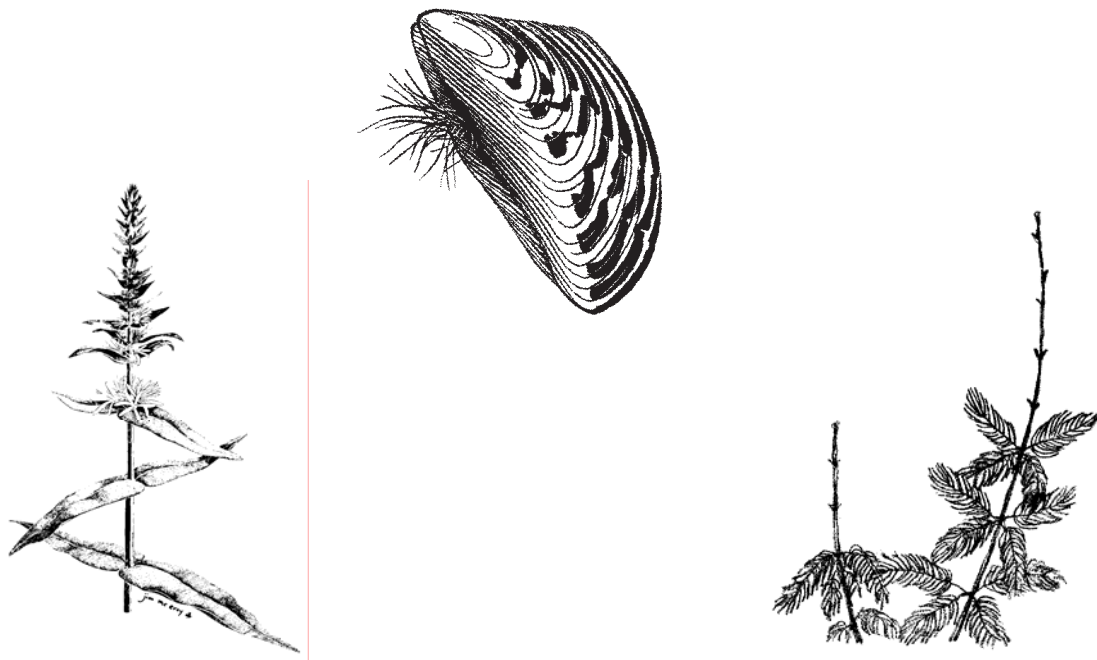


Standardized Reporting for the Aquatic Invasive Species Interstate Management Plans: The St. Croix National Scenic Riverway

Federal Fiscal Year 2006/2007
Calendar Year 2006



Submitted to the U.S. Fish and Wildlife Service by:

National Park Service - St. Croix National Scenic Riverway

Minnesota Department of Natural Resources

Wisconsin Department of Natural Resources

Great Lakes Indian Fish and Wildlife Commission

Preface

Background

The St. Croix Aquatic Invasive Species Task Force (formally the St. Croix Zebra Mussel Prevention Task Force) was formed in 1992, to help formulate policies and direct actions that might stop or slow the spread of zebra mussels into the St. Croix National Scenic Riverway (Riverway). In 1998, an interstate management plan for aquatic nuisance species (as specified in the National Invasive Species Act of 1996) was developed by the St. Croix Aquatic Invasive Species Task Force (SCAISTF) and submitted to the national Aquatic Nuisances Species (ANS) Task Force by the Governors of Minnesota and Wisconsin, and the tribal chairpersons within the St. Croix River watershed. The ANS Task Force approved the plan and in the years since, Minnesota, Wisconsin, and Great Lakes Indian Fish and Wildlife Commission (GLIFWC) have received grants from the USFWS to implement the interstate plan. Each spring since 1993, the SCAISTF has created an annual action plan for zebra mussel prevention and mitigation.

Purpose of this Report

This document is intended to fulfill the annual reporting required by the U.S. Fish and Wildlife Service (USFWS) regarding the use of grant funds by the states of Wisconsin and Minnesota and the Great Lakes Indian Fish and Wildlife Commission to implement of the *St. Croix National Scenic Riverway Comprehensive Interstate Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species* (Interstate Plan). The accomplishments of these entities during calendar year 2006 are included in this document.

The document is also intended to fulfill the reporting required by the USFWS regarding the actions taken by the National Park Service (NPS) – St. Croix National Scenic Riverway to protect endangered mussels in the river from zebra mussels. After the MNDNR legally declared a section of St. Croix River infested with zebra mussels in January 2001, the USFWS reviewed the pending *Cooperative Management Plan for the Lower Riverway*. USFWS determined that plan did not address the increased threat of a zebra mussel infestation on endangered species, and requested the NPS to augment its procedures. In addition to the actions taken, the NPS must account for these activities. This report provides written acknowledgment of the various measures.

Copies of this report and related plans may be obtained from the following sources:

- National Park Service, St. Croix National Scenic Riverway, 401 Hamilton St. N. St. Croix Falls, Wisconsin 54024; 715-483-3284 ext. 616; or email at byron_karns@nps.gov
- Minnesota Department of Natural Resources, 500 Lafayette Road, St. Paul, MN 55155-4025; 651-259-5131; or e-mail at jay.rendall@dnr.state.mn.us
- Wisconsin Department of Natural Resources, P.O. Box 7921, 101 Webster St., Madison, WI 53703; 608-266-9270; or e-mail at martir@wisconsin.gov
- Great Lakes Indian Fish and Wildlife Commission, PO Box 9, Odanah, WI 54861; 715-682-6619 or e-mail at nkmiecik@glifwc.org @glifwc.org

1.0 Summary

Zebra mussels are currently the top AIS priority present in the St. Croix River. Other invasive species documented include purple loosestrife, Eurasian watermilfoil, rusty crayfish, and Chinese mystery snails. Asian carp (bighead, silver, grass, and black), and New Zealand mudsnail are emerging threats (see 3.1).

The 2006 St. Croix River Zebra Mussel Action Plan was adopted on March 3, 2006, with the actions occurring during the open water season. Foundations of the plan continue to be the following activities: information and education, boat inspections, access management, research, and monitoring. These methods were used during the 2006 boating season to limit the spread of zebra mussels and other aquatic invasive species in the Riverway.

This report includes summary field data for all components of the 2006 plan. Strategies identified in the Action Plan are noted with the major headings. Copies of previous years' Action Plans and this 2006 Annual Report may be obtained from the National Park Service, St. Croix National Scenic Riverway, 401 Hamilton St, St. Croix Falls, Wisconsin 54024. Call 715-483-2281, or email <byron_karns@nps.gov>

2.0 Major Accomplishments

(1) Draft of State Management Plan by the Minnesota State Invasive Species Advisory Committee.

(3) Public awareness campaigns - kicked off with press coverage of initial monitoring dive in June (NPS, MNDNR, WIDNR, GLIFWC, USFWS).

(1450) Public Service Announcements and paid radio spots were played on radio throughout the Lower St. Croix River Watershed and nearby infested waters areas.

(1) Purchased revised bait bucket bumper stickers warning anglers of the proper methods for bait disposal.

(7) Events in communities within the watershed included displays at the Outdoor Festival, Trego Lake Association Fair, the Pine County Fair, a presentation at the annual St. Croix research rendezvous, Musky Fest in Hayward, Pokegama Water Fair and St. Croix Soujoun.

(1) Events outside the watershed included a MNDNR display at the State Fair, which showcases zebra mussels.

(1213) Watercraft or trailers were inspected for AIS by the MNDNR. No zebra mussels were found on any watercraft entering the St. Croix during these inspections. (Several hundred) boats and trailers were inspected at Wisconsin launches throughout the summer.

(1) The NPS maintained a floating check station to regulate upstream boaters and reduce the likelihood of infestations north of mile 28.5. This included a houseboat with signs, a floating banner, and six navigation buoys.

(3 dive periods) Monitoring actively for zebra mussels involves scuba dives during the open water season. One week of qualitative searches were performed during June. This dive focuses on preset or appropriate locations on the lower 30 miles of the river. In August, four days were spent performing quantitative sampling at eight locations from Stillwater to Prescott. Finally, locations including many sites within the flowage behind the dam in St. Croix Falls and the Interstate Parks location were examined in September

(49) PVC Hester-Dendy-type samplers were monitored for zebra mussels by USFWS and NPS. Associated glass slides were examined by the MNDNR.

(2352 total boats checked; 848 found w/zms) Dry-docked boats at 14 marinas throughout the Riverway were scrutinized in the fall of 2006, with numerous boats discovered with attached mussels.

(1)The Interstate/Interagency partnership, the St. Croix Aquatic Invasive Species Task Force was supported. The partnership includes: National Park Service, Minnesota Department of Natural Resources, Wisconsin Department of Natural Resources, Great Lakes Indian Fish and Wildlife Commission, U. S. Army Corps of Engineers, the U. S. Fish and Wildlife Service, and Minnesota Sea Grant.

(17) Federal and/or state threatened and endangered unionid mussel species and their important populations were protected.

(1) BIA sponsored a conference, which was coordinated through GLIFWC, promoting cooperation and collaboration on regional AIS management efforts

(1) Mazina'igan, GLIFWC's quarterly newsletter, featured a special supplement on Aquatic Invasive Species.

(1) GLIFWC collaborated with Lac Courte Oreilles Natural Resources Department in hosting a HACCP workshop for area guides, bait dealers, and resort owners.

(1) Provided public access to AIS distribution data via an Internet Map Server (www.glifwc-maps.org). Also updated GLIFWC's invasive species website (www.glifwc.org/invasives).

(1) GLIFWC distributed AIS educational materials at several meetings, conferences, fairs, and tribal communities.

(1) GLIFWC conducted rapid assessment inventories for AIS on 30 inland lakes (8 within the St. Croix River watershed).

(1) GLIFWC inventoried AIS signage at 57 public boat landings (18 within the St. Croix River watershed).

(1) GLIFWC conducted boat landing area observations and recorded the presence/absence of AIS at 57 public boat landings.

3.0 Identify Strategies That Are Not Working And Why?

3.1 Federal/State Implementation Consistency Statement

The continued introduction of AIS into the Mississippi River basin, from the Great Lakes via the waterways in Illinois and from the aquaculture industry in southern states, poses a severe threat to the resources of the St. Croix River and its tributaries. The sources of these threats are beyond the ability of the state and tribes involved with the interstate plan to address.

Federal assistance is needed to develop and maintain barriers to prevent inter-basin and perhaps intra-basin movement of AIS. More involvement of federal agencies and more comprehensive national regulations are needed to limit intentional introduction and transport of AIS such as Asian carp (black, silver, bighead and grass carp) in the country. Improved national ballast water regulations are also necessary to prevent introduction of new AIS into the nearby Great Lakes and other coastal waters. Continued and increased funding for grants to implement state and interstate management plans is also important to maximize state, tribal, and other local efforts to attain state and interstate goals related to AIS.

4.0 Prevention Related Activities

(FWS Funds Used: MN \$65,300 budgeted and spent; WI \$25,000 budgeted, \$20,168 spent; GLIFWC \$2,419 spent)

4.1 Ballast Water Technologies

Not applicable.

4.2 Risk Assessments

(2) A risk analysis began in 2006 by the U.S. Army Corps of Engineers, St. Paul District. Distribution and relative abundance data of zebra mussel and other AIS were collected from field surveys conducted by GLIFWC and compiled from cooperating entities was used together with information on ecological impacts and control options to prioritize future AIS management priorities and strategies.

4.3 Pathway Analyses (Interstate Plan – Strategy IA)

(2) Was scheduled for fiscal year 2006 by the U.S. Army Corps of Engineers, St. Paul District. Spatial and temporal distribution and relative abundance data collected and compiled in FY 2005 was used by GLIFWC to examine regional patterns of AIS colonization and spread. This data will help to identify vectors, likely sites of introduction for new emerging AIS threats, and target audiences for I & E efforts.

4.4 Outreach/Education Activities for Prevention (Interstate Plan - Strategy ID)

Continue Public Awareness (Interstate Plan – Action ID1a)

The National Park Service, U. S. Fish and Wildlife Service, Minnesota and Wisconsin Departments of Natural Resources, Washington County Parks, Minnesota Sea Grant, the U. S. Army Corps of Engineers, the Great Lakes Indian Fish and Wildlife Commission and others all informed the public about zebra mussels and associated problems to help prevent the spread of aquatic invasive species.



Visitor Centers and on Site Contacts: A variety of aquatic invasive species information is available to the public along the Riverway. This information includes exhibits of individual zebra mussels and zebra mussel clusters, invasive species brochures, identification cards and discussions with Park Rangers. The Minnesota and Wisconsin DNRs provide visitors with information, displays, or specific handouts about zebra mussels and invasive species at their contact stations or Interpretive Centers within parks along the river. Carpenter Nature Center has handout information on invasive species, including zebra mussels. Washington County's St. Croix Bluffs Regional Park provides informational handouts and a display on zebra mussels.

- **(558) Programs and (39317) Attendance** - Visitors are contacted during naturalist talks conducted at local, county, and state parks and private campgrounds during the summer. NPS programs including aquatic invasive species information were presented to school groups, at several community outreach presentations, and various demonstrations. NPS Educational Partnership Team rangers included zebra mussel information in their Riverway orientation programs conducted onboard the Taylors Falls tour boat and The Osceola & St. Croix Valley Railway. Agency staff and other partners discussed zebra mussels and aquatic invasive species with the public during special programs, conferences, and community events.
- **(1213 at launches) On Site Contacts** - Visiting boater are also informed about zebra mussels during on-site contacts by, DNR Conservation Officers, Watercraft Inspectors, NPS rangers and Big Dipper staff on the river and at various landings throughout the Riverway. Additionally, signs at every river boat launch warn boaters of the threats from aquatic invasive species.
- **(1450) Mass media: radio and TV spots (1225 paid spots and at least 225 public service announcements)** - The majority of the St. Croix interstate grant funds provided to Minnesota are spent to increase boater awareness of AIS. The Minnesota DNR paid to air radio and television spots in three areas near the St. Croix River: the Duluth area, the twin cities, and along the Mississippi River down stream of the St. Croix River. These areas are a priority because they are the interstate areas that have populations of zebra mussels and numerous boaters who may visit the St. Croix River. Media purchases are focused at three time periods: the Minnesota fishing opener and Memorial Day weekend; the 4th of July holiday period; and late summer. These efforts are done annually and are thought to contribute to the high boater awareness in Minnesota. In 2006, a new Stop Aquatic Hitchhikers! radio and television ads were created and distributed. Other new communication media were used to implement the SAH campaign: panels at traveler information centers; billboards: and lawn banners. Minnesota DNR partnered with Wildlife Forever, US Forest Service, USFWS, and Minnesota Sea Grant to develop and post billboards with the Stop Aquatic Hitchhikers! message on key state travel routes to and from lake areas. One of the most apparent was on I-35 at the point where I-35E and I-35W merge just south of Forest Lake. This billboard was posted for the entire summer.

- **(1888)** Contacts with marinas and slip renters (Interstate Plan – Action ID1c) The NPS provided all Riverway marina operators and their clients with information concerning zebra mussels. On-site contacts by NPS and USFWS during the spring and summer provided marinas with zebra mussel and AIS information, handouts and clusters or loose specimens.

(2) Provide informational materials (Interstate Plan – Action ID1d)

In addition, NPS, the DNRs, and MN Sea Grant yearly produce and/or distribute numerous aquatic invasive species printed information for general handout during the season. Federal agencies, Lake Associations, state parks, marinas, conservation districts, schools, etc., can receive these resources. Youth education resource kits (“traveling trunks”), called *Aquatic Exotics*, continue to be distributed and used by NPS and Sea Grant. . In 2006, New Zealand Mudsnail cards were produced by The DNRs and Minnesota Sea Grant in response to the discovery of the invasive snails in the Duluth-Superior harbor and the potential for their snails to spread to inland waters such as the St. Croix River.

Table 1. NPS Contact Information

NPS Visitor Contacts	Mass Media	Marinas Contacted	Handouts Print
Number of Programs	TV	14	NPS Site bulletin
558	Radio	Slips	“Don’t Dump Bait” Bumpersticker
Total Visitors	Billboards	1888+	<i>Mazina’igan</i> , GLIFWC’s quarterly newsletter, featured a special supplement on Aquatic Invasive Species.
39317	<i>Hudson Star Observer</i> July12, 2006		<i>Help Stop Aquatic Hitchhikers</i> Brochure

4.5 HACCP Plans/SOP/BMP

Current AIS distribution data were used to schedule various GLIFWC biological investigations to insure that infested waters were sampled last to minimize the risk of spreading AIS to noninfested waters. Staff also cleaned boats and equipment following specific protocols developed to minimize the spread of AIS.

Members of the Task Force Dive Team and MN DNR Biologist and Macalester College Researchers.

- **(9)** Staff from nine parks attended a HACCP workshop was conducted by MN SeaGrant for NPS Natural Resource Staff throughout the Great Lakes Network.

GLIFWC staff collaborated with the Lac Courte Oreilles College Extension program to host a HACCP workshop for guides, bait dealers, and resort owners in and around Sawyer County, Wisconsin.

4.6 Watercraft inspections and access management (Interstate plan - Strategy IB)

Watercraft inspections (Interstate Plan – Action IB1e)

- **(2060)** watercraft or trailers were inspected by agency staff for aquatic invasive species and no zebra mussels were found on any watercraft entering the St. Croix River during these inspections.
- **(348 hours)** from May through August, MN DNR staff inspected boats and trailers and contacted visitors at landings and launches north of Prescott to Interstate Park (Table 2) within the St. Croix National Scenic Riverway.

These Watercraft Inspectors are stationed at St. Croix Bluffs Regional Park, Fourth Street City Launch in Bayport, the St. Croix Boomsite Public Access, William O’Brien State Park, Osceola Landing, Interstate Park, MN Lion’s Club Park, and Wild River State Park. As boats are leaving these landings, they are checked for, and information is provided on, Eurasian watermilfoil, zebra mussels and other aquatic invasive species. The vast majority of time spent and contacts made occurred at the Boomsite and St. Croix Bluffs.

- **(18)** GLIFWC staff collected field data from 57 public and private boat landings (18 within the St Croix watershed) in FY 2006 documenting the location and existing AIS signage at each landing. Additional landings were inventoried during fall fishery assessments, but data have not been summarized yet. GLIFWC will share this information with WDNR and use this data in combination with AIS distribution data to prioritize future sign placement so that infested waters are properly posted.

Table 2. MN DNR Inspections.

Minnesota DNR Water Craft Inspections - 2006 Totals				
South to North	River Mile	ACCESS NAME	Total Inspections	Staff Time (Hrs.)
1	4.2	ST CROIX BLUFFS (AFTON)	419	103.5
2	20.2	BAYPORT 4TH ST. RAMP	65	43
3	24.8	BOOMSITE LAUNCH	213	111.25
4	35.7	WILLIAM O'BRIEN STATE PK	23	30
5	44.4	NPS OSCEOLA Day Use Area	57	37.5
6	50	MN INTERSTATE PARK	21	12.25
7		WILD RIVER STATE PARK	2	11
Totals			800	348.75

During the summer of 2006, WIDNR employed 18 watercraft inspectors across the state using state funds to educate boaters how to properly clean their boats, trailers and equipment and provide education and outreach materials.

Two watercraft were hired in 2006 specifically as part of this grant. The WIDNR contracted with the National Park Service to conduct the watercraft inspections. The two inspectors conducted watercraft inspections on the St. Croix as well as waters in the counties adjoining the St. Croix River. A summary of their efforts at the boat launch sites in 2006 showed they logged in **672** hours, inspected **1260** boats and contacted **3150** boaters.

4.7 Regulations, Permits, and Enforcement (Interstate Plan – Strategy IB)

Establish AIS Regulations (Interstate Plan – Action IB1)

- **Minnesota** - Zebra mussel, ruffe, round goby, Eurasian watermilfoil, and several other aquatic plants and animals are prohibited invasive species in Minnesota. These species may not be possessed, transported on public roads, or placed into a waterbody on a boat or trailer (M.S. 84D). No new regulations were established in 2006.

- **Wisconsin** – state law requires the removal of aquatic plants each time a boat is launched in state waters. In addition, the law requires the removal of zebra mussels for any boats launched in the St. Croix River. Conservation wardens or other law enforcement officers can prohibit recreational boaters or anglers from placing a boat in the water if aquatic plants or zebra mussels (St. Croix River only) are attached to the boat or trailer. Boaters who violate the new law also face a \$50.00 fine for the first offense and up to \$100.00 for each subsequent offense within the same year.

- [Invasive Species Statute 23.33](#)
- Purple loosestrife [Statute 23.23](#)
- Nuisance Weeds Statute 23.235
- Noxious Weeds Statute 66.0407
- Placement of boats, trailers, and equipment in navigable waters Statute 30.715

Enforce State AIS Regulations (Interstate Plan – Action IB3)

- **Minnesota** - DNR conservation officers worked to enforce AIS laws along St. Croix and Mississippi River.
- **Wisconsin** – Watercraft inspectors are encouraged to fill out a “Boat Launch Violation Report Form” if they observe a violation of the launching rule. It is then up to the discretion of a conservation warden or local law enforcement officer if they will issue a warning or citation. Two citations have been issued in Wisconsin since the law took effect in 2001.

Enforce NPS Rules (Interstate Plan – Action IB3)

Federal regulations adopted by the NPS prohibit introduction of zebra mussels into the noninfested portion of the St. Croix National Scenic Riverway. Unauthorized boaters

traveling upstream of the Soo Line High Bridge (mile 28.5) north of Stillwater, are in violation of federal law and subject to civil and criminal penalties.

Access is restricted by the NPS in order to prevent the spread of zebra mussels. With very limited exceptions, boats are not allowed to cross upstream past a NPS vessel serving as an information station. The NPS boat, floating banner, and buoys positioned shore-to-shore, provided clear understanding of the prohibition against upstream travel.

5.0 Early Detection and Rapid Response

(FWS Funds Used: MN none budgeted; WI non budgeted; GLIFWC \$7,800 spent)

5.1 Number of Populations (plant or animal) for which there was a Rapid Response

(0) None during this calendar year.

5.2 Number of Known Populations Inventoried/Monitored

(1) An ecological survey was conducted for known populations of zebra mussels in the Lower St. Croix River. This involved measuring densities of zebra mussels associated with known native mussel beds.

5.3 Outreach/Education Activities Supporting Rapid Response and Early Detection

ID cards and AIS brochures were distributed with contact information printed on each for reporting new infestations. This was done by GLIFWC, NPS, and the DNRs.

5.4 Surveys for Early Detection for New Populations (Interstate Plan – Action IC1c)

(1) There was one NPS/FWS/DNR surveys conducted for early detection for new populations of aquatic invasive species (EWM). Plans are underway to survey the Riverway for curly-leaf pondweed, Eurasian water milfoil, and rusty crayfish during 2006.

- GLIFWC conducted a rapid assessment of inland lakes to detect AIS in cooperation with WI DNR staff. The method is a systematic survey of the littoral zone using polarized sunglasses to detect the presence of AIS. An emphasis was placed on areas near boat landings to detect early infestations near primary introduction points. In addition, plankton nets were used to collect samples that were analyzed by WI DNR for the presence of zebra mussel veligers and spiny water fleas. Ten lakes within the St. Croix watershed were monitored in 2006 and all the samples were negative for zebra mussel veligers and spiny water fleas.

(2) Surveys were conducted with divers in noninfested areas (Interstate Park(s) and St. Croix Falls Flowage) of the St. Croix River to detect new infested areas.

6.0 Control and Management Activities

(FWS Funds Used: MN none budgeted; WI none budgeted; GLIFWC non budgeted)

6.1 Aquatic Invasive Species Managed/Controlled (Interstate Plan – Action IIAd)

- Currently, control efforts on the St. Croix River focus on stopping the spread to noninfested waters (within the Riverway and in both states) through education and access restrictions. These control strategies are used in coordination with the appropriate agencies and interested parties. Strategies will continue to be developed using the best available scientific information and be implemented according to agency mandates and sound environmental practices.

(1) There was one cooperative actions/management plan implemented: *St. Croix National Scenic Riverway Comprehensive Interstate Management Plan for Nonindigenous Aquatic Nuisance Species*

(1) Dispersal barrier/interconnected waterway efforts participated in: Minnesota DNR continued to pursue federal funds for the USACE to install Bio-acoustic Fish Fences in the Mississippi River or mouths of key tributaries such as the St. Croix River. Costs to install a bio-acoustic fish fence at the mouth of the St. Croix were investigated and the rough estimate was \$4 million. Due to the relatively high cost and concerns about non-target migrating species that could be affected, no further action was taken and no design fees were needed.

- No populations (animal or plant) managed and controlled **with FWS funds**

- No action items implemented related to control and management **with FWS funds**

(2) Also note the protection of two native mussel species that are being considered for possible federal candidate status and six species of special concern for a total of 23 mussel species listed by the federal and state governments.

6.4 Outreach/Education Activities

GLIFWC has developed a comprehensive website (www.glifwc.org/invasives) devoted to invasive species that provides information and resources for education outreach, control, and coordination of management efforts. This website was updated substantially in FY 2005 for 2006. GLIFWC also distributes hundreds of brochures and ID cards annually to requesting agencies and individuals free of charge. Informational articles have also been published in the *Mazina'igan* - GLIFWC's quarterly newsletter. In addition, the spring 2005 edition of *Mazina'igan* featured a special supplement on Aquatic Invasive Species and was available for handout in 2006.

7.0 Species Baseline Information

(FWS Funds Used: MN \$5,000 budgeted and spent; WI \$5,000 budgeted and spent; GLIFWC \$1,000 spent)

7.1 Baseline Information

(8) Populations of zebra mussels on the lower river were monitored/inventoried for quantitative and qualitative information.

Quantitative percent change in abundance of invasive species is unknown, even for zebra mussels, but baseline data for the mollusk has now been established. Qualitative assessments suggest: zebra mussels have increased in the down rivers pools from Stillwater to the Mississippi; purple loosestrife has maintained on the lower river, increased slightly on the Namekagon and decreased on the Upper St. Croix River; Eurasian watermilfoil and curly-leaf pondweed have increased in the lower river and been found in pockets on the Upper St. Croix. Rusty crayfish may have extended their range, but become less dense in some locations. Other than common carp, no other aquatic invasive species is known of the Riverway at this time.

Decrease percent change in distribution of some invasive species - see separate reports [available from the NPS, USACOE, and MNDNR](#)

7.2a Active Monitoring (Interstate Plan – Action IC1b)

Background - The NPS - St. Croix National Scenic Riverway, established a Riverway SCUBA dive team in 2000, in large part to actively monitor for the presence of zebra mussels. Members of the team include staff from U.S. Fish and Wildlife Service (USFWS) field offices, Macalester College, Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and Riverway staff. Dives were funded, managed and/or staffed by USFWS, NPS, GLIFWC, and WI and MN DNRs.

(3) Efforts in 2006 - Scheduled monitoring dives occurred three times: June, July/August, and September. The activities occurred between river mile 30 (Arcola Sandbar) and the mouth of St. Croix River at Prescott. Below is a brief summary of each dive

The following table highlights the activities of the dive team from the 19th to 22nd of June, 2006. This dive is part of three zebra mussel-specific monitoring dives conducted during the course of each summer. In addition to a qualitative assessment, over four hours of high-definition under water footage was taken, items for possible display were collected, several new divers and support staff were trained, and winged mapleleaf juveniles from a propagation program were released into river-situated cages.

The table shows each surveyed location by accepted name and river mile. Generally, two to three divers would spend 15 to 45 minutes at each location. Time reflects the aggregate for all divers at the site. Zebra mussels were collected at some, but not all sites and examples of cohort sizes are presented. The dive team qualitatively surveyed 30 miles of Riverway, looking at rocks, mussels, riprap, etc. to detect presence/absence along the course of this reach. Up to six divers plus support staff were split into two teams, generally working opposite river banks.

As has been the case to date, no zebra mussels were found upstream of the Stillwater Lift Bridge. From the Bridge to the King Power plant, a few zebra mussels were found – generally greater numbers on more suitable substrate, but a couple to none per native mussel examined was usual. At the King Plant outflow, zebra mussels were more numerous, with dozens found by each diver during their time underwater. Finally, these invasives became too numerous to count or collect from the Hudson Narrows to Prescott.

It appears clear that zebra mussels have established viable reproducing populations within several pools on the Lower St. Croix River. While encrusted native mussels were not found and generally infested mussels were carrying one or two zebra mussels with probably minimal impact, the overall population growth potential seems secure. There were numerous cohorts within each pool and many more zebra mussel of reproductive age than not, were found on substrate brought to the surface for close examination.

A second zebra mussel monitoring dive was held at the end of July and focused on quantitative sampling at the predetermined sites examined since 2004. This provides data on population growth.

Table 1. Zebra Mussel Dive Locations, June 2006

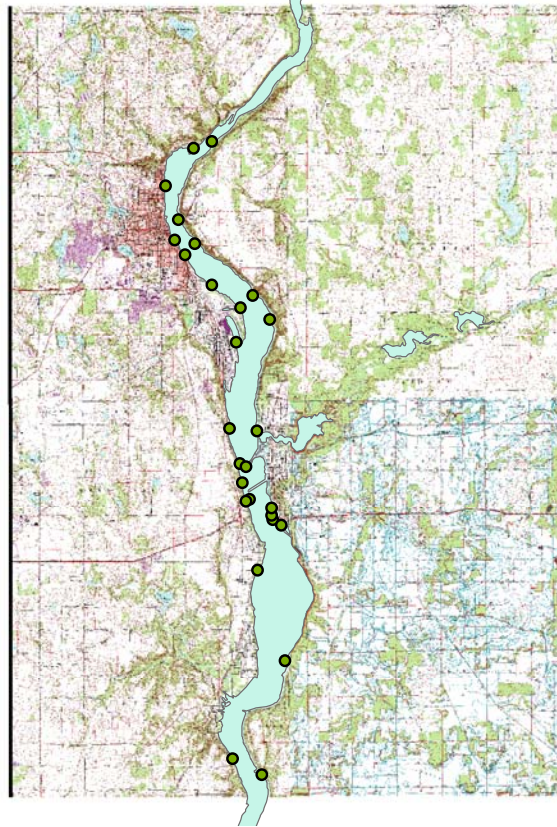
Date	Location	River Mile	Total Diver Time (mins)	Zebra mussels (size range mm)
19-Jun	Below High Bridge	28.5	75	0
19-Jun	Rock Pile Buoy N of Mile long Is.	26.2	93	0
19-Jun	Wolf Marine	24.5	23	0
19-Jun	Opposite (WI shore) – Wolf Marine	24.25	40	0
20-Jun	Stillwater Levy	23.4	90	0
19-Jun	Rip Rap upstream side causeway, Stillwater lift Bridge	23.3	60	0
19-Jun	Relocation Bed below Stillwater Lift Bridge	23.25	72	34
20-Jun	“Hanks” on the Aiple Fert. Building (riprap)	23.1	87	8

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	[note the thermo cline]			
19-Jun	Across from Sunnyside WI Shore over riprap	22.2	30	23
20-Jun	Sunnyside Marina	22.2	50	0
20-Jun	King Plant Barge Mourning Structures	21.8	36	6
Date	Location	River Mile	Total Diver Time (mins)	Zebra mussels (size range mm)
20-Jun	Down Stream of King Outflow	21.5	60	100+ (10-32mm)
19-Jun	High Line Beach – North Side	21	50	16
20-Jun	Highline Beach – South Side	21	135	4
20-Jun	Highline Harbor	21	30	3
20-Jun	Tip of Anderson Point	20.1	100	100+ (10-27mm)
20-Jun	WI shore across from Anderson Point	20	90	35
20-Jun	WI shore across from Anderson Point and South	19.5	90	35
20-Jun	<i>Wild River Yacht Club</i> Beach	18.2	70	100+
21-Jun	North of the Swing Bridge – Hudson Narrows	17.3	42	27
21-Jun	MN Bay below Swing Br. At the Hudson Narrows	17.2	200	50+
21-Jun	Remains, MN Shore, of RR causeway	16.7	40	50-100+
21-Jun	Under the I 94 Bridge, from MN Shore	16.1	90	100+
21-Jun	I 94 Causeway Riprap WI Side upstream	16.1	40	100+
21-Jun	The Peninsula South of 94, WI shore by <i>No Trespassing</i> signs	15.8	170	100+
22-Jun	Troy Twp. St. Croix YMCA Beach	14.5	60	100+
22-Jun	South of Beach at Lake St. Croix Beach	13.8	60	100+
22-Jun	Catfish Bar	11.6	40	100+
22-Jun	Black Bass Bar	10.2	40	100+

22-Jun	MN Shore across for the Kinni Narrows	6.5	30	100+
22-Jun	Prescott Relocation Bed	0.2	26	100+

Figure 1. Zebra Mussel Dive Locations in June. (Stillwater to Black Bass Bar)



In July, quantitative assessments of zebra mussel populations were performed at eight locations from Stillwater to Prescott. These include the two Critical Habitat Areas for the Higgin’s Eye Pearly Mussel, located in Hudson and Prescott, Wisconsin. The remaining sampling locations are just downstream of the Stillwater Lift Bridge, Bayport, Lake St. Croix Beach, Black Bass Bar, the Kinnickinnic Narrows and St. Croix Bluffs Regional Park. The eight sites represent native mussel beds with a high likelihood of continued infestation by zebra mussels. By establishing a baseline data set, it will be possible to track zebra mussel population dynamics within the infestation zone. Besides using mussel beds as criteria for site selection, locations were spread throughout the four pools comprising Lake St. Croix (the last 23 miles).

The St. Croix SCUBA Dive Team, including staff from NPS, FWS, and GLIFWC, collected fixed amounts of substrate from within each location’s set perimeter. Material is then processed and the information collected includes number of native live and dead mussels, live and dead zebra mussels, number of live zebra mussels on native mussels, number of Asian clams, and number and species of snails. The results of this survey for

2004-6 are available in a separate report that can be accessed at <http://www.nps.gov/sacn/management/Final2004ZMDensityonStCroix.pdf>.

In September, the Dive Team performed qualitative sampling in the flowage behind the St. Croix Falls Dam. Sites were also chosen below the tail water in the Interstate Park area. This location contains some of the most outstanding native mussel habitat on the river. During the dive week, eleven sites were searched in the flowage and seven in the Interstate Park area. Hundreds of native mussels and a wide range of suitable habitat areas were examined and explored. No zebra mussels were found during this event.

7.2b Passive Monitoring (Interstate Plan – Action IC1a)

(22) The NPS had **22 PVC plate monitoring samplers** (one per site) in place from Mile Long Island (river mile 25.5) to the headwaters of the St. Croix and Namekagon rivers. These were checked every other week by NPS staff. Glass slides are affixed to these samplers, removed, preserved and replaced every two weeks. Slides provide initial substrate for zebra mussel settlement. Staff from the MN DNR examined the slides over the course of the season. There were no attached zebra mussels on any submitted slides.

(27) The USFWS, LaCrosse Fishery Resources Office, maintains 27 plate samplers at 9 locations from Stillwater to Prescott (Table 3). These samplers are checked every two weeks from ice out to ice up and several are allowed to remain in the water over-winter. Glass slides are also affixed and examined as above. No zebra mussels were found on samplers at Wolf Marine in Stillwater. Samplers found with attached zebra mussels were at Pt Douglas (Prescott), St Croix Bluffs Regional Park (MN side upstream from Prescott), Windmill and Afton Marinas (Afton, MN), St. Croix Marina gas dock (Hudson), Hudson Sailboat Mooring Dike, Bayport Marina, and Sunnyside Marina (Oak Park Heights). Beginning with the initial check in the spring a fair amount of winter carry-over was noted on samplers within the lowest pools (Prescott to Windmill). These were all large adults, not many juveniles. A similar increase of adults carried-over at marina samplers at Windmill, Afton, Hudson, and Bayport. It took a while for spring settlement to show-up on the samplers, but by early June, staff found a very large increase in young mussels on all samplers up to Bayport, and some increase at Sunnyside. This trend continued throughout the summer and may reflect an "infestation" year from the Stillwater Bridge south to Prescott. Contacts with Marina crews and boaters suggests many were finding increased amounts of mussels on boats as well, with increasing numbers the further south from Stillwater the boats had been moored. While there have been no positive finds on samplers above the Stillwater Bridge, both Stillwater and Wolf Marinas are reporting a great increase in numbers on the boats pulled at their docks, which may suggest it is a matter of time before the upstream population increases and substrate zebra mussel finds are located at those sites.

7.2c Veliger Monitoring (Interstate plan – Action IC1c)

The U.S. Army Corps and the Wisconsin DNR collected cross-sectional composite water samples at Prescott and Hudson, during July, August and September of the 2001 through 2006 field seasons. The NPS has aided the WI DNR/USACE efforts since 2004 and worked with the Corps to take samples north of Stillwater. Since 2004 sampling in the St.

Croix basin included Prescott, Hudson, just north of Stillwater, south of St. Croix Falls, and the Sunrise and Snake rivers. These samples were taken in July and August and early September.

The samples are processed and veligers counted at the U.S. Army Engineer Research and Development Center, Vicksburg, MS. The data table from the Corps results is included below. Data for 2006 will be available in early 2007.

Table 4. Veliger Abundance (#/L) [Table adapted from draft data provided by USACE]

	Veliger Abundance (#/L)											
	July						August					
	2001	2002	2003	2004	2005	2006	2001	2002	2003	2004	2005	2006
Tributaries	Live Veligers											
St. Croix R. (Hudson)	0.07*	0	0	0.70	0	0.76	0.60*	0	0	0.5	0	1.11
St. Croix R. (Prescott)	0.1	4.53	0	5.94	2.20	9.17	2.39	0	0.62	5.69	3.56	3.28
St. Croix (Stillwater)	-	-	-	0	0	0	-	-	-	0	0	0
St. Croix Falls	-	-	-	0	0	0	-	-	-	0	0	0
Snake River	-	-	-	0	0	0	-	-	-	0	0	0
Sunrise River	-	-	-	0	0	0	-	-	-	0	0	0
	Dead Veligers											
St. Croix R. (Hudson)	0.01*	0	0	0.13	0	0.11	0.06*	0	0	0.04	0	0.22
St. Croix R. (Prescott)	0.01	0.47	0	0.78	0.61	0.33	0.02	0	0.12	0.83	0.25	0.08
St. Croix (Stillwater)	-	-	-	0	0	0	-	-	-	0	0	0
St. Croix Falls	-	-	-	0	0	0	-	-	-	0	0	0
Snake River	-	-	-	0	0	0	-	-	-	0	0	0
Sunrise River	-	-	-	0	0	0	-	-	-	0	0	0

* represents sample from Kinnickinnic R. mouth

7.2d Other zebra mussel detections

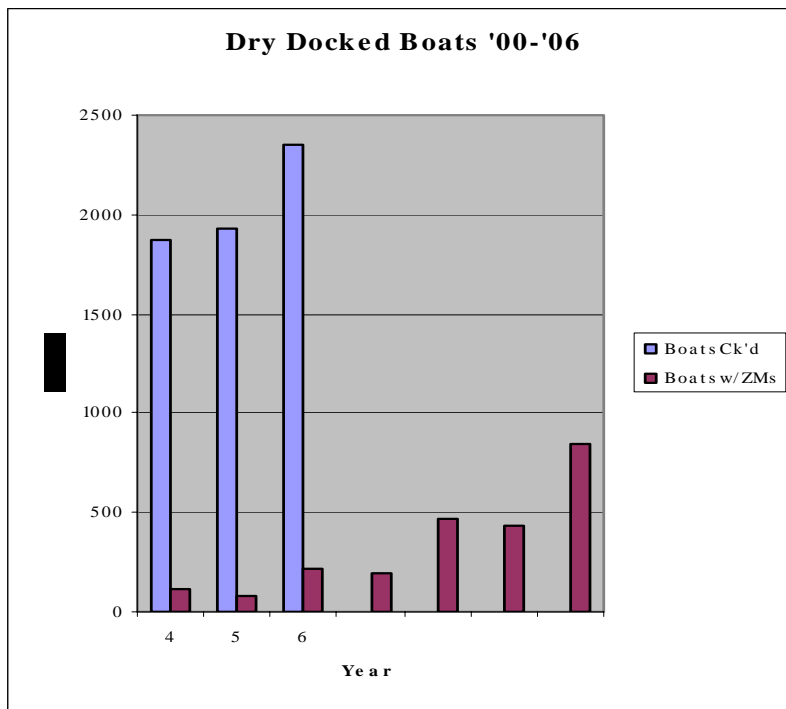
During three days at the end of October, NPS employees conducted an examination of St. Croix boats dry docked for the season and stored at marinas from St. Croix Falls to Hastings (Table 5). Of the **2352** boats checked, **848** were found with attached zebra mussels on their sterns (outdrives, trim tabs, gauges, etc). Most of the finds were at marinas from Bayport south, but every marina within the infestation zone (Stillwater @ RM 25.4 south) had at least one boat with attached zebra mussels.

Table 5. Dry Docked Boats 2000-2006

Marina	00 ZM	01 ZM	02 ZM	03 ZM	4	04 ZM	5	05 ZM	6	06 ZM	Slips
Wolf Marine	0	5	3	4	172	6	166	8	157	18	250
Stillwater Yacht Club	0	1	2	6	108	3	122	5	113	17	157
Sunnyside Marina	8	3	5	4	172	16	195	16	220	29	200+
Beach House Marina	0	0	0	1	192	43	79	2	80	4	180 on Land 70+ 80+30
River Park Marina	6	3	8	8	67	1	113	15	120	29	
Bayport Marina	10	8	7	10	103	19	201	47	244	100	225
St. Croix Marina	17	8	18	13	198	63	215	71	247	185	300+?

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Afton Marina	32	33	57	26	187	100	180	86	118	158	184
Windmill Marina	39	16	48	40	220	92	237	83	232	158	180
Afton Boat Storage	3	3	15	6	94	8	98	16	266	24	0
Miss/Croix	--	--	59	61	104	92	120	82	132	105	?
King's Cove	--	--	--	10	150	24	198	3	301	20	?
Total	116	80	222	189	1869	467	1924	434	2352	848	1888+



7.3 Information Transfers

(various) Number of activities for states/tribes/partners for which technical assistance was provided: Sea Grant, MN DNR, and the National Park Service provided subject experts to provide AIS information at various sites and locations during 2006.

Additionally, GLIFWC continues to update a regional database of AIS occurrences and provides public access to this information via an Internet Map Server (www.glifwc-maps.org). GLIFWC also shares data routinely with cooperating agencies.

8.0 Forging Effective Partnership

(FWS Funds Used: MN none budgeted; WI none budgeted; GLIFWC \$none budgeted)

8.1 Public Awareness Campaigns

(3) Number of public awareness campaigns conducted by: MNDNR, WDNR, GLIFWC.

8.2 Other Cooperative Efforts

One regional panel supported: The efforts under the St. Croix interstate plan fall within the geographic area of the Mississippi River Basin Panel (MRBP) on aquatic invasive species that was established in 2003. Wisconsin and Minnesota participated in the MRBP in 2006.

GLIFWC hosted a conference promoting cooperation and collaboration on regional AIS management efforts. Over 80 participants from various federal, state, tribal, and county governments participated as well as leaders of many grass roots non-government organizations. The conference helped to raise awareness of ongoing efforts, available resources and expertise, and identified many new opportunities for collaborative efforts on regional AIS issues.

One Interstate partnership, the St. Croix Aquatic Invasive Species Task Force, was supported. The partnership includes: National Park Service—St. Croix National Scenic Riverway, Minnesota Department of Natural Resources, Wisconsin Department of Natural Resources, Great Lakes Indian Fish and Wildlife Commission, Army Corps and the USFWS.

No Cooperative or Grant-funded projects were begun in 2006 with FWS funding.

9.0 Other Activities Not Listed Above

(FWS Funds Used: none)

Total FWS Funds Used for All Activities (\$70300+25168+?)

Total State and Tribal Funds Used for All Activities (\$81220+8389+?)

Total Funds used for All Activities (\$151520+33557+?)

**Cost of all Accomplishments*, Activities and/or Projects.
Agreement Number: 14-48-0003-98-1105 Minnesota**

Total Federal Funding (per grantee) since Plan Inception = \$420,500 Minnesota (FYs 98-04)

Maximum Federal Shares (grant agreement amount) FY 2004 Grant Year (use in Calendar 2005) = \$71,551 Minnesota

Invoice Amount and Date (mm/dd/yy)	Activity/Project/Accomplishment ^{*1}	Federal FY (Grant Year) ^{*2}	Budget Line ^{*3}	Total requested payment by budget line (\$)	Matching funds ^{*4} (\$)	FWS ANS funds received (reimbursed) from FY04 grant (\$)	Total Cost (Federal and State) in Federal FY (\$)
na	• Watercraft Insp. • Coordination • Enforcement		Salaries	0	65,220		
				0			
				0	5,000		
na			Benefits	0			
			Travel	0			
			Transportation	0			
	• Radio and TV media purchases	06	Communication	66,300	10,000		
	• Stickers		Printing	0	1,000		
	• Zebra mussel monitoring	06	Other services	4,000			
			Supplies	0			
			Equipment				
	Total			70,300	81,220	0	151,520

* Preferred.

*1 If expenditures were not tracked by either Project or Activity, then track expenditures for all activities combined by Federal FY.

*2 October 1 through September 30. Example - FY2002 ends September 30, 2002.

*3 Salaries, benefits, travel, transportation (e.g., mail, freight), communications (e.g., telephone), printing, other services (e.g., contracts), supplies, equipment.

*4 Includes in-kind match.

Cost of all Accomplishments*, Activities and/or Projects.

Agreement Number: 30181- 4- G050

Wisconsin

Total Federal Funding (per grantee) since Plan Inception = \$55,000 Wisconsin FY 04-05 (Grant Year)

Maximum Federal Shares (grant agreement amount) FY 2005 Grant Year (use in Calendar 2006) = \$30,000 Wisconsin

Activity/Project/ Accomplishment	Federal FY (Grant Year)	Budget Line	Total Requested Payment by budget line (\$)	Matching Funds	FWS ANS funds received (reimbursed) from FY 05 grants (\$)	Total Cost (Federal and State) in Federal FY (\$)
Zebra mussel dive searches	05	Contract	\$ 5,000.00			
Monitoring for new invasive species	05	Travel	\$ 19.83			
		Supplies	\$ 1,019.02			
		Salary & Benefits	\$ 4,311.22			
		Supplies	\$ 1,500.99			
Information/ education and outreach efforts	05	Printing	\$ 296.71			
		Other Services	\$ 136.20			
		Contract Equipment	\$ 5,984.12	\$ 8,389.00		
			\$ -			
Contact boaters at water access sites/ watercraft inspection	05	Contract	\$ 6,900.00			
TOTAL			\$ 25,168.09	\$ 8,389.00	n/a	\$ 33,557.09

*Actual matching funds paid for contractual = \$14,373.12.

**Cost of all Accomplishments*, Activities and/or Projects.
 Agreement Number: 30181-9-G039 GLIFWC**

Total Federal Funding (per grantee) since Plan Inception = \$ 40,000 GLIFWC (FY98 – FY06)

Maximum Federal Shares (grant agreement amount) FY 2005 = \$5,000 GLIFWC

Invoice Amount and Date (mm/dd/yy)	Activity/Project/Accomplishment ^{*1}	Federal FY (Grant Year) ^{*2}	Budget Line ^{*3}	Total requested payment by budget line (\$)	Matching funds ^{*4} (\$)	FWS ANS funds received (reimbursed) from FY06 grant (\$)	Total Cost (Federal and Tribal) in Federal FY (\$)
		06	Salaries		1610	1000	
			Benefits				
			Travel				
			Transportation				
			Communication				
			Printing				
			Other services				
			Supplies				
			Equipment		390		
	Total				3,000	5,000 (FY06)	

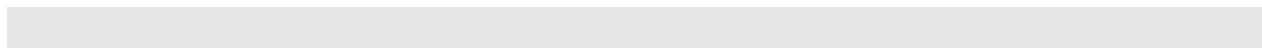
* Preferred.

^{*1} If expenditures were not tracked by either Project or Activity, then track expenditures for all activities combined by Federal FY.

^{*2} October 1 through September 30. Example- FY2002 ends September 30, 2002.

^{*3} Salaries, benefits, travel, transportation (e.g., mail, freight), communications (e.g., telephone), printing, other services (e.g., contracts), supplies, equipment.

^{*4} Includes in-kind match.



10.0 References

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11.0 Appendix

Table 1. Program Information—All years.

Zebra Mussel Prevention Plan Annual Summary Statistics														
Program Year	1994	1995	1996	1997	1998	1999	2000	2001	2002*	2003*	2004	2005	2006	
Visitor Contacts	52,274	56,127	60,356	62,661	66,417	72,210	66,119	35,755	39,017	46,574	42,162	38,857	39317	
Big Dipper Contacts	10,634	6,158	5,826	6,094	6,415	5,534	3784	11,237	11,100	9895	7648	++	++	
Special Use Permits Issued	N/A	N/A	N/A	N/A	N/A	N/A	N/A	39	25	43	45	43	4	
Inspection Dives	0	1	2	2	1	4	2	3	0	0	1	0	1	
Monitoring Dives	6	4	4	3	3	3	3	3	3	3	3	3	10	
Monitoring Samplers	37	34	33	57	53	43	61	64	70	69	~66	49	33	
Winter dry-docked boats inspected	100	100	544	804	1463	1924	1919	1833	1921	2192	1869	2024	2352	

*One/**Two visitor centers were closed. ++Physical boundaries only

Figure 1. Dry Docked Boats—All years.

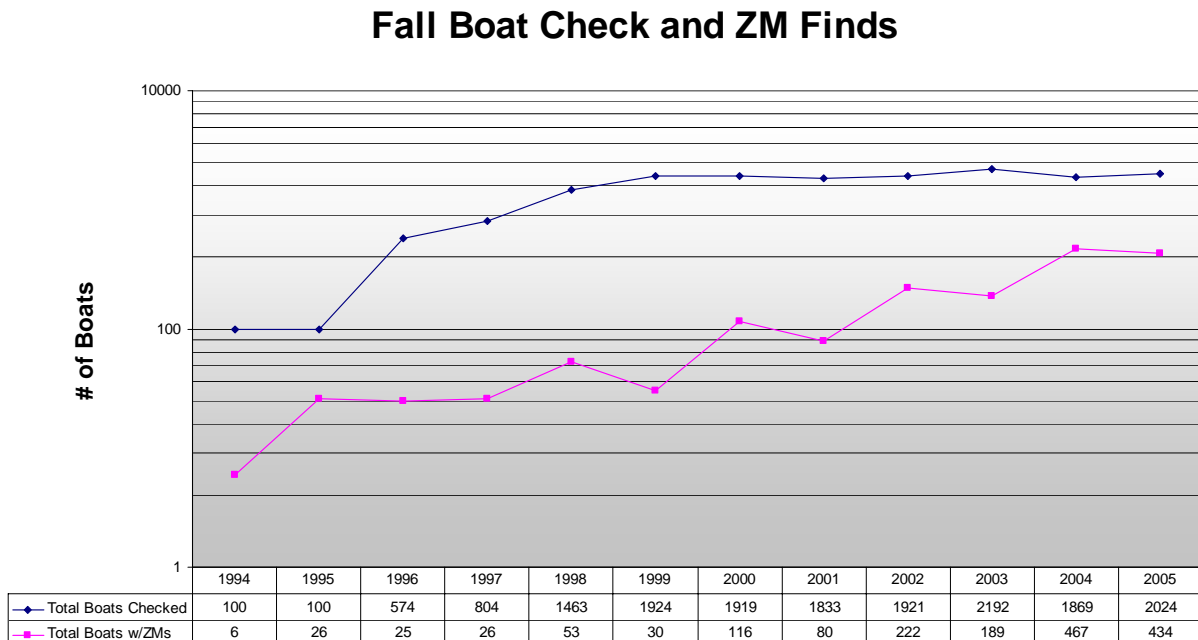


Table 2. Dry Docked Boats—All years.

Marina	00	00 ZM	01	01 ZM	02	02 ZM	03	03 ZM	04	04 ZM	05	05 ZM	06	06 ZM	Slips
Wolf Marine	191	0	185	5	195	3	184	4	172	6	166	8	157	18	250
Stillwater Yacht Club	135	0	163	1	128	2	126	6	108	3	122	5	113	17	157
Sunnyside Marina	254	8	251	3	251	5	294	4	172	16	195	16	220	29	200+
Beach House Marina	89	0	80	0	84	0	86	1	192	43	79	2	80	4	180 on Land 70+ 80+30
River Park Marina	110	6	115	3	103	8	99	8	67	1	113	15	120	29	
Bayport Marina	208	10	119	8	214	7	219	10	103	19	201	47	244	100	225
St. Croix Marina	267	17	231	8	236	18	233	13	198	63	215	71	247	185	300+?
Afton Marina	184	32	184	33	181	57	148	26	187	100	180	86	118	158	184
Windmill Marina	283	39	207	16	206	48	264	40	220	92	237	83	232	158	180
Afton Boat Storage	103	3	125	3	131	15	108	6	94	8	98	16	266	24	0
Miss/Croix	--	--	--	--	121	59	116	61	104	92	120	82	132	105	?
King's Cove	--	--	--	--	--	--	191	10	150	24	198	3	301	20	?
Total	1919	116	1833	80	1921	222	2192	189	1869	467	1924	434	2352	848	1888+

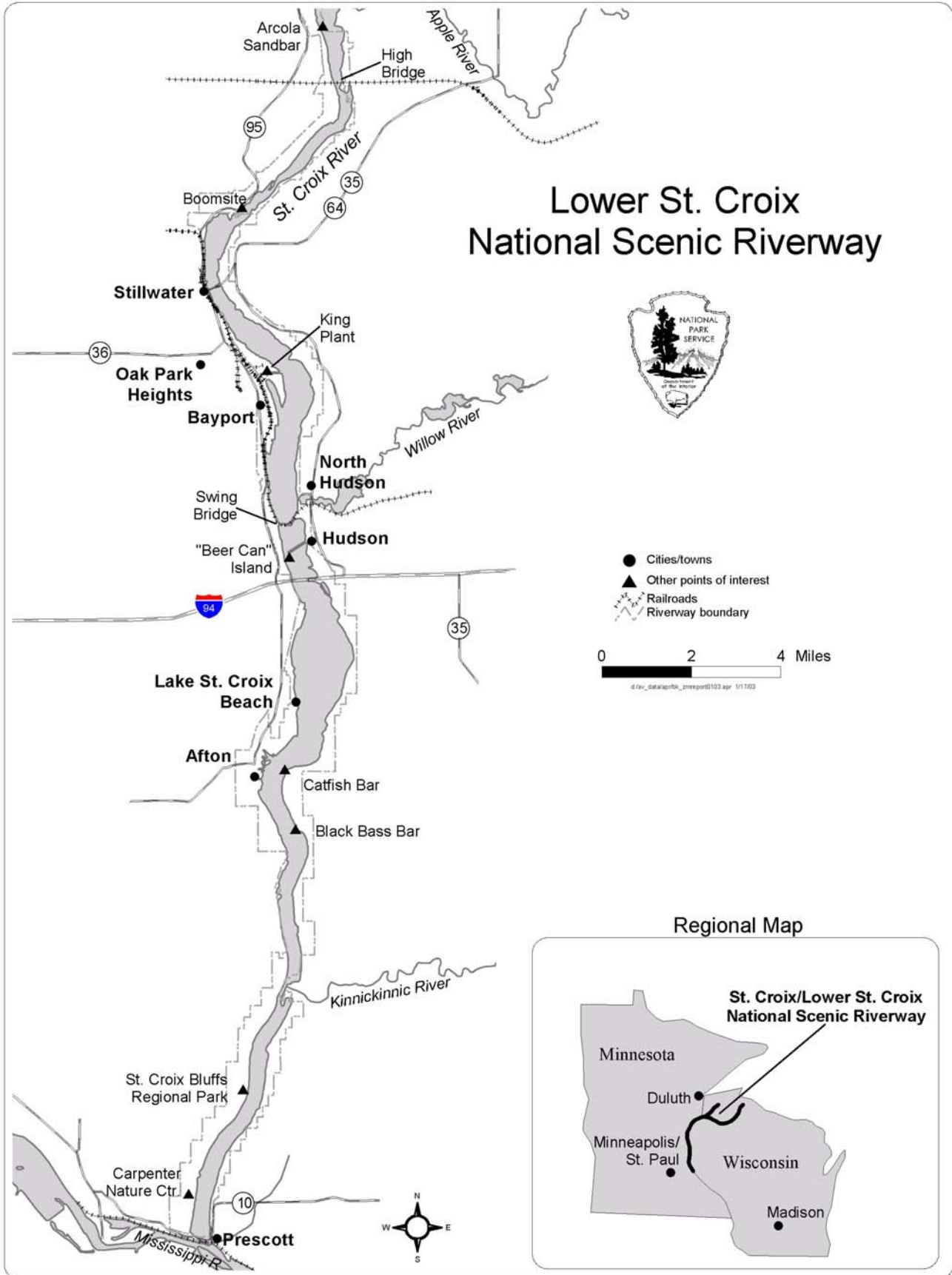


Figure 2. Map of the Lower St. Croix National Scenic Riverway.