

Management of Rooted Aquatic Plants, Algae, Leeches, and Swimmer's Itch, 2015

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TABLE OF CONTENTS

EXECUTIVE SUMMARY 2015 AQUATIC PLANT MANAGEMENT PROGRAM	3
Public Waters/Permits/Properties/Fees	3
Automated Aquatic Plant Control Devices	3
Commercial Harvest of Aquatic Plants:	5
Trends and Observations	6
INTRODUCTION.....	8
Value of Aquatic Plants	8
The Aquatic Plant Management Program (APM).....	9
Administrative Regions	9
Regulations	11
NPDES/SDS Permit.....	11
SUMMARY OF APM PROGRAM ACTIVITIES IN 2015	13
Permit Issuance	13
Inspections	17
Permit Duration.....	17
Permit Fees	19
Timing of Treatment	20
Permitted Off-shore Acres of Aquatic Plant Control	21
Aquatic Plant Control Methods	22
Percent of Aquatic Plant Removal Permits Used	23
Who Does Control.....	25
Satisfaction.....	26
Reapply for Permit.....	27
Automated Aquatic Plant Control Devices (AAPCD)	27
Filamentous Algae Control	29
Chara Control	29
Plankton Algae Control	30
Swimmer’s Itch Control in Minnesota Lakes.....	31
Management of Invasive Aquatic Plants	33
REFERENCES CITED	35
APPENDICES.....	36

EXECUTIVE SUMMARY 2015 AQUATIC PLANT MANAGEMENT PROGRAM

In Minnesota the state is the owner of wild rice and other aquatic plants growing in public waters (*Minnesota Statutes* 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 (*Minnesota Statutes* 103G.615). The purpose of the aquatic plant management (APM) permit program is to protect the beneficial functions that aquatic plants provide to lakes, while allowing riparian property owners to obtain reasonable access to public waters.

In 2015 the Invasive Species Program (ISP) received 323 applications for invasive aquatic plant management permits. Of the 323 applications received 17 applications were withdrawn, three applications were denied, and 297 permits were issued for the selective management of invasive aquatic plants.

Public Waters/Permits/Properties/Fees

In 2015 there were 1,886 public waters with active APM permits. Of the 1,886 public waters with active permits, 910 public waters had permits that were issued during 2015. The number of public waters where aquatic plant management was permitted increased gradually from 1953 until 2000. In recent years the number of lakes with permitted APM activity stabilized at around 900 per year. In 2015 there were 910 lakes with permitted APM activity which is 81 more lakes than in 2014.

The number of APM permits issued statewide in 2015 surpassed the previous peak reached in 2007 by 243 permits (4,876). Central Region had the largest increase in the number of permits issued in 2015. Central Region issued 469 more permits than in 2014. Statewide permit numbers decreased from 2008 through 2014. However, in 2015 the number of permits issued increased in all four regions and was up by 1,200 permits statewide.

The number of property owners applying for APM permits also increased statewide in 2015. The number of properties with permitted aquatic plant management activities increased in all regions except Region 4, which was down by a single property from 2014. There were 1,105 more properties participating in the APM program in 2015 than in 2014.

In 2015 an increase in the maximum permit fee for multi-property permits from \$750 to \$2,500 went into effect. In 2015 permit fees generated \$253,000 in revenue an increase of \$46,000 from 2014.

Automated Aquatic Plant Control Devices

The Department first began issuing permits for Automated Aquatic Plant Control Device's (AAPCD's) in 1997. In 2015 1,680 permits allowed the use of AAPCD's for aquatic plant

control, approximately 35% of the total number of APM permits issued. The remaining 65% of APM permits issued allowed treatment with pesticides or other mechanical removal as the method of control.

The APM rules provide two permit options for AAPCD operation. A person applying for a permit to operate the device in an area greater than 2,500 square feet is required to obtain an annual permit. However, a three-year permit option is available for persons who limit the size of the area of AAPCD operation to 2,500 square feet or less (*Minnesota Rules*, part 6280.0450, subp.3, item A). Revisions to the APM rules implemented in the 2009 permit season restrict submersed aquatic plant removal to 100 feet of shoreline or one-half the owner's frontage whichever is less (*Minnesota Rules*, part 6280.0350, subp. 1a). As a result of this change many more permit holders became eligible for an AAPCD permit of three year duration in 2009. This also results in a spike in 3 year AAPCD permits every fourth year from 2009 when permit holders must renew their permit. The large increase in 3 year permits in 2015 is a result of this provision in rule.

In 2015 there were 1,287 three-year AAPCD permits issued, 630 more than in 2014. The number of single season AAPCD permits issued in 2015 (412) increased by 20 from 2014. The total number of AAPCD permits issued in 2015 was up by 650 permits when compared to 2014. Persons who obtained a three-year permit in 2015 will not need to apply for a permit again until the year 2018.

Most AAPCD permits are issued to a single property owner. In 2015 AAPCD's made up 35% of the permits issued and accounted for 20% of the total number of properties permitted.

Summary of Aquatic Plant Management permits issued by type in 2015 and active permits.

Region	Mechanical Chemical***	2015 Issued Channel*	<2014 Active Channel**	AAPCD's with chemical control	AAPCD Issued in 2015 for 1-year	AAPCD Issued in 2015 for 3-year	AAPCD Issued in 2014 for 3-year	AAPCD Issued in 2013 for 3-year	All Active Permits	Restoration Permits Issued
Reg 1	512	60	-	112	140	673	254	323	2,074	9
Reg 2A	120	16	-	0	0	9	5	8	158	3
Reg 2B	588	29	-	35	33	312	220	205	1,422	9
Reg 3A	1,063	13	-	7	46	48	27	45	1,249	9
Reg 3B	472	23	-	10	33	181	87	149	955	6
Reg 4	256	9	-	1	9	64	44	59	442	14
All	3,011	150	1,292	165	261	1,287	637	789	7,592	50

* Channel permits are of unlimited duration and issued to the property owner to mechanically maintain a channel no more than 15 shoreline feet wide in emergent vegetation.

** All active permits as of 03/26/2015. Total by Region cannot be calculated because Region boundaries were changed in 2003.

All Active Permits = Permits issued in 2015 and all active AAPCD and channel permits excluding restoration permits.

*** Excludes permits for AAPCD's and channel permits.

It is important to note that the numbers of permits and applicants in a single year is only part of the story. In addition to AAPCD permits that can be issued for up to 3-years, a lakeshore property owner can obtain a permit of unlimited duration to mechanically maintain a channel 15 feet wide through emergent vegetation. Multi-year AAPCD permits account for roughly 35% of the total number of active permits in 2015. In 2015 there were 1,442 active channel permits, about 19% of the total number of active permits. The total number of active permits in 2015 was 7,592 including 3,437 annual permits. This does not include 297 permits issued by the Division of Ecological and Water Resources for management of invasive aquatic plants.

Commercial Harvest of Aquatic Plants:

The Department also issues permits that allow commercial harvest and sale of aquatic plants. The Northwest region issued 2 commercial harvest permits in 2015. These permits allowed commercial harvest of aquatic plants from two lakes. Total harvest from these permits includes 245 lbs. of sago pondweed tubers from an Unnamed Lake, in Clay County, and 122 lbs. of wild celery tubers from Lake Osakis, Todd County.

Summary of all APM permits issued for control of aquatic plants and nuisances, numbers of public waters and participating properties in 2015.

Region	All Permits Issued in 2015*	Public waters permitted in 2015.**	Public waters permitted in 2014.	Change in public water permitted	Properties Permitted in 2015	Properties Permitted in 2014	Change in properties permitted by Region
Reg 1	1,494	287	256	+31	1,497	1,059	+438
Reg 2A	146	48	36	+12	146	74	+724
Reg 2B	999	146	126	+20	1,249	1,034	+215
Reg 2 total	1,145				1,395	1,108	+287
Reg 3A	1,176	230	219	+11	3,561	3,351	+210
Reg 3B	720	146	121	+25	1,515	1,344	+171
Reg 3 total	1,896				5,076	4,695	+381
Reg 4	341	76	71	+5	617	618	-1
2015 TOTAL	4,876	933	829	+104	8,585	7,480	+1,105
2014 TOTAL	3,676						
CHANGE	+1200						

* Permits issued for restoration work are excluded.

** Includes all lakes, ponds, ditches and streams listed on APM permits for 2014.

Trends and Observations

Aquatic plant control in Minnesota is highly seasonal. Most aquatic plant control in Minnesota takes place in the months of June, July and August. This trend has been consistent for many years because much of the aquatic plant control is recreationally motivated.

Lakeshore residents often hire commercial services to perform aquatic plant control. Statewide commercial services performed approximately 62% of permitted aquatic plant control. However, in the Central Region commercial services performed about 82% of permitted aquatic plant control in 2015.

Many APM permits are issued on an annual basis. Approximately 80% of 2015 permit holders responding to the survey indicated that they would reapply for a permit in 2016. Of the APM permit holders that did their own control in 2015 80% reported using their permit. Permits that

were issued to property owners that hired a commercial service were more likely to be used (90% of these permits were used).

Lakeshore property owners may apply for a permit to control filamentous algae and chara (a form of macro-algae) with copper sulfate. Applications requesting filamentous algae control were up (20%) over 2014. Requests for control of chara decreased by more than half (54%) from 2014.

Blue green algae blooms are a common nuisance in eutrophic Minnesota lakes. Copper sulfate, a common algaecide, can provide temporary relief from nuisances caused by blue green algae. However, the control obtained by lake-wide application of copper sulfate is usually temporary and treatment is often required at least twice per season. In addition, there is the threat of fish kill from oxygen depletion caused by the decomposition of dead algae. The numbers of lakes where the residents seek a permit to control blue green algae with copper sulfate has been declining since 1997 and continued to decline in 2015.

Swimmer's itch, an infection caused by an immature life stage of a flatworm common in waterfowl, is present in many Minnesota lakes. Lakeshore property owners can get a permit to use copper sulfate to control snails that harbor the immature life stage. The numbers of permits requesting swimmer's itch control has been trending upward since 1997 and was up (30%) in 2015 compared to 2014.

INTRODUCTION

Value of Aquatic Plants

Aquatic plants are essential components of most freshwater ecosystems. The habitat aquatic plants provide in the shallow near-shore areas is important to both 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 on aquatic plants throughout their life histories. Yellow perch, northern pike, muskellunge, sunfish, and bass all depend on aquatic plants 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 plants. Even species that may not require plants for spawning depend on the cover and forage found in aquatic plants.

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 food sources for migratory birds and their young. Ducks have been known to alter migration patterns in response to food availability. Emergent aquatic plants provide 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 they provide to hide young birds from predators.

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

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

Beyond providing food and shelter for fish and wildlife, aquatic plants are important in maintaining a stable lake environment. Aquatic plants help 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 plants.

The Aquatic Plant Management Program (APM)

Riparian property owners (lakeshore property owners) in Minnesota have a right to use and access the lake adjacent to their property. Aquatic plants may interfere with a lakeshore homeowner's ability to exercise that right. The purpose of the DNR's APM program is to regulate how much aquatic vegetation lakeshore residents can control to preserve the beneficial functions of aquatic plant communities.

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 overabundant. Relief from these nuisances may also be sought under an APM permit.

Administrative Regions

The Section of Fisheries in the DNR's Division of Fish and Wildlife is responsible for the administration of the APM permit program. Riparian property owners apply for an aquatic plant control permit to the Regional Fisheries Manager in the region where their lake property is located. APM specialists in each region conduct application review, site inspections when necessary, and make permit recommendations.

The recommendation for the decision on the permit application (approval, modification, or denial) is determined during the review process. This decision may involve a discussion with the lakeshore property owner. When applications for APM permits are received for shallow lakes where waterfowl management is the primary focus, the APM 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 of the permit decision. 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.

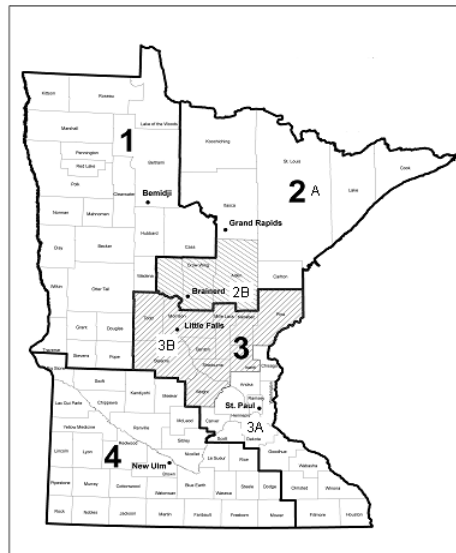
The APM program coordinator is the Department's contact with commercial mechanical control businesses, commercial aquatic pesticide applicators, and the Minnesota Department of Agriculture (MDA). The coordinator provides technical expertise on aquatic plant control methods and permitting requirements 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 mechanical control companies. This person also reviews appeals of permit decisions for the Commissioner. The program coordinator prepares an annual report on program activities (this document) and coordinates the development of informational materials and forms provided to riparian property owners interested in aquatic plant management.

The APM program coordinator supervises staff whose job responsibilities include enforcement of aquatic pesticide rules and pesticide label requirements. The Aquatic Pesticide Enforcement Specialist conducts inspections of herbicide treatments in public waters to monitor compliance with state and federal pesticide law and responds to reports of pesticide misuse (Appendix Table A & B). The U.S. Environmental Protection Agency (EPA) partially funds DNR's aquatic pesticide enforcement activities through a grant administered by MDA.

DNR Administrative Regions by county as of October 2006

NW Region 1

Bemidji
 Kittson
 Roseau
 Lake of the Woods
 Marshall
 Polk
 Pennington
 Red Lake
 Beltrami
 Norman
 Mahnomen
 Clearwater
 Hubbard
 Cass
 Clay
 Becker
 Wadena
 Wilkin
 Otter Tail
 Traverse
 Grant
 Douglas
 Stevens
 Pope



NE Region 2

Grand Rapids (2A)

Koochiching
 Itasca
 St. Louis
 Lake
 Cook
 Carlton

Brainerd (2B)

Crow Wing
 Aitkin
 Cass

Central Region 3

St. Paul (3A)

Anoka
 Carver
 Chisago
 Dakota

Hennepin
 Ramsey
 Scott
 Washington
 Goodhue
 Wabasha
 Olmstead
 Winona
 Fillmore
 Houston

Little Falls (3B)

Benton
 Isanti
 Kanabec
 Pine
 Mille Lacs
 Morrison
 Sherburne
 Stearns
 Todd
 Wright

South Region 4

Big Stone
 Swift
 Kandiyohi
 Meeker
 McLeod
 Renville
 Chippewa
 Lac Qui Parle
 Yellow Medicine
 Lincoln
 Lyon
 Redwood
 Nobles
 Jackson
 Martin
 Faribault
 Freeborn
 Mower

Regulations

Authority for the DNR's APM program is found in Minnesota Statutes M.S. 84.091 Subdivision 1, which designates ownership of wild rice, and other aquatic plants growing in public waters, to the State. In addition, the Commissioner of the DNR is authorized by M.S. 103G.615 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 plants and the permit fee structure are found in [MN Rules Chapter 6280](#).

A permit from the DNR is required to use pesticides for aquatic plant and nuisance control 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, *Minnesota Statutes* 103G.005, subd. 15 and 15a), to use an automated aquatic plant control device, to control emergent plants such as cattails, wild rice, or bulrush and to control submersed or floating leaf plants above specified limits. A riparian property owner may, without a permit, physically remove (cut, pull, or harvest) *submersed* plants 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 plants are interfering with riparian owner access a channel, not more than fifteen feet wide, extending to open water, may be mechanically maintained without a permit. Aquatic plants that are 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, pesticides used in surface waters must be registered with the Department of Agriculture for sale and use in Minnesota. The product must also be registered for aquatic use by 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, irrigation, household, and other uses. The DNR provides these signs to permit holders and commercial applicators at no cost. A list of herbicides commonly used for aquatic plant control and the amounts used under permit in Minnesota from 1987-2015 is found in Appendix Tables C and D.

NPDES/SDS Permit

In November of 2011 the Minnesota Pollution Control Agency (MPCA) published the National Pollution Discharge Elimination System (NPDES) permit for the application of pesticides to

water. This is the MNG87D000 Vegetative Pests and Algae Control Pesticide General Permit. Because the DNR's aquatic plant management rules are more restrictive in many ways than the NPDES permit requirements, the DNR and the MPCA entered into an interagency agreement that allows DNR's aquatic plant management permit to satisfy requirements of the NPDES/SDS permit. The threshold for a notice of intent (NOI) is for treatment of greater than 15% of the littoral zone of lakes that are 20 acres or larger in size. DNR rules require a permit for all aquatic pesticide applications for aquatic plant and nuisance control in Minnesota public waters. Persons who obtain an aquatic plant management permit do not need to apply for an NPDES permit for pesticide control of aquatic plants or nuisances in public water.

SUMMARY OF APM PROGRAM ACTIVITIES IN 2015

The following summary of APM program activities in 2015 comes from four sources: permittee survey forms (Appendix Tables E and F), commercial aquatic applicator and commercial mechanical control reports, and the APM permit database. When we describe information taken from permit holder or commercial company surveys in a table or figure in the report, the term “*reported*” is used. When we discuss data in the report taken from the APM permit database the term “*permitted*” is used.

Commercial applicators, mechanical control companies, 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 plants in public waters is monitored, and trends in aquatic plant management are identified.

Survey forms were sent to all permittees that did their own chemical or mechanical control work in 2015. Of the 1,400 surveys mailed 1005 (71%) were returned. A separate survey was sent to 1,675 AAPCD permit recipients and 1,335 (79%) were returned.

Permit Issuance

In 2015, a total of 4,876 permits were issued statewide for APM activities (this excludes 50 shoreline habitat restoration permits and Invasive Aquatic Plant Management Permits), 1,200 more than in 2014 (Appendix Table G provides the county by county distribution of APM permits and permitted properties). The numbers of permits and of lakes with permitted APM activity varies among regions (Figure 1). The number of permitted properties increased significantly in 2015 (Figure 2).

Figure 1. All APM permits issued, and the number of lakes with permitted aquatic plant control, by region, in 2015.

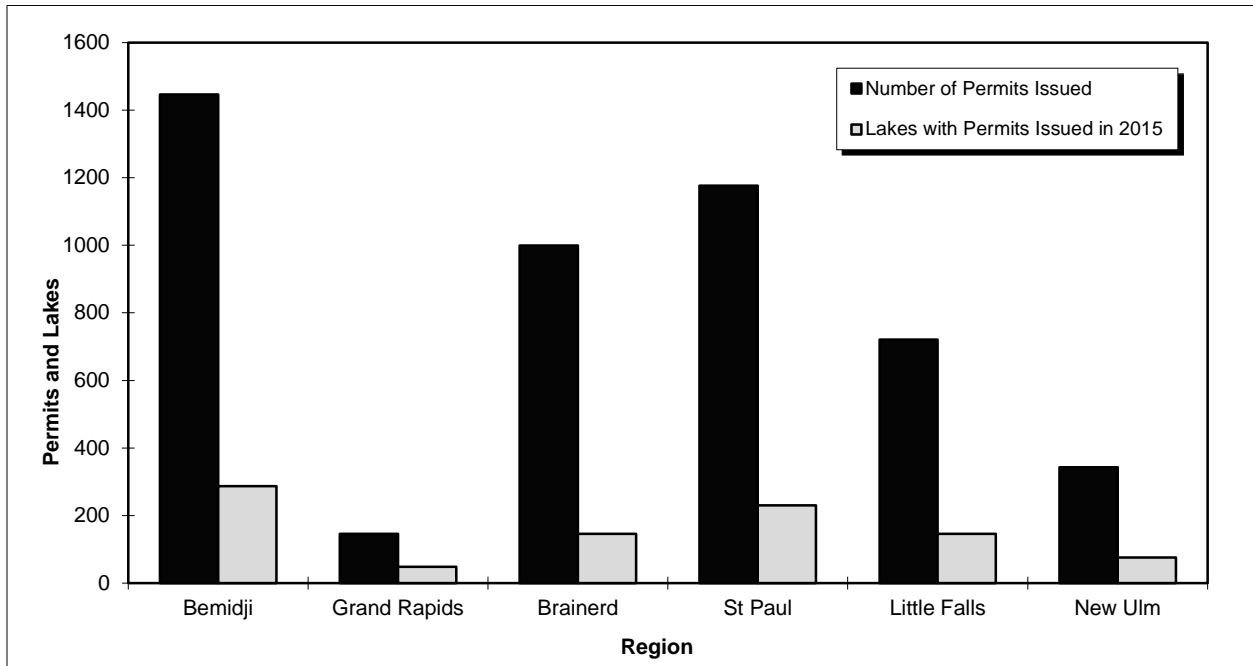
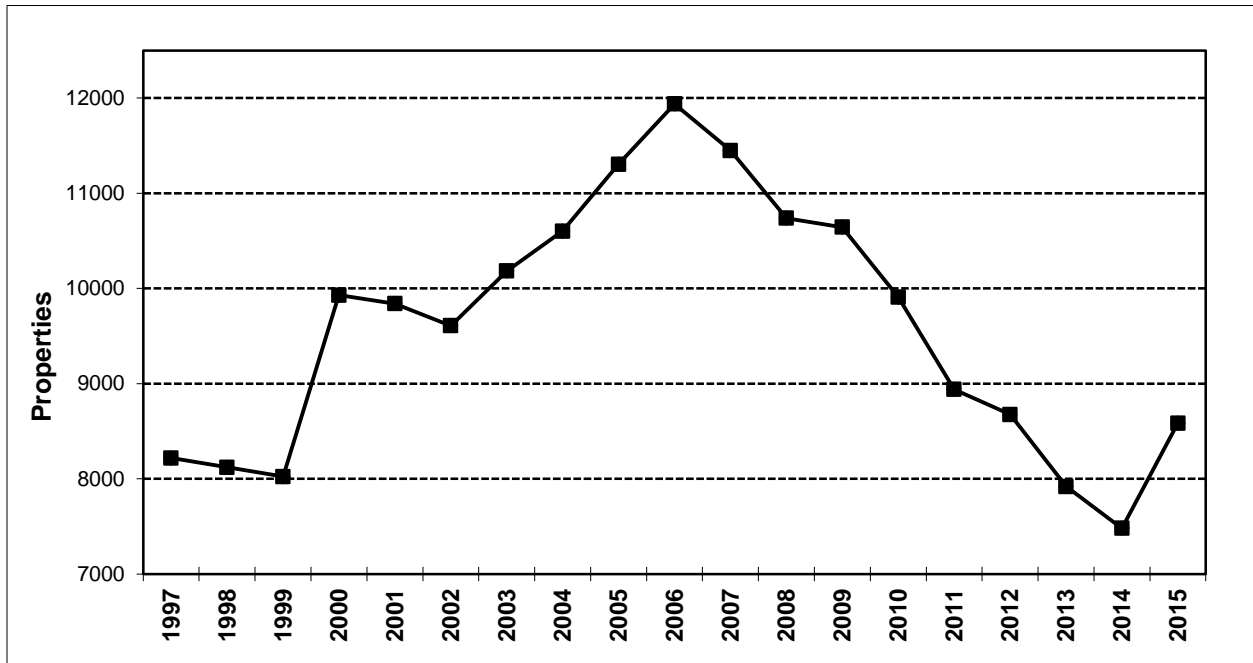
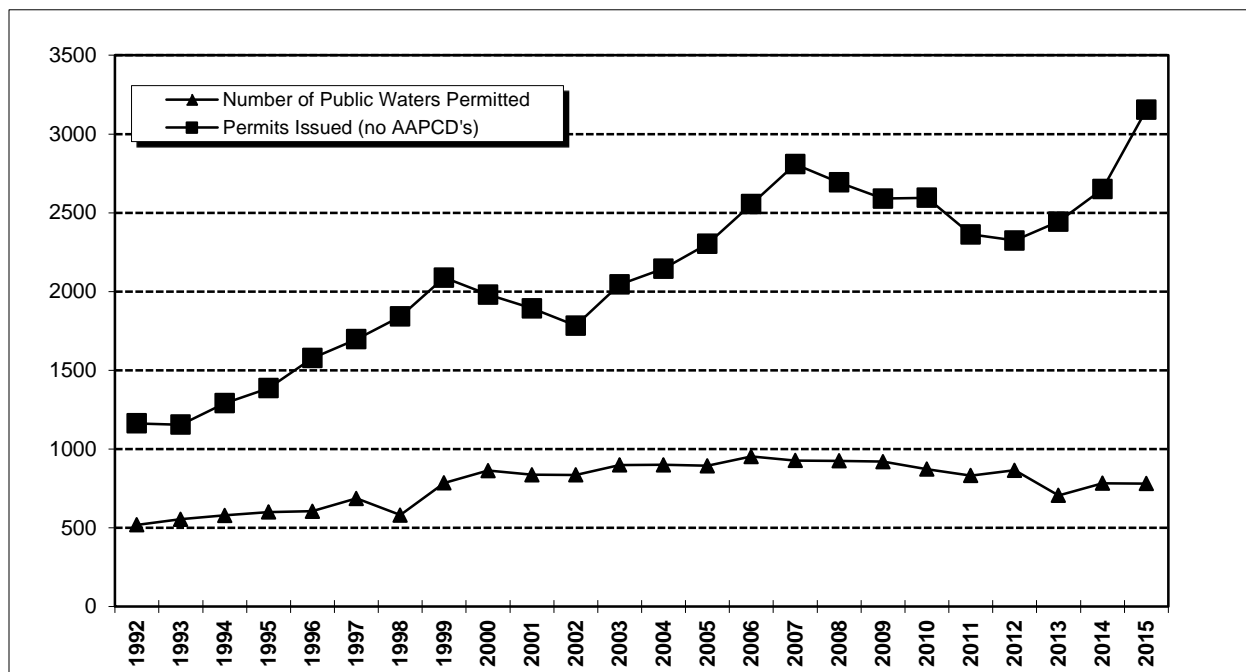


Figure 2. Numbers of properties issued APM permits for aquatic plant control statewide, 1997-2015



In 2015, there were 1,548 permits issued for the operation of Automated Aquatic Plant Control Devices (AAPCD). The remaining 3,328 aquatic plant control permits were issued to municipalities and lakeshore homeowners for pesticide use (includes algae and swimmer's itch control), and mechanical control (cutting, pulling, or harvesting) of aquatic plants (Figure 3).

Figure 3. Numbers of APM permits issued for mechanical and chemical control (excluding AAPCD) of aquatic vegetation, algae, and swimmer's itch, and numbers of lakes where permits were issued 1992-2015.



Over the last 18 years, the number of public waters where permits are issued has almost doubled. Little increase occurred until 1999 when the number of public waters with permitted APM activity increased sharply. The number of public waters permitted in 2015 for APM activity (excluding AAPCD) was 782, nearly the same as 2014.

In 2015, 410 of the APM permits issued were reported not used for various reasons, and 162 of these were for AAPCD use. The remaining 248 permit holders (excluding the AAPCD permit holders) that did not use their permit 178 indicated that they would reapply for APM permit in 2016. This only includes permittees performing their own control.

APM permit issuance increased annually from 1992 until about 1999. 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 2006. In 2014 the total number of property owners participating in the aquatic plant management program decreased for the eighth year in a row. However, in 2015 there was a significant increase in the number permits issued and the number of property owners obtaining APM permits. Warmer temperatures in the early part of the open water season resulting in early

plant growth, and warmer water for swimming, may have contributed to the increase in lakeshore property owners participating in the APM program in 2015.

Lakeshore homeowners can apply for an APM permit as a group. The average number of properties per permit statewide in 2015 was 1.76; less than the average in 2014 of 2.0 properties per permit. Group permits are more popular in the Twin Cities metropolitan area than in Greater Minnesota (Table 1).

The permit fee cap on large group permits increased from \$750 to \$2,500 in 2015. The individual permit fee (\$35.00 per property) begins to decrease for multiparty permits with more than 72 applicants. There are very few permits with more than 72 properties participating on a single permit. In 2015 there were 8,585 properties on 4,876 permits. This number excludes the 50 permits issued to lake shore property owners for restoration of aquatic habitat.

The Central Region, which includes the Twin Cities metropolitan area, typically has larger group permits than other areas of the state. In 2015, the Central Region averaged 2.1 properties per permit, less than the number of properties per permit in 2014 (3.6). The Northwest averaged one property per permit. The Northeast Region averaged about 1.3 properties per permit. The average number of properties per permit in the Southern Region in 2015 was less than 2, a modest decrease from 2014.

Table 1. APM Permits grouped by the number of properties listed (excluding AAPCD) by Region, 2015.

Region	1	2A	2B	3A	3B	4
>100 properties per permit	0	0	0	1	0	0
51-100 properties per permit	0	0	2	4	2	0
21-50 properties per permit	0	0	1	34	9	13
11-20 properties per permit	0	0	2	42	9	13
2-10 properties per permit	0	0	4	142	48	28
1 properties per permit	556	137	609	856	429	231

1 = Bemidji, 2A = Grand Rapids, 2B = Brainerd, 3A = St. Paul, 3B = Little Falls, 4 = New Ulm

Inspections

The rules regulating aquatic plant removal from public waters require an inspection of the treatment site for properties with no previous permit history, or when there are changes in the size of the treatment area, methods used, or the target plant species, requested from the previously issued permit. APM specialists and area fisheries staff visit these sites to determine if the permit application is consistent with the criteria for permit issuance in APM rules. In 2015 there were about 1,260 site inspections conducted. The site inspection provides an opportunity to determine what kinds of plants and habitat are present in the proposed treatment area. During the inspection, the size of the area may be reduced to protect important habitat based on the observations and professional judgment of the APM specialist. Approximately 84% of all near-shore control permit requests were issued unchanged in 2015 (Table 2).

Table 2. Percent of permits requesting near-shore control that were issued as requested by region in 2015.*

	Region 1	Region 2A	Region 2B	Region 3A	Region 3B	Region 4	State wide
Number of Applications that requested Near-Shore Control	1411	130	919	1113	621	286	4,480
Number of Permits issued as requested*	1128	110	911	856	506	247	3,758
% of permits issued as requested	80	85	99	77	81	86	84

1 = Bemidji, 2A = Grand Rapids, 2B = Brainerd, 3A = St. Paul, 3B = Little Falls, 4 = New Ulm

*Includes permits that allowed more shoreline than requested

Permit Duration

Until 1997 aquatic plant management permits were issued for a one year term. In 1997 the APM rules were revised allowing two types of permits to be issued for longer than a single season. Emergent plant control permits can be issued for a period of unlimited duration if the control is limited to a channel not more than 15 feet wide, that remains in the same location each year, and the channel is maintained mechanically after the first year. A person requesting a permit to use an automated aquatic plant control device can obtain a permit of three years duration if they agree to operate the device in an area no larger than 2,500 square feet and the device remains in the same location each year. The permit fee for longer term permits is the same as the permit fee for annual permits.

These longer term permits are intended to offer an incentive to the property owner to remove less aquatic vegetation. In exchange for the smaller area of control the property owner does not have to make an application for a permit on an annual basis and they receive a permit of extended duration at the same cost as a permit issued for a single year. The extended duration permit also benefits the DNR by reducing the annual permit work load for program staff.

The number of active permits of more than annual duration is greater than the number of annual permits issued in 2015 (Figure 3a). Permits issued for more than one year are most often issued to individuals. The number of emergent plant permits of continuous duration and the number of three year duration AAPCD permits represents an additional estimated 4,155 properties under DNR APM permit in 2015. Figure 3b shows the number of emergent plant channel permits issued annually since 1997. The difference in the total number of permits between years is the number of permits issued that year. For example the total number of active emergent plant channel permits in 2014 was 1,411. The total number of active emergent plant channel permits in 2015 was 1,561, therefore 150, the difference between the two totals, is the number of emergent plant unlimited duration permits issued in 2015.

Figure 3a. Number of Active APM Permits 1995-2015.

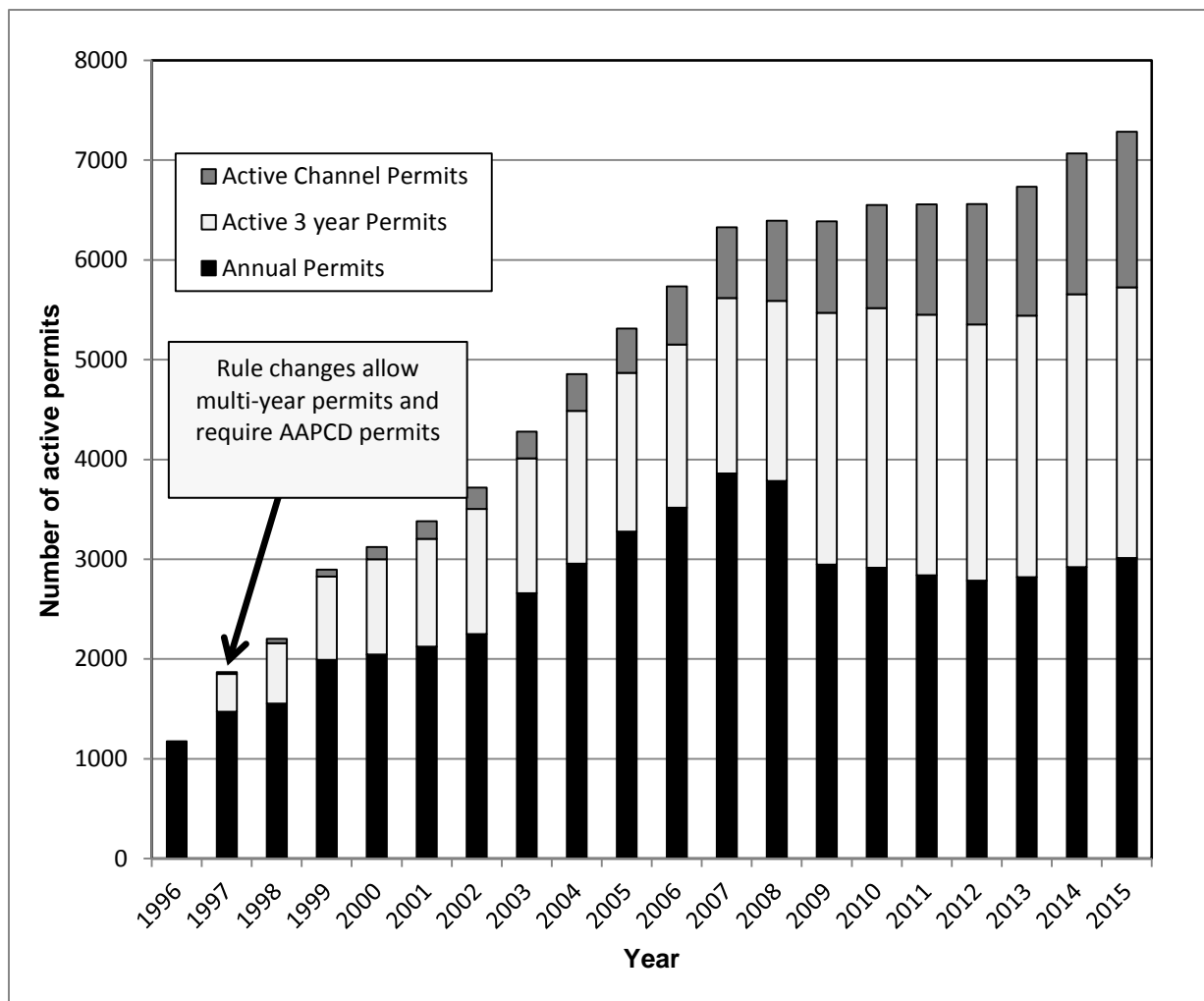
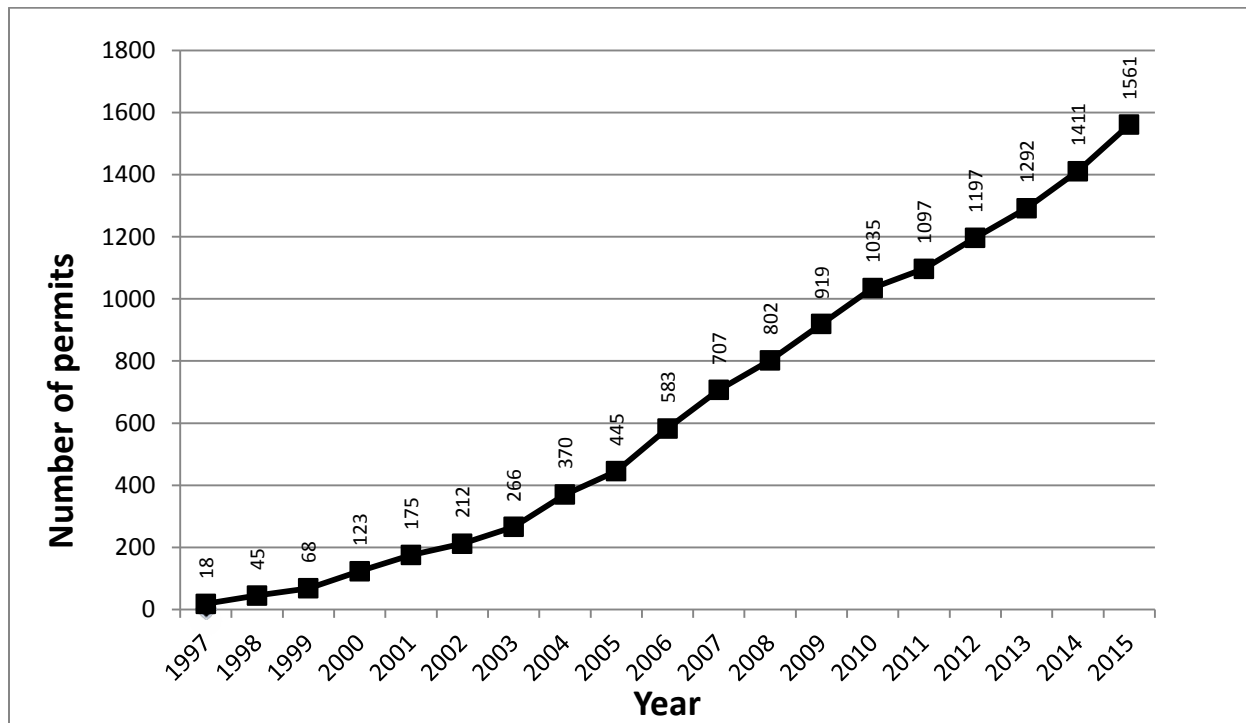


Figure 3b. Unlimited duration emergent plant control permits, 1997-2015



Permit Fees

Fees for an individual APM permit were last increased during the 2003 legislative session. The fee increased applications for most aquatic plant control permits from \$20.00 per property to \$35.00 per property. The cap on group permits to control submersed plants was also increased from \$200 to \$750.

During the 2010 legislative session some permit fees were reduced. The fee for aquatic plant control on water bodies 20 acres or less was reduced to half of the permit fee for larger lakes. The fee for aquatic plant control on water bodies 20 acres or less in size for an individual is \$17.50 and the cap on permit fees for group permits is \$375.00.

In 2015 the cap on group permits was increased to \$2,500, for lakes greater than 20acres. On water bodies 20 acres or less in size the cap rose from \$375.00 to \$1,250.00.

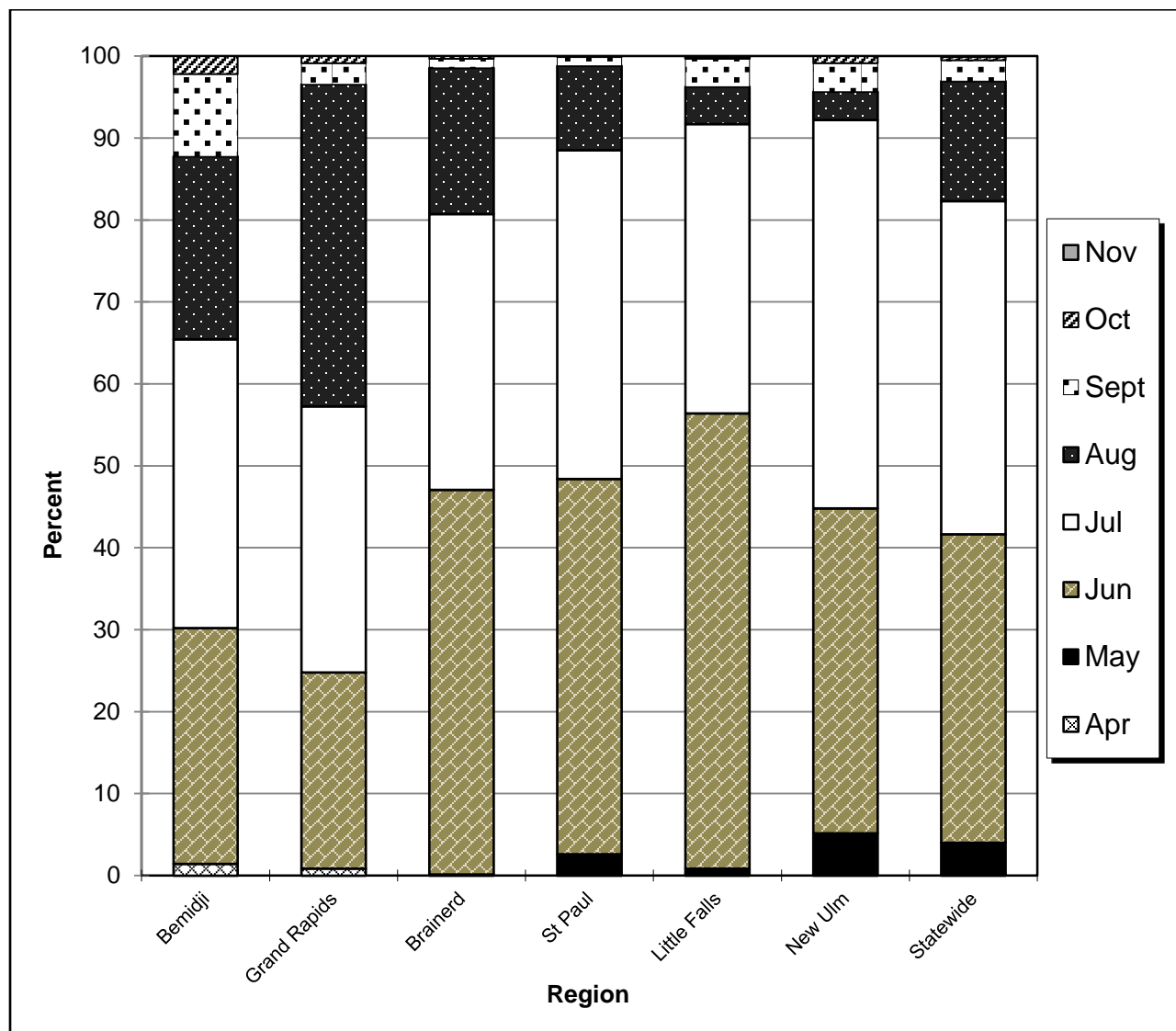
Permit fee revenue in 2015 increased from 2014. In 2015, revenue generated by permit fees was approximately \$253,000, about \$46,000 more than 2014 . Permit fee revenues had been in decline from 2008 (\$300,000) through 2014 when permit fee revenue was \$207,000.

Prior to the legislative change during the 2011 session that defined an invasive aquatic plant management permit (IAPM); these permits were issued with fee. Issuing the IAPM permit free of charge also contributes to the reduction in permit fee revenues.

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 2015 about 90% of the permitted work, reported statewide, was completed in June, July, and August (Figure 4).

Figure 4. Percent of reported APM work by month for each region in 2015.

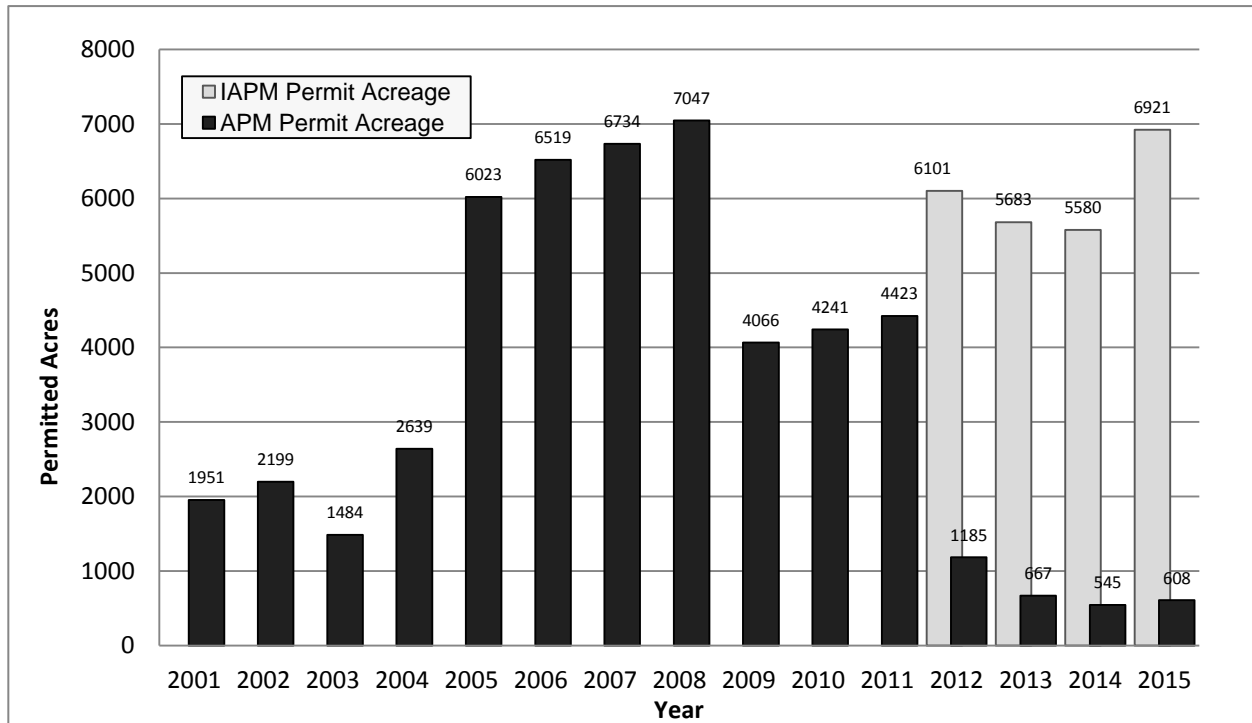


Permitted Off-shore Acres of Aquatic Plant Control

The number of acres permitted for control of aquatic plants fluctuated annually until 2005 when a sharp increase was recorded followed by continued modest annual increases (Figure 5). One contributing factor is the offshore control of aquatic plants 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 between 2004 and 2005. In 2005, 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 (South Region), were treated with an aquatic herbicide again in 2006, 2007, and 2008 to manage curly-leaf pondweed. In 2009, the curly leaf-pondweed treatment in Lake Benton was reduced to 254 acres. In 2010 approximately 120 acres of curly-leaf pondweed was treated in Lake Benton, resulting in a 2,630 acre decrease from Lake Benton alone.

In 2012, permits issued for the management of invasive aquatic plants were separated from the APM program and issued by the invasive species program staff in the Division of Ecological and Water Resources. The acres permitted for offshore control of submersed invasive aquatic plants in 2015 was 6,921 acres and the acres permitted for the offshore control for submersed species in the APM program was 608 acres.

Figure 5. Permitted off-shore herbicide control acreage of aquatic plants statewide from 2001-2015



Acreage reported prior to 2012 did not distinguish between permits issued for the control of invasive aquatic plants (IAPM permits) and permits issued for native aquatic plant control (APM permits). Therefore, it should not be concluded that there were no permits issued for invasive species management prior to 2012.

Aquatic Plant Control Methods

In 2015, about 35% of all permits issued for aquatic plant control allowed plant removal with AAPCD's, up 6% from 2014. Aquatic plant control using herbicides, commercial mechanical control, and plant removal by hand, accounted for the remaining 61% of the APM permits issued (Figure 6). It is important to remember that a limited amount of mechanical control of submersed 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 2015 are found in Table 3. Permit holders were asked if they performed the control over the entire area allowed in their permit. Nearly 27% of those responding indicated that they treated less than the area permitted; slightly more than what was reported in 2014.

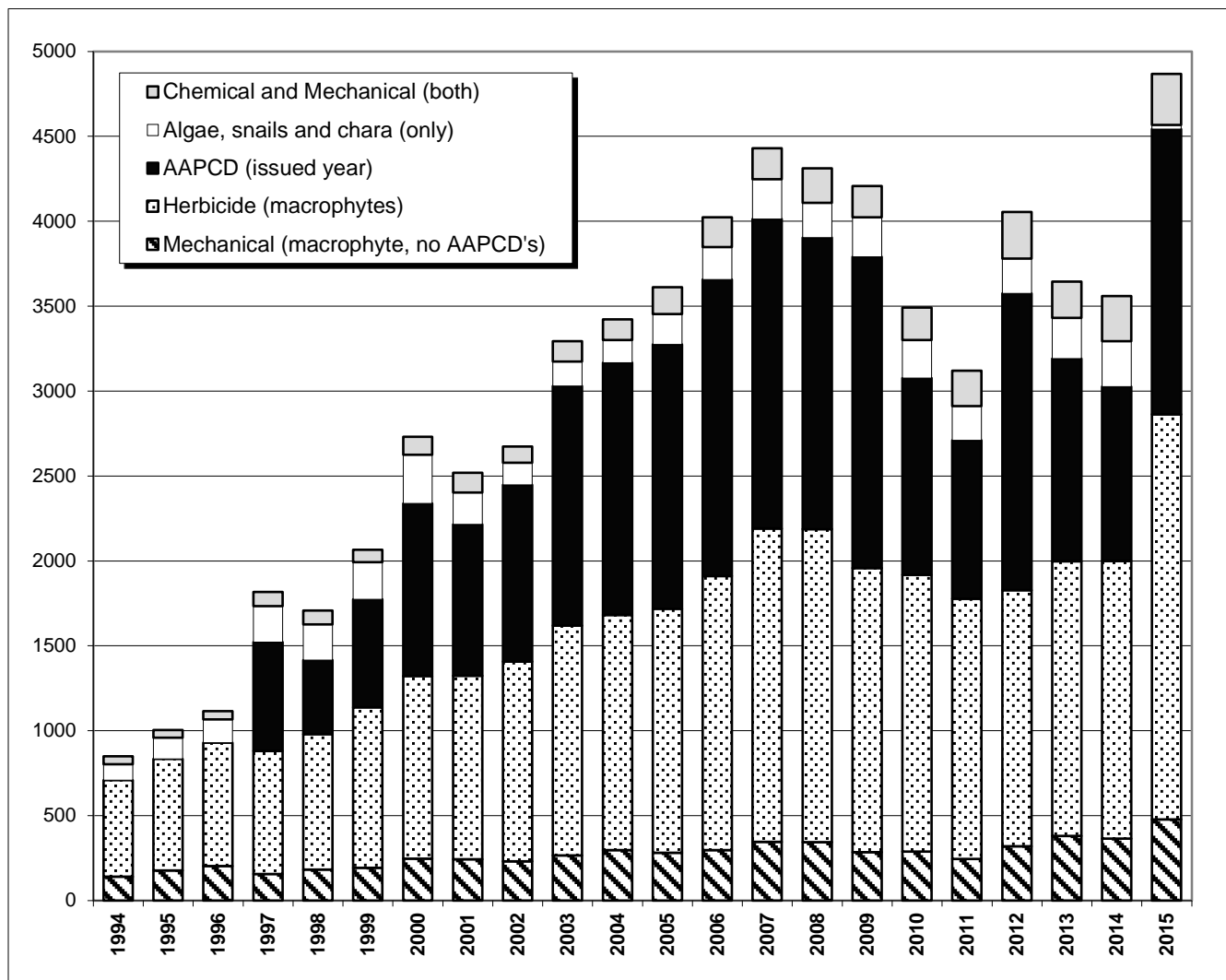
Table 3. Total near-shore area permitted, in acres, for control of submerged vegetation, swimmer's itch, and AAPCD use in 2015.

Control Method	Region 1	Region 2A	Region 2B	Region 3A	Region 3B	Region 4	Total number of Acres	Number of Properties	Average Acres per Prop (ft ²)
Herbicide control excluding open water treatment	16.0	3.0	61.0	75.0	78.0	18.0	251.0	1910	5724
Mechanical control excluding open water removal	10.0	0.0	0.3	2.8	1.1	0.4	14.5	307	2057
Herbicide & mechanical control excluding open water treatment	5.1	0.2	0.6	6.6	1.3	0.3	14.1	210	2925
Swimmer's itch control *	44.0	16.0	89.0	530.0	115.0	2.4	796.0	5047	6870
AAPCD 2015 issued	42.0	0.4	24.0	7.7	13.5	4.6	92.2	1683	2386

* includes permits for swimmers itch control only

1 = Bemidji, 2A = Grand Rapids, 2B = Brainerd, 3A = St. Paul, 3B = Little Falls, 4 = New Ulm

Figure 6. Numbers of APM permits issued by control type, 1994-2015



Percent of Aquatic Plant Removal Permits Used

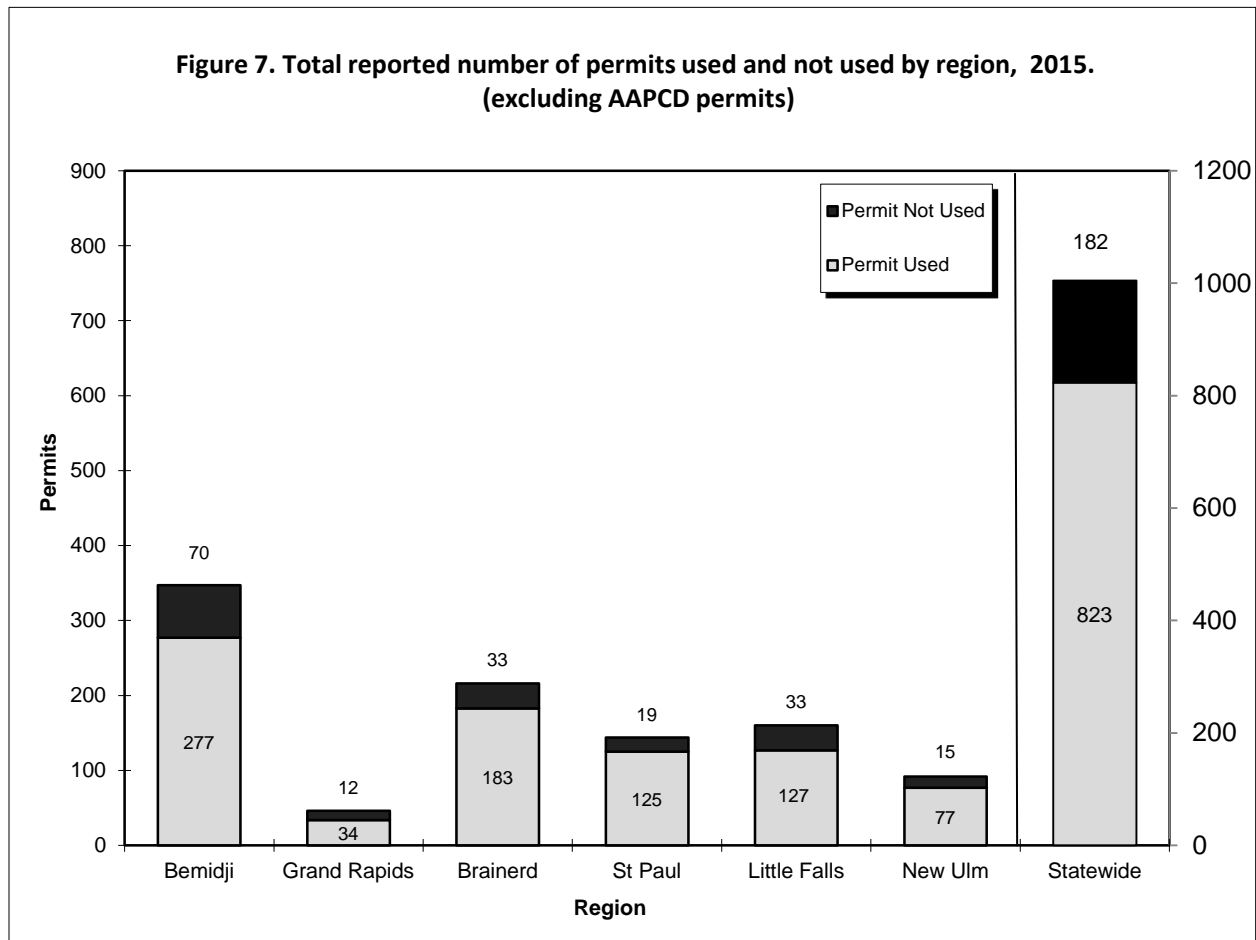
Each year some permits issued for aquatic plant management activities are not used (Figure 7). Of permit holders responding to the survey statewide, 70% of permittees who did their own control reported using their permit. Commercial applicators/operators reported using 90% of the permits issued for work they did. Permittees indicating that their permit was not used were asked to indicate why by responding to one or more choices provided on the survey. In 2015, the reason most frequently given (51%) for not using an APM permit was because the permittee was unable to do the work (Table 4).

Table 4. Permit holders responding to the survey choices indicating that their APM permit was not used, expressed as a percent of statewide responses 2015

Region	1	2A	2B	3A	3B	4	State wide %
Nuisance condition did not develop	9	2	5	5	10	2	18
Got permit too late	5	3	3	2	1	3	10
Unable to do the work	41	7	15	6	16	7	51
Other	15	0	9	6	6	3	22

1 = Bemidji, 2A = Grand Rapids, 2B = Brainerd, 3A = St. Paul, 3B = Little Falls, 4 = New Ulm

Figure 7. Total reported number of permits used and not used by region, in 2015 (excluding AAPCD permits).



Who Does Control

Commercial applicators and mechanical control companies performed about 65% of the permitted control statewide in 2015. This represents a 1% increase from the percent of the permitted control done by commercial applicator and commercial mechanical control companies in 2014. Permit holders in the Central Region hire commercial services more frequently than any other region (Figure 8a). In 2015 commercial aquatic plant control companies performed about 85% of the permitted control in the Metro Area. In 2015, 62% of the permitted control in the Northeast Region was performed by commercial service. Most of this control is in the Brainerd Lakes Area of the NE Region. In the Grand Rapids area (2A) of the NE Region most permitted control (61%) was done by commercial services in 2015. Permit holders perform about 65% of the permitted control in the Northwest Region and 39% in the South Region. Property owner conducted control in 2015 decreased from 2014 (Figure 8b).

Figure 8a. Percent of reported APM work done by permittee or by a commercial service for each region in 2015.

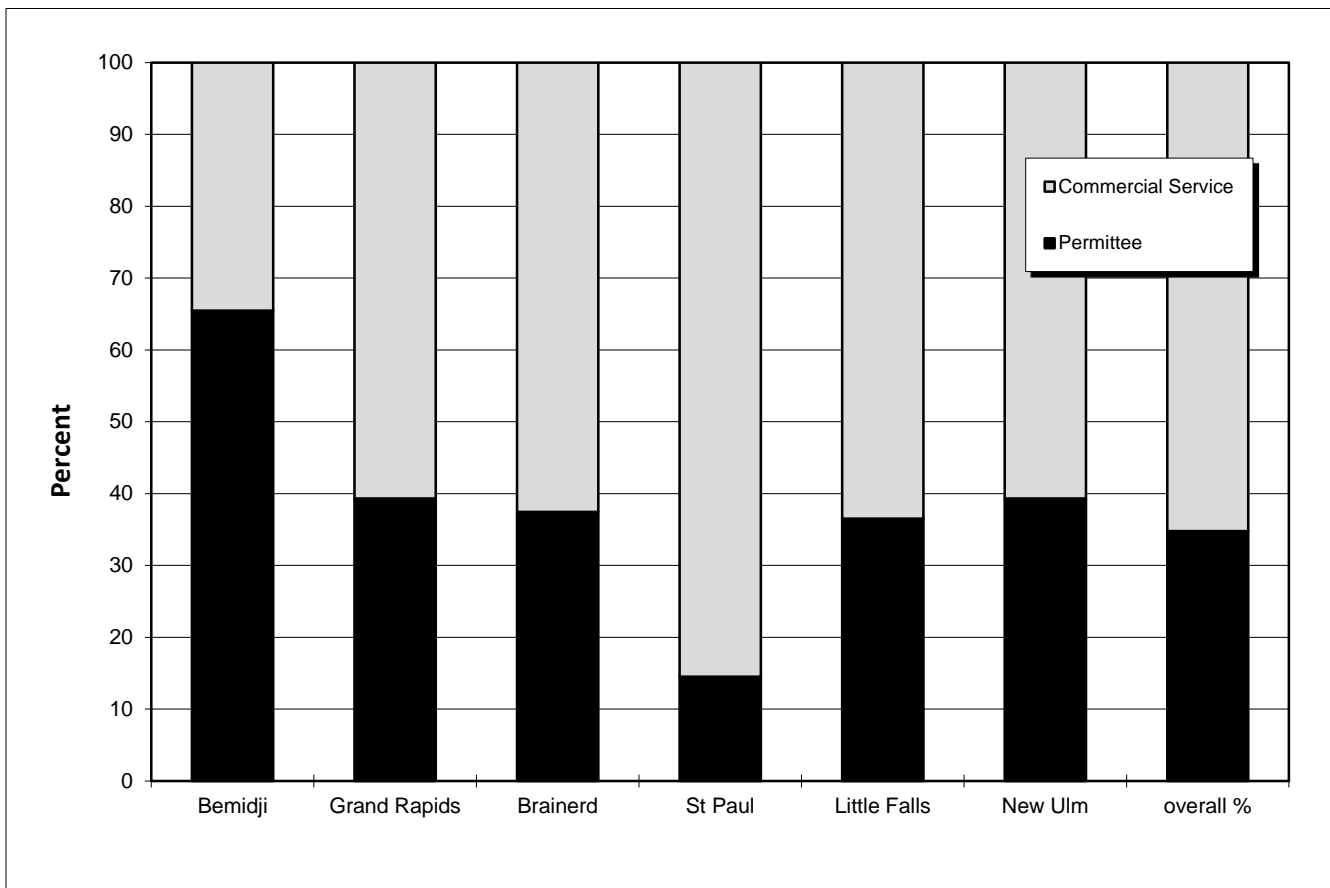
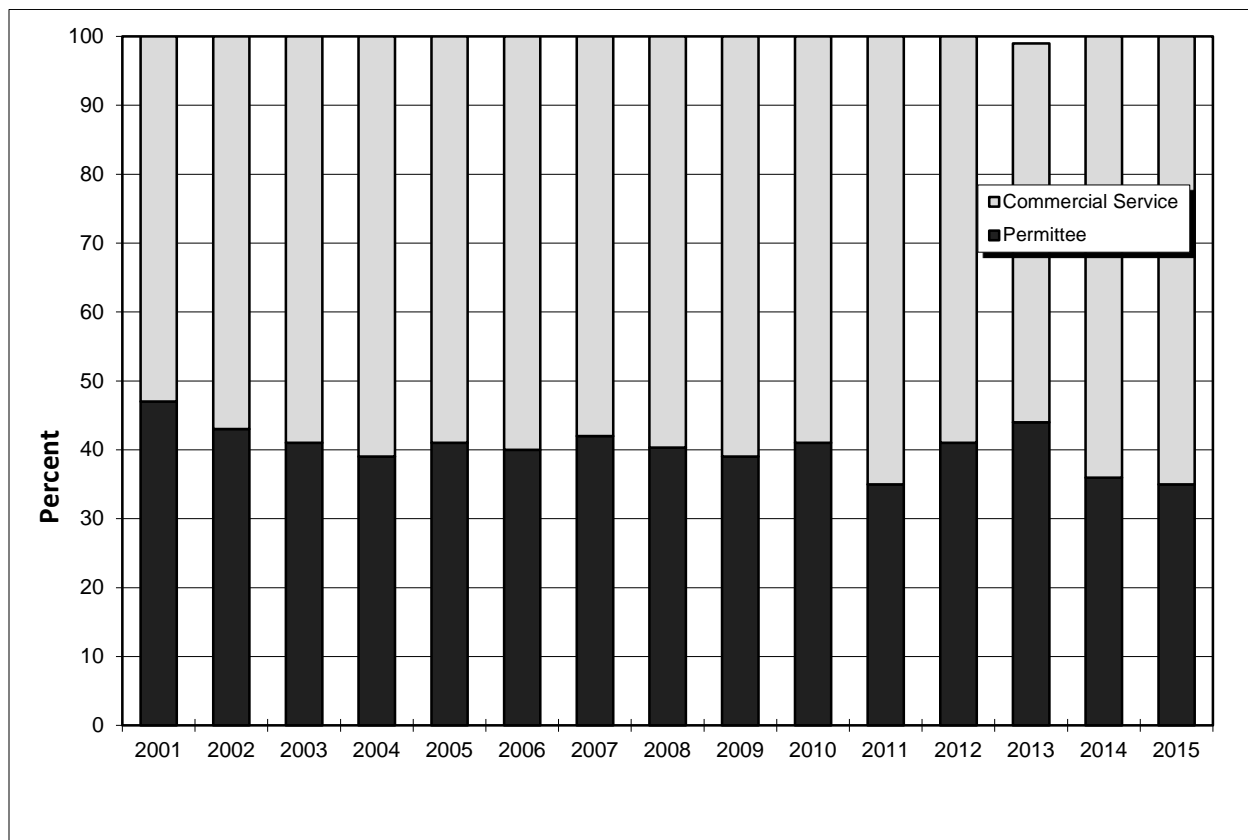


Figure 8b. Percent of reported APM work done by permittee or by a commercial service statewide from 2001-2015.



Satisfaction

Permittees who personally undertook aquatic plant control activities were asked to indicate their satisfaction with the results of the aquatic plant control. About 48% of the respondents were satisfied with the results of herbicide control. Nearly 60% 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.

Reapply for Permit

Permit holders, excluding AAPCD permittees, were asked if they would apply for a permit in 2016. Of the 1005 responses, 802 (80%) said they would reapply for an APM permit next year, about 7% higher than in 2014. Approximately 12% (126) of the permit holders responding indicated that they were unsure if they would reapply for a permit in 2016. The number of permittees reporting that they would not apply (26 or 2%) was about the same as 2014. Regardless of their response, all 2015 permit holders, whose permits expire, will receive permit application materials prior to the start of the 2016 open water season.

Automated Aquatic Plant Control Devices (AAPCD)

Before 1997 the operation of an AAPCD did not automatically require an APM permit, and few AAPCD permits were issued. The APM Rules were revised in 1997 to require a permit for the operation of these devices because of their potential to excavate bottom sediments, and impact spawning habitat. In 2015 there were 1,713 permits issued for these devices statewide. Of those permits 426 were issued for a one-year term and 1,287 were issued for a three-year permit term. About 75 percent of the AAPCD permits were issued in the Northwest and Northeast Regions. In addition to the permits issued in 2015, there are active three-year permits issued in 2013 and 2014 (789 and 637 respectively). Of the 1,675 surveys mailed to AAPCD permit holders, 1,335 (79%) responded to the survey. Three-year AAPCD permit holders issued permits in 2013 and 2014 were not surveyed.

The APM rules provide two permit options for AAPCD operation. A person applying for a permit to operate the device in an area greater than 2,500 square feet is required to obtain an annual permit. However, a three-year permit option is available for persons who limit the size of the area of AAPCD operation to 2,500 square feet or less (*Minnesota Rules*, part 6280.0450, subp.3, item A). In addition, revisions to the APM rules implemented in the 2009 permit season restrict submersed aquatic plant removal to 100 feet of shoreline or one-half the owner's frontage whichever is less (*Minnesota Rules*, part 6280.0350, subp. 1a). Due to this rule change many more permit holders became eligible for an AAPCD permit of three year duration in 2009. In 2015, 1,287 three year AAPCD permits were issued. Three year AAPCD permit issuance in 2015 increased by 650 permits over 2014.

There were 1,713 total AAPCD permits issued in 2015, 684 more than in 2014. The number of single season permits issued in 2015 decreased by 113 over 2014 (Figure 9a).

The numbers of permits issued for AAPCD use increased overall in 2015. Figure 9b compares annual AAPCD permit issuance from 1997 to 2014. In 2015 there were approximately 2,713 active 3-year AAPCD permits. There were about 14 fewer active 3-year AAPCD permits in 2015 than in 2014. The numbers of permits issued for AAPCD use decreased overall in 2015.

About 162 (12%) of persons responding to the AAPCD survey stated that, for various reasons, they did not operate the device in 2015, a decrease from 2014.

Figure 9a. Numbers of permits issued allowing the use of AAPCD's in Minnesota public waters, 1998-2015.

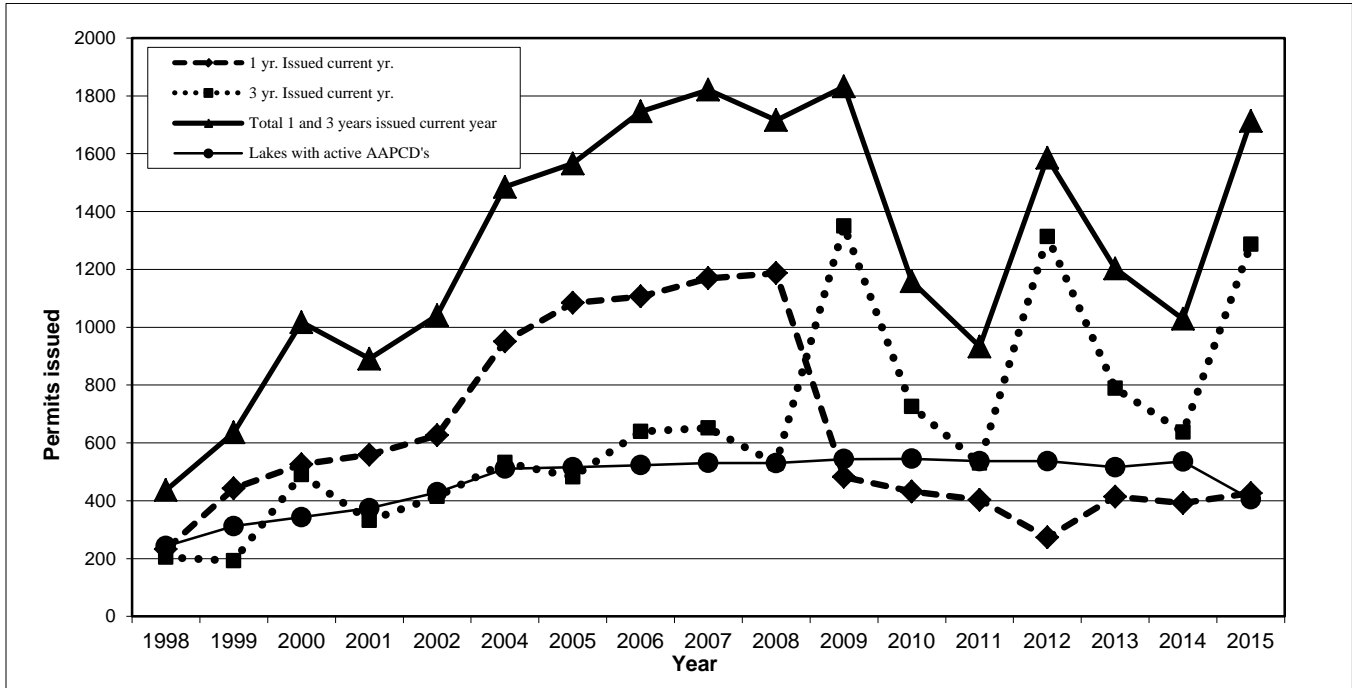
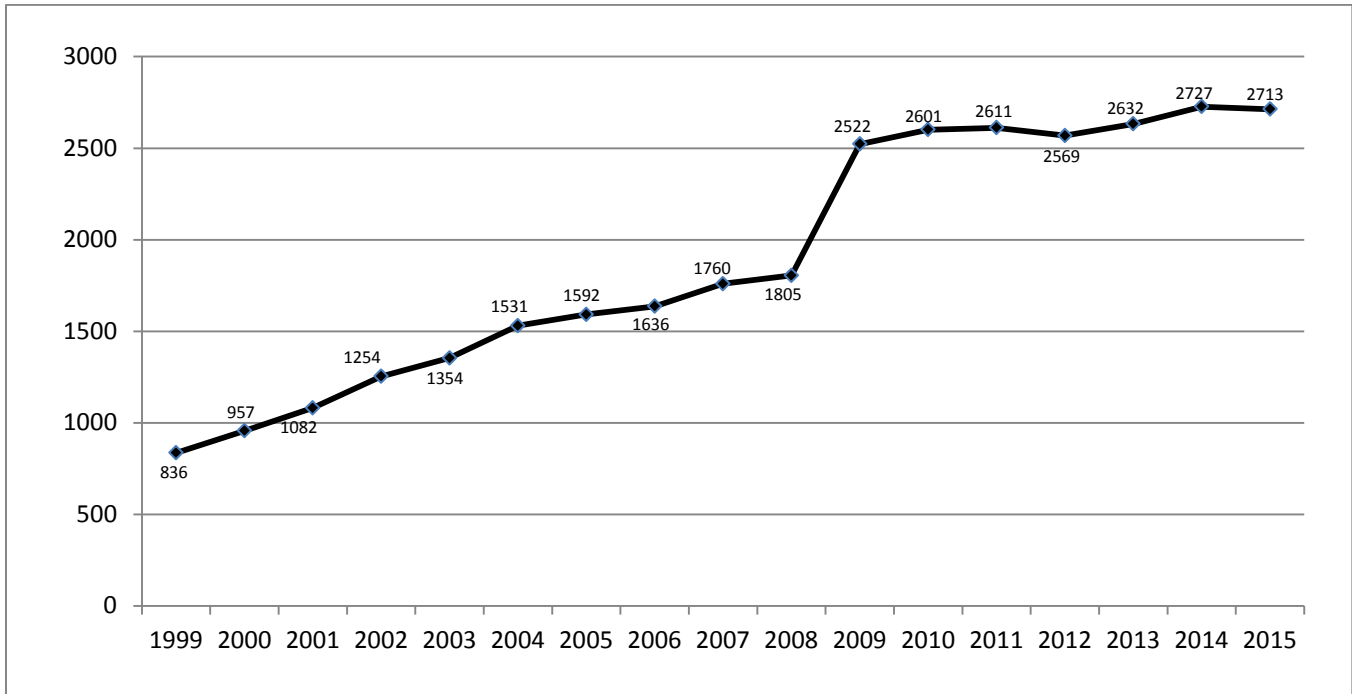


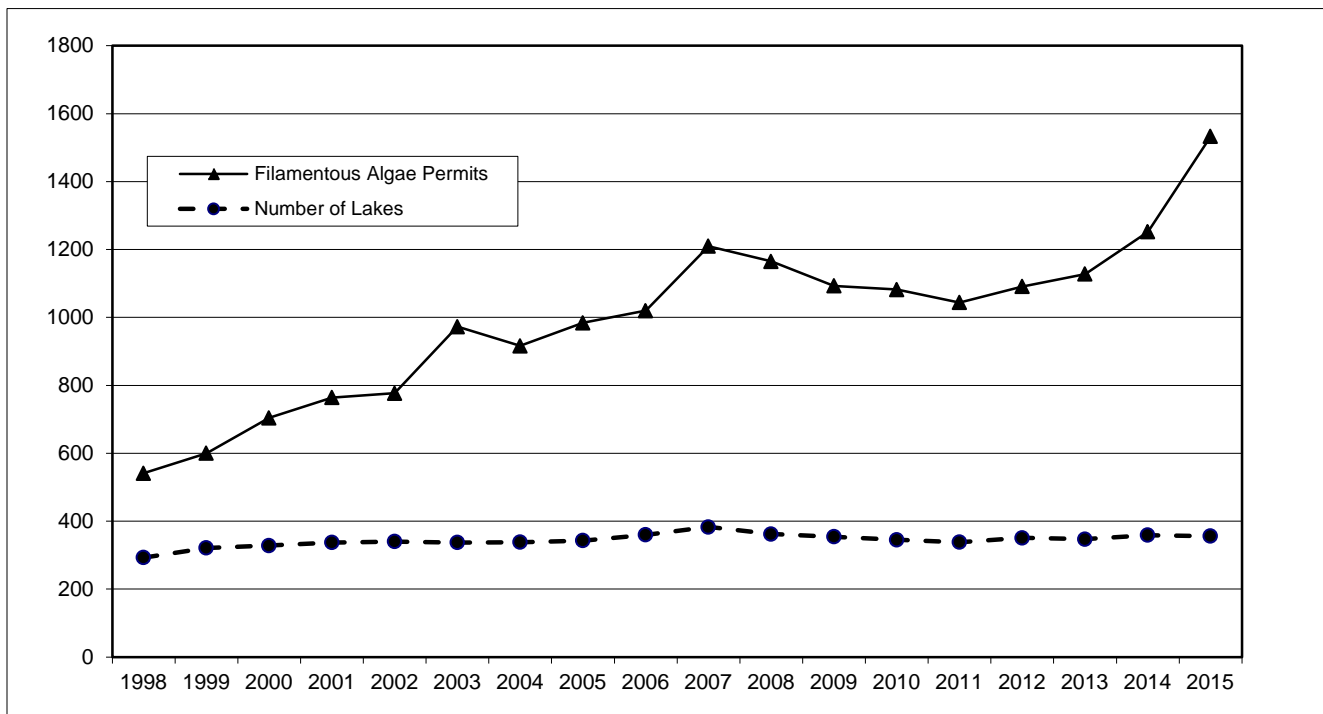
Figure 9b. All active 3 year AAPCD permits issued from 1999-2015



Filamentous Algae Control

The APM rules allow the control of filamentous algae with copper sulfate. Filamentous algae can become a nuisance by interfering with swimming and wading. Permit issuance for filamentous algae control mirrors permit issuance for submersed plant control (Figure 10). Filamentous algae control is commonly requested on applications for control performed by commercial services. Requests for filamentous algae control have been increasing since 2011. Compared to 2014, there were about 257 more permits requesting filamentous algae control in 2015.

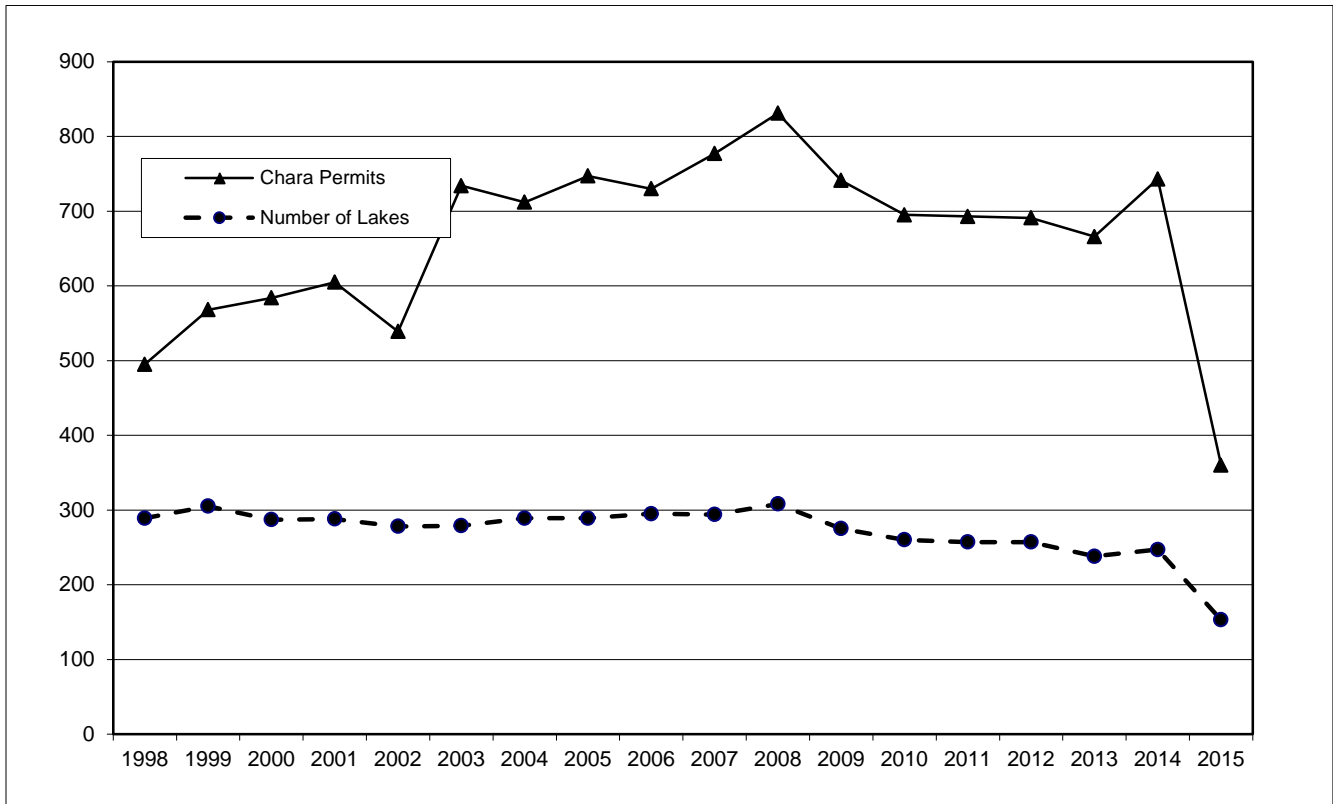
Figure 10. Numbers of permits issued for filamentous control, and numbers of lakes where the permits were issued 1998-2015.



Chara Control

Chara is a macro-alga that can interfere with recreation in some lakes. The APM rules allow the control of chara with copper sulfate. As a result of revisions to the APM rule in 2009, the limits on submersed aquatic plant control (lake shore property owners may receive a permit to control submersed aquatic plants on up to 100 feet, or one-half their frontage whichever less) now apply to the management of chara. In 2015 there were approximately 153 lakes where permits authorized chara control (Figure 11). This was a decrease of 94 lakes from 2014.

Figure 11. Numbers of permits issued for chara control, and numbers of lakes where the permits were issued 1998-2015.

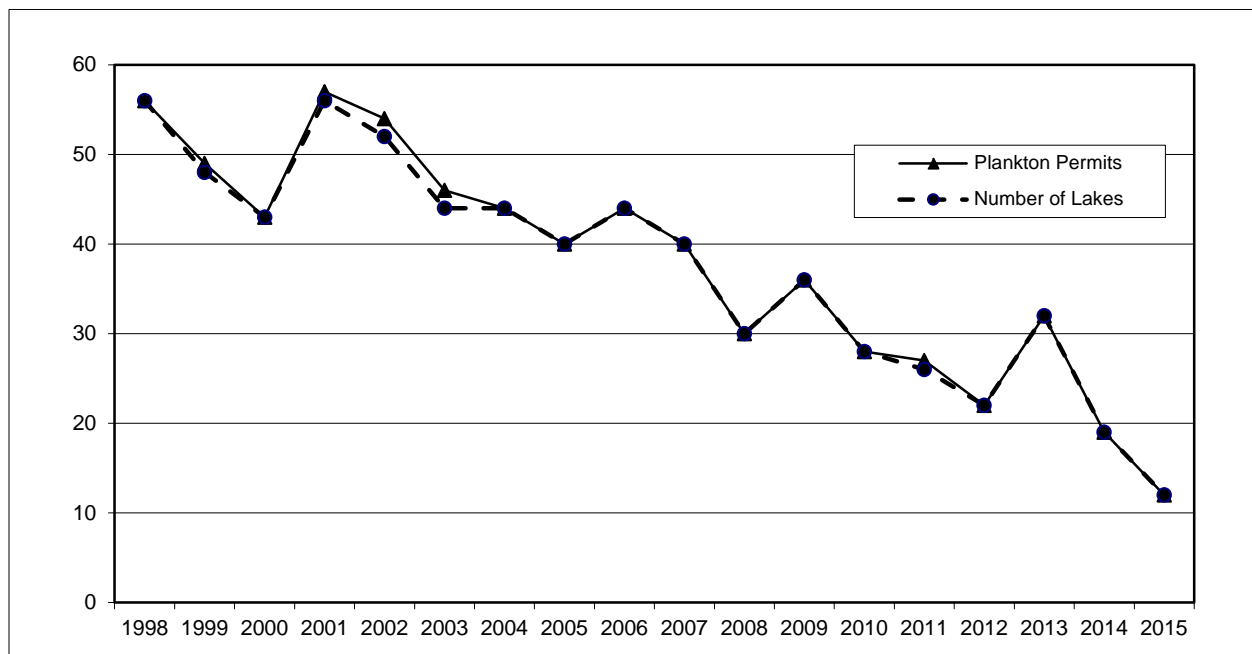


Plankton Algae Control

The APM rules allow the control of plankton algae when there is an “excessive algae bloom.” The characteristics of an “excessive algae bloom” as defined by the rules are: an algae population dominated by blue green algae, a Secchi disc reading typically 2 feet or less, floating mats or scums of algae accumulating on the downwind shore, or decomposition of accumulated algae has occurred releasing a blue-green pigment and causing an offensive odor.

The numbers of lakes treated with algaecides to control plankton algae has been decreasing over the last ten years (Figure 12). In 2015, there was a decrease of 7 permits issued for lakewide plankton algae control. Copper sulfate treatments can cause an increase in water clarity when the turbidity is due to algae, but the increased water clarity is usually temporary and the treatment may need to be repeated. Due to the temporary nature of control, the possibility of a fish kill caused by a dissolved oxygen decline from decomposing algae, the buildup of copper in lake sediments, and the potential for algae to become resistant to copper, lake-wide plankton algae treatments are discouraged.

Figure 12. Numbers of permits issued for lake-wide plankton algae control, and the number of lakes treated 1998-2015.



Swimmer's Itch Control in Minnesota Lakes

A condition known as Swimmer's itch (a.k.a. lake itch, wader's itch) has garnered complaints from swimmers in Minnesota lakes since at least the 1800's and has likely been around for much longer. The cause of this irritating skin condition was discovered by W.W. Cort in 1928 at the University of Michigan Biological Station (Blankespoor and Reimink, 1991). Cort discovered that swimmer's itch (cercarial dermatitis) is caused by the immature life stage of common non-human schistosome trematodes called the cercaria.

These parasites have a complex life history. The adult fluke lives in the blood vessels lining the intestine of its definitive host where it reproduces and releases eggs. The eggs enter the gut and leave the animal in the feces. The eggs hatch when they enter the water becoming a larvae called a miracidia. The miracidia then infects a snail where it develops into a life stage called the cercaria. The cercaria, upon release from the snail, seeks its definitive host, usually some sort of waterfowl. The cercaria does not feed and will only live for about 24 hours unless it finds a proper host. When a proper host is located the cercaria penetrates the skin, finds its way to the blood vessels lining the gut, and becomes an adult completing its life history.

The problem for humans occurs when the cercaria mistakes us for its proper host. When a cercaria penetrates a human's skin it is attacked and killed by the person's immune system. Although the organism cannot complete its life history in humans, individuals sensitive to the infection can suffer from an allergic reaction. The symptoms will appear on areas of the body submersed in the lake and

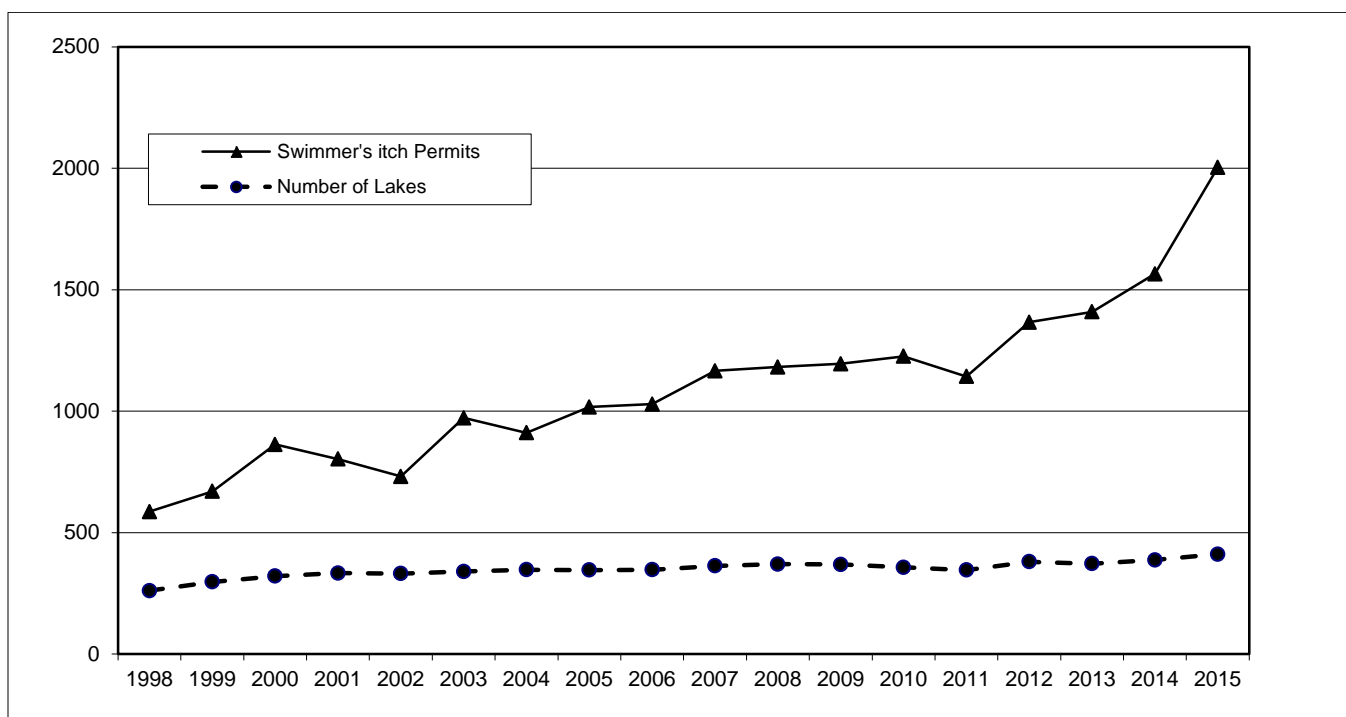
are typified by areas of redness and swelling, similar to a mosquito bite, and are accompanied by a severe itching sensation. These symptoms can last up to two weeks.

Not everyone is bothered by swimmer's itch; about 30 to 40% of the population is sensitive to swimmer's itch infection. This explains why some people swimming in a lake at the same time and place as a person severely affected, experience no symptoms. Like other allergic reactions, a person's degree of sensitivity increases with each exposure.

Lakeshore property owners may get a permit from the DNR that allows the application of copper sulfate to the lake for the control of swimmer's itch. The intent of the copper sulfate application is to kill snails that harbor the immature life stage of the fluke that causes swimmer's itch. Individuals receiving a permit to control swimmer's itch with copper sulfate are generally allowed to treat the permitted area 2 times per summer if allowed by the products label.

The numbers of permits issued for swimmer's itch has increased steadily since 1997. In 2015 there were 411 lakes (24 more than in 2014) statewide where 2004 permits authorized swimmer's itch control (Figure 13 & Appendix Table H).

Figure 13. Numbers of permits issued for swimmer's itch control, and the numbers of lakes where the permits were issued 1998-2015.



Management of Invasive Aquatic Plants

In addition to permitting responsibilities for aquatic plant management efforts conducted by individuals to improve access or recreational use, the DNR has statewide control programs for a number of non-native invasive aquatic plants.

Invasive Aquatic Plant Management (IAPM) permit is defined in *Minnesota Statutes* 103G.615, subd. 3a. The purpose of this aquatic plant management (APM) permit is to authorize “the selective control of invasive aquatic plants at a scale to cause a significant reduction in the abundance of the invasive aquatic plant.” The IAPM permit was first implemented in 2012.

The most commonly used herbicide for control of milfoil is 2,4-D in several formulations labeled for aquatic use.

In 2015 there were approximately 290 permits issued to allow treatment of invasive aquatic plants (ISP 2015). The total reported 2,4-D use in 2015 for milfoil was 16,500 pounds of granular and 7,300 gallons of liquid 2,4-D. The total reported annual use of 2,4-D products since 1987 is provided in Figure 14. Another auxin mimic herbicide used for milfoil control is triclopyr. Figure 15a shows the use of granular triclopyr since 2006. Figure 15b shows liquid triclopyr use since 2006.

For more detailed information on the management of invasive species see the 2015 Invasive Species Program Annual Report. The report may be reviewed on the MNDNR’s web site.

Figure 14. Permitted 2,4-D Herbicide use for Eurasian Milfoil Control in Minnesota, 1987-2015.

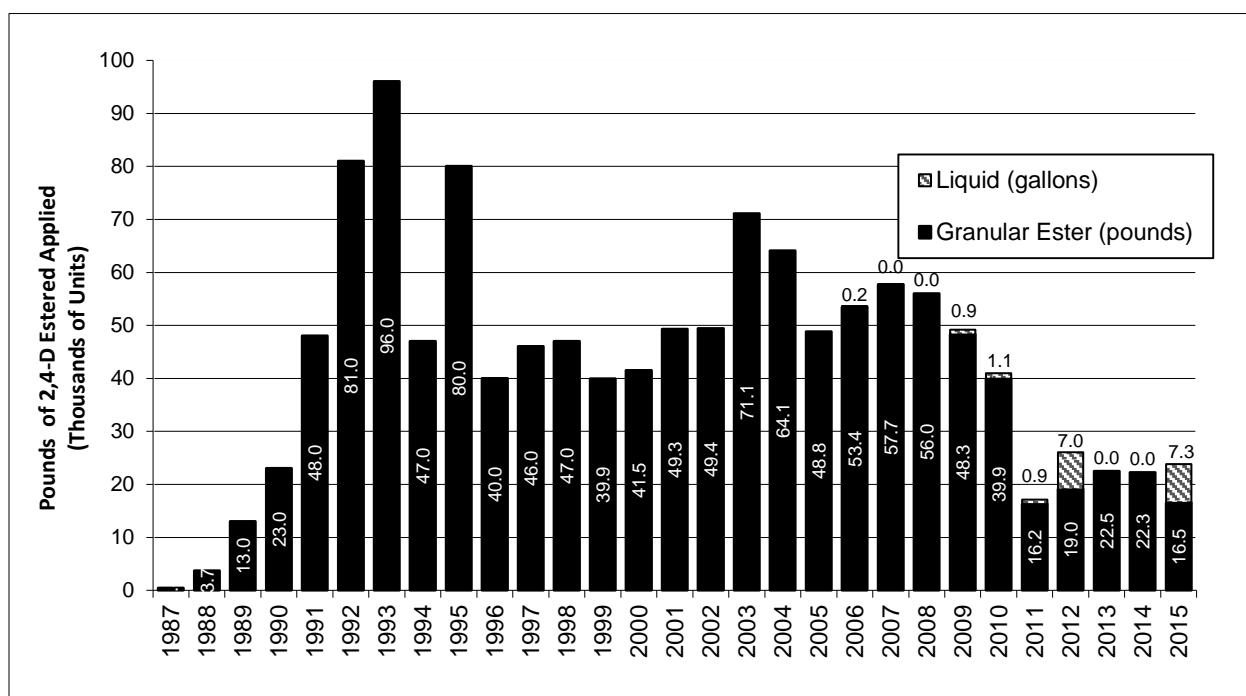


Figure 15a. Permitted Granular Triclopyr reported as being used in Minnesota, 2006-2015.

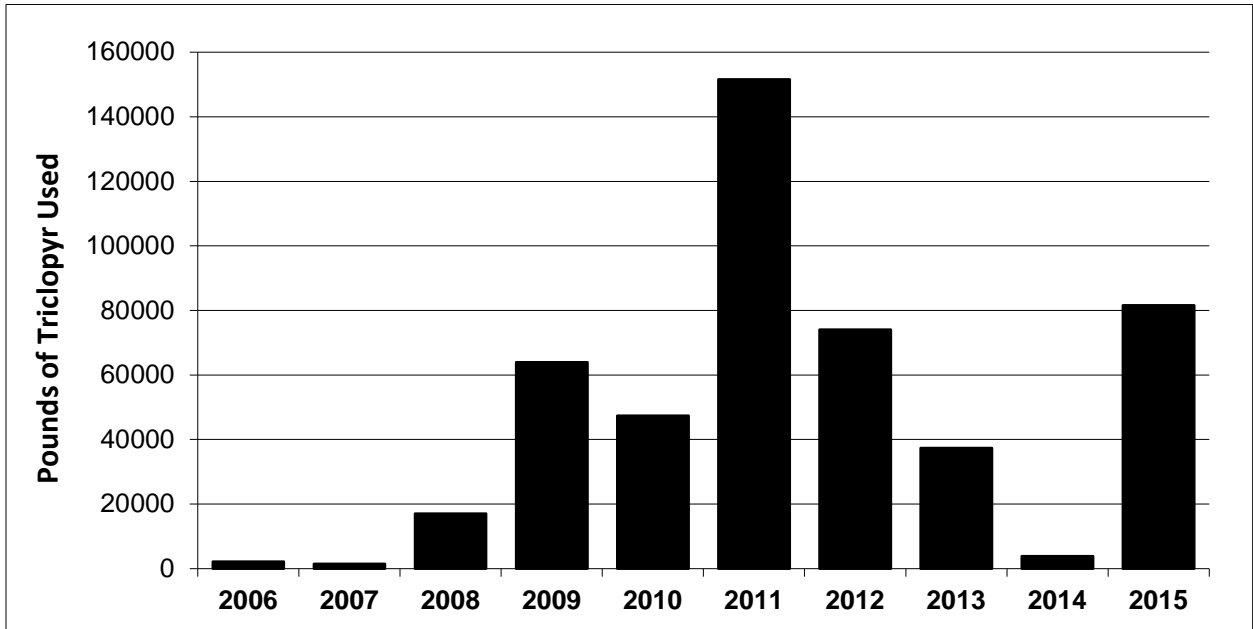
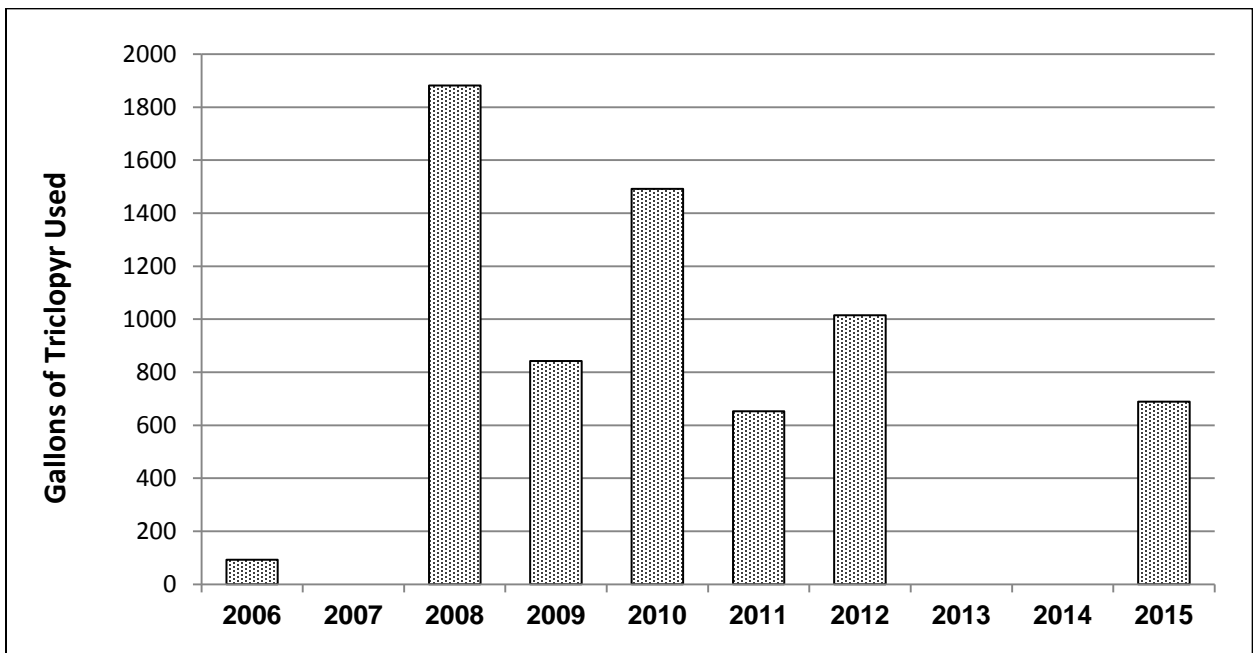


Figure 15b. Permitted Liquid Triclopyr reported as being used in Minnesota, 2006-2015.



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APPENDICES

-	Title	Page
A	Aquatic Pesticide Enforcement Use Inspections, 2015	37
B	Aquatic Plant Management Violations Resulting in Enforcement	38
C	list of commonly used herbicides registered by the EPA for aquatic use and approved by the MN DNR	39
D	Reported various aquatic herbicide use statewide 1981-2015	40
E	Aquatic Plant Management Survey of chemical and mechanical control permit holders in 2015	41
F	Aquatic Plant Management Survey of automated aquatic plant control device permit holders in 2015	42
G	Statewide numbers of permits and properties by county, 2015	43
H	Lakes with permits issued for swimmer's itch in 2015	45

Table A. Aquatic Pesticide Enforcement Use Inspections, 2014.

Treatment Date	County	Lake Name	Applicator	Permit Number
6/24/2015	Anoka	Crooked	Lake Restoration	15W-3A109
7/22/2015	Carver	Riley	Lake Restoration	15F-3A398
7/23/2015	Cass	Margaret	Central Minnesota Aquatic	15F-2B0808
5/5/2015	Chisago	Green Lake	Lake Management	15W-3B001
7/7/2015	Chisago	South Center	Lake Management	15F-3A536
8/10/2015	Chisago	Comfort	Lake Management	15W-3B089
6/23/2015	Crow Wing	Bay	Lake Restoration	15W-2B28
8/5/2015	Crow Wing	Ruth	Professional Lake and Land Management	15W-2B05
7/14/2015	Dakota	O'Brien	Dakota County Parks	15F-1119
4/28/2015	Hennepin	Independence	PLM Lake & Land Management	15W-3A097
5/15/2015	Hennepin	Independence	Aquatic Solutions	15W-3A055
5/22/2015	Hennepin	Shady Oak	City of Hopkins	15F-3A285
6/23/2015	Hennepin	Lower Twin	Jacobson Environmental. PLLC	15F-3A119
7/15/2015	Hennepin	Minnewashta	Jacobson Environmental. PLLC	15F-3A073
7/30/2015	Hennepin	Pamela	Midwest Aqua Care	15F-3A787
8/13/2015	Hennepin	Greentree Pond	Jacobson Environmental. PLLC	15F-3A788
8/17/2015	Hennepin	Sarah	Professional Lake and Land Management	15F-3A1093
5/4/2015	Le Sueur	East Jefferson	Lakescapes, LLC	15W-4016
7/9/2015	Le Sueur	Tetonka	Lake Restoration	15F-4177
7/21/2015	Pine	Sand	Lake Management	15W-2A006
7/21/2015	Pine	Sturgeon	Lake Management	15W-2A005
5/27/2015	Ramsey	Bald Eagle	Jacobson Environmental. PLLC	15F-3A179
5/27/2015	Ramsey	Bald Eagle	Jacobson Environmental. PLLC	15F-3A421
6/5/2015	Ramsey	Silver	Lake Improvement Consulting	15F-3A665
6/23/2015	Ramsey	Turtle	Midwest Aqua Care	15W-3A112
7/7/2015	Ramsey	Johanna	Lake Restoration	15F-3A635
7/31/2015	Ramsey	Peppertree Pond	Lake Restoration	15F-3A845
5/15/2015	Rice	Lake Mazaska	Lakescapes, LLC	15W-4009
7/8/2015	Scott	Lower Prior	Lake Restoration	15F-3A317
7/17/2015	Scott	Thole	Midwest Aqua Care	15F-3A751
8/6/2015	Scott	Upper Prior	Professional Lake and Land Management	15F-3A1097
5/28/2015	Washington	Big Marine	Jacobson Environmental. PLLC	15F-3A775
6/4/2015	Washington	Big Marine	Lake Management	15F-3A335
6/25/2015	Washington	Clear	Lake Management	15F-3A033
8/4/2015	Washington	White Bear	Lake Management	15F-3A584
5/1/2015	Wright	Indian Lake	Aquatic Solutions	15W-3B093
5/11/2015	Wright	Sugar Lake	Lake Restoration	15W-3B081
7/27/2015	Wright	Mink	Clarke Aquatic Services	15W-3B102

Table B. Aquatic Plant Management Violations Resulting in Enforcement

No APM Violations were documented in 2015.

Table C. List of commonly used herbicides registered by the EPA for aquatic use & approved by the MN DNR.

Product Name	Selective	Broad Spectrum	Active Ingredient (Formulation)
<i>Part 1. Aquatically labelled systemic herbicides:</i>			
Aquacide (Pellet)	X		2,4 Dichlorophenoxyacetic Acid (Sodium Salt)
Navigate® (Granular)	X		2,4 Dichlorophenoxyacetic Acid (Butoxyethyl Ester)
SEE 2,4-D (Liquid)	X		2,4 Dichlorophenoxyacetic (Isooctyl Ester)
Weedtrine II (Granular)	X		2,4 Dichlorophenoxyacetic (Isooctyl Ester)
DMA-4 IVM (liquid)	X		2,4 Dichlorophenoxyacetic Acid (Dimethylamine Salt)
Sculpin-G (granular)	X		2,4 Dichlorophenoxyacetic Acid (Dimethylamine Salt)
Renovate MAX G	X		2,4 Dichlorophenoxyacetic Acid (Dimethylamine Salt), Triclopyr
Aquasweep	X		2,4 Dichlorophenoxyacetic Acid (Dimethylamine Salt), Triclopyr
Renovate, Kraken (Liquid or Granular)	X		Triclopyr
Sonar (Liquid or Granular)		X	Fluridone
Rodeo, Refuge, AquaPro, AquaNeat (Liquid)		X	Glyphosate
Habitat		X	Imazapyr
Clearcast		X	Imazamox
Clipper		X	Flumioxazin
<i>Part 2. Contact herbicides:</i>			
Aquathol (Liquid or Granular)		X	Dipotassium salt of endothall
Hydrothol (Liquid or Granular)		X	Mono-amine salt of endothall (liquid by licensed applicator only)
Reward, Redwing, Tribune (Liquid)		X	Diquat dibromide (use by licensed applicator only)
<i>Part 3. Copper Compounds (Algaecides & Herbicides):</i>			
Captain, Nautique (Liquid)	X		Copper Carbonate
Mizzen, Symmetry (Liquid)	X		Copper Triethanolamine Complex
Cutrine Plus (Granular & Liquid)	X		Copper Ethanolamine Complex
Clearigate, Komeen (Liquid)	X		Copper Ethanolamine Complex
<i>Part 4. Other:</i>			
Copper sulfate	X		CuSO4 (wide variety of registered brands)

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Table D. Reported various aquatic herbicide use statewide 1981-2015.

Year	2,4-D Ester (lbs)	2,4-D Ester (gal)	2,4-D Salt (lbs)	2,4-D Salt (gal)	2,4-D Amine/ Acid (gal)	2,4-D Amine/ Acid (lbs)	Aquathol (lbs)	Aquathol (gal)	Diquat (gal)	Hydrothol 191 (lbs)	Hydrothol 191 (gal)	Copper Sulfate (lbs)	Triclopyr (lbs)	Triclopyr (lbs)	2,4-D salt + Triclopyr (lbs)	Imazapyr (gal)	Imazamox (gal)	Flumioxazin (lbs)	Glyphosate (gal)
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	0	*	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	*	*	*	*	*	*	*
2006	53,400	*	805	*	215	*	1,530	8,757	2,953	11,653	126	47,000	2,189	28	*	*	*	*	*
2007	57,700	*	971	*	85	*	1,320	9,838	3,665	10,105	782	46,000	1,400	46	*	*	*	*	*
2008	56,000	*	655	*	7.4	*	2,462	13,208	2,643	10,693	550	32,290	17,025	1,882	*	*	*	*	*
2009	48,250	*	655	*	939	*	725	13,801	1,791	7,963	1,758	25,234	63,896	662	*	*	*	*	*
2010	39,932	*	731	*	1,070	*	737	10,238	1,501	7,973	900	23,200	47,379	1,371	*	*	*	*	*
2011	16,233	*	775	*	1,066	*	578	10,936	1,760	5,426	626	22,341	151,593	587	3120	*	*	*	*
2012	19,007	*	847	*	7,233	*	1,140	12,992	2,197	5,967	493	36,810	74,086	1,014	2488	*	*	*	*
2013	22,486	2,005	753	*	6,108	2	5,423	8,778	2,489	4,889	440	20,442	37,305	573	*	5.68	9113	146	
2014	22,265	0	450.8	11,14	894	585	424	12,524	2,214	6,027	169	22,766	3,847	1,047	*	4.38	11.55	155.09	2,647
2015	16,484	*	686	1,787	7,498	3,113	583	15,866	2,469	6,596	533	24,150	80,660	689	1,200	151	140	138	112

Mention of trademarks or proprietary products does not constitute a warranty of the products by the Minnesota Department of Natural Resources and does not imply its approval to the exclusion of other products that may also be suitable.

Table E. Aquatic Plant Management Survey. Chemical-Mechanical, 2015.

1. Was your 2015 permit used?

1032	Yes, permitted work was done.	17	No, because: I got the permit too late.
33	No, because: The nuisance conditions did not develop.	92	No, because: I was unable to get the work done.
		34	No, because: (Comments)

2. When my permit expires:

802	I will reapply for a permit.	53	Permanent and Non-transferable
26	I will not apply for a permit.	25	Did not answer the question
126	I am undecided at this time.		

3. The method of control was:

355	Mechanical or hand removal.
1925	Chemical treatment.
122	Mechanical and chemical treatment.

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

426	YES	161	Wasn't as good as expected
69	NO	224	Did not answer the question

4B. If you treated for Swimmers Itch were you satisfied with the control ?

173	YES	44	Wasn't as good as expected
19	NO	643	Did not answer the question (may not have treated for swimmer's itch)

5. When was the work done?

5	April	536	August
142	May	93	September
1377	June	16	October
1488	July	2	November

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.

580	Yes, control work was done on the entire area permitted
213	No, less control work was done than the permit allowed
14	did not answer the question

**7. If you used herbicide, please indicate what you used and how much?
(Excludes products applied by commercial companies)**

What Did You Use?	How Much Did You Use?		How Much Did You Use?
Alligare Diquat	336 gal.	Hydrothol 191(liq.)	197.00 gal
Alligare Triclopyr	0.09 gal.	Komeen	40.10 gal
Aquacide	551.00 lbs.	Mizzen	1865 gal.
AquaKleen	466 lbs.	Nautique	18.80 gal
AquaPro	0.22 gal	Navigate	98.40 lbs
Aquathol K (liq.)	2845.00 gal	Refuge	5.37 gal
Clipper	131.00 lbs	Renovate OTF	240.00 lbs
Copper sulphate	20974.60 lbs.	Reward	15.3 gal.
Citrine Plus (gran)	33.10 lbs	Rodeo	22.4 gal
DMA	144.00 gal	Sculpin	65.00 lbs.
Glyphosate	62.00 gal	Super K Aquathol	423.00 lbs
Habitat	144.00 gal.	Tribune	1178.00 gal
Hydrothol 191 (gran)	5757.00 lbs		

Table F. Aquatic Plant Management Survey for automated aquatic plant control device (AAPCD) permit holders 2015.

1. **The type of AAPCD device I use is a:**

1196	Crary WeedRoller <input type="checkbox"/>	11	Other
15	Lake Restoration Lake Maid	5	Unknown device
106	Colman Beach Groomer	1333	Total

2. **I used an AAPCD this year:**

1172	Yes	1	Unanswered
162	No, I did not use an AAPCD this year.	1334	Total

3. **The AAPCD I used in 2015: I have owned for:**

123	less than 1 year	915	more than 3 years
95	1 - 3 years	114	Unanswered

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

8	less than 1 year	0	Was rented.
10	1 - 3 years	0	Was borrowed.
133	More than 3 years		

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

	Not Used	Few Hours (0-20 Hrs)	Several Hours (20-50 Hrs)	Many Hours (50-144 Hrs)	Continuous
In May:	381	425	89	31	12
In June:	109	382	260	108	30
In July:	95	355	291	115	29
In August:	166	406	193	76	22

Table G. Statewide numbers of APM permits and properties by county, 2015.

County	Permits	Properties
Aitkin	158	160
Anoka	65	121
Becker	253	253
Beltrami	50	50
Blue Earth	19	40
Carlton	37	37
Carver	108	262
Cass	258	258
Chisago	123	357
Clay	7	7
Clearwater	5	5
Cottonwood	2	2
Crow Wing	688	937
Dakota	69	243
Douglas	232	232
Faribault	6	69
Freeborn	5	5
Grant	6	6
Hennepin	422	1236
Hubbard	93	93
Isanti	37	105
Itasca	81	81
Jackson	1	1
Kanabec	4	111
Kandiyohi	82	100
Kittson	4	4
Koochiching	1	1
Lake of the Woods	2	2
LeSueur	93	211
Lincoln	7	7

County	Permits	Properties
Mahnomen	6	6
Marshall	4	4
Martin	7	7
Meeker	51	70
Mille Lacs	18	18
Morrison	105	207
Murray	11	11
Nicollet	1	1
Olmsted	1	1
Otter Tail	603	606
Pennington	1	1
Pine	31	66
Pipestone	1	1
Polk	5	5
Pope	68	68
Ramsey	138	713
Rice	32	65
Rock	1	1
Scott	81	199
Sherburne	61	178
St. Louis	27	27
Stearns	121	154
Steele	1	1
Todd	97	105
Wadena	11	11
Waseca	5	9
Washington	170	431
Watonwan	1	1
Wilkin	1	1
Wright	256	579
Grand Total	4834	8544

Table H. Lakes with permits issued for swimmer's itch in 2015.

County	Lake	DOW #	Number of Swimmer's Itch Permits
Aitkin	Aitkin	01004000	1
Aitkin	Big Sandy	01006200	6
Aitkin	Cedar	01020900	2
Aitkin	Esquagamah	01014700	1
Aitkin	Farm Island	01015900	23
Aitkin	Fleming	01010500	1
Aitkin	Gun	01009900	8
Aitkin	Hanging Kettle	01017000	3
Aitkin	Hill	01014200	1
Aitkin	Horseshoe	01003400	1
Aitkin	Little Pine	01017600	1
Aitkin	Minnewawa	01003300	5
Aitkin	South Big Pine	01000100	4
Aitkin	Upper Big Pine	01015700	2
Aitkin	Waukenabo	01013600	1
Anoka	Centerville	02000600	2
Anoka	Coon	02004200	25
Anoka	East Moore	02007501	1
Anoka	George	02009100	1
Anoka	Golden	02004500	4
Anoka	Ham	02005300	1
Anoka	Labelle Pond	02068700	1
Becker	Big Floyd	03038700	2
Becker	Detroit	03038100	9
Becker	Googun	03033500	1
Becker	Ida	03058200	1
Becker	Little Cormorant	03050600	1
Becker	Melissa	03047500	3
Becker	Nelson	03059500	1
Becker	Sallie	03035900	4
Beltrami	Julia	04016600	1
Beltrami	Marquette	04014200	2
Blue Earth	Madison	07004400	17
Carlton	Eagle	09005700	11

County	Lake	DOW #	Number of Swimmer's Itch Permits
Carlton	Island	09006000	17
Carver	Ann	10001200	1
Carver	Bavaria	10001900	3
Carver	Burandt	10008400	5
Carver	Firemans	10022600	1
Carver	Lotus	10000600	18
Carver	Lucy	10000700	2
Carver	Minnewashta	10000900	18
Carver	Pierson	10005300	7
Carver	Riley	10000200	17
Carver	Schutz	10001800	6
Carver	Susan	10001300	2
Carver	Virginia	10001500	4
Carver	Waconia	10005900	2
Carver	West Auburn	10004401	1
Carver	Zumbra	10004100	1
Cass	Birch	11041200	2
Cass	Green Hill	11078600	2
Cass	Gull	11030500	53
Cass	Hardy	11020900	2
Cass	Lawrence	11005300	1
Cass	Loon	11022600	1
Cass	Margaret	11022200	7
Cass	Norway	11030700	7
Cass	Roosevelt	11004300	2
Cass	Ruth	11021100	1
Cass	Sylvan	11030400	2
Cass	Upper Gull	11021800	5
Chisago	Big Green	13004100	3
Chisago	Chisago	13001200	3
Chisago	Fish	13006800	1
Chisago	Green	13004100	7
Chisago	Goose	13008300	3
Chisago	Little Comfort	13005400	1
Chisago	Little Green	13004101	1
Chisago	Mandall	13007400	2

County	Lake	DOW #	Number of Swimmer's Itch Permits
Chisago	North Center	13003200	22
Chisago	North Lindstrom	13003500	2
Chisago	Rabour	13007900	1
Chisago	Rush	13006900	21
Chisago	South Center	13002700	25
Chisago	South Lindstrom	13002800	1
Chisago	West Rush	13006902	4
Clay	Blue Eagle	14009300	1
Crow Wing	Arrowhead	18036600	2
Crow Wing	Bay	18003400	26
Crow Wing	Bertha	18035500	5
Crow Wing	Big Trout	18031500	12
Crow Wing	Borden	18002000	1
Crow Wing	Camp	18001800	1
Crow Wing	Clamshell	18035600	15
Crow Wing	Clark	18037400	2
Crow Wing	Clearwater	18003800	1
Crow Wing	Crooked	18004100	6
Crow Wing	Cross	18031200	17
Crow Wing	Crow Wing	18015500	7
Crow Wing	Daggett	18027100	16
Crow Wing	Edward	18030500	1
Crow Wing	Gilbert	18032000	4
Crow Wing	Gladstone	18033800	3
Crow Wing	Gull	11030500	2
Crow Wing	Gull River	49003600	1
Crow Wing	Holt	18002900	1
Crow Wing	Horseshoe	18025100	1
Crow Wing	Hubert	18037500	4
Crow Wing	Island	18026900	1
Crow Wing	Kimball	18036100	1
Crow Wing	Little Hubert	18034000	2
Crow Wing	Little Pine	18026600	8
Crow Wing	Little Whitefish	18000100	1
Crow Wing	Love	18038800	2
Crow Wing	Lower Cullen	18040300	2

County	Lake	DOW #	Number of Swimmer's Itch Permits
Crow Wing	Lower Hay	18037800	5
Crow Wing	Lower Mission	18024300	1
Crow Wing	Lower South Long	18013600	18
Crow Wing	Lower Whitefish	18031000	7
Crow Wing	Mayo	18040800	1
Crow Wing	Middle Cullen	18037700	4
Crow Wing	Mississippi River	00-00000	2
Crow Wing	Nisswa	18039900	5
Crow Wing	Norht Long	18037200	15
Crow Wing	O'Brien	18022700	1
Crow Wing	Ossawinnamakee	18035200	5
Crow Wing	Pelican	18030800	6
Crow Wing	Pig	18035400	1
Crow Wing	Platte	18008800	36
Crow Wing	Portage	18005000	1
Crow Wing	Rabbit	18009300	3
Crow Wing	Red Sand	18038600	1
Crow Wing	Round	18037300	5
Crow Wing	Roy	18039800	4
Crow Wing	Rush	18031100	18
Crow Wing	Scott	18003300	3
Crow Wing	Sebie	18016100	1
Crow Wing	Serpent	18009000	4
Crow Wing	Sibley	18040400	1
Crow Wing	Thor	11030500	1
Crow Wing	Upper Cullen	18037600	3
Crow Wing	Upper Gull		1
Crow Wing	Upper Hay	18041200	6
Crow Wing	Upper Mission	18024200	3
Crow Wing	Upper South Long	18009600	7
Crow Wing	Upper Whitefish	18031000	14
Crow Wing	West Fox	18029700	10
Crow Wing	White Sand	18037900	8
Dakota	Alimagnet	19002100	10
Dakota	Blackhawk	19005900	2
Dakota	Crystal	19002700	7

County	Lake	DOW #	Number of Swimmer's Itch Permits
Dakota	Fish	19005700	1
Dakota	Lynwood Pond	19036300	3
Dakota	Marion	19002600	4
Dakota	Orchard	19003100	3
Dakota	Rogers	19008000	2
Dakota	Roseberger	19004100	1
Dakota	Sunfish	19005000	2
Dakota	Thomas	19006700	1
Dakota	Unnamed (Fieldstone)	19023300	3
Dakota	Valley	19034800	1
Dakota	Warrior Pond	19009300	1
Douglas	Aaron	21024200	1
Douglas	Carlos	21005700	1
Douglas	Darling	21008000	9
Douglas	Geneva	21005200	2
Douglas	Ida	21012300	2
Douglas	Irene	21007600	4
Douglas	Le Homme Dieu	21005600	9
Douglas	Miltona	21008300	8
Faribault	Bass	22007400	4
Freeborn	Morin	24004300	1
Grant	Pelican	26000200	1
Hennepin	Arrowhead	27004500	1
Hennepin	Bass	27009800	3
Hennepin	Bryant	27006700	6
Hennepin	Bush	27004700	1
Hennepin	Castle Ridge	27044400	4
Hennepin	Cedar Island	27011900	2
Hennepin	Christmas	27013700	1
Hennepin	Duck	27006900	1
Hennepin	Eagle	27011100	3
Hennepin	Fish	27011800	10
Hennepin	Garland Lane Pond	27060900	1
Hennepin	Gleason	27009500	7
Hennepin	Greentree Pond	27046600	1

County	Lake	DOW #	Number of Swimmer's Itch Permits
Hennepin	Hadley	27010900	6
Hennepin	Independence	27017600	7
Hennepin	Indianhead	27004400	1
Hennepin	Libbs	27008500	1
Hennepin	Lower Twin	27004200	1
Hennepin	Medicine	27010400	13
Hennepin	Melody	27066900	19
Hennepin	Mtka Black	27013311	1
Hennepin	Mtka Browns	27013323	6
Hennepin	Mtka Carmans	27013309	4
Hennepin	Mtka Carsons	27013328	6
Hennepin	Mtka Cooks	27013303	8
Hennepin	Mtka Crystal	27013317	6
Hennepin	Mtka E. Upper Lake	27013308	3
Hennepin	Mtka Excelsior	27013330	5
Hennepin	Mtka Gideons	27013331	40
Hennepin	Mtka Grays Bay	27013325	5
Hennepin	Mtka Halsteds	27013301	5
Hennepin	Mtka Harrisons Bay	27013314	7
Hennepin	Mtka Jennings	27013315	7
Hennepin	Mtka Lafayette	27013321	5
Hennepin	Mtka Lower Lake N.	27013333	5
Hennepin	Mtka Lower Lake S.	27013332	3
Hennepin	Mtka Maxwell	27013320	8
Hennepin	Mtka North Arm	27013318	10
Hennepin	Mtka Phelps	27013307	13
Hennepin	Mtka Priests	27013302	4
Hennepin	Mtka Robinsons	27013326	1
Hennepin	Mtka S. Upper Lake	27013305	5
Hennepin	Mtka Smiths	27013322	1
Hennepin	Mtka Smithtown	27013306	5
Hennepin	Mtka Spring Park	27013310	5
Hennepin	Mtka St. Albans	27013329	6
Hennepin	Mtka Stubbs	27013319	3
Hennepin	Mtka W. Upper Lake	27013304	6
Hennepin	Mtka Wayzata	27013324	6

County	Lake	DOW #	Number of Swimmer's Itch Permits
Hennepin	Mtka West Arm	27013316	4
Hennepin	Normandale	27104600	1
Hennepin	Otto Pond	27067800	1
Hennepin	Pamela	27067500	1
Hennepin	Parkers	27010700	4
Hennepin	Pauly'S Pond	27000800	1
Hennepin	Rebecca	27019200	1
Hennepin	Red Rock	27007600	5
Hennepin	Round	27007100	1
Hennepin	Sarah	27019100	9
Hennepin	Shady Oak	27008900	1
Hennepin	Shavers	27008600	14
Hennepin	Unnamed (27-999)	27099900	1
Hennepin	Unnamed (7365 Pond)	27038900	1
Hennepin	Weaver	27011700	3
Hennepin	Wolfe Park	27066400	1
Hubbard	2Nd Crow Wing	29008500	1
Hubbard	Portage	29025000	11
Hubbard	Upper Bottle	29014800	1
Isanti	Blue	30010700	6
Isanti	Green	30013600	3
Isanti	Spectacle	30013500	1
Itasca	Bass	31057600	1
Itasca	Bowstring	31081300	1
Itasca	Cut Foot Sioux	31085700	1
Itasca	Island	31075400	1
Itasca	Jessie	31078600	1
Itasca	Pokegama	31053200	2
Itasca	Sand	31082600	3
Itasca	Snaptail	31025500	1
Itasca	Swan	31006700	34
Kanabec	Fish	33003600	2
Kandiyohi	Andrew	34020600	2
Kandiyohi	Diamond	34004400	2
Kandiyohi	Eagle	34017100	10

County	Lake	DOW #	Number of Swimmer's Itch Permits
Kandiyohi	Long	34006600	1
Kandiyohi	Nest	34015400	2
Lesueur	East Jefferson	40009201	1
Lesueur	Frances	40005700	3
Lesueur	German	40006300	6
Lesueur	Gorman	40003200	1
Lesueur	Jefferson	40009200	4
Lesueur	Middle Jefferson	40009204	2
Lesueur	Rays	40005600	1
Lesueur	Sakatah	40000200	4
Lesueur	Tetonka	40003100	18
Lesueur	Upper Sakatah	40000200	4
Lesueur	Volney	40003300	3
Lesueur	Washington	40011700	15
Lincoln	Shaokatan	41008900	6
Martin	Fox	46010900	1
Meeker	Long	47002600	7
Meeker	Minnie Belle	47011900	8
Meeker	Ripley	47013400	1
Meeker	Spring	47003200	7
Meeker	Washington	47004600	6
Mille Lacs	Mille Lacs	48000200	10
Morrison	Alexander	49007900	13
Morrison	Crookneck	49013300	4
Morrison	Fish Trap	49013700	10
Morrison	Green Prairie Fish	49003500	1
Morrison	Mississippi River	49032300	4
Morrison	Peavy	49000500	2
Morrison	Shamineau	49012700	1
Morrison	Sullivan	49001600	15
Murray	Fulda	51002100	1
Olmsted	George	55000800	1
Otter Tail	Big Mcdonald	56038601	1
Otter Tail	Big Pine	56013000	1
Otter Tail	Clitherall	56023800	1
Otter Tail	Deer	56029800	25

County	Lake	DOW #	Number of Swimmer's Itch Permits
Otter Tail	East Battle	56013800	1
Otter Tail	East Silent	56051700	1
Otter Tail	Ethel	56019300	1
Otter Tail	Marion	56024300	5
Otter Tail	Ottertail	56024200	12
Otter Tail	Prairie	56091500	1
Otter Tail	Rush	56014100	1
Otter Tail	South Lida	56074702	1
Otter Tail	South Turtle	56037700	1
Otter Tail	Stalker	56043700	6
Otter Tail	Wall	56065800	3
Otter Tail	West Leaf	56011400	2
Pine	Cross	58011900	1
Pine	Lower Big Pine	58013800	3
Pine	Pokegama	58014200	4
Pine	Rydberg	58021800	1
Pine	Sand	58008100	3
Pine	Upper Pine	58013000	1
Pipestone	Rock River Park	59002000	1
Pope	Amelia	61006400	1
Pope	Grove	61002300	1
Pope	Linka	61003700	5
Pope	Minnewaska	61013000	5
Pope	Villard	61006700	2
Ramsey	Bald Eagle	62000200	16
Ramsey	Dumbell Pond	62011300	1
Ramsey	Evergreen Pond	62009700	1
Ramsey	Gervais	62000700	3
Ramsey	Island	62007500	1
Ramsey	Johanna	62007800	2
Ramsey	Josephine	62005700	2
Ramsey	Keller	62001000	1
Ramsey	Kerry Pond	62009500	1
Ramsey	Kohlman	62000600	2
Ramsey	Mccarrons	62005400	1
Ramsey	Oak	62017300	1

County	Lake	DOW #	Number of Swimmer's Itch Permits
Ramsey	Owasso	62005600	5
Ramsey	Peppertree Pond	62008600	1
Ramsey	Pike	62006900	1
Ramsey	Sherwood Pond	62009600	1
Ramsey	Silver (Nsp)	62000100	16
Ramsey	Snail	62007300	5
Ramsey	Turtle	62006100	3
Ramsey	Wabasso	62008200	1
Ramsey	White Bear	82016700	1
Rice	Cedar	66005200	11
Rice	French	66003800	1
Rice	Hunt	66004700	1
Rice	Mazaska	66003900	5
Rice	Roberds	66001800	4
Scott	Cedar	70009100	3
Scott	Cleary	70002200	1
Scott	Dan Patch (Unnamed)	70001600	1
Scott	Fish	70006900	1
Scott	Lower Prior	70002600	28
Scott	Mill Pond	70011300	1
Scott	O'Dowd	70009500	2
Scott	Spring	70005400	7
Scott	Thole	70012000	6
Scott	Upper Prior	70007200	13
Sherburne	Big	71008200	11
Sherburne	Briggs	71014600	2
Sherburne	Eagle	71006700	5
Sherburne	Julia	71014500	1
Sherburne	Little Elk	71005500	1
Sherburne	Long	71015900	2
Sherburne	Mitchell	71008100	5
Sherburne	Orono	71001300	1
Sherburne	Rush	71014700	2
St. Louis	Big Sturgeon	69093900	2
St. Louis	Caribou	69048900	1
St. Louis	Prairie	69084800	1

County	Lake	DOW #	Number of Swimmer's Itch Permits
Stearns	Augusta	86028400	1
Stearns	Cedar Island (Koetter)	73013300	1
Stearns	Clearwater	86025200	1
Stearns	East	73013304	3
Stearns	Grand	73005500	3
Stearns	Koronis	73020000	3
Stearns	Little Birch Lake	77008900	1
Stearns	Marie	73001400	1
Stearns	Middle Spunk	73012800	3
Stearns	North Brown	73014700	5
Stearns	Pearl	73003700	4
Stearns	Pelican	73011800	9
Stearns	Rice	73019600	1
Stearns	Upper Spunk	73011700	3
Steele	Kohlmeier	74001900	1
Todd	Big Birch	77008400	7
Todd	Big Swan	77002300	5
Todd	Latimer	77010500	1
Todd	Little Birch Lake	77008900	1
Todd	Mound	77000700	3
Todd	Osakis	77021500	11
Waseca	Clear	81001400	2
Waseca	Reeds	81005500	1
Washington	Big Carnelian	82004900	3
Washington	Big Marine	82005200	6
Washington	Bone	82005400	2
Washington	Clear	82016300	2
Washington	Demontreville	82010100	6
Washington	Forest	82015900	16
Washington	Halfbreed	82008000	1
Washington	Jane	82010400	2
Washington	Long	82013000	1
Washington	Mckusick	82002000	1
Washington	Olson	82010300	6
Washington	Potamogeton Pond	82021200	1
Washington	Square	82004600	1

County	Lake	DOW #	Number of Swimmer's Itch Permits
Washington	Tanners	82011500	1
Wright	Bass	86023400	2
Wright	Cedar	86022700	3
Wright	Clearwater	86025201	16
Wright	Clearwater	86025202	1
Wright	Eagle	86014800	2
Wright	Fish	86018300	2
Wright	French	86027300	12
Wright	Granite	86021700	3
Wright	Howard	86019900	4
Wright	Little Pulaski	86005301	1
Wright	Locke	86016800	3
Wright	Louisa	86028200	1
Wright	Maple	86013400	3
Wright	Martha	86000900	1
Wright	Mink	86022900	1
Wright	Mink	86008800	9
Wright	Mink-Somers	86023000	1
Wright	Pleasant	86025100	1
Wright	Pulaski	86005300	1
Wright	Pulaski	86005302	10
Wright	Sugar	86023300	20
Wright	Sullivan	86011900	2
Wright	Sylvia	86027900	11
Wright	Sylvia	86028900	1
Wright	Waverly	86011400	7
Wright	Waverly	86001400	19