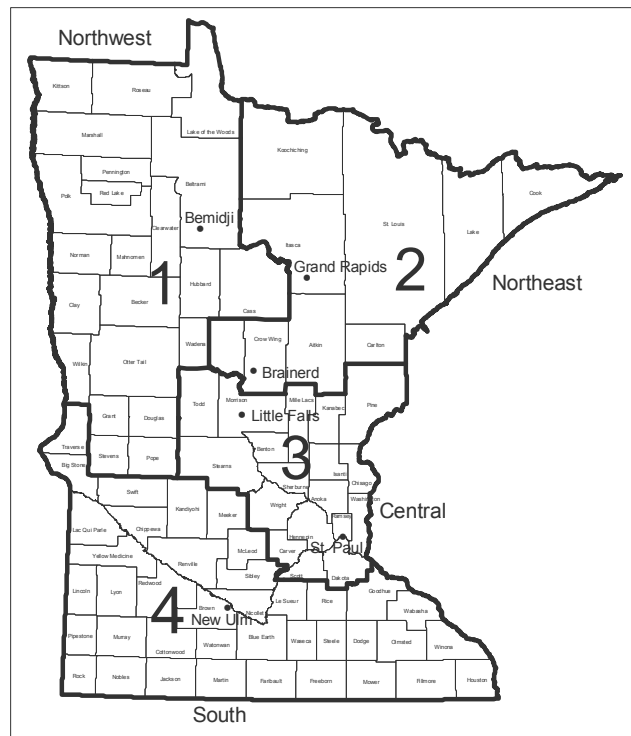
Administrative Regions

In July of 2002 the number of DNR administrative regions was reduced. The previous six region structure was reduced to four administrative regions. The Brainerd Lakes Region, previously Region Three, was divided up between the Northeast Region (Region Two) and the Metro Region (Region Six), now the Central region. The southeastern part of the state, region five, was combined with the South Region or Region Four. Aquatic plant management permits were issued as they had been in the six region structure through the remainder of the 2002 open water season. In 2003 APM permits were issued according to the new regional boundaries.

Pre- July-2002



Post-July -2002



The number of staff reviewing APM permit applications increased concurrent with the reduction of DNR regions. The reorganization moved some regional headquarters farther away from the major centers of APM permit activity (Appendix Figure G.). The Brainerd DNR Office, now in the Northeast Region, retained an Aquatic Plant Management specialist because the Brainerd Lakes Area is a center of APM permit activity. The Brainerd (2B) area office is responsible for application review for Aitkin, Crow Wing, and southern Cass Counties. Grand Rapids (2A) the location of the Northeast Regional DNR Headquarters is responsible for application review for

Carlton, St. Louis, Lake, Cook, Koochiching, and Itasca Counties. The Central Region added an APM position to the Little Falls Fisheries Office to accommodate the large number of permits previously issued from the Brainerd Office. The Little Falls office (3B) is responsible for application review for Benton, Isanti, Kanabec, Pine, Mille Lacs, Morrison, Sherburne, Stearns, Todd and Wright Counties. The Central Regional DNR Headquarters in St. Paul (3A) is responsible for application review for the metropolitan area, Anoka, Carver, Chisago, Dakota, Hennepin, Ramsey, Scott, and Washington Counties. The new regional structure makes historical comparisons between regions much more difficult. However, it is still possible to identify statewide trends and make comparisons between years.

The DNR's, Division of Fish and Wildlife is responsible for the administration of the Aquatic Plant Management Permit Program. Riparian property owners apply for a permit to their Regional Fisheries Manager. The Northwest, Northeast, and Central DNR Regions have Aquatic Plant Management Specialists who make site inspections and review applications for permit. In the South Region site inspections and application review are the responsibility of the Area Fisheries Supervisor. The recommendation for the disposition of the permit application (approval, modification or denial) is determined during the review process. This decision often involves a discussion with the property owner. When applications for APM permits are received for shallow lakes where waterfowl management is the primary focus, the Aquatic Plant Management Specialist will seek the advice of the Area Wildlife Manager. When applications are modified or denied the applicant may appeal to the Commissioner's Office for review. The purpose of this review is to determine if the permit decision was based upon rule standards. Finally, permit decisions can be appealed to an Administrative Law Judge through the contested case hearing process. Usually the cost of control is borne by the individual (permittee) directly benefiting from the control effort.

The coordinator of the Aquatic Plant Management Program is in the Division of Ecological Services. This position is the department's contact with commercial aquatic plant harvesters, aquatic herbicide applicators, and the Minnesota Department of Agriculture (MDA). The coordinator provides technical expertise on aquatic plant control methods, and permitting requirements to lakeshore property owners and Department staff. The coordinator works to insure consistent interpretation of the APM rules throughout the Department. This position administers exams, and issues operating permits to commercial aquatic plant harvesters. This person also reviews appeals of permit decisions for the Commissioner. The Program Coordinator maintains current labeling and material safety data sheets on products allowed for aquatic plant control and provides that information to field personnel. The Program Coordinator also prepares an annual report on program activities (this document) and coordinates the development of materials and forms provided to riparian property owners asking about aquatic management.

The APM program coordinator supervises staff in the Division of Ecological Services whose job responsibility includes enforcement of aquatic pesticide rules and pesticide label requirements. Aquatic Pesticide Enforcement Specialists conduct inspections of herbicide applications in public waters to monitor compliance with state and federal pesticide law and respond to reports of pesticide misuse (Appendix Tables E and F). Through June of 2003 there were two Aquatic Pesticide Enforcement Specialist positions, one for the southern half of the state located in the St. Paul Central Office and one for the northern half of the state located in the Brainerd Regional DNR Office. Beginning in July of 2003 the work activity of the Brainerd Aquatic Pesticide Enforcement specialist position was significantly curtailed due to budget reductions. The U.S. Environmental Protection Agency (EPA) partially funds DNR's aquatic pesticide enforcement activities through a grant administered by MDA.

Regulations

Authority for the DNR's aquatic plant management program is found in Minnesota Statutes M.S. 84.091 Subdivision 1, which designates ownership of wild rice and other aquatic vegetation in public waters to the State. M.S. 103G.615 authorizes the Commissioner of the DNR to issue permits to harvest or destroy aquatic plants, establish permit fees, and prescribe standards to issue or deny permits for aquatic plant control. The standards for the issuance of permits to control aquatic vegetation and the permit fee structure are found in MN Rules Chapter 6280. Minnesota Statutes and Rules can be reviewed at the Revisor of Statutes website <http://www.leg.state.mn.us/leg/statutes.asp>.

A permit from the DNR is required to use pesticides in public waters (generally any body of water 2.5 acres or larger within an incorporated city limit, or 10 acres or larger in rural areas), to use an automated aquatic plant control device, and to control emergent vegetation such as cattails, wild rice or bulrush. A riparian property owner may, without a permit, physically remove (cut, pull or harvest) *submerged* vegetation along one half the individual's lake frontage or 50 feet, whichever is less. The total area may not exceed 2,500 square feet. In addition, a boat channel up to 15 feet wide, and as long as necessary to reach open water, may also be maintained by mechanical means without a permit. If floating leaf vegetation is interfering with riparian owner access a channel not more than fifteen feet wide extending to open water may be mechanically maintained without permit. The vegetation that is cut or pulled must be removed from the lake and the managed area must remain in the same location each year.

The mechanical control of purple loosestrife, a plant on the Minnesota Department of Agriculture's noxious weed list, does not require a permit from the DNR. However, herbicide control of purple loosestrife below the ordinary high water level on public waters does require a permit. Because of the plant's status as a noxious weed, these permits are issued free of charge.

Beyond the permit requirement, any pesticide used in lakes must be labeled for aquatic use and registered with the United States Environmental Protection Agency. When using an aquatic herbicide all label instructions and precautions must be followed. The permittee must post areas treated with herbicides so that anyone entering the area is informed of the herbicide application. The signs contain the following information: the name of the applicator, the treatment date, the name of the product used, expiration dates of any water use restrictions on swimming, fishing, household, and other uses. The DNR provides these signs to permittees and commercial applicators at no cost. A list of herbicides most commonly used for aquatic plant control and the amount used under permit in Minnesota is found in Appendix A.1 and A.2.

Summary of Aquatic Plant Management Program Activities in 2005

The following is a summary of Aquatic Plant Management Program (APMP) activities in 2005. The data for this report comes from four sources: permittee survey forms (2005 Appendix Table C and D), commercial aquatic applicator and harvester reports, and Aquatic Plant Management (APM) permits. Commercial applicators, harvesters, and riparian property owners who do control work in public waters are required to provide a yearly summary of their APM activity. With this information the past year's activities can be summarized, the control of aquatic vegetation in public waters is monitored, and trends in aquatic plant management are identified.

Survey forms are mailed to permit holders that did their own aquatic plant control work. Prior to 2000, permit holders that hired commercial applicators to perform the control work for them were included in the survey. They were asked to answer only those few questions pertinent to their situation. This often caused confusion and permittees would either not respond or would

send the form to the commercial service for completion. In addition, when commercial applicators do the control work there are usually many customers on a single permit. However, only one of those customers is listed as the permittee, hence you must rely on one individual to provide accurate information for up to 100 or more other people. Since commercial pesticide applicators are required by law to keep detailed records, and their reporting is generally more precise, permit holders who hire a commercial firm no longer receive a survey form.

Survey forms were sent to all permittees that did their own chemical or mechanical control work. Of the 966 surveys mailed 824 (85%) were returned. A separate survey was sent to all 1,556 AUAPCD permit recipients, 1,412 (91%) were returned.

Permit Issuance

In 2005 a total of 3,859 permits were issued statewide for APM activities, 232 more than in 2004 (Appendix G provides a map of the county by county distribution of permits and permitted properties). These permits were issued for properties on 894 public waters (i.e. lakes, ponds, and streams) in 2005 (Figures 1, 2, and 3). In 2005, there were 1,556 permits issued for the operation of Automated Untended Aquatic Plant Control Devices (AUAPCD). The remaining 2,303 permits were issued to municipalities and lakeshore homeowners for either pesticide use (includes algae and swimmer’s itch control) or mechanical control (cutting, pulling, or harvesting) of aquatic vegetation.

The number of public waters where permits were issued remained nearly constant until 1999 when the number of public waters with permitted APM activity increased by 204 to 785 (Figure 2 & 3). The number of public waters with permitted APM activity in 2005 was 894, essentially unchanged from 2004.

Figure 1. Permits issued, and the number of lakes with permitted aquatic plant control, by region, in 2005.

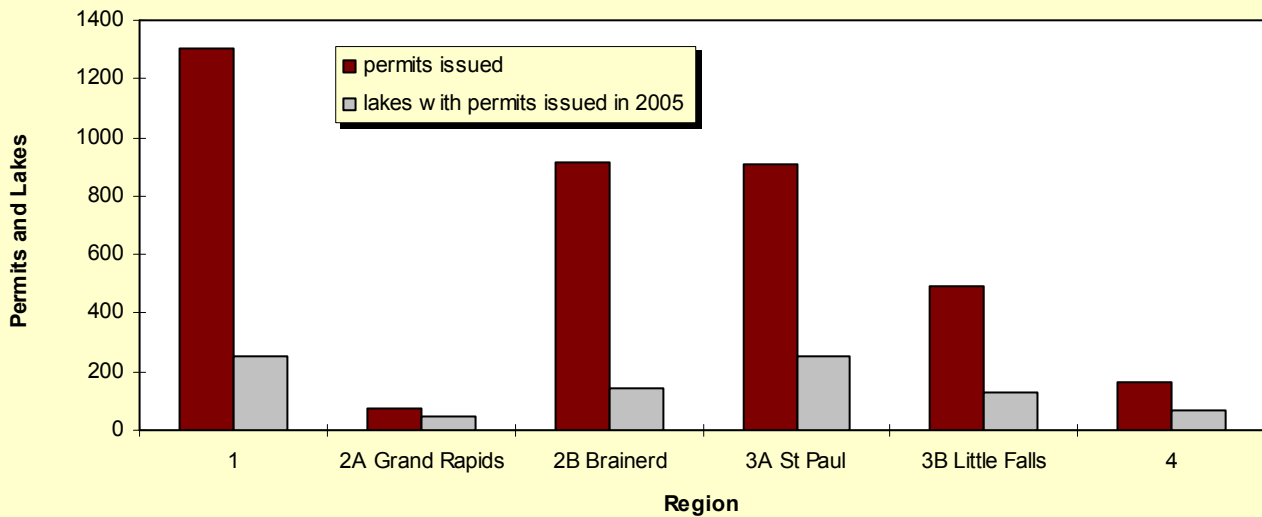


Figure 2. Numbers of permits issued for mechanical and chemical control (excluding AUAPCD) of aquatic vegetation, algae and swimmer's itch and numbers of lakes where permits were issued 1992-2005.

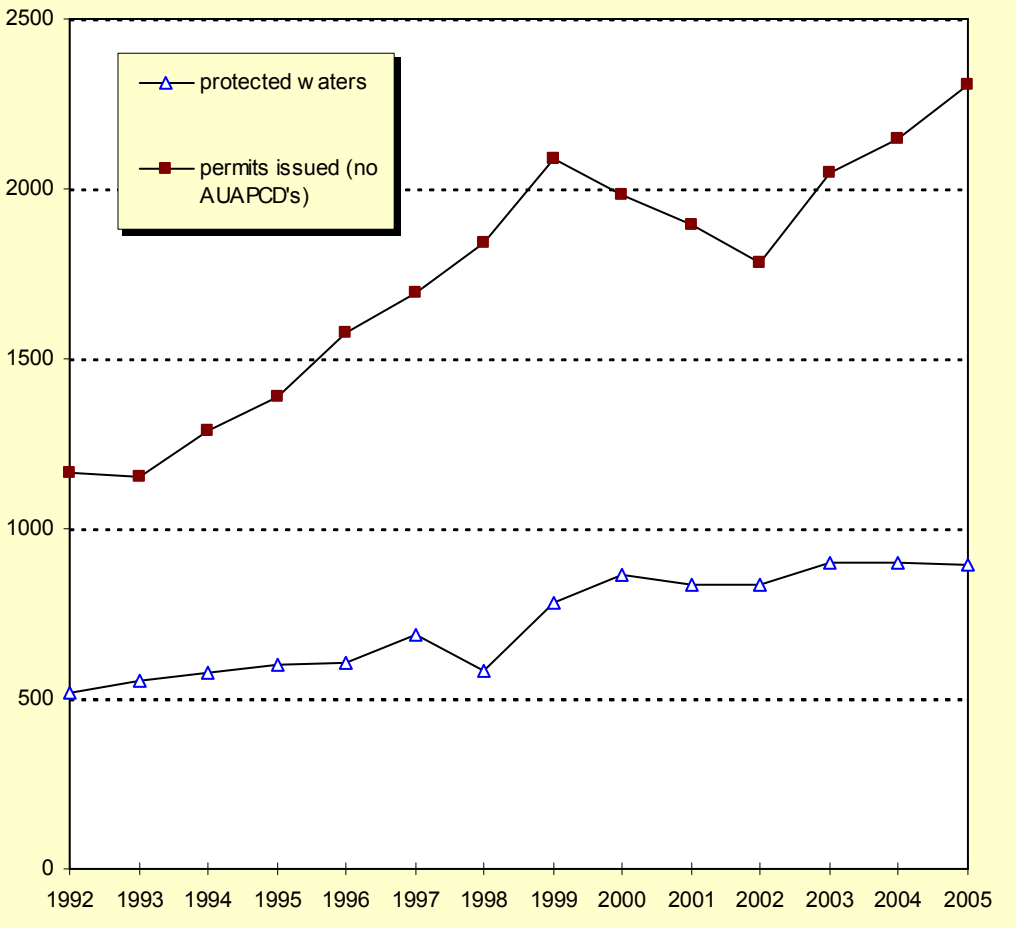
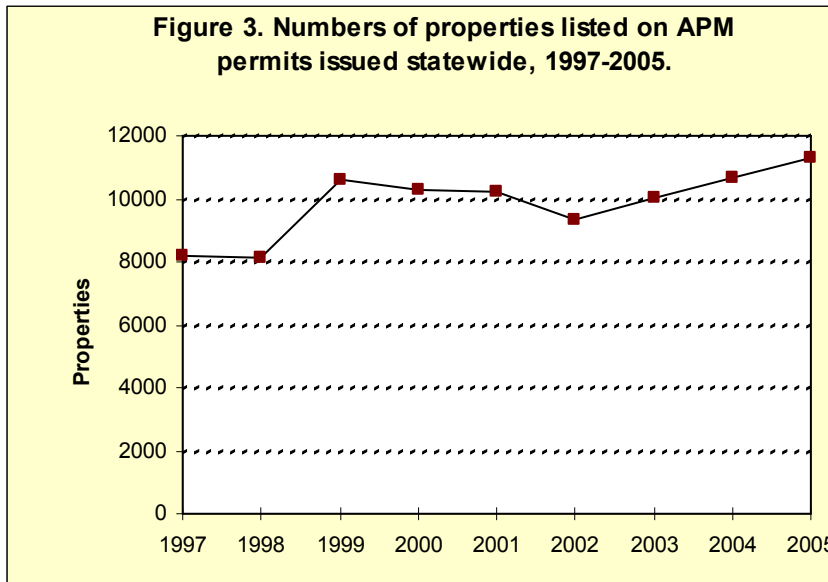


Figure 3. Numbers of properties listed on APM permits issued statewide, 1997-2005.



Aquatic plant management permit issuance increased annually from 1992 until about 1999. Then in the early 2000's the numbers of permits issued decreased and there was a corresponding decrease in the numbers of participating properties. Permit numbers and properties began to increase again in 2003 through 2005. Spring of 2000 was the beginning of several years in a row that were cooler and wetter than normal in the Metro area. Temperatures may have contributed to the decline in lakeshore property owners participating in the Aquatic Plant Management program.

Lakeshore homeowners may apply for an aquatic plant management permit as a group. Group permits are more popular in the Twin Cities metropolitan area than in greater Minnesota (Table 1). Homeowner's on large group permits can benefit from the \$750 cap on permit fees. The permit fee per individual begins to go down after 21 properties. Some permits have more than 100 properties listed on a single permit. In 2005 there were 11,283 properties covered by the 3,859 permits issued.

The statewide average number of properties per permit in 2005 remained the same as in 2004 at 2.9 properties. The Central Region, which includes the Twin Cities metropolitan area, typically has larger group permits than other areas of the state. In 2005, in the Central Region there were 5.2 properties per permit issued. The Northwest Region averaged just over one property per permit (1.03); the Northeast Region averaged nearly two properties per permit (1.7). The largest increase in permitted properties occurred in the Southern Region. The average number of properties per permit in 2004 in the South Region was 3.9, but increased to nearly 6 properties per permit (5.7) in 2005.

Table 1. Numbers of permits listing multiple and single properties (excluding AUAPCD permits) by Region, 2005.

| Region | 1 | 2A | 2B | 3A | 3B | 4 |
|------------------------|------|----|-----|-----|-----|-----|
| Permits/property: >100 | 0 | 0 | 0 | 4 | 1 | 4 |
| 51-100 | 0 | 3 | 2 | 13 | 6 | 3 |
| 21-50 | 1 | 0 | 5 | 46 | 16 | 2 |
| 11-20 | 1 | 0 | 7 | 63 | 20 | 2 |
| 2-10 | 4 | 0 | 17 | 159 | 44 | 14 |
| 1 | 1298 | 71 | 887 | 621 | 404 | 141 |

The rules regulating aquatic plant removal from public waters allow for an inspection of the treatment site the first time an application is received or when there are changes requested to previously issued permits. Aquatic plant management specialists and area fisheries staff visit these sites to determine if the standards for permit issuance in APM rules are met prior to issuing a permit for plant removal. This is also an opportunity to determine what kinds of plants and habitat are present in the treatment area. During these inspections the size of the area may be reduced based on the observations and professional judgment of the specialist. The number of applications received for shoreline vegetation removal and the numbers of permits that are issued as requested is shown in Table 2. Table 2 includes both new and previously issued permits.

Table 2. All APM applications, including new and previously issued permits, requesting *control along shore and the number of permits issued as requested, by region in 2005.

| | Region | | | | | | |
|----------------------------------|--------|----|-----|-----|-----|-----|-----------|
| | 1 | 2A | 2B | 3A | 3B | 4 | Statewide |
| Number of applications | 1,240 | 52 | 873 | 773 | 428 | 129 | 3,495 |
| Permits issued as requested | 1,018 | 41 | 782 | 637 | 371 | 89 | 2,938 |
| % of permits issued as requested | 82 | 79 | 90 | 82 | 87 | 69 | 84 |

* Includes chemical, mechanical, AUAPCD, and swimmer's itch control.

Permit Fees

The 2003 legislature increased permit fees. People applying for APM permits after August 1, 2003 were required to pay the higher fee. The new fee increased many types of APM permit from \$20.00 per property to \$35.00 per property. The cap on large group permits was increased from \$200 to \$750. All permits in 2005 were issued under the new fee structure.

Revenues in 2005 were \$270,496 about \$8,884 more than 2004. The average permit fee per property owner in 2004 was \$24.58 in 2005 the average fee per property was \$23.97. There is still economy of scale for large group permits, hence the statewide average cost per property was about \$24.00 in 2005, \$11.00 less than the cost of an individual permit under the new fee structure.

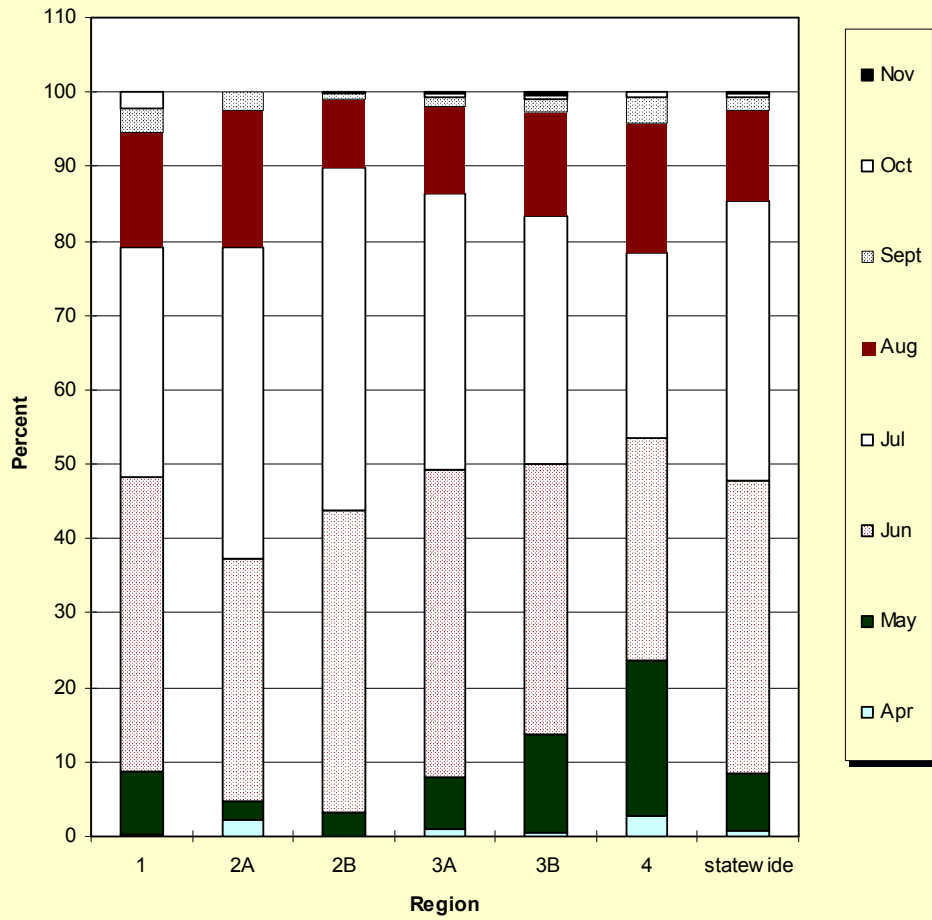
Timing of Treatment

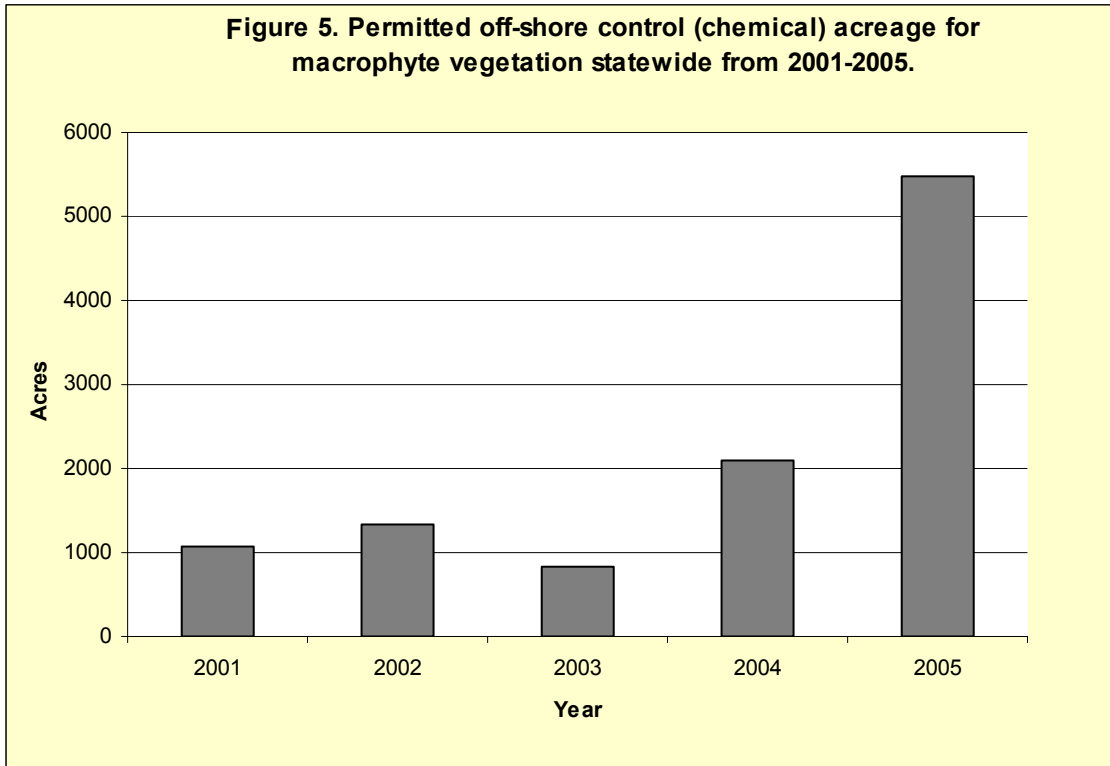
Permits are issued for the open water season, generally from May through September 1. However, aquatic plant control can begin as early as January and extend through November. In 2005, about 87% of the permitted work, reported statewide, was completed in June, July, and August (Figure 4). Because most aquatic plant control in Minnesota is recreationally motivated this pattern has been consistent over time.

Acres of aquatic plant control permitted

The number of acres permitted for submerged aquatic plant control (both chemical and mechanical methods) fluctuates annually. This may mean that aquatic plant control is highly variable depending on the season. The off shore control of aquatic vegetation (Figure 5) is focused primarily on non-native invasive species. A few large Eurasian watermilfoil and curly-leaf pondweed treatments, can have a significant influence on the total number of acres permitted for treatment. This was evident in 2004 and 2005. In 2004 several lake-wide treatments of curly-leaf pondweed in the Central Region were responsible for the increase in treated acres. These lakes in addition to Lake Benton, a 3000-acre lake in Lincoln County, were treated again in 2005 with an aquatic herbicide to manage curly-leaf pondweed. As the interest in managing invasive species increases this trend will likely continue.

Figure 4. Percent of reported APM work by month for each region in 2005.





In 2005, about 41% of all permits issued for aquatic plant control permitted the use of plant removal with AUAPCD's. Aquatic plant control using herbicides, plant harvesting, and plant removal by hand, accounted for the remaining 59% of the permits issued for aquatic plant management (Figure 6). It is important to remember that a limited amount of mechanical control of submerged and floating leaf vegetation can be done without a permit and a permit is always required when herbicides or automated devices are used for aquatic plant control. The total area permitted statewide for the various methods of near shore aquatic plant removal and the average area permitted per property in 2005 are found in Table 3.

Figure 6. Numbers of permits issued for aquatic vegetation, algae and snail control, and AUAPCD permits, 1994-2005.

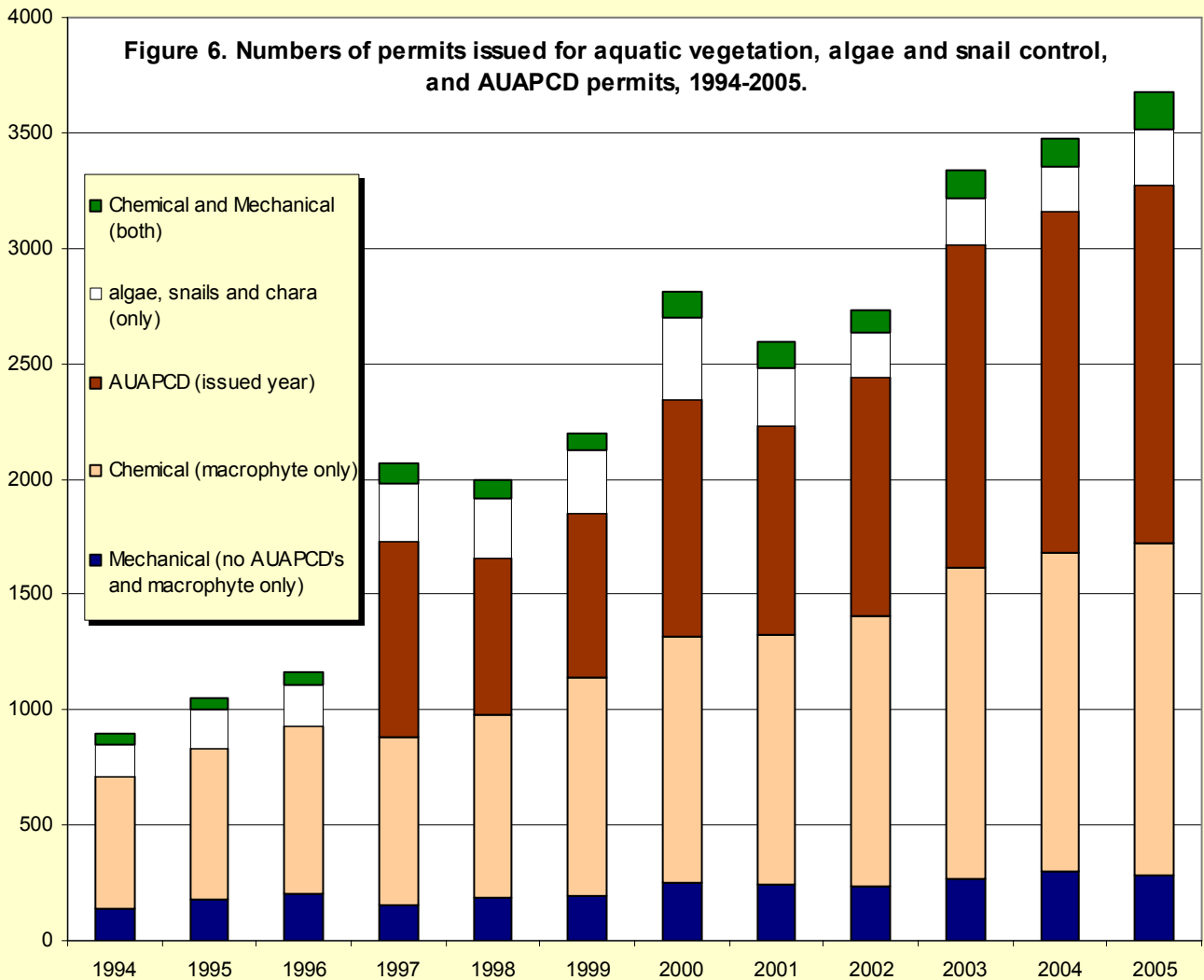


Table 3. Total near shore area permitted, in acres, by region, for control of submerged vegetation, swimmer's itch and AUAPCD use 2005.

| Control | Region | | | | | | Total number of acres | Props | Ave. Acres/ Prop. |
|--|--------|-----|------|------|------|-------|-----------------------|-------|-------------------|
| | 1 | 2A | 2B | 3A | 3B | 4 | | | |
| Herbicide control excluding open water treatment | 14.2 | 0.5 | 7.3 | 49.0 | 45.6 | 4.6 | 121.2 | 610 | 0.199 |
| Mechanical control excluding open water removal | 8.7 | 0.2 | 21.1 | 65.7 | 3.8 | 101.4 | 200.9 | 400 | 0.502 |
| Swimmer's itch control | 23.1 | 3.8 | 14.6 | 10.7 | 51.1 | 3.6 | 106.9 | 486 | 0.220 |
| AUAPCD 2005 issued | 61.8 | 0.2 | 22.5 | 8.4 | 10.9 | 1.6 | 105.4 | 1560 | 0.068 |

Numbers of Aquatic Plant Removal Permits Used

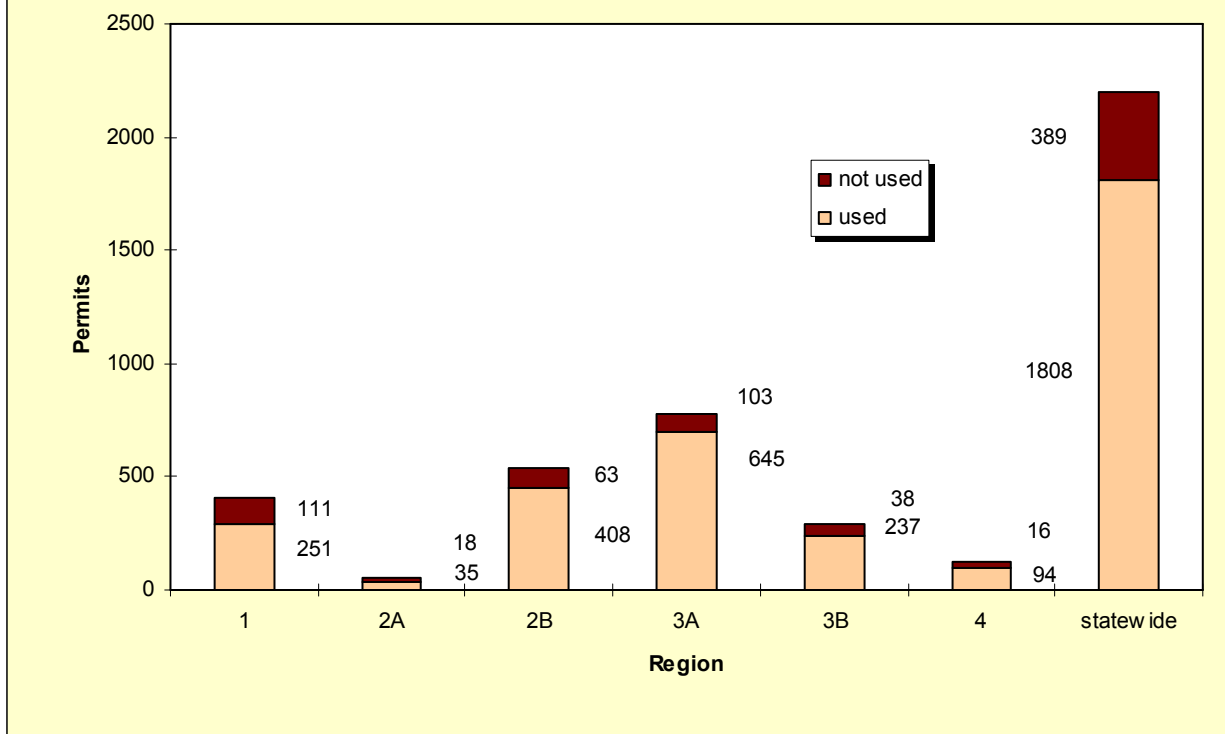
Each year some permits issued for aquatic plant management activities are not used (Figure 7). Statewide, 82% of permits issued were reported used by the permittees or commercial applicators/operators doing the work, this is unchanged from 2004. Permittees indicating that their permit was not used, were asked to indicate why by responding to one or more choices provided on the survey. The results are summarized in Table 4, below. In 2005, the reason most frequently given (50%) for not using an APM permit was that the property owner was unable to do the permitted work; 14% reported not doing the work because of getting their permit too late.

Table 4. Response to choices provided to indicate that the permit was not used and why, expressed as a percent, by region in 2005.

| Region | 1 | 2A | 2B | 3A | 3B | 4 | Statewide |
|------------------------------------|-----|-----|-----|-----|-----|-----|-----------|
| nuisance condition did not develop | 4 | 0 | 10 | 31 | 6 | 27 | 10 |
| got permit too late | 13 | 5 | 16 | 19 | 17 | 18 | 14 |
| unable to do the work | 67 | 42 | 52 | 38 | 39 | 27 | 50 |
| other | 15 | 53 | 23 | 13 | 39 | 27 | 26 |
| total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

216 permit holders who would do their own work reported not using their permit.

Figure 7. Total reported number of permits used and not used by region (excluding AUAPCD permit holders), 2005.

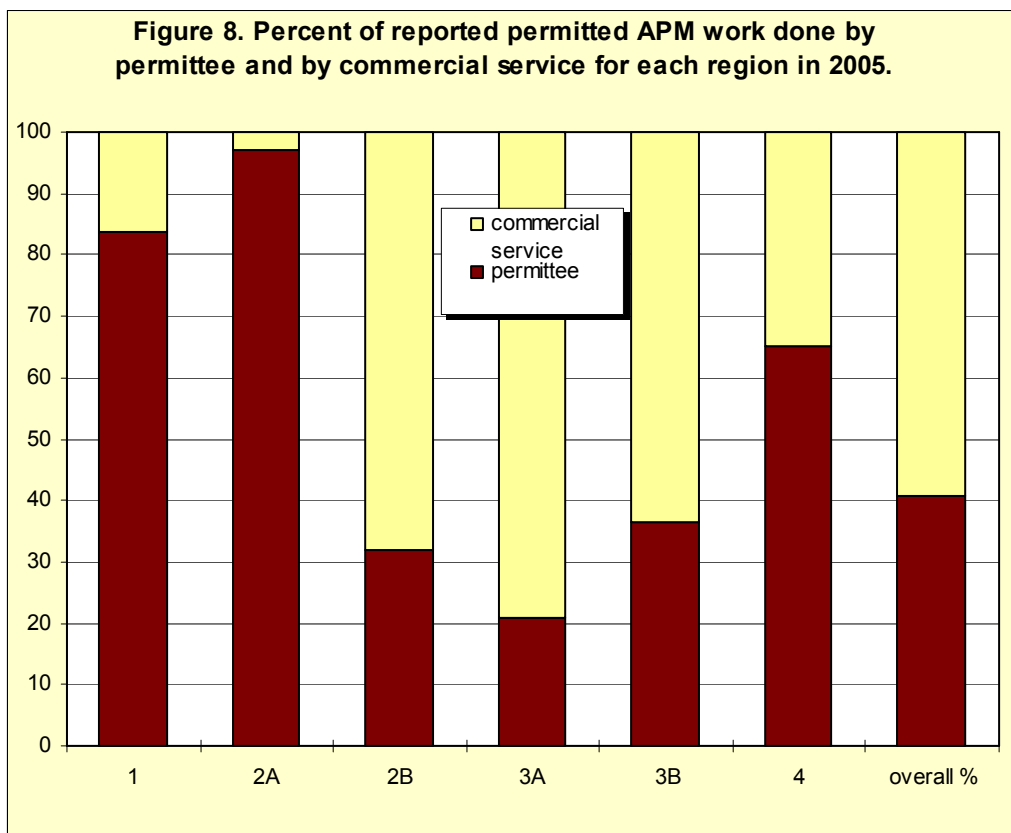


Lakeshore homeowners perform about 41% of mechanical and herbicide control permitted statewide. About 59% of the control work in 2005 was done by commercial applicator and aquatic plant harvesting companies. Permit holders in the Central Region hire commercial services more frequently than any other region (Figure 8). Commercial aquatic plant management companies perform about 75% of the control in the Central Region. In 2005, over half of the control in the Northeast Region was done by commercial service. However, most of the commercial treatment was done in the Brainerd Lakes Area (2B), most permitted control in the Grand Rapids area (2A) is still done by the homeowner. Permit holders perform about 84% of the control in the Northwest Region and 65% in the South Region.

Satisfaction

Permittees who personally undertook aquatic plant control activities were asked to indicate their satisfaction with the results of the aquatic plant control. Generally, permit holders were satisfied with the results of the control. About 66% of the respondents were satisfied with the results of the herbicide control. About 84% of those responding were satisfied with the results of treatments to control swimmer's itch and 71% of respondents were satisfied with results of mechanical control. It is important to remember that permit holders hiring commercial services were not included in the survey.

Permit holders, excluding AUAPCD permittees, were asked if they would apply for a permit in 2005. Of the 824 responses, 612 (74%) said they would reapply next year a 15% increase from 2004. The number of permittees reporting that they would not apply (23 or 2.8%) was slightly less than in 2004. Approximately 23% (189) of the permit holders responding indicated that they were unsure if they would reapply for permit in 2006. Regardless of their response, all 2005 permit holders whose permit expires will receive permit application materials in 2006.



Automated Untended Aquatic Plant Control Devices (AUAPCD)

Before 1997 the operation of an automated mechanical aquatic plant control device did not automatically require an APM permit, and few AUAPCD permits were issued. The Aquatic Plant Management Rules were revised to require a permit for the operation of these devices because of their potential to excavate bottom sediments, and impact spawning habitat. In 2005, there were 1,556 permits issued for these devices statewide. Of those permits 1,081 were issued for a one-year term and 475 were issued for a 3-year permit term. Permits are issued for 3 years if the applicant agrees to a reduced area of operation and qualifies for a 3-year permit based on the vegetation types present. More than 79 percent of the AUAPCD permits were issued in the Northwest and Northeast Regions. In addition to the permits issued in 2005, there are active three-year permits issued in 2003 and 2004 (594 and 523 respectively). Of the 1,556 surveys mailed 1,412 (91%) of the AUAPCD permit holders statewide responded to the questionnaire. Three year AUAPCD permit holders issued permits in 2003 and 2004 were not surveyed.

There are at least three different companies producing AUAPCD's that are used in Minnesota, the Crary Company WeedRoller®, the Colman Beach Groomer and the Lake Restoration Lake Sweeper. Permits for 45 homemade devices were also issued in 2005. About one third of AUAPCD owners in Minnesota have owned their device for more than 3 years (554 or 39% of the respondents). Only 356 have owned their device from 1 to 3 years and 209 people responded that they have owned their device for less than one year.

Most of the people responding to our questionnaire (79%) own their AUAPCD. In 2005, two permit holders stated that they rented the device (seven in 2004). Some homeowners opt to purchase the device cooperatively and share it during the summer months. Approximately 12%

of the people who used an AUAPCD in 2005 either, borrowed, own and share, or jointly own their AUAPCD, a slight reduction from 2004.

Lakeshore homeowners have two AUAPCD permit options, provided the location is suitable for the operation of these devices. The annual renewal option is used when the lakeshore homeowner operates in an area greater than 2,500 square feet or more than 50 feet alongshore. The three-year permit option is used as an incentive for lakeshore property owners to impact a smaller area. The three-year permit option has steadily declined in popularity the last two-years (Figure 9). Reasons for this decline likely include; people are not satisfied with the limitations of the three-year permit option and are applying for an annual permit, or people who have gotten three-year permits in the past are not renewing their permits when the permit expires.

The manufacturer of the WeedRoller® has stated that with time people will need to use the WeedRoller® less frequently to achieve acceptable control. The company explained that once the plants were gone there would be little need to use the machine. We have asked the question, how often do you operate your AUAPCD? and sorted the responses by the length of time people had indicated they had owned the machine. Recent AUAPCD owners are more likely to operate the device longer than those people who have owned the device for several years (Figure 10). About 135 persons permitted to operate an AUAPCD stated that, for various reasons, they did not operate the device in 2005, down from 153 in 2004.

The AUAPCD had higher satisfaction ratings than other methods of aquatic plant control. When asked, were you satisfied with your AUAPCD, 98% of those responding indicated that they were satisfied with these devices this is identical to 2004.

Figure 9. Numbers of permits issued allowing the use of AUAPCD's in Minnesota public waters, 1997-2005.

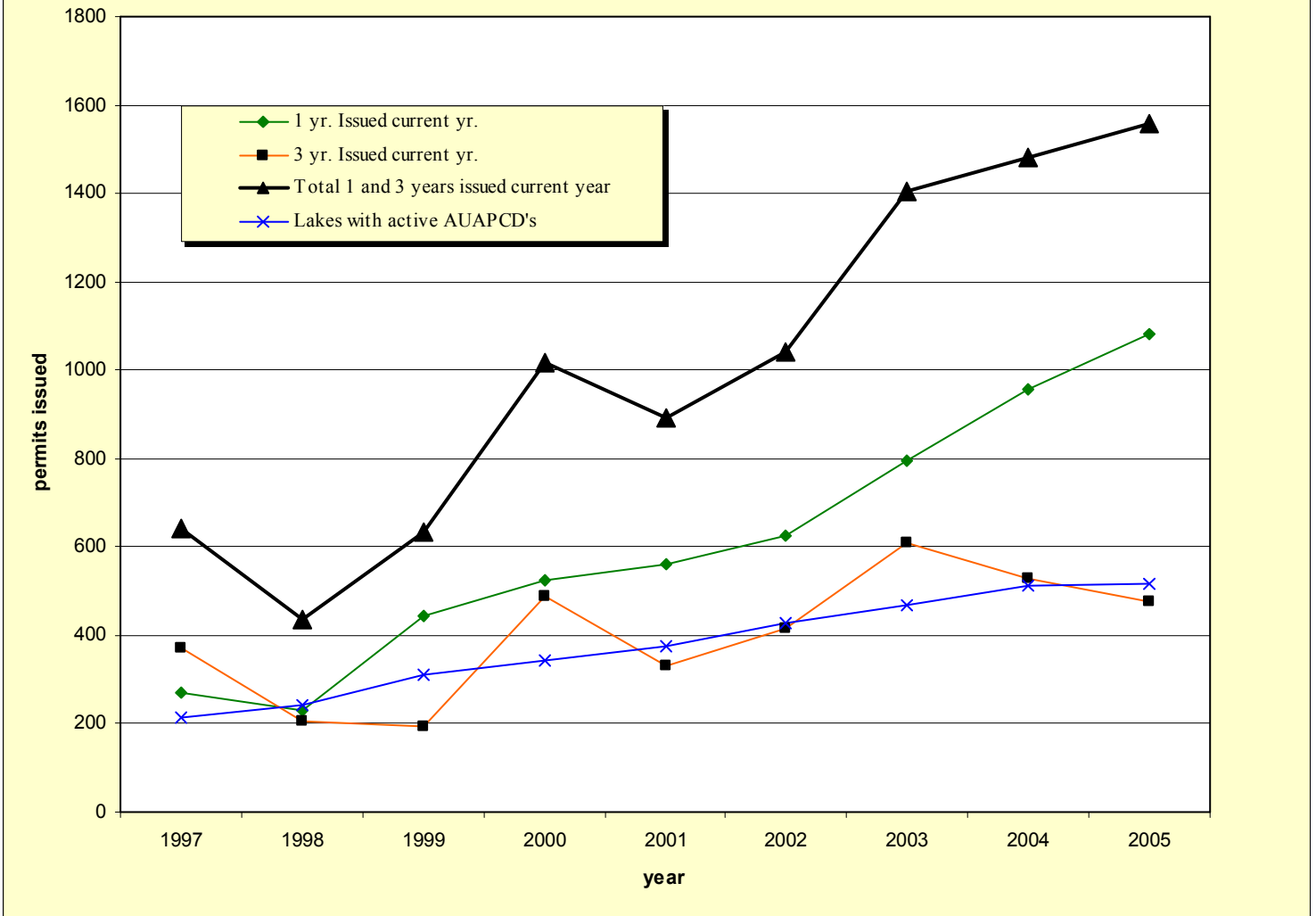
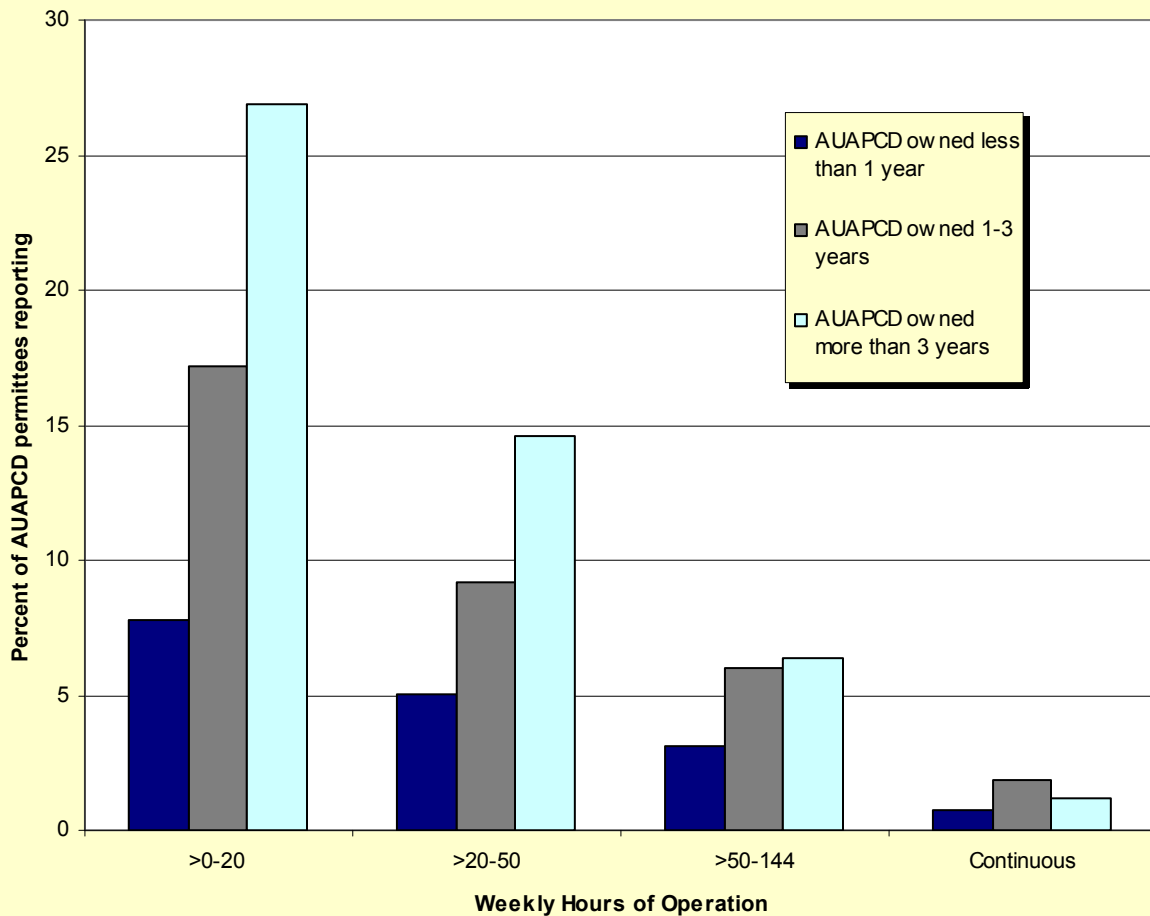


Figure 10. Hours per week of AUAPCD use from May through September 2005, categorized by length of ownership expressed as a percent of all AUAPCD permittees reporting.



The DNR sends AUAPCD permit holders a sticker to help Conservation Officers and APM staff identify permitted units. Beginning in 2000 use of the sticker became a mandatory condition of the permit. About 97% of the permit holders responding to this question had no difficulties displaying the sticker.

Invasive Species Control

In addition to oversight (permitting) responsibilities for aquatic plant management efforts conducted by individuals to improve access or recreational use, the DNR has statewide control programs for two, non-native invasive aquatic plants: purple loosestrife and Eurasian watermilfoil. In addition, to the efforts to manage these invasive species the DNR has more recently been involved with research and management of curly-leaf pondweed.

Curly-leaf pondweed

Curly-leaf pondweed (*Potamogeton crispus*) is a non-native invasive, submersed aquatic plant species introduced to Minnesota at the turn of the 20th Century. Curly-leaf pondweed is known to occur in 729 Minnesota lakes in 67 of the 87 counties in Minnesota. In many lakes this plant causes severe recreational nuisances.

Curly-leaf pondweed's life cycle is considerably different than native aquatic plants. When native aquatic plants are just beginning to grow (mid to late May) curly-leaf pondweed is forming dense mats on the lakes surface that can interfere with recreation and the growth of native aquatic plants. By mid-summer, (early to mid July) curly-leaf plants begin to die back, which results in rafts of dying plants piling up on shorelines. But before the plants die they form vegetative propagules called turions (hardened stem tips). New plants sprout from turions when they germinate in the fall (Catling and Dobson, 1985). The die back is often followed by an increase in phosphorus (Bolduan et al., 1994) and undesirable algal blooms. These algae blooms interfere with light penetration and can also reduce native plant abundance.

Standard control methods provided relief to lakeshore property owners from the recreational nuisances caused by surface mats of curly-leaf pondweed, but had no long-term effect on the abundance of the plant. Recent research conducted by the U.S. Army Corps of Engineers (ACE) has revealed promising control strategies that may help to reduce the abundance of this plant. The key to the new strategies for the control of curly-leaf pondweed is treating the plant early in the season (when water temperatures are approximately 50 degrees F.) before the plant produces turions. If this early season treatment strategy is repeated in successive years the turion bank will be depleted, reducing the overall abundance of the plant, the severity of algae blooms, and give native vegetation a competitive advantage.

The Department of Natural Resources is conducting early season curly-leaf pondweed treatments in cooperation with several lake associations on a trial basis to determine the effectiveness of this strategy. In 2005, two lakes were treated with the aquatic herbicide fluridone and several others were treated with Aquathol K. These lakes will be treated and monitored for at least 3 successive years to determine if it is possible to:

1. Reduce the interference with use of the lake caused by curly-leaf pondweed.
2. Reduce the abundance of curly-leaf pondweed for long periods of time.
3. Increase the abundance of native, submersed aquatic plants.
4. Reduce peaks in concentrations of phosphorous and associated algal blooms.

See the 2005 Invasive Species Program Annual report for more detailed information on this project (http://files.dnr.state.mn.us/ecological_services/invasives/annualreport.pdf).

References Cited

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- Catling, P.M. and I. Dobson. 1985. The biology of Canadian weeds. 69. *Potamogeton crispus* L. *Canadian Journal of Plant Science* 65:655-668.

Purple Loosestrife

Purple loosestrife, a non-native invasive plant that can out compete native wetland vegetation, was introduced to North America from Europe in the 1800's and until 1987 was a common ornamental sold by nurseries and landscape companies. Natural resource managers became aware of the plant's invasive nature and disruptive effects on native wetland vegetation in the early 1980's. The DNR, concerned about the plants impact on native species and wildlife

habitat, conducted preliminary surveys to determine the status of the plant in Minnesota. The survey revealed that 77 of Minnesota's 87 counties had populations of purple loosestrife in wetlands, lakeshore, stream banks and ditches. In 1987 Minnesota became one of the first states in the nation to develop a program to control this invasive plant. Purple loosestrife was designated a noxious weed, which makes it illegal to import, buy, sell, propagate and transport. The main components of the purple loosestrife program are:

- An inventory of purple loosestrife sites is maintained and used to prioritize control efforts.
- Carry out management activities including chemical and biological control.
- Support research to evaluate and expand control efforts.
- Monitor and evaluate the success of biological control and other management efforts.
- Public education/awareness efforts to involve the public in the management of this plant.

Large stands of purple loosestrife are extremely difficult to control because of their enormous seed bank; therefore, it is necessary to prioritize purple loosestrife control efforts. Highest priority stands are those located in watersheds with little purple loosestrife. Those stands that do exist are small and newly established (e.g., they consist of a few plants covering a small area) and are found near the headwaters of the watershed. Because of their small size these newly established sites are poor candidates for biocontrol. Rodeo, a broad-spectrum glyphosate herbicide, is used to spot treat high priority purple loosestrife sites with a backpack sprayer.

Minnesota's herbicide control effort has been reduced dramatically since the introduction of bio-control agents began in 1992. In 2005, DNR staff treated a total of 39 purple loosestrife sites with 0.58 gallons of Rodeo herbicide. Most of these sites were very small with the majority having fewer than 100 plants. The total cost for the herbicide control effort was \$9,400.00. For more detailed information on Minnesota's purple loosestrife program see the 2005 Invasive Species Annual Program report.

Eurasian Watermilfoil

Eurasian watermilfoil, hereafter called milfoil, is an exotic aquatic plant introduced to North America in the mid-1900's. It was first identified in Minnesota in 1987 in Lake Minnetonka. Milfoil is a submerged aquatic plant that can displace native vegetation. The plant reproduces by fragmentation, establishes itself readily in disturbed areas, and has the potential to become a nuisance in Minnesota lakes. The main strategies of the Eurasian watermilfoil program are:

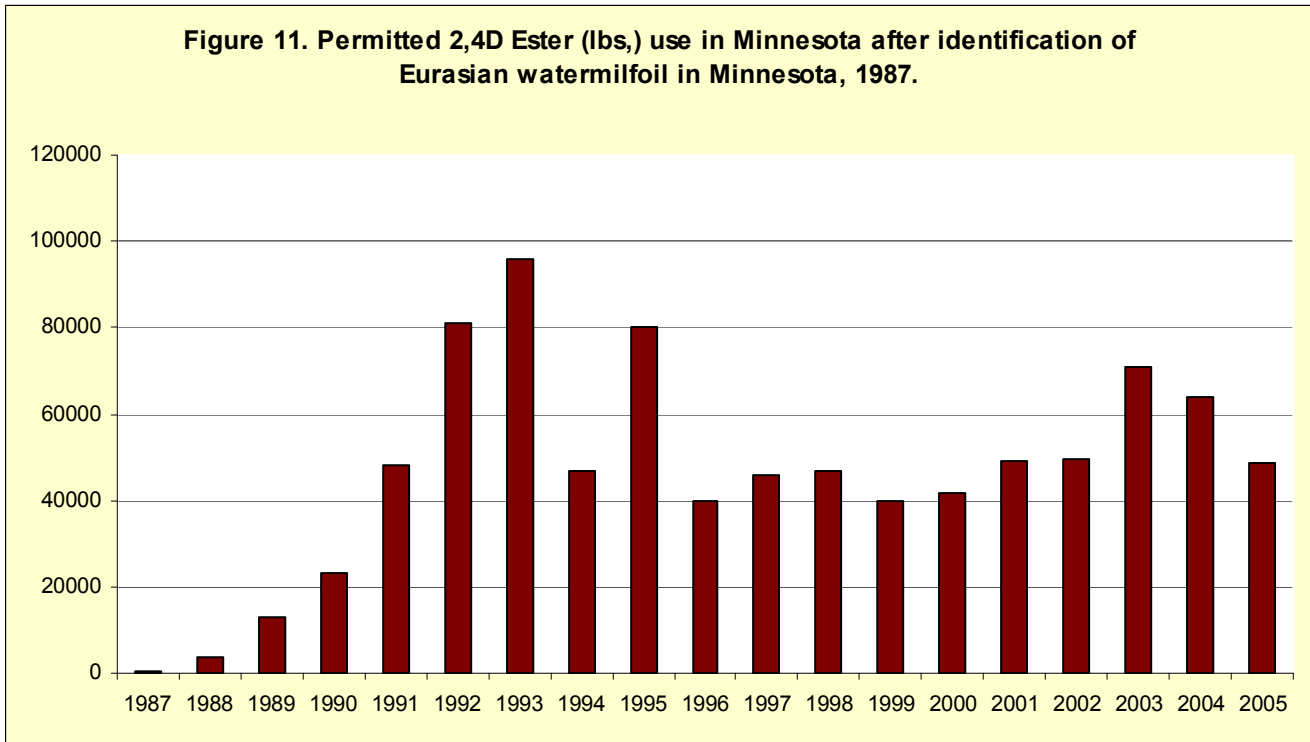
- Slow the spread of the plant through public education and awareness activities.
- Support lake associations and local units of government to manage problems caused by milfoil.
- Maintain an accurate inventory of populations.
- Investigate new methods for control and the biology of the plant.

The most commonly used herbicide for control of milfoil is a granular 2,4-D ester product labeled for aquatic use. In 2001, a liquid dimethylamine salt 2,4-D product was registered for aquatic use and has been applied to milfoil in Minnesota. Late in 2002, a liquid trimethylamine salt, triclopyr product, was registered for aquatic use and is available for control of milfoil in Minnesota. These systematic herbicides are preferred because they are the most selective products available.

Eurasian watermilfoil was discovered in 13 additional water bodies in 2005. There are now 177 Minnesota lakes known to have populations of this invasive submersed aquatic plant.

In 2005, the DNR provided \$90,000 in state funds to cooperators on 25 lakes for management of milfoil. The DNR spent an additional \$8,000 on control work at public water accesses to control Eurasian watermilfoil to help minimize its spread between lakes.

The use of 2,4-D ester products increased steadily from 1988 through 1993 to a high of more than 95,000 pounds. The total reported 2,4-D use in 2005 for milfoil was 50,487 pounds. The total reported annual use of 2,4-D ester products since 1987 is provided in Figure 11. For more detailed information on the management of invasive species see the 2005 Invasive Species Program Annual Report. The report may be reviewed on line at http://www.dnr.state.mn.us/ecological_services/invasives/index.html.



APPENDIX

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Table A. A list of commonly used herbicides registered by the EPA for aquatic use and approved by the MN DNR.

| Product Name | Selective | Broad Spectrum | Active Ingredient (Formulation) |
|--|-----------|----------------|--|
| <u>Part 1. Aquatically labeled systemic herbicides.</u> | | | |
| Aquacide (Pellet) | X | | 2,4 Dichlorophenoxyacetic Acid (Sodium Salt) |
| Navigate® (Granular) | X | | 2,4 Dichlorophenoxyacetic (Butoxyethyl Ester) |
| Aqua-Kleen (Granular) | X | | 2,4 Dichlorophenoxyacetic (Butoxyethyl Ester) |
| Sonar™ (Liquid or Granular) | X | | Fluridone |
| Rodeo (Liquid) | | X | Isopropylamine salt of Glyphosate |
| Aqua Master (Liquid) | | X | Isopropylamine salt of Glyphosate |
| Aqua Neat | | X | Isopropylamine salt of Glyphosate |
| Aqua Pro | | X | Isopropylamine salt of Glyphosate |
| Garlon-3A | | X | Triclopyr |
| Habitat | | X | Isopropylamine salt of Imazapyr <i>(licensed applicator only)</i> |
| <u>Part 2. Contact Herbicides.</u> | | | |
| Aquathol (Liquid or Granular) | | X | Dipotassium salt of endosulfar |
| Hydrothol 191 (Liquid or Granular) | | X | Mono-amine salt of endosulfar <i>(liquid by licensed applicator only)</i> |
| Reward (Liquid) | | X | Diquat dibromide <i>(licensed applicator only)</i> |
| <u>Part 3. Copper Compounds (Algaecides and Herbicides).</u> | | | |
| Citrine Plus (Liquid or Granular) | X (A) | | Copper-Ethanolamine complex |
| Komeen (Liquid) | X (H) | | Copper-Ethylenediamine complex |
| K-Tea | X (A) | | Copper-Triethanolamine complex |
| <u>Part 4. Other.</u> | | | |
| Copper sulfate | X (A) | | CuSO ₄ (at least 2 aquatic labeled products) |
| Aquashade (Liquid) | | X | Acid Blue 9 / Acid Yellow 23 (Filters light in wavelengths required for plant growth) |
| Green Clean | X (A) | | Sodium carbonate peroxyhydrate |

Table B. Reported various aquatic herbicide use statewide, 1981-2005.

| Year | 2,4-D ester lbs. | 2,4-D salt lbs. | 2,4-D amine/ acid gal. | Aquathol lbs. | Aquathol gal. | Diquat (Reward) gal. | Hydrothol 191 lbs. | Hydrothol 191 gal. | copper sulfate lbs. |
|------|------------------|-----------------|------------------------|---------------|---------------|----------------------|--------------------|--------------------|---------------------|
| 1981 | 150 | 370 | 0 | 1,900 | 1,300 | 730 | 3,200 | 390 | * |
| 1982 | 120 | 320 | 0 | 1,700 | 1,500 | 550 | 4,200 | 44 | * |
| 1983 | - | 350 | 0 | 1,400 | 1,500 | 560 | 11,900 | 31 | * |
| 1984 | 110 | 130 | 0 | 730 | 980 | 780 | 7,300 | 80 | * |
| 1985 | 25 | 270 | 0 | 740 | 1,200 | 870 | 14,000 | 100 | * |
| 1986 | 25 | 370 | 0 | 1,100 | 1,400 | 1,200 | 6,900 | 170 | * |
| 1987 | 100 | 1,400 | 0 | 1,100 | 1,400 | 1,400 | 13,000 | 62 | * |
| 1988 | 3,700 | 600 | 0 | 950 | 1,300 | 1,300 | 11,000 | 100 | * |
| 1989 | 13,000 | 470 | 0 | 910 | 1,300 | 1,700 | 12,000 | 200 | * |
| 1990 | 23,000 | 290 | 0 | 680 | 1,100 | 1,500 | 9,500 | 130 | * |
| 1991 | 48,000 | 1,300 | 0 | 1,400 | 850 | 1,400 | 9,600 | 210 | 55,400 |
| 1992 | 81,000 | 320 | 0 | 870 | 1,600 | 1,700 | 9,000 | 67 | 64,000 |
| 1993 | 96,000 | 400 | 0 | 830 | 1,000 | 1,600 | 5,000 | 240 | 34,600 |
| 1994 | 45,000 | 700 | 0 | 710 | 940 | 1,800 | 10,000 | 510 | 59,800 |
| 1995 | 80,000 | 87 | 0 | 930 | 700 | 2,300 | 8,300 | 420 | 55,000 |
| 1996 | 39,000 | 400 | 0 | 1,000 | 730 | 1,900 | 8,900 | 830 | 32,500 |
| 1997 | 46,000 | 290 | 0 | 1,200 | 700 | 2,400 | 7,800 | 820 | 39,700 |
| 1998 | 47,000 | 440 | 0 | 790 | 1,280 | 2,580 | 4,460 | 670 | 50,800 |
| 1999 | 39,800 | 650 | 0 | 1,050 | 740 | 2,280 | 4,190 | 740 | 31,600 |
| 2000 | 41,500 | 700 | 0 | 1,380 | 1,850 | 2,970 | 5,820 | 530 | 41,900 |
| 2001 | 49,300 | 1,000 | 0 | 700 | 2,600 | 2,700 | 3,900 | 950 | 58,200 |
| 2002 | 49,400 | 700 | 20 | 540 | 2,660 | 2,530 | 4,220 | 760 | 42,200 |
| 2003 | 71,100 | 634 | 336 | 339 | 2,515 | 2,370 | 7,610 | 429 | 47,100 |
| 2004 | 64,100 | 1,068 | 216 | 366 | 5,200 | 2,856 | 8,040 | 643 | 53,700 |
| 2005 | 48,800 | 1,154 | 533 | 1,077 | 7,054 | 2,773 | 6,744 | 715 | 63,500 |

* Data not available

Table C. Aquatic Plant Management Report Survey Results, Chemical-Mechanical, 2005.

1. Was your 2005 permit used?

| | |
|---|--|
| 685 Yes, permitted work was done. | |
| 14 No, because: The nuisance conditions did not develop. | |
| 20 No, because: I got the permit too late. | |
| 70 No, because: I was unable to get the work done. | |
| 35 No, because: | Thanks! Please use the back for comments |
| 824 | |

2. When my permit expires:

612 I will reapply for a permit. **23** I will not apply for a permit. **189** I am undecided at this time.

3. The method of control was:

142 mechanical or hand removal. **487** chemical treatment. **58** mechanical and chemical treatment.

4. A. Were you satisfied with the aquatic plant control work done (for Swimmers Itch control only skip to 4.B) ?

382 YES **46** NO **149** wasn't as good as expected

B. If you treated for **Swimmers Itch** were you satisfied with the control ?

133 YES **4** NO **21** wasn't as good as expected

5. When was the work done?

7 April **107** May **309** June **264** July **161** August **32** September **12** October **3** Nov. **30** uncertain

6. To provide us with some idea of how much control actually took place we would like to know if the control work done was the entire area allowed by the permit or less than the allowed area.

501 Yes, control work was done on the entire area permitted

139 No, less control work was done than the permit allowed

7. If you used herbicide, please indicate what you used and how much?

What Did You Use?

How Much Did You Use?

(concentrated product before mixing)

| | | | | | |
|--------------------|--------------|-----------------|--------------------|--------------|-----------------------|
| Copper sulphate | <u>26027</u> | lbs. | Aquakleen/Navigate | <u>11430</u> | lbs. |
| gran.Hydrothol 191 | <u>6741</u> | lbs. | Aquacide | <u>1154</u> | lbs. |
| liq. Aquathol K | <u>140</u> | gal., qts., oz. | Citrine Plus | <u>4</u> | gal., qts., oz. |
| gran.Aquathol | <u>1074</u> | lbs. | Rodeo | <u>13</u> | gal., qts., oz. |
| liq. Hydrothol 191 | <u>16</u> | gal., qts., oz. | other: | _____ | lbs., gal., qts., oz. |
| Reward | <u>9</u> | gal., qts., oz. | other: | _____ | lbs., gal., qts., oz. |

Table D. Aquatic Plant Management Report Survey Results, AUAPCD, 2005.

Please check the appropriate circle.

Please return survey by **DECEMBER 5, 2005**.

1. The type of AUAPCD device I use is a:
- 1130** Crary WeedRoller®
 - 48** Lake Restoration Lake Sweeper (Maid)
 - 156** Colman Beach Groomer
 - 45** home made
 - 33** unknown
2. I used an AUAPCD this year. 1412

1277 Yes

135 No, I did not use an AUAPCD this year.

1412

I'll explain on the space below.

3. The AUAPCD I used in 2005-
I have owned for:

209 less than 1 year

356 1 - 3 years

554 more than 3 years

Is jointly owned and shared
with the other co-owners and
has been for:

27 less than 1 year

29 1 - 3 years

78 more than 3 years

2 was rented.

20 was borrowed.

4. How often monthly did you operate the AUAPCD you used ?

| | not used | few hours >0-20 | several hours >20-50 | many hours >50-144 | continuous |
|----------------------|------------|--------------------|-------------------------|-----------------------|------------|
| In May: | 806 | 297 | 106 | 46 | 21 |
| In June: | 251 | 486 | 323 | 172 | 44 |
| In July: | 124 | 482 | 398 | 221 | 51 |
| In August: | 207 | 566 | 297 | 165 | 41 |
| In September: | 890 | 279 | 70 | 26 | 11 |

5. Were you satisfied with the AUAPCD you used?

1257 Yes

17 No

6. Did you have any problems displaying the sticker you got with your permit ?

29 Yes, please explain: _____

1243 No _____

Table E. Aquatic Pesticide Enforcement Citizen Complaint Investigations, 2005.

| Date | Complaint | Lake Name | County | Observation | Action | Result |
|-------------|--|------------------|---------------|--|--|--|
| June 15 | Possible unauthorized herbicide treatment resulting in herbicide drift | Coon | Washington | No field inspection | Contacted commercial applicator and then talked to complain tent. | No violation. Complainant was satisfied with a detailed explanation of the treatment. |
| June 15 | Possible unauthorized chemical dumping | Fish | Hennepin | The on-site inspection found no evidence of chemical dumping. No fish kill or plant damage found. | The witness could not identify the persons dumping the substance into the water. Complainant was notified of findings. | The complainant was satisfied with the investigation. |
| July 19 | Possible unauthorized chemical application | Upper Prior | Scott | No field inspection | Contacted the commercial applicator for an explanation. | The commercial applicator admitted to making application to the wrong property. |
| August 3 | Inadequate posting of herbicide application. | White Bear | Washington | No field inspection | Contacted the commercial applicator for an explanation. | The company owner had the applicators properly repost. |
| August 11 | Unauthorized herbicide treatment and mechanical vegetation removal | Long | Washington | The on-site inspection found large areas of damaged water lily and evidence of significant submerged vegetation removal. | Contacted the area CO and provided site photos. | CO issued citations for unauthorized chemical application and removal of aquatic vegetation. |

Table F. Aquatic Pesticide Enforcement Use Inspections, 2005.

| Treatment Date | County | Lake | Applicator | Number of Treatments Inspected |
|-----------------------|---------------|---------------|---------------------------------|---------------------------------------|
| April 14 | Scott | Fish | Lake Restoration | 1 |
| April 19 | Hennepin | Medicine | Lake Restoration | 1 |
| April 21 | LeSueur | Washington | Lake Restoration | 1 |
| May 6 | LeSueur | Washington | Lake Restoration | 1 |
| May 10 | Anoka | Reshanau | Lake Management | 2 |
| May 23 | Crow Wing | Mayo | Lake Association | 1 |
| May 23 | Dakota | Orchard | Lake Management | 2 |
| May 24 | Wright | Deer | Lake Restoration | 2 |
| May 31 | Kanabec | Knife | Minnesota Shoreline Restoration | 2 |
| June 1 | Becker | Toad | Professional Lake Management | 2 |
| June 6 | Ramsey | Bald Eagle | Lake Restoration | 2 |
| June 6 | Hennepin | Mtka Gideons | Lake Management | 2 |
| June 8 | Washington | Big Carnelian | Lake Improvement | 2 |
| June 9 | Scott | Prior | Lake Restoration | 2 |
| June 13 | Ramsey | Gervais | Lake Improvement | 2 |
| June 16 | Hennepin | Mtka Grays | Midwest Aquacare | 2 |
| June 17 | Washington | Big Marine | Lake Management | 2 |
| June 20 | Ramsey | Silver | Aquatic Engineering, Inc. | 2 |
| June 21 | Ramsey | Snail | Midwest Aquacare | 2 |
| July 5 | Hennepin | Medicine | Lake Restoration | 2 |
| July 6 | Hennepin | Mtka Black | Lake Restoration | 2 |
| July 7 | Washington | Forest | Lake Management | 2 |
| July 8 | Chisago | Green | Green Lake Association | 2 |
| July 13 | Anoka | Coon | Lake Restoration | 2 |
| July 14 | Scott | Prior | Lake Management | 2 |
| July 14 | Scott | Prior | Midwest Aquacare | 2 |
| July 19 | Hennepin | Mtka Wayzata | Lake Management | 2 |
| July 20 | Cass | Leech | Lake Restoration | 2 |
| July 20 | Morrison | Alexander | Lake Restoration | 1 |

Table F. (Continued)

| Treatment Date | County | Lake | Applicator | Number of Treatments Inspected |
|-----------------------|---------------|-------------|-------------------|---------------------------------------|
| July 20 | Ramsey | Owasso | Lake Management | 2 |
| July 21 | Wright | Maple | Lake Restoration | 1 |
| July 25 | Aitkin | Mille Lacs | Lake Restoration | 9 |
| July 25 | Washington | Forest | Lake Restoration | 2 |
| July 29 | Washington | White Bear | Lake Restoration | 2 |
| August 4 | Carver | Pierson | Lake Management | 2 |

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