

Ecologically Harmful Exotic Aquatic Plant and Wild Animal Species in Minnesota

Annual Report 1993

*for the year
ended December 31*



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Submitted to
Environment and Natural Resources Committees
of the Minnesota House and Senate

This report should be cited as follows:

Exotic Species Programs. 1993. Ecologically Harmful Exotic Aquatic Plant
and Wild Animal Species in Minnesota: Annual Report for 1993. Minnesota
Department of Natural Resources, St. Paul, MN.

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Executive Summary

In this report, we describe the progress made during 1993 by the Exotic Species Programs of the Minnesota Department of Natural Resources (DNR). These programs are responsible for monitoring and management of ecologically harmful exotic aquatic plant and wild animal species. These are species that may harm communities of native plants and animals; they also can limit water recreation and increase operating costs for industry. The first exotic species program in the DNR was established in 1987 to address problems caused by purple loosestrife. Since 1987, the exotic species program has been expanded to include Eurasian watermilfoil, zebra mussel, flowering rush, ruffe, and other exotics.

The funding for programs on aquatic exotic species is derived primarily from a surcharge of \$5 on registrations of watercraft which must be purchased once every three years. The surcharge generates approximately \$1,000,000 annually. Additional funding for exotics comes from other sources. These additional funds totalled \$177,900 in fiscal year 1993 and represented both direct funding and in-kind services. In this report, we describe expenditures for fiscal year 1993 and planned expenditures for fiscal year 1994, as well as, the organization of programs and staff that implement the exotic species programs.

The general approach to management of an individual exotic species includes four primary elements: inventory, public awareness and education, control or eradication, and research. In this report, we describe progress in these elements for management of Eurasian watermilfoil, purple loosestrife, zebra mussel, flowering rush, ruffe, and Eurasian swine. Regulations intended to help prevent the spread of exotics and efforts to enforce the regulations also are described in the report.

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Introduction

Administration of state exotic species control programs

The control and prevention programs for harmful exotic species in the State of Minnesota are administered by the Department of Natural Resources (DNR) and the Department of Agriculture. The DNR's Division of Fish and Wildlife is responsible for programs covering ecologically harmful exotic aquatic plant and wild animal species that may harm native plant and animal communities. DNR's Division of Forestry, working in cooperation with the Minnesota Department of Agriculture, is charged by state law with surveying and controlling forest pests, including exotic organisms such as gypsy moth and evergreen spruce bark beetle. A separate annual report is prepared by the Forest Pest Program to report on these issues. The Minnesota Department of Agriculture is responsible for the state's noxious weed and seed laws which apply primarily to terrestrial plants which harm agricultural crops. Questions about harmful terrestrial plants control and prevention programs should be addressed to the Minnesota Department of Agriculture.

Requirement to prepare annual report

Each year, by January 1, the DNR is required to prepare a report for the legislature regarding ecologically harmful exotic species (see M.S. 84.968 in Appendix A). This report will cover the activities of the DNR's exotic species programs.

According to state statute, this report must include:

- (1) detailed information on expenditures for administration, education, eradication, inspections, and research;
- (2) an analysis of the effectiveness of management activities conducted in the state, including chemical eradication, harvesting, educational efforts, and inspections;
- (3) information on the participation of other state agencies, local government units, and interest groups in control efforts;
- (4) information on management efforts in other states;
- (5) information on the progress made by species;
- (6) an estimate of future management needs; and
- (7) an analysis of the financial impact on persons who transport weed harvesters of the prohibition [on transportation of northern and Eurasian milfoil] in section 1 [of the law].

Other sections have been added to this report beyond the minimum statutory requirement in order to provide background information.

Overview of Minnesota Exotic Species Programs

History of exotic species programs in Minnesota

Although ecologically harmful exotic species have been present in the state for many years (e.g. common carp and sea lamprey), state programs to prevent their spread and mitigate their negative impacts are relatively new to state government. In 1987, the DNR was designated the lead agency for control of purple loosestrife, an invasive plant of particular concern for the state's wetlands, and \$196,000 was appropriated to carry out a pilot control program during that biennium (Table 1). Minnesota was the first state in the country to create such a program. In 1989, DNR was officially assigned (see M.S. 103G.617 in Appendix A) an additional coordinating role for Eurasian watermilfoil (EWM) control and was appropriated \$125,000 to initiate that program.

In response to the number of harmful exotic species being discovered in the state, the potential for more introductions, and the high cost of control activities, the state began to prepare a proactive response to the exotics problem.

Interagency exotic species task force

An Interagency Exotic Species Task Force was established in 1990 and was composed of the Department of Natural Resources, Department of Transportation, Department of Health, Board of Water and Soil Resources, Minnesota Pollution Control Agency, Army Corps of Engineers, U. S. Fish and Wildlife Service, National Park Service, U.S. Department of Agriculture - Animal Plant Health Inspection Service (APHIS), and three private sector representatives. The task force identified and ranked the existing and potential exotic species threats as required in 1989 Legislation (Laws of Minnesota for 1989, Chapter 335, Article 1, Section 268 in Appendix A). The task force submitted its findings in the document "Report and Recommendations of the Interagency Exotic Species Task Force" to the House and Senate Environment Committees in 1991.

Responsibilities assigned to the DNR

During its 1991 session, and in response to the task force report, the legislature called for DNR to establish a statewide coordinating program to prevent and curb the spread of ecologically harmful exotic wild animals and aquatic plants. Many species, in addition to purple loosestrife and Eurasian watermilfoil, fall under the DNR's statewide coordinating responsibility. They include harmful exotic species that are currently found in Minnesota, such as zebra mussel, flowering rush, and ruffe. It is the DNR's responsibility to coordinate activities to minimize the spread and control infestations of these species.

The primary purpose for exotic species control programs is to minimize harmful effects on the state's lakes, rivers, wetlands, and other ecosystems. However there are additional reasons to control harmful exotic species: they can limit water recreation and angling, and increase operating costs for industry.

Statewide coordinating program staff

Responsibilities for overall coordination of the DNR's program are assigned to an Exotic Species Coordinator located in the Division of Fish and Wildlife's Administrative Services Section. This position dedicates 60% of its time to exotic species issues. Exotic species policy, rulemaking, legislation, state representation on the Great Lakes Panel on Aquatic Nuisance Species, and involvement with federal exotic species issues are coordinated by this position.

Implementation of activities by the DNR's ecologically harmful exotic species programs are carried out primarily by the Ecological Services' staff in the Division of Fish and Wildlife.

Existing staff positions include:

Exotic Species Coordinator	Jay Rendall (297-1464)
Purple loosestrife Coordinator	Luke Skinner (297-3763)
Eurasian watermilfoil Coordinator	Charles (Chip) Welling (297-8021)
Exotic Species Specialist (2)	Donna Sheridan (282-2508)
	Wendy Crowell (282-2509)
Clerical	Debbie Hunt (296-2835)
Exotic Species Information Specialist	Currently Vacant (Seasonal)

Other staff support

Staff from other units of the Division of Fish and Wildlife, Division of Enforcement, and Minnesota Conservation Corps also contribute significantly to the implementation and coordination of exotic species activities.

Ecological Services Section Supervision of the exotic species staff is carried out by the Supervisor of the Aquatic Plant Management Program. The Control and Monitoring Unit Coordinator is responsible for managing the watercraft surcharge budget and other issues related to implementation of exotic species activities. Pesticide Enforcement specialists from Ecological Services and Aquatic Plant Management specialists in the Section of Fisheries are also involved in survey and control of purple loosestrife, Eurasian watermilfoil, and flowering rush. The Department's expert on the biology of zebra mussels and other exotic aquatic invertebrates is the Ecological Services aquatic invertebrate biologist. In addition to the Ecological Services Section, many other individuals from the Division of Fish and Wildlife also contribute to information gathering, biological expertise, control, inventory and public awareness.

Division of Enforcement Conservation Officers are responsible for enforcing the state regulations regarding ecologically harmful exotic species.

Minnesota Conservation Corps (MCC) Beginning in 1992, 11 corps members were hired to conduct inspections at public water access sites. One MCC supervisor and 5 two-person crews carried out the inspection program in that year. In 1993, 10 corps members were hired. A summary of their efforts is included in this report (see Inspections).

Funding

Funding for the DNR's exotic species activities is derived primarily from the surcharge on watercraft. The surcharge for a three year license period is \$5, or \$1.67 per year, and generates an average of approximately \$1,000,000 per year. Additional appropriations, primarily for specific research, have come from the Environment and Natural Resources Trust Fund and Minnesota Future Resources Fund (Table 1).

Contracts

Two large components of the exotic species programs are carried out under contract: research and control. Research to identify and test organisms capable of biologically controlling these organisms is done under contract with various research facilities. Purple loosestrife research was conducted under contract with the University of Minnesota and Cornell University. Biological control research for Eurasian watermilfoil is done under contract with EcoScience, a private business, and the University of Minnesota (see Management of Eurasian watermilfoil). An evaluation of mechanical control methods for flowering rush was done under contract in 1993. Control of purple loosestrife and Eurasian watermilfoil is usually carried out by licensed private contractors under state contract. Local lake associations, conservation districts, or local governments share the cost of the contract work for most chemical control of Eurasian watermilfoil.

Regulations

Summary of Minnesota exotic species statutes and rules

State statutes pertaining to ecologically harmful exotic species have changed repeatedly for the past several years. The first laws regarding ecologically harmful exotic species were passed during the 1987 Legislative session and pertained to purple loosestrife (see M.S. 18.78, Subd. 2 and 84.966 in Appendix A). During the 1989 Legislative session, new statutes regarding Eurasian watermilfoil were passed including the first prohibition on transporting Eurasian watermilfoil (see M.S. 103G.617, 86B.401, 18.317 in Appendix A).

In 1989, legislation (Laws of Minnesota for 1989, Chapter 335, Article 1, Section 268 in Appendix A) established an Interagency Exotic Species Task Force to review the issue of harmful exotic species, rank the existing and potential exotic species threats, and make recommendations to the legislature. That report was submitted to the Legislature in 1991 and many of its recommendations were the basis for new legislation. During 1991, the DNR was mandated to establish a statewide coordinating program to prevent and curb the spread of ecologically harmful exotic animals and aquatic plants, prepare a statewide management plan for ecologically harmful exotic species, and was given rulemaking authority to restrict the introduction and spread of ecologically harmful exotic species in the state (see M.S. 84.967, 84.968, 84.969, and 84.9691 in Appendix A).

Additional statutory changes made in 1992 required the DNR to conduct 10,000 hours of random inspections of watercraft at water accesses on infested waters and prepare an annual report on ecologically harmful exotic species. Also in 1992, new legislation made transportation of zebra mussels on a public road a misdemeanor.

Statutory changes made in 1993 included the establishment of civil penalties for transporting exotic species on public roads (see M.S. 84.9692) and increasing mandated hours of random boat inspections at infested waters from 10,000 hours to 20,000 hours beginning in calendar 1994. In 1993, the Department of Natural Resources adopted emergency rules (see M.R. 6216 Appendix B) under the rulemaking authority in M.S. 84.9691. The rule does the following:

- 1) establishes which ecologically harmful exotic species are *undesirable* exotic species and prohibits their import, transport, possession, sale, propagation, or release;
- 2) requires a permit to possess *undesirable* species;
- 3) establishes the owner as the party responsible for recapturing or destroying *undesirable* species that escape or are released;
- 4) defines *limited infestations* of Eurasian watermilfoil and how they will be marked;
- 5) defines "*other water transmitted harmful exotic species*";
- 6) prohibits certain activities on infested waters; and
- 7) establishes a process for approving or denying importation and release of exotic species.

Selected statutes and rules related to exotic species, including some that are not mentioned in the text, are located in Appendix A and B.

Future needs for regulations:

- Comprehensive permanent rules need to be developed to replace, expand, and improve the existing emergency rules in order to curb the introduction and spread of additional ecologically harmful species.
- Existing state statutes need to be amended to provide criminal penalty provisions for exotic species rules.
- Technical changes in rule and statute are needed to simplify and clarify existing regulations.
- One specific policy change in statute is recommended to help prevent dispersal of aquatic exotic plants and animals - all reference to transportation of Eurasian watermilfoil and northern water milfoil in statute should be replaced with either:
1) submersed aquatic plants, or 2) milfoil species.

Economic impact of transportation prohibitions on commercial harvesters

Background It is generally accepted that plant fragments carried on watercraft, including aquatic plant harvesting equipment, are a primary source of Eurasian watermilfoil spread. Legislation was enacted during the 1992 session specifically to reduce the transportation of Eurasian watermilfoil fragments. Minnesota Statutes 18.317, Subd. 1. prohibits the transportation of Eurasian and northern watermilfoil and subd. 2. allows transportation of these plants "for disposal as part of a harvest or control activity." Subd. 3. prohibits the launching of watercraft with these plant species or "other water transmitted harmful exotic species..." and paragraph (c) of subd. 3 requires commercial harvesters to "clean aquatic plant harvesting equipment of all aquatic vegetation at a suitable location before launching in another body of water."

Commercial operator permits issued by the DNR in 1992 were modified to reflect these statutory requirements. In addition, to allow inspections and to monitor compliance, commercial operators were required to notify the DNR before harvesting equipment was transported.

Survey Methods A telephone survey of permitted commercial harvesters was conducted to evaluate economic impacts of the legislation cited above. A survey form was developed and the survey was conducted by telephone in December 1992 and early January 1993. All six commercial harvesters in the state were contacted.

Discussion Costs incurred by commercial harvesters as a result of prohibitions on the transport of milfoil species and cleaning requirements are:

- Increased labor costs
- Revenue hours lost:
 - Time spent cleaning equipment
 - Travel time to cleaning site
 - Time lost for inspections
- Purchase of cleaning equipment or money spent at truck washes

These expenses can be recovered or reduced by raising customer fees or by working bigger jobs on fewer lakes. Prices for harvesting were not raised during the 1992 season, however, at least one operator planned to raise prices in 1993. Survey results show no indication that commercial harvesters worked fewer lakes because of the 1992 legislation.

When asked if the requirements of the 1992 legislation reduced the number of lakes they were able to work, four said, "yes". However, the answers are difficult to interpret. One of the respondents that stated, "no" the requirements did not make a difference, worked on two fewer lakes in 1992. One of the respondents that answered "yes" worked six more lakes in 1992 than in 1991. The average decrease in the number of lakes worked in 1992 was three. One company worked on six more lakes in 1992 than in 1991 while another worked on 20 fewer lakes in 1992 making the range quite large (from six more lakes to 20 fewer in 1992). The mode and median were both zero indicating that the prohibitions probably made little difference in the number of lakes harvesters were able to work on overall.

Additional cleaning costs were incurred by complying with the legislation, however they varied widely. High pressure washing was the only method used to clean equipment by the six harvesters operating in 1992. Four of the six purchased their own washing equipment. Commercial truck washes were also used. The range in the amounts spent at truck washes was highly variable. One company spent \$50.00 on truck washes for the entire season. Another company purchased a high pressure washer and spent an additional \$2,500.00 dollars on truck washes. Some of the variability may be due to the type and size of harvesting equipment; small less complex equipment is probably easier and therefore faster to clean. The number of lakes worked would also have an influence on the time and money spent at truck washes (e.g. larger jobs, fewer lakes, equate to less time spent moving and cleaning equipment). Equipment allowed to stand for several days prior to cleaning may be more difficult and costly to clean.

Commercial harvesters generally felt that inspectors were prompt and time spent for DNR inspections was insignificant. The average inspection took about 40 minutes and did cost harvesters some time. The DNR did not get the impression from respondents that they felt overly inconvenienced by equipment inspections.

Three of six commercial harvester operators agreed that cleaning harvesters of EWM will make a difference in preventing its spread. Two gave an unconditional "yes" response to this question and one felt that cleaning would make a difference, but only when leaving a lake known to have Eurasian watermilfoil. Three stated "no", cleaning their equipment did not make a difference in stopping the spread of Eurasian watermilfoil in 1992.

Summary On the average, compliance with current regulations costs commercial harvesters about five hours additional time per lake worked. Commercial harvesters were not asked to provide hourly wage information, but the cost of labor for the five hours their equipment is out of production is also a cost of compliance with the new regulations. The purchase of high pressure spray washing equipment and money spent at truck washes is an additional expense. The new regulations will most seriously impact those harvesters working small jobs on a large number of lakes. One harvester reported that they chose to work only on Lake Minnetonka in 1992 and refused work on five or six other lakes (at about \$1,000.00 per job). Because of these regulations, harvester operators will probably have to increase fees and may need to increase the minimum number of clients per lake before they accept work. Compliance with new regulations did increase labor costs and reduce revenue hours. Half of the operators surveyed, however, felt that the increase in expense was either minimal or at least worth it from a public relations point of view.

Expenditures

Appropriations and activities

Funding for DNR efforts to control exotic species was first appropriated in 1988 and, since 1989, funding has been increasing. A summary of appropriations to the program for fiscal years 1988 through 1995 is provided in Table 1. As these appropriations have increased, the program expenditures and activities have increased and diversified.

A detailed list of program expenditures, by activity, is presented for calendar year 1993. This period covers parts of two fiscal years, 1993 and 1994, for which expenditures are shown separately (Table 2 and 3). The following assumptions and definitions were used to report on expenditures:

Administration

Clerical staff, telephones, general postage, office rent, and staff time spent on administrative activity are considered administrative costs. Administrative staff time includes staff training and development, assistance with other division or department activities, leave pay with employee separation and achievement awards (\$8,400 in FY93), compensatory time taken (\$5,300 in FY93), and fees paid to the Section for laboratory and mapping support services.

Program support

State program coordination includes preparation of state plans and reports, legislative hearings, and promulgation of rules. Expenditures represent staff time spent on these activities.

Coordination with regional and federal activities includes staff time and out-of-state travel to represent the state at meetings of the Great Lakes Panel on Aquatic Nuisance Species, seek federal funding for state management plans, and participate in regional meetings on exotic species issues.

Equipment and storage building expenses represent the purchases of equipment such as boats, trailers, and computers. An expenditure for a storage building for the program's boats and field equipment is included.

Public awareness

Expenditures in this category include staff time*, in-state travel expenses, fleet charges, mailings, supplies, printing and advertising costs, and billboard rental to increase public awareness of exotic species.

Control, Eradication, and Inventory

Expenditures in this category include staff time*, in-state travel expenses, fleet charges, commercial applicator contracts, and supplies to prepare for, conduct, supervise, and evaluate control activities.

Research

Expenditures in this category include staff time*, in-state travel expenses, fleet charges, supplies, and contracts with the University of Minnesota and other research organizations that were established to develop new, or improve existing, control methods.

* Staff time includes hours worked plus a proportion of leave time used. Leave time is apportioned to each activity based on distribution of hours worked.

Expenditures are further subdivided to reflect variations in spending, or planned spending, for each species. This level of detail was not appropriate for program support and public awareness activities, which generally do not focus exclusively on one exotic species.

Fiscal Year 1993

The expenditures related to exotic species activities during fiscal year 1993 (July 1, 1992 - June 30, 1993) are shown in Table 2. Expenditures reflect both funds appropriated in fiscal year 1993 (\$657,000) and rollover funds from fiscal year 1992. Expenditures of the watercraft surcharge revenues, the primary source of funding, are shown along with additional expenditures from other funds. The staff and related expenditures from funds other than the Water Recreation Account are for individuals who are not hired as exotic species specialists, but work on exotics issues as a part of existing department positions.

Fiscal Year 1994

Since fiscal year 1994 was only partially completed when this report was due, actual expenditures to date are not shown. Instead we have presented the planned expenditures for fiscal 1994. Appropriation to the Water Recreation Account increased in FY 1994 to \$1,011,000, a \$354,000 increase over FY 1993. The specific activities where the additional funding is targeted are shown in Table 4. Access inspection efforts, EWM control and research, and enforcement are three program activities where spending will increase substantially.

Table 1. Appropriations for DNR Exotic Species Programs.

	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
Purple loosestrife (PL)	\$98,000 from Minnesota Future Resources Fund for pilot program	\$98,000 from Minnesota Future Resources Fund for pilot program	\$125,000 from Water Recreation Account for PL program (\$1 watercraft surcharge) and \$100,000 from Minnesota Future Resources Fund for research	\$125,000 from Water Recreation Account for PL program (\$1 watercraft surcharge) and \$100,000 from Minnesota Future Resources Fund for research			\$75,000 from Minnesota Environment and Natural Resources Trust Fund for research	\$75,000 from Minnesota Environment and Natural Resources Trust Fund for research
Eurasian watermilfoil (EWM)			\$125,000 from Water Recreation Account for EWM program (\$1 watercraft surcharge)	\$125,000 from Water Recreation Account for EWM Program (\$1 watercraft surcharge)		\$160,000 from Minnesota Future Resources Fund for research	\$125,000 from Minnesota Environment and Natural Resources Trust Fund for research (requires a \$100,000 nonstate match)	\$125,000 from Minnesota Environment and Natural Resources Trust Fund for research (requires a \$100,000 nonstate match)
Aquatic exotic species (including Eurasian water milfoil and purple loosestrife)					\$416,000 from Water Recreation Account (\$2 watercraft surcharge)	\$657,000 from Water Recreation Account (\$3 watercraft surcharge)	\$1,011,000 from Water Recreation Account (\$5 watercraft surcharge)	\$1,112,000 from Water Recreation Account (\$5 watercraft surcharge)

Table 2. Exotic species related expenditures in fiscal year 1993.

	Water Recreation Account	Game and Fish Fund	General Fund/Other	Env. and Natural Resources Trust Fund
Administration/Operations				
Rent	11,500			
Phones / postage	10,400			
Staff Administrative Activities	26,600			
Clerical	30,400			
Program Support				
State program coordination	50,200	5,200	21,700	
Coordination with regional / federal activities	2,700		4,200	
Equipment and storage building	34,200			
Public Awareness				
Communications plan, workshops, presentations	85,400	3,800	6,900	
Control, Eradication, and Inventory				
Eurasian watermilfoil	264,100	27,800	300	
Purple loosestrife control	60,700	1,600	2,300	
Inspections/Containment				
MCC - access inspections	68,100			
Enforcement - road checks	22,000			
Research				
Purple loosestrife	49,000	500		
Eurasian watermilfoil	36,300	2,100		101,500
Totals	751,600 ¹	41,000 ²	35,400 ³	101,500

¹ Exceeds \$657,000 appropriated in FY93 because of funds which rolled over from FY92.² Two staff positions which contribute to exotic activities (staff supervisor and invertebrate biologist) are supported by the Game and Fish Fund. These staff commitments were higher than normal in FY93 because of vacant exotic species positions.³ Two positions which contribute to exotic activities (Exotic Species Coordinator and Ecological Services Unit Head) were funded by the General Fund in FY 1993. In FY 1994, the Exotic Species Coordinator salary will be shifted to the Water Recreation Account.

Table 3. Planned exotic species related expenditures for fiscal year 1994.

	Water Recreation Account	Game and Fish Fund	General Fund/Other	Env. and Natural Resources Trust Fund
Administration/Operations				
Rent	23,000			
Phones / postage	16,000			
Staff Administrative Activities	17,000			
Clerical	31,000			
Program Support				
State program coordination	69,000	4,200	10,000	
Coordination with regional / federal activities	9,000			
Equipment and storage building	23,000			
Public Awareness				
Communications plan, workshops, presentations	67,000			
Control, Eradication, and Inventory				
Eurasian watermilfoil	273,000	2,800		
Purple loosestrife control	91,000			
Zebra mussel surveys on St. Croix	5,000			
Inspections/Containment				
MCC - access inspections	180,000			
Enforcement - road checks	50,000			
St. Croix River - boat monitoring	10,000			
Research				
Purple loosestrife	30,000			75,000
Eurasian watermilfoil	100,000	4,134		125,000
Flowering rush	18,000			
Zebra mussel	5,500	6,200		
Totals	1,011,000	17,334	10,000	200,000

Table 4. Planned increase in Water Recreation Account expenditures in fiscal year 1994.

Activity	Estimated Increase
Administration/Operations	17,000
Program Support	
Exotic Species Coordinator (0.6 FTE)	29,000 ¹
Control, Eradication, and Inventory	
Cost share on existing EWM infestations	77,000
Inspections/Containment	
MCC-access inspections	112,000
Enforcement	28,000
Research	
Flowering Rush	10,000
Eurasian watermilfoil	65,000
Zebra mussels/St. Croix	15,000
Totals	353,000

¹ This increase represents a shift of salary from the general fund to the water recreation account.

Education / Public Awareness Activities

Background

Over the past several years many efforts have been made by the DNR to increase public awareness of harmful exotic species. These efforts have been designed to: 1) make the public aware of the harm caused by exotics; 2) help the public identify exotic species when they see them; 3) outline the specific actions boaters can use to clean their watercraft; 4) summarize control approaches and activities. The following is a list of the primary public awareness activities completed prior to 1993 to meet these goals:

- 1987
 - Printed and distributed a brochure about purple loosestrife
 - Established state fair exhibit on purple loosestrife
 - Organized Purple Loosestrife Awareness Day
- 1988
 - Designed, produced and distributed a poster about purple loosestrife
 - State fair exhibit on purple loosestrife
 - Published and distributed a newsletter titled *On the Loose*
- 1989
 - Produced and distributed the first Eurasian watermilfoil brochure.
- 1990
 - Posted Eurasian watermilfoil warning signs at all public water accesses
 - Placed "Spread the word, not the plant" messages on billboards
 - State fair exhibit on purple loosestrife and Eurasian watermilfoil
- 1991
 - Prepared and distribute TV public service announcements about Eurasian watermilfoil
 - Organized and publicized Eurasian Watermilfoil Awareness Day that included an Eurasian watermilfoil video news release
 - State fair exhibit on purple loosestrife, Eurasian watermilfoil, and zebra mussels

1992

Beginning in 1992, public education efforts conducted by the Exotic Species Program were guided by a communications plan. The communication plan was developed by the advertising agency Mona, Meyer, McGrath and Gavin to address ways to inform important segments of the public about exotic species. The theme "Clean Boats, Clean Waters" originated from the communication plan. Components of the plan include:

- displays at sports shows and at the state fair,
- newsletters,
- brochures and posters,
- milfoil identification cards,
- exotic species kits and handbooks for organizations,
- radio public service announcements, and
- presentations to various groups.

Progress in public awareness - 1993

The DNR communications plan for 1993 was again built around the theme "Clean Boats, Clean Waters". Key components of the plan in 1993 included:

- statewide kickoff using radio coverage during the fishing opener and Memorial day weekends,
- *On the Waterfront* newsletter published in Focus 10,000 magazine,
- continued to produce and distribute exotic species kits to lake associations,
- displays at sports shows and at the state fair,
- billboards on key travel routes,
- prepare and distribute press releases,
- radio public service announcements, and
- regional exotic species workshops.

An aquatic exotic species exhibit and Exotics Program staff were present at the Midwest Sportshow held in Minneapolis in April. Literature was distributed at the annual Minneapolis Boat Show. A large display on aquatic exotic species was again present at the State Fair where 800,000 people visit the DNR building each year.

Several awareness activities were developed to reach anglers and boaters. In conjunction with the fishing opener, radio spots were aired on WCCO radio asking people to clean their boats to prevent the spread of exotic species. Radio spots were also aired for 13 weeks on KSTP - AM 1500 during their Monday night Outdoor show called "Bear Facts and Fish Tales". Public service announcements, narrated by Minnesota Vikings Coach Dennis Green, were sent to 164 radio stations in greater Minnesota along with printed support materials. Several stations requested additional on air interviews. Information about aquatic exotic species was included in the annual DNR fishing regulations.

Eleven billboards were posted along major highways leading from infested waters and to popular vacation areas to encourage people to clean their boating equipment. Six billboard locations were in the Twin Cities metro area, three near Duluth, one west of Rogers, and one west of Sauk Center. These billboards remained in place from June through September.

DNR staff held exotic species workshops in the following cities: Grand Rapids, Hackensack, Shakopee, Hinckley, White Bear Lake, Willmar, Waterville, Detroit Lakes, and St. Patrick. The nine workshops covered several topics including: an overview of harmful exotic species, identification of native and exotic aquatic plants, directions on how to monitor lakes for harmful exotics, and organizing volunteers for access awareness events. The total attendance at the workshops was 340 individuals, representing approximately 130 lake associations.

Various other presentations were conducted for high schools, teacher workshops, and lake associations.

Participation of others in public awareness activities

Other agencies have been involved with public awareness activities in the state. Billboards posted in the summer of 1993 were jointly sponsored by the DNR, U.S. Fish and Wildlife Service, and the Province of Manitoba. Reprinting of *A Field Guide to Aquatic Exotic Plants and Animals*, our most popular public awareness pamphlet, was jointly funded by the National Park Service, the U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers as well as numerous midwestern states and Provinces.

Three private sector initiatives also aided awareness efforts. During fiscal year 1993, Cenex - Land O' Lakes donated \$15,000 to produce exotic species kits and handbooks for lake associations. Again in the summer of 1993, Cenex - Land O' Lakes provided \$3000 for the DNR to produce 40,000 milfoil identification cards that were distributed to the public. Northern States Power produced 800,000 inserts regarding zebra mussels in their July 1993 bills at a cost of approximately \$20,000. The 3M company produced special "no zebra mussel" stickers for the Interagency St. Croix River Zebra Mussel Response Plan.

The University of Minnesota Sea Grant, part of Minnesota Extension Service and the National Sea Grant Network, has established and operated a Zebra Mussel Information Center in Duluth for the past three years. The information center is part of Sea Grant's wide effort to inform municipal and industrial water users in the Great Lakes region, and the general public, about the effects of zebra mussels on the economy and environment. Activities of the information center are funded, in part, by a grant from the National Oceanic and Atmospheric Administration. Progress of the information center includes:

- organizing a workshop for water users and managers in the Upper Mississippi River basin to address likely impacts associated with zebra mussel invasion,
- maintaining a library of visuals and graphics, responding to public inquiries about zebra mussels,
- development of a training program for extension agents and resource managers on zebra mussels,
- conducting scientific surveys of public response to information campaigns to determine the most effective means of changing public behavior to avoid spreading aquatic exotic species.

Effectiveness of public awareness efforts

Education methods are being evaluated as recommended in the current draft of the Statewide Comprehensive Management Plan for Ecologically Harmful Exotic Species. Minnesota Sea Grant has received federal funds to evaluate the zebra mussel and other exotic species public awareness methods used in Minnesota and other states. The Sea Grant study should provide valuable information about the value of inspections, roadchecks and other activities. Continued DNR watercraft inspections and road checks will also monitor the level of compliance and effectiveness of public awareness activities.

It is our impression that 1993 was the first year in which Eurasian watermilfoil and zebra mussels became old news to the media. Media coverage shifted to prevention activities on the St. Croix River, flowering rush in the Detroit Lakes area, and coverage of purple loosestrife biological control efforts. There was not much general coverage on exotic species in the media. In past years, heavy media coverage helped raise awareness. Because of the reduced media attention, we believe awareness efforts conducted or supported by state and federal agencies are more critical. Expanded use of paid media, such as billboards and radio, helped meet the need created by reduced media attention. The boat inspection program also helps build awareness.

Future Needs for public awareness:

- Expand on past successful efforts:
 - Develop and air new radio spots on a variety of stations to broaden exposure.
 - Rent additional billboards on major travel routes and at critical state entrances.
 - Reprint publications to meet the demand.
- Update Exotic Species Handbook material.
- Provide information about exotic species and the surcharge to all boat owners who register their boats through deputy registrars offices.
- Begin development of an exotic species curriculum for youth.

Inspections and Enforcement

The potential for boaters to accidentally move aquatic exotic species from one lake or river to another has long been recognized as a serious problem. For this reason, the 1991 Legislature mandated DNR conservation officers to conduct inspection of tailored boats on Minnesota highways. The purpose of the inspections was to look for Eurasian watermilfoil, issue citations to violators, and to inform the public about the potential spread of exotic species. In 1992, the DNR, the Minnesota Lakes Association, and angling groups proposed and supported legislation (adopted as M.S. 18.317, Subd. 3a, see Appendix A) calling for 10,000 hours of random inspections of watercraft leaving "infested" waterbodies, that contain harmful aquatic exotic species such as Eurasian watermilfoil, spiny water flea, and zebra mussels. Subsequently, in 1992, a watercraft inspection program was established by the DNR to help contain ecologically harmful aquatic exotic species.

Exotic Species Monitors, employed through the DNR's Minnesota Conservation Corps, conduct inspections at public water access sites on infested waters. The goal of their effort is to increase public awareness of the threats posed by exotic species and the laws regarding their transportation, and to show individuals how to inspect and remove exotics from their own boating equipment before leaving an access. Inspection activities are targeted at high use accesses and during high use periods.

Watercraft inspection summary - 1993

Inspections during 1993 began on May 1 and ended October 15 as prescribed in state statute. Within this 27 week period 10,245 inspection hours were logged and 11,261 watercraft were inspected (see Tables 5 and 6).

Table 5. Hours spent inspecting watercraft for exotic species in Minnesota during 1993.

Area	Hours Accomplished	% of Time Per Area
Metro Area (7 Co.)	6,070	60%
Duluth/Superior	2,182	21%
Mississippi River	1,993	19%
State-wide Total	10,245	100%

Most of the infested waters in the state are located within the metropolitan area and include some of the most heavily used recreation lakes in Minnesota. As shown in Table 6, inspection efforts were concentrated at accesses in the seven county metropolitan area, where eighty-three percent of the inspections occurred.

The numbers of inspections conducted per day varied with the weather and boating activity. The cool wet weather typical of last summer undoubtedly reduced boating traffic; there were many days when the number of boats inspected per hour was low. Special events, such as fishing tournaments and the waterfowl hunting opener along the Mississippi River, brought a large number of boaters to infested waters. Increased inspection efforts were targeted on these high use periods.

Table 6. Number of watercraft inspections for exotic species during 1993.

Area	Number of Watercraft/Trailers Inspected	Percentage of Inspections
Metro Area (7 Co.)	9,327	83
Duluth/Superior	752	7
Mississippi River	1,162	10
State-wide Total	11,261	100

Inspection results provide the DNR with important information on the public's awareness of exotic species laws and identify high risk areas. The percentage of boats/trailers carrying Eurasian watermilfoil as they pull out of infested waters varied widely. Hennepin County accesses showed the highest rates (see Table 7). These results identified a need to increase access inspection efforts in Hennepin County so that boats leaving public water accesses are cleaned. The percentage of boats with Eurasian watermilfoil was higher in 1993 than in 1992. This increase may either reflect year-to-year variation or the longer access inspection period in 1993. All milfoil was removed during the inspection and before trailered boats left the water access area.

Table 7. Percentage of boats exiting infested waters with Eurasian watermilfoil by county (calculated from random sample of survey results).

County Inspected	1992		1993	
	Percent of boats exiting with Eurasian watermilfoil	Number of Boats Inspected	Percent of boats exiting with Eurasian watermilfoil	Number of Boats Inspected
Anoka	n.s.	n.s.	0 %	23
Carver	2 %	379	10 %	764
Dakota	n.s.	n.s.	1 %	561
Goodhue	n.s.	n.s.	0 %	45
Hennepin	15 %	157	36 %	1,232
Ramsey	n.s.	n.s.	6 %	779
St. Louis	n.s.	n.s.	0 %	303
Scott	2 %	173	0 %	827
Wabasha	n.s.	n.s.	0 %	218
Washington	n.s.	n.s.	< 1 %	200
Winona	2 %	53	6 %	17

n.s. - no surveys conducted

The 1993 inspection effort was generally well received by boaters. A concerted effort was made to hire individuals with good communication skills and inspection personnel were provided training in customer relations.

Awareness of exotic species laws is high among Minnesota boaters, particularly in the metropolitan area, and appears to have increased slightly from 1992 to 1993 (see Table 8). In 1993, ninety-one percent of the interviewed boaters in Hennepin County were aware of the laws regarding exotic species transportation, while statewide, 80% of surveyed boaters indicated awareness. This suggests that public awareness efforts are reaching recreational boaters. Awareness of exotic species laws, however, does not measure whether boaters are cleaning their watercraft adequately. Enforcement efforts are necessary to evaluate compliance with existing exotic species laws.

Other accomplishments and responsibilities of exotic species monitors

In addition to inspections, monitors also clear floating aquatic plants from public water accesses as required by M.S. 18.317 (see Appendix A). We believe this effort was reasonably successful in 1993. Plant accumulation at accesses is dependent upon weather, particularly wind direction, so monitors cannot always keep accesses clear of plants. Increasing access inspection efforts to 20,000 hours in 1994 will help address this issue.

Other accomplishments and responsibilities of the exotic species monitors included:

- Additional staffing for two Division of Enforcement road checks and monitoring fishing tournaments when requested by the Section of Fisheries.
- Exotic species signs were placed at all 165 public water access sites on infested waters. These postings include both the new advisory sign and the new limited infestation sign.
- Exotic alert tags were distributed on 8,296 vehicles and trailers at access points on infested waters.

Table 8. Awareness of "Exotic Species Laws in Minnesota" by county.
(Calculated from random sample of survey results)

County	1992		1993	
	Percent of individuals who answered "yes" when asked whether they were aware of Exotic Species Laws	Number of individuals who were asked whether they were aware of Exotic Species Laws	Percent of individuals who answered "yes" when asked whether they were aware of Exotic Species Laws	Number of individuals who were asked whether they were aware of Exotic Species Laws
Anoka	n.s.	n.s.	78%	23
Carver	84%	367	93%	756
Dakota	n.s.	n.s.	94%	557
Goodhue	n.s.	n.s.	89%	45
Hennepin	90%	150	91%	1232
Ramsey	n.s.	n.s.	83%	779
St. Louis	n.s.	n.s.	76%	303
Scott	79%	170	93%	827
Wabasha	n.s.	n.s.	84%	218
Washington	n.s.	n.s.	66%	200
Winona	75%	44	88%	17

n.s. - no surveys conducted

Participation of volunteers and others

Lake associations and individual volunteers aided containment efforts during 1993 by conducting 307 hours of access inspections and distributing 1,849 exotic alert tags at public water accesses on infested waters. These individuals worked for the Exotic Species Program as DNR volunteers. Volunteer recruitment, which focused on Lake Associations and Lake Home Owners Associations on infested waters, was disappointing.

Other agencies and organizations also hired paid staff to conduct inspections at White Bear Lake, Lotus Lake, and Christmas Lake. Numerous lake associations participated in awareness events at water accesses on non-infested waters.

St. Croix zebra mussel response plan

The Exotic Species Program recorded boat registration numbers on the St. Croix River in 1993. This was part of the interagency effort to keep zebra mussels from being transported upstream of the Arcola Flats area. The National Park Service and U.S. Fish and Wildlife Service used the boat registration numbers to verify that a boater, wishing to travel into the restricted area (above Arcola), had not been in zebra mussel infested waters.

Future needs/recommendations for watercraft inspection:

- During the 1994 open water season, the number of inspection hours will increase from 10,000 to 20,000. Additional effort will be focused on high-use access points where 1993 surveys indicated a high percentage of watercraft pull out of the water with Eurasian watermilfoil or other exotics attached (e.g. Hennepin County).
- The number of monitors will be increased from 10 to 21 to meet the additional inspection requirements.
- The volunteer component will be continued in 1994 for individuals or organizations interested in supplementing existing containment efforts, however, recruitment efforts will be decreased because of low participation in 1993.
- A new rake (Duro-Barn Fork/Rake) will be used to more effectively remove Eurasian watermilfoil and other aquatic vegetation from public water accesses.

Checks of trailered boats in 1991 and 1992

In 1991, the Minnesota Legislature directed the DNR Commissioner of Natural Resources to establish a two year program designed to check trailered boats for the presence of milfoil (see M.L. 1991, Ch. 241, Sec. 10 in Appendix A). Five checks per year were to be performed to inspect boats and trailers for the presence of milfoil fragments and to educate and inform boaters about milfoil. The requirement became effective on August 1, 1991.

The DNR sponsored a "Eurasian Water Milfoil Awareness Day" on July 28, 1991. Eighteen access sites on ten Metropolitan lakes with Eurasian watermilfoil were staffed by Conservation Officers and other employees to provide educational and identification materials to boaters. Through these efforts, 669 boaters were contacted on that one day. Additionally, there was extensive television and print media coverage both in the Metro area and greater Minnesota.

The Division of Enforcement conducted a two year evaluation of compliance with milfoil transportation regulations. Conservation officers conducted inspections of trailered boats at water accesses and on highways at a variety of locations in Minnesota. In 1991, eight checks of trailered boats were conducted (Table 9), while seven checks were conducted in 1992 (Table 10).

Table 9. Summary of road checks of trailered boats conducted by the Division of Enforcement, DNR during 1991.

7/6/91	Hwy. 71	Wadena County
7/8/91	Hwy. 371	Morrison County
7/28/91	Clearwater Lake	Wright County
8/31/91	Hwy. 10	Benton County
9/21/91	Hwy. 89	Marshall County
9/2/91	Hwy. 71	Beltrami County
10/6/91	Hwy. 64	Hubbard County
10/20/91	Hwy. 72	Beltrami County

Table 10. Summary of road checks of trailered boats conducted by the Division of Enforcement, DNR during 1992.

5/23/92	Hwy. 371	Cass County
5/24/92	Hwy. 72	Beltrami County
5/30/92	Hwy. 78	Grant County
5/31/92	Hwy. 11	Kittson County
7/3/92	Hwy. 10	Sherburne County
6/7/92	Hwy. 12	Bigstone County
6/7/92	Hwy. 7	Bigstone County

During 1992, the DNR Division of Enforcement hired law enforcement interns to conduct inspections at water accesses in the Metropolitan area. A total of 242 work hours resulted in approximately 1,500 boater contacts.

The results of the 1991 and 1992 checks are shown in Table 12. Roadchecks are a valuable way to increase public awareness and to document instances of milfoil transport by trailered boats. The checks during the two year period did not reveal a high frequency of violations in areas where Eurasian watermilfoil is not present. Both 1991 and 1992 roadchecks reveal a violation rate below 2% of vehicles checked. However, even violations at these levels indicate that there is a significant potential for boats to introduce Eurasian watermilfoil or other harmful aquatic species to new locations throughout the state.

Progress in exotic species enforcement - 1993

Conservation Officers conducted 1,697 hours of exotic species enforcement activities during 1993. These activities focused on enforcing exotic species laws and improving containment efforts. In addition to scheduled roadchecks, Conservation Officers examined watercraft for milfoil as a part of their routine activities. In 1993, a total of 167 exotic species violations were recorded, mostly in Hennepin County (see Table 11).

Conservation Officers conducted a total of 37 roadchecks in 11 counties. A total of 982 watercraft were checked and 72 boats/trailers were found to be illegally transporting milfoil (northern or Eurasian). The watercraft owners received warnings or summons, but only five of these violations were specifically for Eurasian watermilfoil. The percentage by county of boats/trailers with either milfoil species ranged from 0% to 26%, with an average violation rate of seven percent (Table 13). For Eurasian watermilfoil specifically, the violation rate ranged from 0 to 5%, and averaged 0.5% statewide. Eurasian watermilfoil was found on trailered watercraft as far north as Walker and Baudette. Discovering Eurasian watermilfoil so far from any known infestation strongly reinforces the need to continue enforcement activities throughout the State.

Table 11. Total exotic species checks conducted and violations detected by DNR Conservation Officers in 1993.

County	No. of Checks ¹	Violations
Anoka	4	8
Carver	2	4
Cass	2	3
Chisago	2	3
Crow Wing	1	0
Douglas	2	2
Hennepin	41	138
Sherburne	1	1
Stearns	4	3
Washington	1	3
Wright	2	2
Total	62	167

¹A check may be a predetermined check point or a site visited during routine duties.

Table 12. Summary of checks of trailered boats conducted in Minnesota by the Division of Enforcement, DNR in 1991 and 1992.

Year	No. of Roadchecks	No. Vehicles Checked	Summons	Violation Warnings	Percent Violations
1991	8	818	5	9	1.7%
1992	7	1,412	12	14	1.8%

Table 13. Enforcement activities at predetermined check points in 1993.

County	Boats Checked	Summons	Written Warnings	Verbal Warnings	Percent Violations	EWM ¹ Violations	Total
Carver	240	0	0	0	0%	0	0
Cass	52	2	3	2	13 %	2	7
Chisago	75	1	3	3	9%	2	7
Crow Wing	74	1	1	16	24%	0	18
Douglas	85	0	2	2	5%	0	4
Hennepin	24	0	3	0	13%	0	3
Sherburne	0	0	0	0	0%	0	0
Stearns	260	1	1	0	1%	0	2
Washington	0	0	0	0	0%	0	0
Wright	90	3	3	17	26%	0	23
Lake of the Woods	19	1	3	0	21%	1	4
Mississippi R.	37	0	0	4	11%	0	4
Total	982	9	19	44	7%	5	72

¹Milfoil detected was positively identified as Eurasian watermilfoil.

Future plans and needs regarding enforcement:

- The Division of Enforcement is currently working with the State Judicial Branch to raise the level of awareness and establish a uniform fine schedule for violations of exotic species law. The recommendations are currently being evaluated by the Conference of Chief Judges, and should be approved by the Legislature in the winter of 1993-94.
- The Division of Enforcement will begin to issue civil citations in 1994. These citations will be issued by trained, licensed peace officers and personnel designated by the Commissioner of Natural Resources. The policy defining who the Commissioner of Natural Resources will designate is currently being established. Training and implementation of new civil citations procedures are scheduled for spring of 1994.
- The Division of Enforcement will establish an exotic species specialist position in 1994. This seasonal assignment will be responsible for:
 - Organizing exotic species road checks and spot-checks.
 - Continuing awareness efforts directed at the boating public and improving the judicial systems awareness of exotic species issues.
 - Coordinating education and enforcement activities with the Division of Fish and Wildlife and Minnesota Conservation Corps.
 - Preparing an annual summary of exotic species enforcement activities.
- A series of inspections at commercial accesses on infested waters is planned in 1994. Inspections will concentrate on high use marinas and resorts on infested waters.
- Harbors with commercial vessels will be contacted in 1994. These contacts will initially be conducted to increase exotic species awareness among commercial watercraft users. Contact sites will include cooperating harbors and boatyards, specifically those in the Duluth area and along the Mississippi River.

Management of Eurasian Watermilfoil

Eurasian watermilfoil (*Myriophyllum spicatum*) is an exotic aquatic plant that was inadvertently introduced to Minnesota. The Minnesota DNR manages milfoil because it can limit recreational activities on water-bodies and alter aquatic ecosystems by displacing native plants. In this report we describe the DNR's efforts in 1993 to contain this exotic plant and limit its spread in Minnesota.

Progress in management of Eurasian watermilfoil

- In 1993, the number of Minnesota water-bodies with Eurasian watermilfoil increased by five lakes. This is the smallest number of water-bodies added to the list in any year since 1987, when milfoil was first discovered in the state.
- In 1993, the DNR could not find Eurasian watermilfoil in five Minnesota lakes where control work was done in 1992 or before. In another seven lakes where control work was done in 1992, milfoil was still present in 1993 but the acreage was reduced.
- In 1993, cooperative agreements were established between the DNR and 20 outside organizations to share costs of controlling Eurasian watermilfoil in Minnesota lakes.
- In 1993, the DNR supported six Minnesota studies of the biology of Eurasian watermilfoil and potential for biological control of this species. In 1993, the DNR also participated in two studies of herbicides with potential to control milfoil.

Management plan for Eurasian watermilfoil

In January, 1992 the DNR produced a comprehensive management plan for Eurasian watermilfoil to serve as a guide and reference for staff of the DNR's exotic species program. This plan also addresses questions and concerns of legislators, lake associations, sport fishing organizations, staff outside the DNR's exotic species program, and other interested citizens. One hundred thirty copies of that version, Review Draft 2.0, were distributed for review. In response, ten reviews were received from DNR staff outside the DNR's exotic species program and 26 reviews were received from individuals and organizations outside the DNR. Those reviews helped us develop a second version, Review Draft 3.4, approximately 340 copies of which were distributed for review during April 1993. In response, we received three reviews from DNR staff outside the DNR's exotic species program and 12 external reviews. The current version of the plan, Review Draft 3.5, includes revisions made in response to comments received in 1993 and changes made to keep the plan consistent with the current status of the Eurasian Watermilfoil Program. Draft 3.5 is currently under review by the Commissioner's Technical Council within the DNR.

Distribution of new lakes with Eurasian watermilfoil

The number of Minnesota lakes discovered in 1993 to have Eurasian watermilfoil was lower than the number found in any of the preceding five years (Table 14). The five lakes discovered to have milfoil in 1993 all are located within 40 miles of Lake Minnetonka, the largest and longest-known population in Minnesota. Two of the new populations were discovered in Hennepin County and the other three were found in Wright County.

It is encouraging that the number of milfoil populations discovered in Minnesota during 1993 is low because this suggests that the DNR's Exotic Species Program is succeeding in limiting the spread of this exotic. Nevertheless, it is important to note that we can't determine for certain whether the rate of spread actually decreased or the rate of detection was low. It is possible milfoil might have been more difficult to detect in 1993 than in other years because low temperatures, gray skies, and high water levels which occurred in Minnesota during 1993 limited growth of plants.

The participation of the public in monitoring the distribution of milfoil remains a critical element in the Eurasian Watermilfoil Program. Though most reports received in 1993 of suspected occurrences of milfoil turned out to be another plant species, some reports were new occurrences. The DNR continues to follow through on likely reports as soon as possible because early detection and treatment of milfoil is the key to limiting the spread of this exotic.

Table 14. Numbers of lakes or rivers and creeks in which Eurasian watermilfoil was discovered in different years in Minnesota.

Year	Number of Lakes in which milfoil was discovered	Number of Creeks and Rivers in which milfoil was discovered	Cumulative number of water-bodies with milfoil
1987	1	0	1
1988	6	0	7
1989	14	1	22
1990	11	1	34
1991	14	0	48
1992	10	2	60
1993	5	0	65

Control of Eurasian watermilfoil

Surveys conducted during 1993 could not locate any Eurasian watermilfoil in four lakes where control work was done in 1992 by the DNR and its cooperators (Table 15). In addition, no Eurasian watermilfoil was seen in Sugar Lake in Wright County during 1993, the second consecutive year during which this waterbody was free of milfoil. If no milfoil is found in Sugar Lake during 1994, the DNR will consider the plant to have been eradicated from this lake.

Surveys conducted during 1993 also indicated that the DNR and its cooperators have succeeded in reducing, but not eliminating, the acreage of Eurasian watermilfoil in seven of the lakes where control work was done in 1992 (Table 15). Unfortunately, the acreage of milfoil in 12 other lakes to which herbicide was applied in 1992 increased between that year and 1993. In two lakes, no change in acreage was evident between 1992 and 1993.

In 1993, efforts were made to control Eurasian watermilfoil in 23 Minnesota lakes at a cost of \$156,629 (Tables 16 and 17). The DNR and its cooperators succeeded in reducing the acreage of Eurasian watermilfoil by an average of nearly 80% in fifteen of the sixteen lakes that were inspected after application of herbicide (Table 16). In the sixteenth lake, there was no reduction of milfoil apparent following the application of herbicide. We will have to wait for surveys conducted during 1994 to determine how many of these lakes will experience a long-term reduction in the amount of milfoil present.

In Minnesota, Eurasian watermilfoil is controlled by mechanical harvesting of large areas in only one body of water, Lake Minnetonka, where 600 acres of milfoil were harvested in 1993. This work was done by the Lake Minnetonka Conservation District. Lake Minnetonka has approximately 3,000 acres of milfoil, more than is found in any other lake in Minnesota. The next largest population of milfoil in a single Minnesota lake occupies only 320 acres.

Mechanical harvesting is an option for managing large populations of milfoil by opening channels from shore to open water. The primary advantages of harvesting are that 1) it does not involve the introduction of chemicals into lakes and 2) the harvested vegetation is removed from the lake. Disadvantages of harvesting are that 1) it is not selective; it will remove all material in the path of the harvester including native vegetation, any fish and invertebrates not able to escape; these invertebrates may include potential biocontrol agents, 2) it leaves the root system intact, so it does not have the potential to eradicate milfoil from a basin, 3) it adds to the natural rate of fragmentation of Eurasian watermilfoil, which causes more vegetation to wash up on lake shores and may spread milfoil to previously unoccupied areas. Consequently, mechanical harvesting should only be used in waterbodies where milfoil occurs in dense stands that cover large areas within the waterbody and where further spread of the plant by fragmentation is probably inevitable.

Table 15. Summary of acres of Eurasian watermilfoil in lakes to which 2,4-D herbicide was applied in 1992 and surveyed in 1993.

County	Lake (Herbicide if not 2,4-D alone)	Acres of milfoil treated in 1992	Acres of milfoil present in 1992	Acres of milfoil present in 1993	Percent reduction in acres between 1992 and 1993
Anoka	Crooked (Sonar®)	40	40	0	100
Carver	Bavaria	65	65	65	0
	Lotus	7	10	40	--
	Waconia	10	10	38	--
Chisago	Green (Sonar® & 2,4-D)	303	≥ 303	≥ 158	≤ 50
	Rush	43	43	144	--
Crow Wing	Bay	48	44	0	100
Dakota	Crystal	1	1	3	--
Douglas	Oscar	16	9	5	40
Hennepin	Bryant	48	48	56	--
	Christmas	2	2	0	100
	Dutch	27	20	8	60
	Eagle	3	3	4	--
	Independence	33	95	110	--
	Little Long	2	2	1	50
	Long	11	11	29	--
	Schmidt	10	34	34	0
Kanabec	Knife	7	7	20	--
Ramsey	Bald Eagle	3	3	28	--
	Silver	38	38	1	97
	Wabasso	2	2	0	100
Scott	Prior	132	132	220	--
Washington	White Bear	63	63	72	--
Wright	Pulaski	90	90	18	80
	Waverly	47	145	90	40

Table 16. Summary of acres of Eurasian watermilfoil that were treated with herbicide by the DNR and its cooperators in 1993.

County	Lake	Acres of milfoil present	Acres of milfoil treated ¹	Percent reduction in acres of milfoil treated
Carver	Bavaria	65	95	70
	Waconia	38	43	-- ²
Chisago	Rush	144	71	50
Dakota	Crystal	3	3	--
Douglas	Oscar	5	10	--
Hennepin	Bryant	56	56	100
	Dutch	8	7	15
	Eagle	4	4	100
	Fish	1	1	100
	Little Long	1	1	100
	Long	29	26	60
	Knife	20	23	100
Ramsey	Bald Eagle	28	28	--
	Island	21	21	60
	Silver	1	1	--
Scott	Prior	220	171	--
Washington	White Bear	72	65	--
Wright	Augusta	2	2	100
	Beebe	17	25	--
	Little Waverly	20	17	90
	Pulaski	18	27	100
	Rock	76	90	100
	Waverly	90	56	80

¹ In lakes where the "acres of milfoil treated" are greater than the "acres of milfoil present," some acres were re-treated with herbicide during 1993.

² Absence of a value for percent reduction in acres of milfoil indicates either that there was no decrease in acres of milfoil after treatment or there were no observations of milfoil after treatment.

Participation in control efforts by other state agencies, local units of government, and interested groups

The success achieved in controlling Eurasian watermilfoil in Minnesota is due in large part to cooperation between the DNR and other organizations such as lake associations, and various local units of government. In 1993, the DNR established cooperative agreements with 20 organizations outside the DNR to share costs of controlling Eurasian watermilfoil (Table 17). We were unsuccessful in attempts to establish agreements with an additional three local units of government and one lake association. In the basic agreement to share costs of control work, the DNR agreed to pay the first \$2,000 of the cost and would cover 50% of the remainder of the cost up to a maximum of \$15,000 total. Organizations outside the DNR which entered into these agreements were expected to pay all costs above \$15,000. Forty percent of the funds spent on efforts to control milfoil in Minnesota lakes during 1993 came from organizations outside the DNR. Of the sixty percent of the funds spent on control of milfoil that came from the DNR, somewhat less than one third was spent on lakes outside the Minneapolis and St. Paul metropolitan area where Eurasian watermilfoil was first discovered in 1993. In these situations, treatments were made immediately by the DNR without risking loss of time that might occur if a cooperative agreement was required.

Table 17. Summary of expenditures for control of Eurasian watermilfoil in Minnesota lakes during 1993.

Lake	State dollars	Local dollars	Source of local dollars
Bavaria	3,579	1,579	Lake Bavaria Improvement Association
Lotus	0	0	City of Chanhassen ¹
Waconia	6,144	4,144	Lake Waconia Association
Green	0	0	Green Lake Association ¹
Rush	7,518	5,518	Rush Lake Association
Bay	0	0	Bay Lake Association ¹
Crystal	610	0	City of Burnsville
Oscar	3,197	1,196	Oscar Lake Association
Bryant	6,523	4,524	Hennepin Parks
Dutch	1,386	0	Dutch Lake Association
Eagle	792	---	
Fish	198	---	(Discovered in 1993) ²
Little Long	101	0	Hennepin Conservation District
Long	3,417	1,417	City of Long Lake
Riley	0	0	City of Eden Prairie ¹
Knife	3,349	1,350	Knife Lake Improvement District
Bald Eagle	3,959	1,959	Bald Eagle Area Lake Association
Island	3,509	1,509	Ramsey County
Silver	237	0	Ramsey County
Wabasso	0	0	Ramsey County ¹
Prior	8,500	28,226	Prior L./Spring L. Watershed District
White Bear	8,500	9,115	White Bear Lake Conservation District
Augusta	491	---	(Discovered in 1993) ²
Beebe	6,554	---	(Discovered in 1993) ²
Little Waverly	3,752	---	
Pulaski	3,523	1,524	Pulaski Lake Improvement District
Rock	17,877	---	(Discovered in 1993) ²
Waverly	852	---	(Discovered in 1993) ²
Total	94,568	62,061	

¹ A cooperative agreement was established between the DNR and this organization but no control work was done on this lake.

² Lakes where Eurasian watermilfoil was first discovered in 1993 were treated immediately by the DNR without risking loss of time that might occur if a cooperative agreement was required.

Research on Eurasian watermilfoil

In 1992 and 1993, the DNR supported research on several aspects of biological control and biology of Eurasian watermilfoil. In addition, the DNR also participated in research on herbicides with potential to control milfoil.

Insects as biological controls of Eurasian watermilfoil in Minnesota

In 1992 and 1993, aquatic insects known to feed on Eurasian watermilfoil have been found in Minnesota by researchers at the University of Minnesota with special funding appropriated by the Minnesota Legislature (Table 18). These researchers are investigating the feeding preferences of the insects as well as their potential to damage and control milfoil in Minnesota. In other states and in Canada, investigators have found that these same native or naturalized aquatic insects are associated with, and may be causes of, declines in abundance of milfoil. Reductions in abundance of milfoil by herbivorous insects, i.e., biological control, is an ecologically sound method for management of Eurasian watermilfoil and would minimize our need to use herbicides for control.

Fungus as a biological control of Eurasian watermilfoil in Minnesota

In 1992 and 1993, EcoScience Corporation encountered serious difficulties in achieving control of Eurasian watermilfoil when the biological control fungus was applied in field environments. This research also was conducted with special funding appropriated by the Minnesota Legislature (Table 18). The DNR supported this research because the fungus, *Mycileptodiscus terrestris* (Mt), is capable of damaging milfoil plants in laboratory environments. Mt has been found in 15 of 21 Minnesota lakes sampled by EcoScience. The failure of Mt to damage milfoil in the field is a setback for this approach to biological control. The problems reported by EcoScience are consistent with results achieved by the U.S. Army Corps of Engineers in similar research.

Use of genetic markers to distinguish between Eurasian and native watermilfoils

In 1993, genetic markers that differentiate between Eurasian and native watermilfoils were found by researchers at the University of Minnesota with special funding appropriated by the Minnesota Legislature (Table 18). The results of this research will be useful to managers who must be able to confirm the identity of a suspected population of Eurasian watermilfoil before expensive control efforts are undertaken.

Genetic variation in Eurasian watermilfoil

Recent research has found that at least two different genotypes of Eurasian watermilfoil occur in Minnesota lakes. These different genotypes may react differently to chemical and biological control techniques in ways that could explain observed variations in control success. Current research at the University of Minnesota is being carried out with special funding appropriated by the Minnesota Legislature (Table 18). The objective of this research is to determine the total number of genotypes present in Minnesota, their geographic location, and whether or not multiple genotypes are present in the same lake.

Viability of Eurasian watermilfoil seeds in Minnesota

In 1993, research on viability of Eurasian watermilfoil seeds was begun by researchers at the University of Minnesota with special funding appropriated by the Minnesota Legislature (Table 18). It is generally assumed that milfoil spreads primarily by vegetative fragmentation.

Nevertheless, past research in other states has shown that Eurasian watermilfoil can produce viable seeds. Though establishment of milfoil seedlings appears to occur only rarely, this mechanism of establishment merits investigation because it could re-establish milfoil in lakes following successful control of established plants.

Natural declines of Eurasian watermilfoil in Minnesota

Major declines of Eurasian watermilfoil have been reported in other states but the causes of such declines are often difficult to determine. Research on apparent declines of milfoil in Minnesota and the possible relationships with environmental factors, biological agents or other management efforts is being done with special funding appropriated by the Minnesota Legislature (Table 18). The utility of this information will become evident if we can identify and enhance factors that cause declines in milfoil.

Evaluation of herbicides for long-term control of Eurasian watermilfoil

The DNR is conducting research to evaluate the potential of Sonar® herbicide, to control Eurasian watermilfoil. Evidence from other states suggests that applications of Sonar® at low rates control milfoil and have minimal effects on native plant species. The DNR study is designed to confirm these findings and examine potential impacts on the fish and macroinvertebrate communities. The DNR is cooperating with other groups to identify the best application rate and method for Sonar®.

The DNR also is participating in a study of Garlon™ herbicide. This study is being conducted by the U.S. Army Corps of Engineers, the University of Florida, and DowElanco, the manufacturer of this compound. The purpose of this study is to produce information for the U.S. Environmental Protection Agency which is considering the registration of Garlon™ for use in aquatic environments. The DNR is interested in assisting this study primarily because 2,4-D, the herbicide currently used by the DNR for milfoil, might lose its aquatic registration. If that were to happen, then Garlon™ would be an acceptable replacement. In 1993, the DNR assisted in the evaluation of potential study sites in Lake Minnetonka to be used in 1994.

Table 18. Summary of research on Eurasian watermilfoil, allocations of funds to different projects, and sources of these funds.

Research project	Organization conducting the research	FY 93	FY 94	Source of funding
Biological control - insects	University of Minnesota	55,000	-----	MFRF
		-----	83,333	MENRTF
			41,667	ACE
- fungus	EcoScience Corporation	105,000	-----	MFRF
		-----	16,667	MENRTF
			8,334	ACE
Genetic markers and variability	University of Minnesota	-----	10,000	MENRTF
		-----	5,000	ACE
Viability of seeds	University of Minnesota	-----	833	MENRTF
			1,667	ACE
Natural declines	University of Minnesota	-----	19,167	MENRTF
			38,333	ACE
Replacement species	E. Miller		20,000	MFRF

MFRF = Funding was appropriated from the Minnesota Future Resources Fund as recommended by the LCMR in response to a proposal submitted by the DNR.

MENRTF = Funding was appropriated from the Minnesota Environment and Natural Resources Trust Fund as recommended by the LCMR in response to a proposal submitted by the DNR.

ACE = Funding was provided by the Army Corps of Engineers to match funding appropriated from the Minnesota Environment and Natural Resources Trust Fund as recommended by the LCMR in response to a proposal submitted by the DNR.

Management of Eurasian watermilfoil in other states

All states and provinces where Eurasian watermilfoil is present have aquatic plant management programs, but only a few have programs that were specifically established for management of milfoil. In addition to Minnesota, there are several northern states that manage Eurasian watermilfoil.

Management of Eurasian watermilfoil in Vermont is unique because it includes experimental use of the same weevil that is present in Minnesota and is undergoing study to determine its potential as a biological control agent. In 1993, the Vermont Department of Environmental Conservation introduced weevils into two lakes in an attempt to control milfoil. These weevils were both collected in the field and reared in the laboratory. This effort was undertaken in cooperation with researchers at Middlebury College who have conducted extensive investigations of the potential for biological control of milfoil with aquatic insects.

Eurasian watermilfoil has been present in southern Wisconsin since the 1960s, but the state did not have a program to prevent spread of this exotic until the plant appeared in northern Wisconsin. Milfoil is now present in 13 counties in the northern half of Wisconsin, including Bayfield County which is at the same latitude as Duluth, Minnesota. In northern Wisconsin, milfoil has not yet been found to grow in surface mats that have the greatest impact on recreation. In Wisconsin, management of Eurasian watermilfoil by local governments and the public consists of control by mechanical harvesting or limited use of herbicides. The Wisconsin Department of Natural Resources monitors the distribution of the plant and emphasizes maintenance of lake ecosystems and the communities of native plants they contain to help limit the spread of milfoil (Bode et al.).

In Michigan, Eurasian watermilfoil is managed in the southern portions of the state by use of herbicides. The Michigan Department of Natural Resources is gaining experience with the application of Sonar® herbicide to whole lake basins. The results of these applications have been, and will continue to be, considered by the Minnesota DNR in efforts to evaluate the potential of Sonar® to provide selective control of Eurasian watermilfoil.

Future needs of the Eurasian watermilfoil program:

The Eurasian Watermilfoil Program is now well established and the increase in the surcharge on licenses for watercraft (see M.S. 86B.415 in Appendix A) passed during the 1993 legislative session will generate adequate funds for this program in calendar 1994. Priorities for the Eurasian Watermilfoil Program, which are described in detail in the DNR's management plan, include:

- Inform the public about Eurasian watermilfoil and the problems that it can cause,
- Contain the plant's spread by targeting access inspection and enforcement efforts in areas of the state where infestations currently occur,
- Monitor the distribution of milfoil in the state with special emphasis on verification of reports of new occurrences of milfoil,
- Control milfoil in Minnesota lakes, especially new populations in areas outside Minneapolis and St. Paul metropolitan area, and
- Support research on the potential for biological control of milfoil and the biology of this species.

Management of Purple Loosestrife

Purple loosestrife (*Lythrum salicaria*) is a wetland plant from Europe and Asia that invades marshes and lakeshores, replacing cattails and other wetland plants. The DNR and other agencies manage purple loosestrife because it harms ecosystems and reduces biodiversity. State statutes direct the DNR to coordinate a control program to curb the growth of purple loosestrife (see M.S. 84.966 in Appendix A).

Progress in management of purple loosestrife

Much progress has been made toward the development of a sound approach to the management of this ecologically harmful exotic since the establishment of the DNR Purple Loosestrife Program (PLP) in 1987.

- The DNR's Purple Loosestrife Program has taken a major step forward towards the development of long-term control methods for loosestrife. Insects released as biological control agents in Minnesota in 1992 survived the winter and produced offspring. However, more research is needed to determine how rapidly these populations will expand and how effective the insects will be at reducing purple loosestrife in Minnesota.
- No purple loosestrife could be found in 19 sites where purple loosestrife infestations were treated with herbicides in 1992. This control success is limited to the small infestations that are treated soon after purple loosestrife invades an area.

Statewide inventory of purple loosestrife

In 1987, the PLP began to inventory sites in Minnesota where purple loosestrife was established. Observations by DNR Area Wildlife Managers, county agricultural inspectors, local weed inspectors, personnel of the Minnesota Department of Transportation, and the general public are reported to the PLP. The PLP maintains a computerized list or database of sites that includes the observer's name, location, type of site and number of loosestrife plants present.

In Minnesota, 49 new purple loosestrife infestations were identified in 1993. Most of the new sites (48%) reported were roadsides and ditches. Lakes, rivers and wetlands accounted for 47% of the new sites identified (Table 19). Overall, there are now 1558 purple loosestrife infestations documented in the inventory. Of those sites, the majority (70%) are lakes, rivers or wetlands (Table 19). Inventory totals indicate that Minnesota presently has 38,000 acres that are infested with purple loosestrife. These infestations range in size from a few plants to thousands, and vary greatly in plant density.

Table 19. Purple loosestrife infestations documented by the Purple Loosestrife Program, Minnesota Department of Natural Resources in 1992 and 1993.

Site Type	Total Sites - 1992	New Sites - 1993	Total Sites - 1993
Lake	479	16	495
River	127	1	128
Wetland	460	6	466
Roadsides and ditches	319	24	343
Other	124	2	126
Total	1509	49	1558

Control of purple loosestrife

Attempts by the PLP to control purple loosestrife have relied on the use of herbicides. For control of loosestrife, the most effective herbicide is Rodeo®, or glyphosate, which is a broad spectrum herbicide that is also toxic to desirable, native plants. To allow maximum survival of native plants, Rodeo® is most frequently applied by backpack sprayer as a 'spot-treatment' to individual loosestrife plants. A second herbicide, 2,4-D, or 2,4-dichlorophenoxyacetic acid, also is used because it affects primarily broad-leaved or dicotyledonous plants. Because this herbicide is less effective than Rodeo®, it is not frequently used. A third herbicide, Garlon 3A®, or triclopyr, has been applied to purple loosestrife on a trial basis to test whether it will selectively kill loosestrife. Between 1990 and 1993, herbicides were applied to an average of 180 purple loosestrife sites per year (Table 20). This summary includes applications made by DNR personnel, commercial applicators working under contract to DNR, and certain cooperators; it is not a complete listing of all herbicide applications made in Minnesota.

Beginning in 1991, a prioritization plan was developed for selecting sites in public waters and wetlands to be treated with herbicides. This was done because there are insufficient resources to apply herbicides to all purple loosestrife sites in Minnesota. In addition, DNR personnel observed that herbicides do not result in long lasting reductions of loosestrife when applied to large populations that have been established for a number of years. This is due to the plant's ability to reestablish through recruitment of seedlings from the seed bank. Research done by the University of Minnesota, under contract to the DNR, demonstrated that long-established stands of loosestrife develop very large and persistent seed banks. Consequently, small and recently established populations of loosestrife, which are likely to have small seed banks, are given the highest priority for treatment. In addition, sites located in the upper regions of watersheds with little loosestrife are treated before those located in watersheds with large amounts of loosestrife, because seeds of this species are disseminated by water. Implementation of the prioritization scheme in 1991 resulted in fewer large sites (≥ 1000 plants) being treated (Table 20).

During the summer of 1993, the DNR applied herbicide to 175 purple loosestrife stands covering 633 acres. Another 37 sites were visited with the intent to apply herbicide. At 29 of these sites workers found no loosestrife plants, while eight sites had too many loosestrife plants to treat. At 19 of the 29 sites visited in 1993 with no loosestrife plants, purple loosestrife had been located and treated during 1992.

Most of the sites treated by the DNR were very small; 55% of the treated sites had less than 100 plants. These applications used 48 gallons of herbicide and took 2,283 worker hours. Garlon 3A was used at 104 of the sites (26 gallons), and Rodeo was used at 71 sites (22 gallons) (Table 21). The total cost for these control efforts was \$65,000.

In addition to the sites treated by the DNR Purple Loosestrife Program, local units of government and private landowners treated loosestrife infestations scattered around the state. Ramsey county treated 26 purple loosestrife infestations through a DNR commercial applicator contract. These sites used 19 gallons of Garlon 3A herbicide, and took 282 worker hours to treat. Many other areas treated for purple loosestrife control, particularly non aquatic sites, were not reported to the DNR.

Table 20. Number of purple loosestrife infestations treated by the Purple Loosestrife Program classified by infestation size.

Year	< 20 plants	20-99 plants	100-1000 plants	≥ 1000 plants	Total number of sites treated	Number of sites visited where no herbicide was applied because no plants were found
1990	29	45	48	72	194	0
1991	64	45	50	8	167	33
1992	67	43	56	21	187	40
1993	49	47	52	27	175	19

Table 21. Summary of herbicide applications to purple loosestrife infestations in 1993. This list includes only applications made by or reported to the Purple Loosestrife Program, Minnesota Department of Natural Resources.

DNR Region	Treated By	Number of sites treated with Rodeo	Number of sites treated with Garlon 3A	Hours of labor	Acres treated	Total cost
I	PLP	15	25	578	107	15,150
	other	0	0	0	0	0
II	PLP	17	45	516	78	5,005
	other	0	0	0	0	0
III	PLP	24	23	950	297	22,090
	other	0	11	27	5	0
IV	PLP	15	0	174	112	10,000
	other	0	0	0	0	0
V	PLP	0	10	62	38	1,320
	other	0	0	0	0	0
VI	PLP	0	1	3	1	50
	other	0	15	255	526	5,905
Total	PLP	71	104	2283	633	63,615
	other	0	26	282	532	5,905

Research on purple loosestrife

In 1993, the DNR carried out and supported research on two different biological control approaches for purple loosestrife and hosted a regional biological control conference.

Insects as biological control agents

Insects for biological control of purple loosestrife were first released at one research site by DNR staff in 1992. This research was expanded in 1993 through funding appropriated by the legislature as recommended by the LCMR. Three species of insects, two leaf-eating beetles and one root-boring weevil, are being tested as potential biological controls for loosestrife in Minnesota. All three species passed their first test by surviving through the winter. The leaf-eating beetles also successfully produced offspring in 1993. In 1993, the Minnesota Department of Agriculture began collaborative biological control research by releasing the leaf-eating beetles at four sites in southeastern Minnesota.

The DNR is also funding biological research at Cornell University to accelerate the establishment of the insects already present in Minnesota and bring two new insects, both flower feeding weevils, into the state. Researchers believe that insects which attack different parts of the loosestrife plant will increase the likelihood of achieving successful control.

Fungus as a biological control agent

In 1991 and 1992, the PLP funded research to isolate fungal pathogens that can cause damage to purple loosestrife plants. This research is continuing with funding appropriated by the legislature as recommended by the LCMR. Several pathogens have been isolated that show promise as a fungal herbicide. However, more research is needed before the utility of this control method can be evaluated.

Regional biological control workshop

The DNR hosted a purple loosestrife biological control workshop in May of 1993. Representatives from six states and two Canadian provinces which included over 40 researchers and resource managers participated in the workshop. Its purpose was to provide resource managers with up-to-date information on insects to control purple loosestrife. Keynote speakers were Dr. Bernd Blossey and Dr. Richard Malecki of Cornell University. Dr. Blossey discovered the insects in Europe, researched their potential as control agents, and helped bring the insects to the United States.

Management of purple loosestrife in other states

Six states including New York, Pennsylvania, Maryland, Virginia, Oregon and Washington are participating in biological control research. Insects have been released in these states and are being monitored by local researchers. A cooperative workshop will be held in March of 1994 to discuss results in each state.

The U.S. Fish and Wildlife Service's Federal Aid Program in a coordinated effort with the Minnesota DNR, is working to start biological control efforts in seven midwest states. This effort will provide midwest states with a source for insects, technical assistance for their initial release, and monitoring strategies. Planning efforts are continuing and will culminate with a meeting with Indiana, Missouri, Michigan, Iowa, Wisconsin, Illinois and Ohio to coordinate logistics of this effort.

Participation of others in purple loosestrife control efforts

In 1993, the PLP worked with a variety of local governments and other organizations to control purple loosestrife in Minnesota (Table 22). Control information and technical assistance was provided to landowners and local units of government.

Table 22. List of cooperators participating in purple loosestrife control efforts and the type of participation.

Government/Organization	Type of Cooperation
Ramsey County	Cooperative agreement to allow Ramsey Co. to utilize state contract to hire commercial applicators.
City of Grand Rapids	Cooperative agreement to cost-share on control in the city of Grand Rapids.
City of Sunfish Lake	DNR provided equipment and herbicide
Dodge Nature Center, Ramsey Co.	DNR provided equipment and herbicide
City of Hibbing	DNR provided herbicide and technical assistance
Pelican Lake Watershed	DNR received funding for control in Pelican Lake watershed
Birch Lake Association, Ramsey Co.	DNR provided equipment and herbicide
L. Sand Lake Association, St Louis Co.	DNR provided equipment and herbicide
City of Lakeville	DNR provided equipment and herbicide

Future Needs for managing purple loosestrife:

- Continue research on biological controls of purple loosestrife. This includes the development of insect rearing and release strategies. Implementation strategies will be needed for actual distribution in the field and subsequent monitoring of the insects.
- Continue funding control efforts on small infestations of loosestrife.
- Increased coordination to control loosestrife on other state agency managed areas.

Management of Zebra Mussels

The zebra mussel (*Dreissena polymorpha*) is a small striped exotic mollusk brought to North America in the ballast waters of trans-Atlantic freighters in the late 1980's. It secretes sticky threads which it uses to firmly attach itself to any hard surface in the water. The bio-fouling life style of the zebra mussel has created problems, such as clogging of intake pipes for industry and killing native species of mollusks. The free-floating microscopic larval life stage of the zebra mussel allows rapid dispersal of this exotic within a waterbody. Despite having been present in North America for less than a decade, it has established populations throughout most of the eastern United States and its eventual distribution is expected to include most of the U.S. and southern Canada. The following report summarizes activities in Minnesota.

Progress in management of zebra mussels

- No new infestations of zebra mussels were recorded from inland waters in Minnesota in 1993.
- Watercraft inspections and public information activities increased significantly over 1992 levels (see Education and Inspection sections).
- The initial draft of the zebra mussel management plan is nearly complete. Internal and external review will follow using the process adopted for other exotic species plans. A draft version of the plan should be ready by spring 1994.

Inventory of zebra mussels

The DNR assisted in active monitoring for zebra mussels on the St. Croix River in cooperation with the National Park Service (NPS), and provided technical advice for monitoring activities.

No zebra mussels were documented from any lakes or inland rivers in the state. Reproducing populations of zebra mussels have been documented in the Mississippi River as far upstream as Lock and Dam 1 at St. Anthony Falls (Yager, et al. 1993). No mussels have been documented upstream of this point. Population levels in the Mississippi River continue to increase, and native mussels in Lake Pepin are showing heavier levels of infestation than documented in 1992. Zebra mussels continue to be found in the Duluth Harbor. It has not been established if these mussels are reproducing or being continually introduced through commercial shipping. Zebra mussels have also been reported from commercial shipping docks in Two Harbors.

Zebra mussels have not been documented from the Minnesota River; however, mussels have been collected from barges moored in the lower Minnesota and it is likely that zebra mussels are present as far upstream as commercial traffic travels the river. Zebra mussels have not been reported from the St. Croix River on any passive samplers, and none were found in five dive searches of the lower river from Stillwater to Prescott.

Control of zebra mussels

There was no control of zebra mussels conducted in 1993. Based on currently available control technologies we do not anticipate undertaking control activities at any time in the near future. There is still no environmentally safe control method available for natural systems. Thus, control is not a viable option once the mussel becomes established in a lake or river.

Because safe control methods do not exist, it is essential that a strong effort remains focused on public education and awareness to prevent spread. Boat checks, access inspections and talks/displays all serve to make the public aware of this exotic and how to prevent its spread (see Education and Inspection sections of this report).

Research on zebra mussels

The DNR began a risk assessment study for zebra mussel infestation and survival in the St. Croix River in 1993. The DNR also conducted research to establish levels of infestation of zebra mussels on native unionids in Lake Pepin on the Mississippi River. DNR staff attended the Third International Zebra Mussel Research Conference to hear current information on research being conducted throughout the United States and Canada. Research efforts continue in the United States and Canada on zebra mussel biology, ecology, impacts, and potential control techniques. A summary of some of the major studies follows.

Research has demonstrated serious impacts of zebra mussel infestation on native mussels, including the virtual elimination of populations of native mussels in areas of the Great Lakes. Zebra mussel populations have also been implicated in changes in water clarity, which may have impacts on lake or river ecosystems. Most control research is conducted by private industry (power companies, municipal water suppliers) to protect facilities. A variety of methods are available for industry and with proper pre-planning and monitoring, most facilities can remain ahead of zebra mussel infestations. Control in a natural system is not possible at this time. Some potential control research includes disruption of the zebra mussel spawning cycle, or disruption of the formation of the byssal threads. However, environmentally-safe control remains elusive and may never be possible.

Management of zebra mussels in other states

Management efforts in other states are very similar to efforts in Minnesota. With no control options available, management focuses mainly on public information and education to prevent or slow the spread of the zebra mussel. The term "management of zebra mussels" can give false hopes and impressions. Because this organism can withstand a lack of water or oxygen for extended periods, has no environmentally acceptable control options, spreads rapidly once introduced to a lake or river, and has extremely small life stages, detection and prevention of spread are difficult. It is highly likely that management of zebra mussels will remain focussed on public awareness and education.

Currently, New York is the only state that has a state-wide action plan. Wisconsin recently completed a report to their legislature ("Zebra Mussels: An Exotic Invader to Wisconsin Waters: A Report to the Legislature"). This report gives an overview of the biology, ecology, and problems from zebra mussels, examines potential impacts and outlines state activities, which deal mainly with public information and education. Few states have legislation regarding transport of zebra mussels (New York, Minnesota) and most do not have active monitoring efforts in place. Most states monitor populations and distribution through cooperative efforts between industry, Sea Grant extension offices, and federal and state agencies.

Coordination of efforts

An interagency workgroup was established by the NPS and U.S. Fish and Wildlife Service (USFWS) to develop a zebra mussel response plan for the St. Croix River. This plan was intended to keep zebra mussels from being introduced to the St. Croix River. The DNR provided technical information and assisted the agencies in the development of the response plan. As part of the plan, emergency travel restrictions were placed on the St. Croix River north of the Arcola sandbar to try and protect the native mussel fauna in the river above Stillwater. Boaters were not allowed to proceed north of Arcola if they had been in zebra mussel infested waters (below the Kinnickinnic River). DNR personnel monitored boat traffic proceeding upstream at Kinnickinnic narrows and recorded registration numbers to assist NPS personnel in verifying boaters statements of travel. This cooperative surveillance effort also involved assistance from Wisconsin Department of Natural Resources personnel at the Kinnickinnic State Park.

Research is being conducted by DNR personnel to estimate the potential for zebra mussel infestation and reproduction in various parts of the St. Croix watershed. These data will assist NPS and DNR managers in effectively targeting access monitoring and public awareness efforts.

Public awareness and education efforts benefit from cooperation between many participants: federal agencies (USFWS), state (DNR), Minnesota Sea Grant Extension, private industry (Northern States Power). These efforts are addressed in the Education section of this report.

Future needs for management of zebra mussels:

- A centralized, easily accessible statewide database on distribution and abundance should be top priority.
- Priority should be given to funding long-term research on infestation and impacts of zebra mussels on native unionids in the Mississippi River.
- If zebra mussels move upstream into the Lower St. Croix River, the state should support stringent restrictions on access into the uninfested portions of the river to protect threatened or endangered native mussels.

Management of Flowering Rush

Flowering rush (*Butomus umbellatus*) is an aquatic plant that has been introduced to North America from Europe and is currently found in several lakes in north-central Minnesota. The Minnesota Department of Natural Resources (DNR) is concerned about flowering rush because it has the potential to spread into a variety of aquatic habitats, where it may grow abundantly and possibly crowd out native aquatic vegetation. For these reasons, it has been identified as an undesirable exotic species in Minnesota.

Progress in flowering rush management

- Flowering rush was designated an undesirable exotic aquatic plant by DNR in 1993. This status makes transportation and propagation of flowering rush unlawful (see Appendix B).
- All known commercial growers of flowering rush were contacted by the DNR to advise them of the undesirable exotic aquatic plant status.
- The state management plan for flowering rush has been drafted and following an internal and external review and comment process, the final version should be adopted by spring of 1994. The plan includes information on flowering rush biology, the potential problems the plant may cause and management options. It outlines the Exotic Species Program's goals, objectives, strategies and actions for flowering rush management in 1994 and the future.
- Flowering rush continues to be included in the Exotic Species Program's public awareness efforts (also see Educational section). Identification and management of flowering rush was emphasized at exotic species workshops in 1993, particularly in west-central Minnesota where flowering rush is currently known to occur. The flowering rush fact sheet was updated following the 1993 field inventory, literature review and correspondence with other agencies who have had experience with flowering rush.
- An 'alert' tag was produced to distribute at lakes containing flowering rush; the tag informs lake users that flowering rush occurs on the lake and instructs them to clean their boats and equipment of all vegetation.

Inventory

Historically, flowering rush has been reported in Anoka, Rice and Becker Counties in Minnesota. In 1993, no flowering rush plants were located in Anoka County and only three plants (which were subsequently hand-pulled) were found at the Rice County site. Flowering rush populations were confirmed in Detroit Lakes and the Pelican River, Becker County. Lake Sallie and Lake Melissa, Becker County, are also reported to contain flowering rush, but were not inventoried in the last year.

Control of flowering rush

Past attempts to control flowering rush with herbicides have not been effective in Minnesota. Flowering rush can tolerate a wide range of aquatic habitats and may grow as a submersed or emergent form. Different herbicides are needed for controlling submersed and emergent plants. Herbicide control is not very effective on partially emergent plants. Application rates and techniques are still in the experimental stage. Herbicides currently available for flowering rush control are not selective and may harm non-target native plant species. For these reasons, no herbicide control was conducted for flowering rush in 1993.

As in past years, the Pelican River Watershed District mechanically harvested submersed flowering rush stands. Some lakeshore owners controlled small emergent stands by hand-pulling. There is concern that mechanical and/or manual removal of flowering rush may increase the natural rate of spread by breaking and distributing viable rhizome parts. Research that addresses this concern was initiated by the DNR in 1993 (see below).

Beginning in 1993, DNR Fisheries staff clipped flowering stalks in emergent stands to prevent seed set.

Research on flowering rush

The DNR's existing literature review on flowering rush was updated in 1993 to include articles from other countries where flowering rush occurs. Information about the distribution, biology and potential impacts of flowering rush was updated through correspondence with other states and individuals who have studied the species.

A consultant was hired to investigate alternative manual methods of flowering rush control. Experimental plots were established in Deadshot Bay of Detroit Lakes. Techniques that were evaluated included hand-pulling, raking and manually cutting. A final report for this study will be completed early in 1994 and should provide guidance for future control efforts.

Management of flowering rush in other states

In Michigan, flowering rush has been found since at least 1930. Currently, it is mostly found around Lake St. Clair and the western end of Lake Erie, but it is not abundant and is not considered a nuisance in that region (Wilcox 1993, pers. comm.).

Flowering rush has occurred in Ohio since at least 1941, but the Ohio Department of Natural Resources does not consider it a problem species and has no control program for it. (Schneider 1993, pers. comm.) There are dense stands of flowering rush in the Lake Erie region of Ohio and it may spread locally during periods of high water, but in Ohio it does not appear to be an aggressive weedy plant nor does it appear to eliminate native wetland species (Stuckey 1993, pers. comm.).

Flowering rush was found in Wisconsin as early as 1958 and there are at least seven collections from the state (Nichols 1993, pers. comm.). The species has not become widespread and the Wisconsin Department of Natural Resources does not control flowering rush (Engel 1993, pers. comm.).

The U.S. Bureau of Reclamation is the only agency in The United States known to control flowering rush. The Bureau used herbicides to control flowering rush in Idaho because it was causing water delivery problems within irrigation canal systems (Boutwell 1990). Broad spectrum herbicides were used because preservation of native plant species was not a concern. Methods used by the Bureau would not be acceptable in Minnesota lakes, such as Detroit Lakes, where healthy communities of native plants species exists.

Participation of others in control of flowering rush

The Pelican River Watershed District has been very active in the control of flowering rush. The District manages the existing mechanical harvesting program which is regulated by DNR's Division of Fish and Wildlife.

In 1993, members of the Pelican River Watershed District, the DNR area fisheries manager and the regional aquatic plant management specialist met with Ecological Services staff to discuss present and future management needs for flowering rush. Coordination with these individuals and organizations will continue in the future.

Future needs for flowering rush management:

- A determination of the statewide distribution and abundance of flowering rush is needed to assess its potential threat and the need for control.
- A long-term monitoring program for existing flowering rush populations is necessary to evaluate its rate of spread and its potential impact on native plant communities.
- More information on the biology of flowering rush and control options is required to develop a sound management program.

Management of Ruffe

The ruffe (*Gymnocephalus cernuus*), a Eurasian fish of the perch family, was introduced into Minnesota in the mid-1980s. Its likely source of introduction was from ballast water discharge by transoceanic ships. Since the discovery of the ruffe in the St. Louis River near Duluth in 1987, many agencies from Minnesota, Wisconsin, and Ontario as well as the U.S. Fish and Wildlife Service (USFWS) have been studying this exotic fish to better understand its impacts on North American fish communities. Research has not shown how fisheries will be most affected, but rapid increase in the ruffe population and possible replacement of fish biomass concerns many fish management agencies and sportfishing interests. Opinions within fish management agencies vary about how, and whether it is possible, to control ruffe in North America (Ruffe Control Program, 1993).

Progress in management of ruffe

- In Minnesota, regulations have been enacted to help prevent the dispersal of ruffe from the St. Louis River estuary. Currently, it is illegal to possess, transport, propagate, import, or sell ruffe in the state, except when taking dead ruffe specimens to the DNR for identification and/or to report a new occurrence (see M.R. 6216.0200 in Appendix B).
- Angling regulations in the St. Louis River estuary were modified in an attempt to increase predation on ruffe.
- Information about the ruffe has been included in brochures, billboards, and the state fishing regulations synopsis.
- Advisory signs have been posted in Wisconsin and Minnesota to alert boaters and anglers of the presence of ruffe in the St. Louis River estuary.

In 1992, the Great Lakes Fishery Commission established a Ruffe Task Force which prepared a report on ruffe. The report was submitted to the Federal Aquatic Nuisance Species (ANS) Task Force for consideration of the ruffe as a nuisance aquatic species. In April 1992, the ANS Task Force declared the ruffe an aquatic nuisance species, and a ruffe control committee was established. The two Minnesota representatives on the committee are Paul J. Wingate, Minnesota DNR Fisheries Research Manager, and Dr. George Spangler, Professor of Fisheries at the University of Minnesota. This committee prepared a Ruffe Control Program and a draft environmental assessment of the program. Members of the committee will continue to meet in 1994 to refine the program based on comments from the publication in the Federal Register. The USFWS allocated \$320,000 for research and control during their fiscal year 1993 (Busihan 1993). The USFWS and National Biological Survey have allocated a total of \$365,000 for ruffe control and research in fiscal year 1994.

Inventory of ruffe

The ruffe was first identified in 1987 in the St. Louis River adjacent to the Duluth / Superior harbor. A coordinated field sampling effort was organized and initiated in the spring of 1988. Cooperators were the USFWS, Minnesota DNR, Wisconsin DNR, Great Lakes Indian Fish and Wildlife Commission, and the Fond du lac Band of Lake Superior Chippewa. Sampling indicated the ruffe were widely distributed in the St. Louis River estuary.

The population of ruffe in the St. Louis River estuary has shown a rapid increase (see Table 23). The ruffe population there, and in the adjacent Lake Superior waters, is now estimated to be three million fish.

Table 23. Density and population estimate for ruffe in the St. Louis River 1989 - 1993.

Year	1989	1990	1991	1992	1993
No / Hectare	81	257	422	403	588
Total Population	0.36 Million	1.15 Million	1.9 Million	1.8 Million	2.6 Million

Source: National Biological Survey - Ashland Biological Station

The National Biological Survey, Ashland Biological Station of the National Fisheries Research Center - Great Lakes has taken the lead role in ruffe population investigations. In the spring of 1992, the Ashland Fisheries Resources Office began a surveillance program for ruffe in the upper Great Lakes. A total of 16 potential locations were sampled for ruffe in Lake Superior. Ruffe were found in 13 rivers along the south shore of Lake Superior. The presence of ruffe in these locations indicates an expansion of their range from the original St. Louis River estuary population.

During Lake Superior fish population assessment netting, DNR has set nets in inshore areas. Ruffe have been found in Minnesota waters of Lake Superior as far north as French River. Seven ruffe were found in the harbor area of Thunder Bay, Ontario during 1991; however, sampling by Canadian officials in 1992 and 1993 did not collect ruffe. It is presumed that population did not reproduce and is hoped that it no longer exists.

The USFWS Fisheries Resources Offices will continue to conduct or coordinate surveillance sampling in potential infestation areas in U.S. waters of the Great Lakes. The Ontario Ministry of Natural Resources will conduct surveillance in Canadian waters of Lake Superior and other Great Lakes.

In Minnesota inland waters, there is no special surveillance effort for ruffe. DNR's Section of Fisheries lake surveys and angler reports will be the primary method of detecting movement of ruffe populations to inland waters. No ruffe were confirmed in Minnesota inland waters in 1993.

Control of ruffe

The Minnesota and Wisconsin DNR have attempted to control ruffe in the Duluth area of Lake Superior and the St. Louis River since 1988. Several tactics were considered including predator control, chemical treatment of the lower St. Louis River system, and stocking sterile male ruffe. Chemical treatment was not considered feasible and sterile male techniques were not practical because a large ruffe population had developed already.

Predator control was chosen as a tactic that could be implemented immediately and might provide a check on the ruffe expansion. Angling regulation changes and stocking of predator fish have been used in an attempt to increase predation on ruffe by native fish.

Since it is not possible or feasible to eradicate ruffe from the Duluth harbor area with existing technology, the objective of the Federal Ruffe Control Program is to contain ruffe to western Lake Superior. The current draft of the Federal Ruffe Control Program has six components and three requisites.

The control components are:

- 1) Chemical treatments on the periphery of the range
- 2) Ballast water management
- 3) Population investigations of ruffe genetics
- 4) Surveillance
- 5) Predator enhancement evaluation
- 6) Education

The requisites of a ruffe control program are:

- 1) International cooperation
- 2) Assessment of control activities
- 3) If ruffe are found outside Lake Superior or beyond Keewenaw Peninsula, control efforts will be re-evaluated

In certain situations, chemical control may be a feasible alternative; however, local citizen concern and the difficulty in obtaining permits may limit chemical control options.

Research on ruffe

The USFWS and the National Biological Survey are conducting most of the research on ruffe. The amount of research they have conducted has been limited by funding. Current research topics include: monitoring in St. Louis River estuary, monitoring areas of future expansion, predator food habits on ruffe, and project work of U.S. Environmental Protection Agency-Duluth Lab.

Effectiveness of ruffe management

The effectiveness of the state's predator stocking and angler regulations is unclear and debated among biologists. Those activities were the only control strategies initially available and are being evaluated. Regulations to prevent the transportation of ruffe to inland lakes have, to date, been effective.

Management in other states

Wisconsin is the only other state with known populations of ruffe. It has not been found in any inland waters of that state. Wisconsin DNR has established regulations to prohibit possession of ruffe and harvest of bait fish in Lake Superior and its tributaries up to the first fish barrier. Angling regulations, similar to Minnesota's, in the St. Louis river estuary were also used in an attempt to increase predation on ruffe by native fish. In the St. Louis River, in both Minnesota and Wisconsin, daily limits of northern pike and walleye were reduced from 6 to 2 per day. The Wisconsin DNR is proposing to prohibit bait harvesting in Lake Superior.

Neither the state of Wisconsin, USFWS, or the Indian tribes have used chemical control on ruffe in the Superior harbor or in tributaries along the south shore of Lake Superior. It is not clear if chemical or physical control of ruffe may occur in Wisconsin waters in future years.

Participation of others in ruffe control efforts

The National Biological Survey has been involved in ruffe research and a USFWS biologist is the chairperson of the Ruffe Control Committee. Employees of provinces, tribes, and other Great Lakes states have been involved in development of reports and plans regarding ruffe.

Future needs for ruffe management:

If ruffe are to be contained in existing waters, continued efforts in the areas of public awareness, watercraft inspections, regulations, and enforcement will be necessary.

- Ruffe identification cards for anglers would be beneficial for reliable reporting of new infestations.
- If ruffe populations are to be controlled or eradicated at existing or future locations, there must be considerable investment in the research of environmentally sound control methods.
- The state should support an continued biological assessment efforts by the USFWS and NBS.

A response plan needs to be developed to prepare for potential discoveries of ruffe in inland waters of the state.

Management of Eurasian Swine

In a number of states, populations of escaped Eurasian swine (*Sus scrofa* subspecies) and feral swine have been recognized to be undesirable. The Minnesota Department of Agriculture (MDA) conducted a survey of wildlife officials and chief veterinarians in other states to determine the degree of harm caused by wild hogs (Minnesota Department of Agriculture 1993). Many states indicated that free roaming swine damage streams, woodlands, and wildlife.

Eurasian swine have been unregulated in Minnesota, except for testing for disease by the State Board of Animal Health. Many organizations in Minnesota have called for Eurasian swine to be prohibited or closely regulated because of the potential ecological harm they could cause if wild populations became established. According to the MDA survey, 27 states recommended banning "wild hogs from our state."

Progress in management of Eurasian swine

During 1993, new legislation (see M.S. 84.9695 in Appendix A) and rules (see M.R. 6216 in Appendix B) were enacted that designated Eurasian swine as a restricted species and undesirable exotic wild animals. These designations are intended to keep Eurasian swine from escaping and becoming naturalized in the state. The restricted species legislation does the following:

- creates a task force to conduct a study of Eurasian swine in the state and report to the legislature;
- makes importation, possession, propagation, transportation and release of Eurasian swine unlawful in the state;
- authorizes DNR to issue permits to possess herds that were in existence in the state on March 1, 1993;
- requires animals to be marked to identify ownership;
- requires that escaped animals must be reported to a DNR conservation officer within 24 hours of the escape;
- prescribes the penalty for violating the law as a misdemeanor;
- requires owners to file a bond with the DNR;

Distribution of Eurasian swine

There are no known populations of naturalized Eurasian swine or feral swine in Minnesota. However in September of 1991, 14 Eurasian swine escaped from a farm in Cottonwood County. Some of the animals traveled at least 46 miles during a two week period before returning to the owners farm. The other escaped animals were shot: one by a county sheriff, and seven by a neighbor in his cornfield.

There are five known herds of Eurasian swine held in captivity in Minnesota. There may be additional herds in captivity that have not been registered with the Board of Animal Health as required by 1993 legislation. Simple methods are not available to determine the parentage of Eurasian swine. This may make it difficult to determine if swine herds in Minnesota are Eurasian or domestic (*Sus scrofa domesticus*).

Management in other states

The survey of other states revealed this information:

- 32 states considered wild hogs a liability if they are loose in the wild
- 5 states said they were an asset if they are loose in the wild
- 12 states have organized control efforts to reduce the number of wild hogs
- 19 states allow hunting of wild hogs, many with year round hunting and no limits

Future needs for Eurasian swine management:

- Non-registered herds need to be identified.
- Facilities holding known herds need to be inspected and issued permits when appropriate.
- Methods should be developed to differentiate between domestic and Eurasian swine herds.

Appendix A - Selected Minnesota Exotic Species Statutes

Compiled by the Minnesota Department of Natural Resources - Exotic Species Program

M.S. 18.317 WATER TRANSMITTED HARMFUL EXOTIC SPECIES.

Subd.1. **Transportation prohibited.** Except as provided in subdivision 2, a person may not transport Eurasian or Northern water milfoil, *myriophyllum spicatum* or *exalbensis*, zebra mussels, or other water-transmitted harmful exotic species identified by the commissioner of natural resources on a road or highway, as defined in section 160.02, subdivision 7, or on forest roads.

Subd.1a. **Placement Prohibited.** A person may not intentionally place ecologically harmful exotic species, as defined in section 84.967, in public waters within the state.

Subd. 2. **Exception.** A person may transport Eurasian or Northern water milfoil, *myriophyllum spicatum* or *exalbensis*, or other water-transmitted harmful exotic species identified by the commissioner of natural resources for disposal as part of a harvest or control activity.

Subd. 3. **Launching of watercraft with Eurasian or Northern water milfoil or other Harmful Species prohibited.**

(a) A person may not place a trailer or launch a watercraft with Eurasian or Northern water milfoil zebra mussels, or other water-transmitted harmful exotic species identified by the commissioner of natural resources attached into waters of the state. A conservation officer or other licensed peace officer may order the removal of Eurasian or Northern water milfoil, zebra mussels, or other water-transmitted harmful exotic species identified by the commissioner of natural resources from a trailer or watercraft before being placed or launched into waters of the state.

(b) For purposes of this section, the meaning of watercraft includes a float plane and "waters of the state" has the meaning given in section 103G.005, subdivision 17.

(c) A commercial harvester shall clean aquatic plant harvesting equipment of all aquatic vegetation at a suitable location before launching the equipment in another body of water.

Subd. 3a. **Inspection of Watercraft and Equipment.**

(a) Licensed watercraft and associated equipment including weed harvesters, that are removed from any waters of the state that the commissioner of natural resources identifies as being contaminated with Eurasian water milfoil, zebra mussels, or other water-transmitted harmful exotic species identified by the commissioner of natural resources, shall be randomly inspected between May 1 and October 15 for a minimum of 10,000 hours by personnel authorized by the commissioner of natural resources. Beginning in calendar year 1994, a minimum of 20,000 hours of random inspections must be conducted per year.

Subd. 4. **Enforcement.** This section may be enforced by conservation officers under sections 97A.205 and 97A.211, and other licensed peace officers.

Subd. 5. **Penalty.** A person who violates subdivision 1, 1a, 3, or 3a is guilty of a misdemeanor. A person who refuses to obey the order of a peace officer or conservation officer to remove Eurasian or Northern water milfoil from a trailer or watercraft is guilty of a misdemeanor.

NOXIOUS WEEDS

M.S. 18.75 PURPOSE.

It is the policy of the legislature that residents of the state be protected from the injurious effects of noxious weeds on public health, the environment, public roads, crops, livestock, and other property. Sections 18.76 to 18.88 contain procedures for controlling and eradicating noxious weeds on all lands within the state.

M.S. 18.76 CITATION.

Sections 18.76 to 18.88 may be cited as the "Minnesota noxious weed law."

M.S. 18.77 DEFINITIONS.

Subd. 8. **Noxious Weed.** "Noxious weed" means an annual, biennial, or perennial plant that the commissioner (of agriculture) designates to be injurious to public health, the environment, public roads, crops, livestock, or other property. (MN Department of Agriculture Commissioner's Order declares purple loosestrife, both *L. salicaria* and *L. virgatum* to be a noxious weed.)

M.S. 18.78 CONTROL OR ERADICATION OF NOXIOUS WEEDS.

Subdivision 1. **Generally.** Except as provided in section 18.85, a person owning land, a person occupying land, or a person responsible for the maintenance of public land shall control or eradicate all noxious weeds on the land at a time and in a manner ordered by the commissioner (of agriculture), a county agricultural inspector, or a local weed inspector.

Subdivision 2. **Control of purple loosestrife.** Except as provided below, an owner of nonfederal lands underlying public waters or wetlands designated under section 103G.201 is not required to control or eradicate purple loosestrife below the ordinary high water level of the public water or wetland. The commissioner of natural resources is responsible for control and eradication of purple loosestrife on public waters and wetlands designated under section 103G.201, except those located upon lands owned in fee title or managed by the United States. The officers, employees, agents and contractors of the commissioner of natural resources may enter upon public waters and wetlands designated under section 103G.201 and, after providing notification to the occupant or owner of the land, may cross adjacent lands as necessary for the purpose of investigating purple loosestrife infestations, formulating methods of eradication, and implementing control and eradication of purple loosestrife. The commissioner, after consultation with the commissioner of agriculture, shall, by June 1 of each year, compile a priority list of purple loosestrife infestations to be controlled in designated public waters. The commissioner of agriculture must distribute the list to county agriculture inspectors, local weed inspectors, and their appointed agents. The commissioner of natural resources shall control listed purple loosestrife infestations in priority order within the limits of appropriations provided for that purpose. This procedure shall be the exclusive means for control of purple loosestrife on designated public waters by the commissioner of natural resources and shall supersede the other provisions for control of noxious weeds set forth elsewhere in Minnesota Statutes, chapter 18. The responsibility of the commissioner to control and eradicate purple loosestrife on public waters and wetlands located on private lands and the authority to enter upon private lands ends ten days after receipt by the commissioner of natural resources of a written statement from the landowner that the landowner assumes all responsibility for control and eradication of purple loosestrife under sections 18.78 to 18.88. State officers, employees, agents, and contractors of the commissioner of natural resources are not liable in a civil action for trespass committed in the discharge of their duties under this section and are not liable to anyone for damages, except for damages arising from gross negligence.

M.S. 18.79 DUTIES OF THE COMMISSIONER (OF AGRICULTURE).

Subd. 1. **Enforcement.** The commissioner of agriculture shall administer and enforce sections 18.76 to 18.88.

Subd. 4. **Rules.** The commissioner may adopt necessary rules under chapter 14 for the proper enforcement of sections 18.76 to 18.88.

Subd. 5. **Order For Control Or Eradication Of Noxious Weeds.** The commissioner (of agriculture), a county agricultural inspector, or a local weed inspector may order the control or eradication of noxious weeds on any land within the state.

ECOLOGICALLY HARMFUL SPECIES**M.S. 84.966 CONTROL OF PURPLE LOOSESTRIFE.**

Subd. 1. **Definition.** For the purpose of this section, "purple loosestrife" means *Lythrum salicaria*.

Subd. 2. **Establishment of Control Program.** The commissioner of natural resources shall coordinate a control program to curb the growth of purple loosestrife. The commissioners of agriculture and transportation must aid and cooperate with the commissioner of natural resources to establish, implement and enforce the control program.

M.S. 84.967 ECOLOGICALLY HARMFUL SPECIES: DEFINITION.

For the purposes of sections 10 to 12, "ecologically harmful exotic species" means non-native aquatic plants or wild animals that can naturalize, have high propagation potential, are highly competitive for limiting factors, and cause displacement of, or otherwise threaten, native plants or native animals in their natural communities.

M.S. 84.968 ECOLOGICALLY HARMFUL SPECIES: MANAGEMENT PLAN; REPORT.

Subdivision 1. Management Plan.

(a) By January 1, 1993, a long-term statewide ecologically harmful exotic species management plan must be prepared by the commission of natural resources and address the following:

- (1) coordinated detection and prevention of accidental introduction;
- (2) coordinated dissemination of information about ecologically harmful exotic species among resource management agencies and organizations;
- (3) a coordinated public awareness campaign regarding ecologically harmful exotic animals and aquatic plants;
- (4) a process, where none exists, to designate and classify ecologically harmful exotic species into the following categories:

(i) undesirable wild animals that must not be sold, propagated, possessed, or transported; and

(ii) undesirable aquatic exotic plants that must not be sold, propagated, possessed, or transported;

(5) coordination of control and eradication of ecologically harmful exotic species on lands and public waters; and

(6) develop a list of exotic wild animal species intended for nonagricultural purposes, or propagation for release by state agencies or the private sector.

(b) The plan prepared under paragraph (a) must include containment strategies that include:

(1) participation by lake associations, local citizen groups, and local units of government in the development and implementation of lake management plans;

(2) a reasonable and workable inspection requirement for boats and equipment participating in organized events on the waters of the state.

(3) allowing access points infested with ecologically harmful exotic species to be closed, for not more than a total of seven days during the open water season, for control or eradication purposes, and requiring posting of signs.

(4) provisions for reasonable weed-free maintenance of public accesses to infested waters; and

(5) notice to travelers of the penalties for violations of laws relating to ecologically harmful exotic species.

Subd. 2. Report. The commissioner of natural resources shall by January 1 each year submit a report on ecologically harmful exotic species to the legislative committees having jurisdiction over environmental and natural resource issues. The report must include:

(1) detailed information on expenditures for administration, education, eradication, inspections, and research;

(2) an analysis of the effectiveness of management activities conducted in the state, including chemical eradication, harvesting, educational efforts, and inspections;

(3) information on the participation of other state agencies, local government units, and interest groups in control efforts;

(4) information on management efforts in other states;

(5) information on the progress made by species;

(6) an estimate of future management needs; and

(7) an analysis of the financial impact on persons who transport weed harvesters of the prohibition in section 1.

M.S. 84.969 COORDINATING PROGRAM, GRANTS, AND REGIONAL COOPERATION.

Subd. 1. **Coordinating Program.** The commissioner of natural resources shall establish a statewide coordinating program to prevent and curb the spread of ecologically harmful exotic animals and aquatic plants.

Subd. 2. **Grants.** The coordinating program created in subdivision 1 may accept gifts, donations, and grants to accomplish its duties and must seek available federal grants through the federal Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990. A portion of these funds shall be used to implement the plan under section 10.

Subd. 3. **Regional Cooperation.** The governor may cooperate individually and regionally, with other state governors in the midwest for the purposes of ecologically harmful exotic species management and control.

M.S. 84.9691 RULEMAKING

(a) The commissioner of natural resources may adopt emergency and permanent rules restricting the introduction, propagation, use, possession, and spread of ecologically harmful exotic species in the state, as outlined in section 84.967. The emergency rulemaking authority granted in this paragraph expires July 1, 1994.

(b) The commissioner shall adopt rules to identify bodies of water with limited infestation of Eurasian watermilfoil. The areas that are infested shall be marked and prohibited for use.

M.S. 84.9692 CIVIL CITATIONS AND PENALTIES

Subdivision 1. **Authority to issue.** After appropriate training, conservation officers, peace officers, and other staff designated by the commissioner may issue warnings or citations to persons who:

- (1) unlawfully transport ecologically harmful exotic species on a public road;
- (2) place a trailer or launch a watercraft with ecologically harmful species attached into waters of the state;
- (3) operate a watercraft in a Eurasian water milfoil infestation area; or
- (4) damage, remove, or sink a buoy marking a Eurasian water milfoil infestation area.

Subd. 2. **Penalty Amount.** A citation issued under this section may impose up to the following penalty amounts:

- (1) \$50 for transporting visible Eurasian water milfoil on a public road in each of the following locations:
 - (i) the exterior of the watercraft below the gunwales including the propulsion system;
 - (ii) any surface of a watercraft trailer;
 - (iii) any surface of a watercraft interior of the gunwales;
 - (iv) any water container including livewells, minnow buckets, or coolers which hold water; or
 - (v) any other area where visible Eurasian water milfoil is found not previously described in items (1) to (4);
- (2) \$150 for transporting visible zebra mussels on a public road;
- (3) \$300 for transporting live ruffe or live rusty crayfish on a public road;
- (4) for attempting to launch or launching into noninfested waters a watercraft with visible Eurasian water milfoil or adult zebra mussels attached, \$500 for the first offense and \$1,000 for a second or subsequent offense;
- (5) \$100 for operating a watercraft in a marked Eurasian watermilfoil infestation area other than as provided by law;
- (6) \$150 for intentionally damaging, moving, removing, or sinking a milfoil buoy; or
- (7) \$150 for launching or attempting to launch into infested waters a watercraft with visible Eurasian water milfoil or visible zebra mussels attached.

Subd. 3. **Payment of Penalty.** If not appealed under subdivision 4, civil penalties are payable to the commissioner no later than 30 days after issuance. Fines collected under this section must be credited to the water recreation account.

Subd. 4. **Appeals.** Citations may be appealed under the procedures in section 116.072, subdivision 6, if the person requests a hearing by notifying the commissioner within 15 days after receipt of the citation. If a hearing is not requested within the 15-day period, the citation becomes a final order not subject to further review.

Subd. 5. **Enforcement of Field Citations.** Field citations may be enforced under section 18.317.

Subd. 6. **Cumulative Remedy.** The authority of conservation officers to issue field citations is in addition to other remedies available under law, except that the state may not seek penalties under any other provision of law for the incident subject to the citation.

M.S. 84.9695 RESTRICTED SPECIES

Subdivision 1. Definitions.

- (a) The definitions in this subdivision apply to this section.
- (b) "Commissioner" means the commissioner of natural resources.
- (c) "Restricted species" means Eurasian wild pigs and their hybrids (*Sus scrofa* subspecies and *Sus scrofa* hybrids), excluding domestic hogs (*S. Scrofa domesticus*)
- (d) "Release" means an intentional introduction or escape of a species from the control of the owner or responsible party.

Subd. 2. Importation: Possession: Release of Restricted Species. It is unlawful for a person to import, possess, propagate, transport, or release restricted species, except as provided in subdivision 3.

Subd. 3. Permits.

(a) The commissioner may issue permits for the transportation, possession, purchase, or importation of restricted species for scientific, research, educational, or commercial purposes. A permit issued under this subdivision may be revoked by the commissioner if the conditions of the permit are not met by the permittee or for any unlawful act or omission, including accidental escapes.

(b) the commissioner may issue permits for a person to possess and raise a restricted species for commercial purposes if the person was in possession of the restricted species on March 1, 1993. Under the permit, the number of breeding stock of the restricted species in the possession of the person may not increase by more than 25 percent and the person must comply with the certification requirements in subdivision 7.

(c) A person may possess a restricted species without a permit for a period not to exceed two days for the purpose of slaughtering the restricted species for human consumption.

Subd. 4. Notice of Escape of Restricted Species. In the event of an escape of a restricted species, the owner must notify within 24 hours a conservation officer and the board of animal health and is responsible for the recovery of the species. The commissioner may capture or destroy the escaped animal at the owner's expense.

Subd. 5. Enforcement. This section may be enforced under sections 97A.205 and 97A.211.

Subd. 6. Penalty. A person who violates subdivision 2, 4, or 7 is guilty of a misdemeanor.

Subd. 7. Certification and Identification Requirements.

(a) A person who possesses restricted species on the effective date of this section must submit certified numbers of restricted species in the person's possession to the board of animal health by June 1, 1993.

(b) Restricted species in the possession of a person must be marked in a permanent fashion to identify ownership. The restricted species must be marked as soon as practicable after birth or purchase.

Subd. 8. Containment. The commissioner shall develop criteria for approved containment measures for restricted species with the assistance of producers of restricted species.

Subd. 9. Bond; Security. A person who possesses restricted species must file a bond or deposit with the commissioner security in the form and in the amount determined by the commissioner to pay for the costs and damages caused by an escape of a restricted species.

Subd. 10. Fee. The commissioner shall impose a fee for permits in an amount sufficient to cover the costs of issuing the permits and for facility inspections. The fee may not exceed \$50. Fee receipts must be deposited in the state treasury and credited to the game and fish fund and are appropriated to the commissioner for the purposes of this section.

RESTRICTED SPECIES TASK FORCE

Subdivision 1. Creation. A task force is created to evaluate the feasibility of allowing restricted species in the state. The task force shall consist of the following members: a member of the senate appointed by the subcommittee on committees of the committee on rules and administration, a member of the house of representatives appointed by the speaker of the house of representatives, the commissioner of natural resources or the commissioner's designee, the commissioner of agriculture or the commissioner's designee, a representative of the board of animal health, two representatives of producers of restricted species, a representative of the Minnesota pork producers association, and a representative of the conservation community appointed by the commissioner of natural resources.

Subd. 2. Chair. The commissioner of agriculture or the commissioner's designee shall chair the task force and shall make the appointments for the producers of the restricted species and the board of animal health as provided in subdivision 1.

Subd. 3. **Duties.** The task force shall conduct a study of restricted species in the state and make recommendations concerning the following issues:

- (1) the economic viability of raising restricted species in the state in a safe manner;
- (2) health threats, including the spread of diseases posed by restricted species;
- (3) the ecological threat to the state posed by restricted species;
- (4) the administrative impact on the departments of agriculture and natural resources if restricted species are permitted in the state;
- (5) development of a plan to ban restricted species from the state and recommendations for the amount of compensation that is appropriate to pay producers if a ban is enacted into law;
- (6) a determination of the number of restricted species in the state and their location; and
- (7) any other factors relative to the costs, benefits, and feasibility of permitting restricted species in the state.

Subd. 4. **Report.** The task force shall submit a written report containing its recommendations and findings to the legislature by January 1, 1994.

LICENSES

M.S. 86B.401 WATERCRAFT LICENSES.

Subd. 11. **Suspension for not removing Eurasian water milfoil or other harmful species.** The commissioner, after notice and an opportunity for hearing, may suspend for a period of not more than one year the license of a watercraft if the owner or person in control of the watercraft or its trailer refuses to comply with an inspection order of a conservation officer or other licensed peace officer or an order to remove Eurasian or Northern watermilfoil, *myriophyllum spicatum* or *exalbenscens*, zebra mussels, or other ecologically harmful species identified by the commissioner from the watercraft or its trailer as provided in section 18.317, subdivision 3.

M.S. 86B.415 LICENSE FEES.

Subd. 7. **Watercraft surcharge.** A surcharge is placed on each watercraft licenses under subdivisions 1 to 5, for control, public awareness, law enforcement, monitoring, and research of nuisance aquatic exotic species such as zebra mussel, purple loosestrife and Eurasian water milfoil in public waters and public wetlands. The surcharge is \$5 until December 31, 1996, and \$3 there after.

HARVEST AND CONTROL OF AQUATIC PLANTS

103G.615 PERMITS TO HARVEST OR DESTROY AQUATIC PLANTS.

Subd.1. Authorization.

- (a) The commissioner may issue permits, with or without a fee, to:
- (1) gather or harvest aquatic plants, or plant parts, other than wild rice from public waters;
 - (2) transplant aquatic plants into public waters;
 - (3) destroy harmful or undesirable aquatic vegetation or organisms in public waters under prescribed conditions to protect the waters, desirable species of fish, vegetation, other forms of aquatic life, and the public.

- (b) Application for a permit must be accompanied by a permit fee, if required.

Subd. 2. Fees.

(a) The commissioner shall establish a fee schedule for permits to harvest aquatic plants other than wild rice, by order, after holding a public hearing. The fees may not exceed \$200 per permit based upon the cost of receiving, processing, analyzing, and issuing the permit, and additional costs incurred after the application to inspect and monitor the activities by the permit.

(b) The fee for a permit for chemical treatment of rooted aquatic vegetation may not exceed \$20 for each contiguous parcel of shoreline owned by an owner. This fee may not be charged for permits issued in connection with lakewide Eurasian water milfoil control programs.

(c) A fee may not be charged to the state or a federal government agency applying for a permit.

(d) The money received for the permits under this subdivision shall be deposited in the treasury and credited to the game and fish fund.

Subd 3. **Permit standards.** The commissioner shall, by order, prescribe standards to issue and deny permits under subdivision 2. The standards must ensure that aquatic plant control is consistent with shoreland conservation ordinances, lake management plans and programs, and wild and scenic river plans.

103G.617 EURASIAN WATER MILFOIL EDUCATION AND MANAGEMENT.

Subd. 1. **Definition.** For the purposes of this section, "Eurasian water milfoil" means *myriophyllum spicatum*.

Subd. 2. **Inventory.** The commissioner shall inventory and monitor the growth of Eurasian water milfoil on lakes in the state. The commissioner may use volunteers to aid in the inventory effort.

Subd. 3. **Education.** The commissioner shall publish and distribute informational materials to lakeshore owners and boaters on the control problems of Eurasian water milfoil.

Subd. 4. **Management.** The commissioner shall coordinate a control program to manage the growth of Eurasian water milfoil with appropriate local units of government, special purpose districts, and lakeshore associations. Technical assistance may be provided by the commissioner upon request.

Subd. 5. **Research.** The commissioner shall initiate cooperative research with the University of Minnesota and other public and private research facilities to study the use of nonchemical methods, including biological control agents, for control of Eurasian water milfoil.

103G.625 MUNICIPAL CONTROL OF AQUATIC VEGETATION AND ORGANISMS.

Subdivision 1. **Authority.** The governing body of a municipality or town may expend funds for the control or destruction of harmful or undesirable aquatic vegetation or organisms in public waters and may cooperate with other governing bodies and landowners in the control or destruction.

Subd. 2. **Permit required.** The control or destruction of the aquatic vegetation or organisms may not be started unless a permit has been obtained from the commissioner under section 103G.615 and the work is done in accordance with the terms and conditions of the permit.

Subd. 3. **Funding.**

(a) The governing body of a municipality or town may use any available funds and may levy a tax not to exceed the lesser of (1) 0.01596 percent of taxable market value, or (2) 50 cents per capita, to implement this section.

(b) To provide funds in advance of collection of the tax levies, the governing body may, at any time after the tax has been levied and certified to the county auditor for collection, issue certificates of indebtedness in anticipation of the collection and payment of the tax. The total amount of the certificates, including principal and interest, may not exceed 90 percent of the amount of the levy and must become payable from the proceeds of the levy not later than two years from the date of issuance. The certificates shall be issued on terms and conditions as the governing body may determine and sold as provided in section 475.60.

(c) If the governing body determines that an emergency exists, it may make appropriations from the proceeds of the certificates for authorized purposes without complying with statutory or charter provisions requiring that expenditures be based on a prior budget authorization or other budgeting requirement.

(d) The proceeds of a tax levied or an issue of certificates of indebtedness must be deposited in a separate fund and expended only for purposes authorized by this section. If a disbursement is not made from the fund for a period of five years, money remaining in the fund may be transferred to the general fund.

SESSION LAWS

M.L. 1989, Chapter 335, Art. 1, Sec. 268

Sec. 268 Exotic Species Management and Monitoring.

Subdivision 1. **Definition.** For the purpose of this section, "exotic species" means non-native plants or wild animals that have the potential to harm the environment, or threaten native plants or wild animals.

Subdivision 2. Task Force.

(a) An interagency task force is created to establish a long-term program on exotic species management. The task force shall be composed of the commissioner or director of the department of natural resources, agriculture, health, transportation, and the board of water and soil resources, and three people with special expertise in the private sector on exotic plants or animals, to be appointed by the commissioner of natural resources who shall also serve as the chair.

(b) Each commissioner or director may designate a delegate from their respective state agencies to represent that commissioner on the task force.

(c) The three private citizens on the task force may be reimbursed for their necessary expenses in attending task force meetings according to Minnesota Statutes, section 15.075.

Subd. 3. Duties; Responsibilities. The task force shall:

- (1) identify the existing and potential exotic species threats to be state's environment;
- (2) rank the exotic species identified according to their degree of threat;
- (3) develop a long term management program for exotic species control; and
- (4) report on findings and recommendations to the natural resources committees in the house and senate by January 1, 1990, along with any necessary changes in the legislation.

M.L. 1991, Chapter 241

Section 10. Checks of Trailered Boats (SF 800).

(a) The Commissioner of natural resources shall establish a two-year program of at least five checks per year of trailered boats. The purpose of the checks is to inspect boats and trailers for Eurasian water milfoil fragments, and to inform and educate the boat owners about Eurasian milfoil and other exotic species and how to prevent their spread.

(b) The commissioner shall assess the effectiveness of the program established in paragraph (a), keep records on the occurrence of Eurasian water milfoil fragments or other exotic species, and report to the legislature by January 1, 1993.

M.L. 1992, Ch. 513, Art. 2, Sec. 9

Biological Control of Eurasian Water Milfoil

160,000

This appropriation is to the commissioner of natural resources for a research program leading to biological control of Eurasian water milfoil.

\$166,000 for the fiscal year ending June 30, 1992 and 166,000 for the fiscal year ending June 30, 1993, are appropriated to the commissioner of natural resources from the water recreation account for control, public awareness, law enforcement, monitoring, and research of exotic species such as zebra mussel, purple loosestrife and Eurasian water milfoil in public waters and public wetlands. Any unencumbered balance in the first year does not cancel and is available for the second year. (effective the day following enactment)

M.L. 1992, Ch. 594, Sec. 11

\$219,000 is appropriated from the water recreation account in the natural resources fund to the commissioner of natural resources for control, public awareness, law enforcement, monitoring, and research of nuisance exotic species in public waters. Of this amount, \$80,000 may be used to conduct access inspections under section 5 [Inspection of watercraft and equipment].

M.L. 1993, Ch. 235 (HF 864)

Sec. 6. Management of Eurasian water milfoil in White Bear lake.

By May 31, 1993, the department of natural resources shall recommend appropriate management methods for the control of Eurasian water milfoil in White Bear Lake to be implemented by the White Bear Lake conservation district in cooperation with local units of government, lake associations, and other local citizen groups.

Sec. 7. Appropriation.

\$347,000 in fiscal year 1994 and \$448,000 in fiscal year 1995 are appropriated from the water recreation account in the natural resources fund to the commissioner of natural resources for control, public awareness, law enforcement, monitoring and research on nuisance aquatic exotic species in public waters and wetlands.

M.L. 1993. Ch. 172, Article 1., Sec. 14, Subd. 12 (I)

This appropriation is from the trust fund to the commissioner of natural resources to research biological control for purple loosestrife and Eurasian watermilfoil. The purple loosestrife research must be done in cooperation with the commissioner of agriculture. \$100,000 is for the propagation, release, and evaluation of insects for purple loosestrife control; \$50,000 is for the development of mycoherbicides to control purple loosestrife; \$200,000 is for evaluation of biocontrol agents for Eurasian watermilfoil fungi and insects; and \$50,000 is to research the biology of Eurasian watermilfoil. The \$250,000 for Eurasian watermilfoil must be matched by \$200,000 of nonstate funds.

Appendix B - Selected Minnesota Rules

WATERWAY MARKERS

M. R., Chapter 6110.1500, Subp. 7. Milfoil areas. Buoys or signs indicating an area that is infested with Eurasian water milfoil may be marked using a solid yellow sign or buoy. If a buoy is used, it shall be no less than four inches in diameter and extend at least 30 inches above the surface of the water. The words "Milfoil" or "Milfoil Area" must appear on opposing sides of the buoy in at least two-inch high black letters. If a sign is used, it shall be no more than 12 inches in width or more than 18 inches in height and extend 30 inches above the surface of the water at normal water level. The words "Milfoil" or "Milfoil Area" must appear on the sign in at least two-inch high black letters.

ECOLOGICALLY HARMFUL EXOTIC SPECIES EMERGENCY RULES

(effective August 12, 1993 -August 11, 1994)

M.R. 6216.0100 DEFINITIONS.

Subpart 1. **Scope.** The terms used in chapters 6216.0100 through 6216.0700 have the meanings given to them in *Minnesota Statutes*, sections 84.967 and 97A.015, unless otherwise noted.

Subp. 2. **Applicant.** "Applicant" means any person who applies for a permit pursuant to parts 6216.0100 to 6216.0700.

Subp. 3. **Aquatic plant.** "Aquatic plant" means a plant, including any part or seed of a plant, that can grow in water or on a substrate that is at least periodically deficient in oxygen as a result of water content.

Subp. 4. **Commissioner.** "Commissioner" means the commissioner of natural resources or a designated employee.

Subp. 5. **Department.** "Department" means the Department of Natural Resources.

Subp. 6. **Escape.** "Escape" means an accidental introduction or escape of a species from the control of the owner or responsible party.

Subp. 7. **Exotic species.** "Exotic species" means a species that enters or is introduced into an ecosystem beyond its historic range, except through a natural range expansion, including any such organism transferred from another country into the state, unnaturally occurring hybrids, cultivars, non-Minnesota genetic lineage or subspecies, genetically engineered species or strains, or other genetically altered species.

Subp. 8. **Exotic species importation and release permit.** "Exotic species importation and release permit" means a permit issued by the commissioner to allow the importation and release of an exotic species in the state.

Subp. 9. **Infested waters.** "Infested waters" means bodies of water with populations of zebra mussels, Eurasian water milfoil, ruffe, spiny water flea, or white perch.

Subp. 10. **Limited infestation of Eurasian watermilfoil.** "Limited infestation" means an infestation of Eurasian watermilfoil occupying less than 20 percent of the littoral area of a water body up to maximum of 75 acres, excluding water bodies where mechanical harvesting is used to manage Eurasian watermilfoil or where no Eurasian watermilfoil control is planned.

Subp. 11. **Littoral area.** "Littoral area" means those areas of a water body 15 feet or less in depth.

Subp. 12. **Native species.** "Native species" means any species present in an ecosystem within its historic range, or naturally expanded from its historic range, in the state.

Subp. 13. **Naturalize.** "Naturalize" means to establish a self-sustaining population of exotic species in the wild.

Subp. 14. **Release.** "Release" means an intentional introduction or release of a species from the control of the owner or responsible party.

Subp. 15. **Transport.** "Transport" means causing or attempting to cause undesirable aquatic plants and wild animals to be carried or moved by a device and includes, but is not limited to, accepting or receiving undesirable aquatic plants or wild animals for transportation or shipment. Transport does not include the incidental movement of undesirable aquatic plants or wild animals within a contiguous water body.

Subp. 16. **Undesirable exotic aquatic plant.** "Undesirable aquatic plant" means the following ecologically harmful exotic species:

- A. Eurasian watermilfoil (*Myriophyllum spicatum*);
- B. curly leaf pondweed (*Potamogeton crispus*);
- C. flowering rush (*Butomus umbellatus*);
- D. any variety, hybrid, or cultivar of purple loosestrife (*Lythrum salicaria*, *Lythrum virgatum*, or combinations thereof);
- E. water chestnut (*Trapa natans*); and
- F. hydrilla (*Hydrilla verticillata*).

Subp. 17. **Undesirable exotic aquatic plant or wild animal permit.** "Undesirable exotic aquatic plant or wild animal permit" means a permit issued by the department to transport, possess, sell, purchase, import, take, or propagate undesirable exotic aquatic plants or undesirable exotic wild animals.

Subp. 18. **Undesirable exotic wild animal.** "Undesirable wild animal" means the following ecologically harmful exotic species:

- A. white perch (*Morone americana*);
- B. ruffe (*Gymnocephalus cernua*);
- C. grass carp (*Ctenopharyngodon idella*);
- D. zander (*Stizostedion lucioperca*);
- E. any strain of nutria (*Myocastor coypu*);
- F. European rabbit (*Oryctolagus cuniculus*);
- G. Asian raccoon dog, also known as finnraccoon (*Nyctereutes procyonoides*);
- H. Eurasian wild pigs and their hybrids (*Sus scrofa subspecies* and *Sus scrofa hybrids*), excluding domestic hogs (*S. scrofa domestica*);
- I. rusty crayfish (*Orconectes rusticus*);
- J. zebra mussel species (all species of the genus *Dreissena*);
- K. spiny waterflea (*Bythotrephes cederstroemi*);
- L. asiatic clam (*Corbicula fluminea*);
- M. mute swan (*Cygnus olor*);
- N. Sichuan pheasant (*Phasianus colchicus strauchi*);
- O. sea lamprey (*Petromyzon marinus*);
- P. common carp (*Cyprinus carpio*);
- Q. tilapia species (all species of the genus *Tilapia*);
- R. rudd (*Scardinius erythrophthalmus*);
- S. tubenose goby (*Proterorhinus marmoratus*); and
- T. round goby (*Neogobius melanostomus*).

Subp. 19. **Water Transmitted Exotic Species.** "Water transmitted harmful exotic species" means:

- A. hydrilla (*Hydrilla verticillata*);
- B. curly leaf pondweed (*Potamogeton crispus*);
- C. flowering rush (*Butomus umbellatus*);
- D. any variety, hybrid, or cultivar of purple loosestrife (*Lythrum salicaria*, *Lythrum virgatum*, or combinations thereof);
- E. water chestnut (*Trapa natans*);
- F. white perch (*Morone americana*);
- G. ruffe (*Gymnocephalus cernua*);
- H. grass carp (*Ctenopharyngodon idella*);
- I. zander (*Stizostedion lucioperca*);
- J. rusty crayfish (*Orconectes rusticus*);
- K. spiny waterflea (*Bythotrephes cederstroemi*);
- L. asiatic clam (*Corbicula fluminea*);
- M. sea lamprey (*Petromyzon marinus*);
- N. common carp (*Cyprinus carpio*);
- O. tilapia species (all species of the genus *Tilapia*);
- P. rudd (*Scardinius erythrophthalmus*);
- Q. tubenose goby (*Proterorhinus marmoratus*); and
- R. round goby (*Neogobius melanostomus*).

6216.0200 POSSESSION, TRANSPORTATION, PURCHASE, SALE, OR IMPORTATION OF UNDESIRABLE EXOTIC SPECIES.

Subpart 1. **Prohibition.** A person may not transport, possess, sell, purchase, import, propagate, or release undesirable exotic plants and animals in this state except as provided in subparts 2 to 4, and part 6216.0300, subpart 5, or:

- A. under an aquatic nuisance control permit;
- B. under an undesirable exotic aquatic plant or wild animal permit,
- C. under a transportation permit as provided in Minnesota Statutes 17.4985,
- D. as provided by law; or
- E. when these species are transported, in direct passage, through Minnesota in according to appropriate state and federal regulations.

Subp. 2. **Control Activities.** A person authorized by a permit issued by the commissioner may transport Eurasian water milfoil or other water transmitted harmful exotic species identified by the commissioner for disposal as part of a permitted harvest or control activity as specified in *Minnesota Statutes* 18.317. Subd. 2.

Subp. 3. **Possession and transportation of dead undesirable exotic species.** A person may possess and transport dead undesirable exotic species to the department to report their occurrence and for identification.

Subp. 4. **Common Carp.** A person may possess, transport, buy, or sell common carp as provided by the game and fish laws.

6216.0300 PERMIT REQUIREMENTS FOR UNDESIRABLE EXOTIC SPECIES.

Subpart 1. **Permits.** Before a person may transport, possess, purchase, sell, import, take, or propagate an undesirable aquatic plant or animal specified in part 6216.0100 for scientific, research, education, control, or exhibition purposes, a permit must be obtained from the commissioner.

Subp. 2. **Revocation of permit.** Permits issued under this part may be revoked by the commissioner if the conditions of the permit are not met by the permittee or for any act or omission, including release or escape, that threatens native plant and animal populations in the state.

Subp. 3. **Expiration date.** All permits shall expire on December 31 of each year, except permits issued less than 90 days before December 31 shall expire on December 31 the following year.

Subp. 4. **Application period.** Persons possessing undesirable exotic wild animals on the effective date of parts 6216.0100 to 6216.0700 must apply for an undesirable exotic aquatic plant or wild animal permit under subp. 5 within 60 days of the effective date of parts 6216.0100 to 6216.0700.

Subp. 5. **Commercial purposes.** The following species may be possessed, sold, exported, taken, or transported live for commercial purposes under an undesirable exotic aquatic plant or wild animal permit, a game farm license, a commercial fishing license or permit, a commercial crayfish harvest permit, commercial crayfish importation permit, or aquatic farm or private fish hatchery license issued by the commissioner:

- A. rusty crayfish;
- B. common carp;
- C. wild pigs;
- D. Sichuan pheasant; and
- E. tilapia.

Subp. 6. **Inspection of permitted sites.** Facilities for holding undesirable exotic wild animals and aquatic plants for research, exhibition, education, or commercial purposes are subject to inspection at any reasonable time by the commissioner.

Subp. 7. **Contingency plans.** Permittees must prepare written contingency plans for eradication or recapture of released or escaped species as specified in their undesirable exotic aquatic plant or wild animal permit.

6216.0400 NOTIFICATION, RECAPTURE, AND DESTRUCTION OF RELEASED UNDESIRABLE EXOTIC SPECIES.

Subpart 1. **Notice; actions to recapture or destroy.** In the event of an escape or a release of an undesirable exotic wild animal or aquatic plant species, the owner must immediately notify a conservation officer and is personally responsible for the recovery or destruction of the plants or animals. The owner of an

escaped undesirable wild animal or accidentally introduced aquatic plants must immediately implement the actions specified in the contingency plan required by an undesirable exotic aquatic plant or wild animal permit. If the owner is unable to recapture or otherwise destroy the released or escaped plants or animals within ten days of the escape, the escaped plant or animal may be captured or destroyed by the department at the owner's expense.

Subpart 2. **Department action.** Released, escaped, or other unconfined undesirable exotic wild animals or accidentally introduced aquatic plants, that have not been reported to the department as provided in subpart 1, may be captured or destroyed at any time by the department to avoid potential establishment of naturalized populations.

6216.0500 RESTRICTED ACTIVITIES ON INFESTED WATER BODIES.

Subpart 1. **Prohibition on entry.** Entry by boaters, anglers, or other water users and their associated equipment into infestations of Eurasian water milfoil marked with yellow buoys according to part 6216.0600, on waterbodies identified with limited infestations under part 6216.0600, is prohibited, except for emergencies.

Subp. 2. **Exceptions.** Enforcement, emergency, resource management, and other government personnel or contractors are exempt from this part when performing official duties or authorized work as prescribed in part 6110.1200, Subpart 2, item D, subitem. (3). Owners or leases of land adjacent to the control area, that do not have an alternative route for their watercraft from their property to reach waters may use the shortest and most direct route through the limited infestation when traveling to and from their property. They shall also operate their watercraft in a manner that would least disturb the aquatic plants in the marked area.

Subp. 3. **Prohibition on taking bait from infested waters.** The taking of minnows for bait purposes from all infested waters in Minnesota is prohibited.

Subp. 4. **Commercial fish nets used in infested waters.** Commercial fish nets that are used in infested waters in Minnesota may only be used in other infested bodies of water with the same species designation. In addition to the information required under Minnesota Statutes, section 97C.351, commercial fish nets used in infested waters must be marked with the species designation of the infested body of water.

Subp. 5. **Transporting water from infested waters.** Owners or operators of watercraft leaving waters of the Mississippi River downstream of St. Anthony Falls, Minnesota waters of Lake Superior including waters of the St. Louis River downstream of the Fond du Lac dam, waters of the Minnesota River downstream of Shakopee and Island Lake in St. Louis County, must drain livewells, bait containers, other boating related equipment holding water, and bilges by removing the drain plug before transporting the watercraft on public roads. This subpart does not apply to ballast water utilized by documented commercial vessels engaged in interstate or international commerce.

Subp. 6. **Fish hatchery or aquatic farms in infested waters.** Infested waters will not be licensed for private fish hatcheries or aquatic farm use.

Subp. 7. **Designation of infested waters.** Infested waters shall be designated by the commissioner by publishing an official notice in the state register and posting all public access points. Water bodies may be removed from designation by the commissioner by publishing an official notice in the state register and removal of posting at public access points.

6216.0600 IDENTIFICATION AND MARKING OF LIMITED INFESTATIONS OF EURASIAN WATER MILFOIL.

Subpart 1. **Publication.** The commissioner shall identify bodies of water having limited infestations of Eurasian water milfoil by publishing the names of those bodies of water in the state register and a local newspaper. At any time the commissioner may amend the list as additional limited infestations are discovered or water bodies are determined to no longer have limited infestations.

Subp. 2. **Marking.** Infestations of Eurasian water milfoil on bodies of water determined to be limited infestations, shall be marked by the department according to part 6110.1500 subpart. 7. The commissioner will mark areas where Eurasian water milfoil control is planned. The markers will be removed after control actions are completed and Eurasian water milfoil plants are no longer a threat to fragment or transport by boaters, anglers, or other water users and their associated equipment.

6216.0700 IMPORTATION AND RELEASE, OF EXOTIC WILD ANIMALS AND AQUATIC PLANT SPECIES.

Exotic species of wild animals or aquatic plants may not be imported for release, or released unless they meet one or more of the following conditions:

- A. it is authorized to be released from a licensed shooting preserve according to the conditions of the shooting preserve license; or
- B. it is a ringnecked pheasant, gray (Hungarian) partridge, or Chukar partridge, or quail;
- C. it is an exotic bird permitted for falconry under a state falconry permit and registered by submitting a Federal Form 3-186A (Migratory Bird Acquisition/Disposition Report);
- D. it is a biological control that has been thoroughly tested by United States Department of Agriculture, and approved by the Minnesota Department of Agriculture, and the Department of Natural Resources;
- E. released according to a plan approved by the commissioner;
- F. it is imported and released according to Chapter 17.4981 to 17.4997 and Commissioner's Order 2450, section 1, chapter 6250, or its successor;
- G. it is a game fish already present in Minnesota and released according to a fish stocking permit issued by the department; or
- H. for an exotic species that is not an undesirable exotic wild animal or aquatic plant, or not exempted in this part, all the following steps must be completed to the satisfaction of the commissioner:
 - (1) the applicant applies for an exotic species importation and release permit ;
 - (2) the applicant must submit health information and history for the animals to be imported;
 - (3) the applicant must prepare an environmental assessment worksheet including data verifying that the proposed introduction does not have the characteristics of an ecologically harmful species and indicating for what reasons species native to the state are not an acceptable alternative to the proposed release;
 - (4) the commissioner determines it is in the best interest of the state to release the species from captivity; and
 - (5) the commissioner issues an importation and release permit to the applicant.

REPEALER. Commissioner's Order Number 2450, section 1, Chapter 6216, is repealed.

Other References to Statutes

Minnows. "Minnows" is defined in *Minnesota Statutes* 97A.015, subdivision 29.

Possession. "Possession" is defined in *Minnesota Statutes* 97A.015, subdivision 36.

Private aquatic life. Private aquatic life is defined in *Minnesota Statutes* chapter 17.

Wild animal. "Wild animal" is defined in *Minnesota Statutes* 97A.015, subdivision 55. ("Wild animals" means all living creatures, not human, wild by nature, endowed with the sensation and power of voluntary motion, and includes but is not limited to mammals, birds, fish, amphibians, reptiles, crustaceans, and mollusks.)

Appendix C - References

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