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UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

RECORD OF DECISION

FINAL ENVIRONMENTAL IMPACT STATEMENT COOPERATIVE MANAGEMENT PLAN

Lower St. Croix National Scenic Riverway
Minnesota / Wisconsin

INTRODUCTION

The National Park Service (NPS), Minnesota Department of Natural Resources (DNR), and Wisconsin Department of Natural Resources prepared the *Final Environmental Impact Statement (FEIS) for the Cooperative Management Plan* for the Lower St. Croix National Scenic Riverway (October 2000). Pursuant to section 102 (2) (C) of the National Environmental Policy Act of 1969, Public Law 91-190 (as amended), and the regulations promulgated by the Council on Environmental Quality at 40 CFR 1505.2, the Department of the Interior, National Park Service, has prepared the following Record of Decision (ROD) on the EIS.

In Wisconsin, the Department of Natural Resources is required to comply with the Wisconsin Environmental Policy Act (WEPA) as described in s.1.11, Wis. Stats., and Ch. NR 150, Wis. Adm. Code, to assure consideration of the short- and long-term environmental and economic consequences of policies, plans, programs or other actions upon the quality of the human environment. As a cooperating agency in plan development and in design of the public review process, the Department has assured the CMP/EIS satisfies the substantive and procedural requirements of WEPA.

This ROD is a concise statement of what decisions were made, what alternatives were considered, the environmentally preferred alternative, the basis for the decision, and the mitigating measures developed to avoid or minimize environmental impacts.

DECISION (SELECTED ACTION)

The managing agencies will implement the preferred riverway management alternative and the preferred management structure option, as described in the FEIS (with some minor clarifications, as listed in appendix A (Errata Sheet) of this ROD).

The managing agencies will emphasize protection and enhancement of the riverway's diverse character. Long stretches of the lower riverway's natural and rural landscape will be maintained, while allowing limited, planned development in communities that is consistent with the historic character of the communities. Limited new development could occur within existing municipalities along the river, although maintenance of the overall character of the municipalities will be emphasized. Outside of municipalities, landowners will be encouraged to maintain the natural character of the landscape, particularly the blufflines, as seen from the water. Protection of natural resources, including the valley's important biological diversity, will be enhanced. Riverway users will continue to find opportunities to

engage in a wide range of recreational experiences. The emphasis will be on maintaining and enhancing the diverse landscape character and the diverse water-based recreational opportunities.

The Lower St. Croix Management Commission will continue as the primary policy body for joint management of the riverway. The Minnesota DNR, Wisconsin DNR, and NPS will continue as the three voting members. The management commission will include an additional nonvoting member from the newly created Lower St. Croix Partnership Team that will serve an advisory role. The Minnesota-Wisconsin Boundary Area Commission will continue in its administrative support and nonvoting advisory roles. The three managing agencies will provide staff for the management commission for riverway management, and for plan implementation. The two state departments of natural resources will adopt rules to form a basis for riverway ordinances that local governments will be required to adopt and enforce. The states will have objection (Wisconsin) or certification (Minnesota) authority over local ordinances, amendments to the ordinances, and variances. The management commission's technical committee will review local zoning actions. The technical committee and managing agencies can comment on the proposed actions. Managing agencies will have no veto authority over a local government's decision on a conditional use permit, or subdivision; if there were disagreement, appeals could be made to the courts. Existing water use enforcement roles will continue and the three agencies will provide staff for on-water law enforcement, rescue, and related activities. The three agencies will provide staff for management of lands each owns.

OTHER RIVERWAY MANAGEMENT ALTERNATIVES AND MANAGEMENT STRUCTURE OPTIONS CONSIDERED

Five other riverway management alternatives were evaluated in the draft and final environmental impact statements.

Alternative A would seek to maintain long stretches of the lower riverway's natural and rural landscape, while allowing limited, planned development within the boundary that was consistent with the historic character of the riverway's communities. However, a slightly greater proportion of the lower riverway would encompass town landscapes, allowing greater opportunities for development within or adjacent to riverway towns. Additional residential development would also occur in rural areas. Riverway users would continue to find an array of recreational opportunities, including increased opportunities for more social activity on parts of the river, but no efforts would be made to regulate user activities if they were not causing significant damage to the resource or posing safety hazards to others.

Alternative B would stress maintaining the current landscape character within the riverway boundary and maintaining the diversity of water recreational experiences as much as possible. However, the overall level of recreational use would be allowed to increase but some use would be reallocated and separated. New development would be more limited than alternative A and slightly more limited than the preferred alternative.

Alternative C would achieve the same conditions as alternative B — views of the land within the boundary and the diversity of river recreational experiences would be maintained. The major difference from other alternatives would be in the strategy used to maintain the diversity of recreational experiences would be to freeze the growth of recreational use.

Alternative D would promote and restore the natural qualities of the lower riverway — the predominance of natural features over modern developments would increase. Natural landscapes would be restored where feasible, and managing agencies would strive to make the landscape appear more natural than it

does now. Emphasis would be placed on promoting quieter, slower, and less intrusive experiences that would not disturb others. Overall recreational use would be reduced.

Alternative E, the no-action alternative, provides a baseline for comparing the other alternatives. The managing agencies would continue to manage the lower riverway as they have in the past. The agencies would continue to follow the 1976 *Master Plan* (with some changes based on current management practices) and the Lower St. Croix Management Commission's policy resolution. Management would focus on maintaining existing land use and recreational use patterns and would react to recreational use as they have in the past. Rural residential development would be allowed to a greater degree than all of the alternatives except alternative A. The Riverway Management Policy Resolution would be used to address new issues that arose.

Four management structure options were evaluated in the draft and final environmental impact statements.

Option 1 would also retain the management commission but would include a local government representative. The planning task force would be restructured and made permanent. It would assist in rules interpretation, mediation, and coordination for land management and/or water use management. Options 2 and 3 would further expand the management commission and create a water patrol. Option 2 would create a joint powers board for land use management, whereas option 3 would create a riverway board to manage land use. Option 4 would continue the existing management structure for policy direction and land and water use.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

A ROD must identify the environmentally preferable alternative, which is that alternative which causes the least damage to the biological environment, and that best protects, preserves, and enhances historic, cultural, and natural resources. Alternative D is the environmentally preferred alternative, although not by a great measure over the selected action. Alternative D includes a greater emphasis on restoration of natural qualities, fewer areas for new residential or commercial development, and a reduction in overall water use and speed levels when compared to the selected action and the other alternatives. Alternative D would result in primarily negligible to moderate positive effects to resources, compared to primarily negligible to minor positive effects to resources under the selected action. However, the selected action provides greater, more holistic emphasis on the maintenance and enhancement of the outstandingly remarkable values for which the riverway was designated as a unit of the national wild and scenic river system (namely, scenic, recreational, and geologic values). The selected action better ensures the riverway's unique diversity of landscape character and water surface recreational opportunities, which result in somewhat fewer benefits to resources than under alternative D.

The management structure options address the organizational structure and administration of the riverway only. Impacts of these options are associated with nonenvironmental type effects such as costs, staffing requirements, and agency roles and responsibilities. Consequently, there is no environmentally preferred option.

BASIS FOR DECISION

The Lower St. Croix National Scenic Riverway is included in the national wild and scenic rivers system because of its scenic, recreational, and geologic values. These combined values are the hallmark of this diverse resource. Both the riverway's landscape character and its water-based recreation reflect diverse

uses. Parts of the valley remain relatively wild and undisturbed, while other areas reflect the valley's proximity to a large urban area. On-water recreation reflects the diversity of the surroundings: experiences range from the quiet solitude of a nonmotorized area to a very social and highly motorized environment. The new management strategy for the Lower St. Croix National Scenic Riverway provides greater emphasis than ever to ensure continuation and enhancement of that diversity. This emphasis on protection of the riverway's diversity, along with improvements in the protection of riverway's natural, cultural, and scenic resources, reduction in conflicts between landowners and recreational users, and implementation costs provided the basis for selecting the preferred alternative for implementation.

It must also be noted that the Lower St. Croix Planning Task Force, composed of interested members of the public, citizens representing boaters, businesses, landowners, environmental groups, local governments, and various other interests, and staff of the riverway managing agencies, played a key role in developing the preferred alternative and completing the riverway plan. The overall direction and most of the elements of the preferred alternative for managing the lower riverway were agreed upon by the citizen-driven task force in a consensus-based process.

The managing agencies consulted with the U.S. Fish and Wildlife Service on two occasions regarding the likely effects of the cooperative management plan on the endangered winged mapleleaf and Higgins' eye pearly mussels. Based on those consultations, the U.S. Fish and Wildlife Service determined that the selected action will not jeopardize the continued existence of the two species. A copy of the U.S. Fish and Wildlife Service's April 2, 2001 biological opinion is attached to this ROD as appendix B.

FINDINGS ON IMPAIRMENT OF RIVERWAY RESOURCES AND VALUES

The NPS may not allow the impairment of riverway resources and values unless directly and specifically provided for by legislation or proclamation establishing the riverway. Impairment that is prohibited by the NPS Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of riverway resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. In determining whether impairment would occur, park managers examine the duration, severity and magnitude of the impact; the resources and values affected; and direct, indirect, and cumulative effects of the action. According to NPS policy, an impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is: a) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the riverway; b) key to the natural or cultural integrity of the riverway or to opportunities for enjoyment of the riverway; or c) identified as a goal in the riverway's general management plan or other relevant NPS planning documents.

This policy does not prohibit all impacts to riverway resources and values. The NPS has the discretion to allow impacts to riverway resources and values when necessary and appropriate to fulfill the purposes of a riverway, so long as the impacts do not constitute impairment. Moreover, an impact is less likely to constitute impairment if it is an unavoidable result, which cannot be further mitigated, of an action necessary to preserve or restore the integrity of riverway resources or values.

After analyzing the environmental impacts described in the *Final Cooperative Management Plan / Environmental Impact Statement* and public comments received, the NPS has determined that implementation of the preferred alternative will not constitute an impairment to the Lower St. Croix National Scenic Riverway's resources and values. The actions comprising the preferred alternative are intended to maintain and enhance the outstandingly remarkable values for which the riverway was designated as a unit of the national wild and scenic river system. While the preferred alternative would have some adverse effects on park resources and recreational use, none of the impacts would adversely

affect resources or values to a degree that would prevent the NPS from fulfilling the purposes of the riverway, threaten the natural or cultural integrity of the riverway, or eliminate the opportunity for people to enjoy the riverway. Overall, the preferred alternative would protect and enhance the riverway's natural, cultural, and scenic resources and the diverse recreational uses found there.

MEASURES TO MINIMIZE HARM

The preferred alternative provides a policy-level management framework for the riverway. Within this broad context, the preferred alternative includes all practical measures to minimize environmental harm. However, additional appropriate mitigation will be identified as part of follow-up implementation plans and for individual construction projects (such as bridge and utility line replacements) to further minimize resource impacts. Additional environmental documentation, with mitigation measures, will be required before project implementation. Management actions designed to avoid or minimize impacts to resources, such as keeping people away from bald eagle nests, will continue to be employed as necessary. New regulations may be instituted to address resource protection needs that might arise from recreational use within the riverway. The managing agencies will also implement their respective components of the U.S. Fish and Wildlife Service's recovery plans for the endangered winged mapleleaf mussel and the Higgins' eye pearly mussel, which include measures to minimize impacts and recover these species.

PUBLIC INVOLVEMENT

Public involvement was vitally important throughout the planning process. The public had two primary avenues by which it participated in the development of the plan - participation in the Lower St. Croix Planning Task Force and responses to newsletters, workbooks, and the draft and final versions of the plan/EIS. The task force met 53 times between February 1996 and August 1998. Membership in the task force was open throughout the planning process to all interested citizens. Persons could attend any meetings they wanted to; new participants were welcome throughout the process. Notification of task force meetings and workshops was provided through mailing lists and news releases; all meetings were open to the public.

During the planning process two newsletters and three workbooks were prepared and mailed to the public. Newsletter No. 1 (May 1996) alerted citizens that the planning process was beginning. It included draft purpose, significance, and exception resource/value statements, and asked for public comment on these statements, on desired futures for the riverway, and on issues the plan should address.

Newsletter No. 2 (November 1996) summarized responses to Newsletter No. 1 and identified changes made in the purpose, significance, and exceptional resource/value statements based on the public's comment. The newsletter also identified the issues and concerns to be addressed in the plan, described landscape units of the lower St. Croix, and described the activities of the task force. This newsletter was informational and no public input was collected.

In April 1997 Workbook No. 1 was published. The workbook described potential land and water management areas, and five preliminary management alternatives (plus a "no action" alternative), as well as a "vision" for the lower riverway. The public was asked to comment on the management alternatives and on the vision statement.

Workbook No. 2 (April 1998) was intended to compile the existing products of the task force and serve as a reference tool for persons who intended to participate in a preferred alternative workshop. This workbook was informational and no public input was collected.

Workbook No. 3 (also April 1998) focused on the guidelines for revising state land use and surface water regulations. The public was asked to indicate its support for different options being considered by the task force.

The *Draft Cooperative Management Plan/Environmental Impact Statement* for the Lower St. Croix National Scenic Riverway was released to the public on September 17, 1999. The 60-day public review period ended on November 30, 1999. About 650 copies of the document were distributed to federal and state officials and agencies, local governments, organizations, individuals, and public libraries. The document also was available via the internet. Informational open houses were held on October 26 and 27, 1999. The purpose of the open houses was to discuss and answer questions about the document and solicit written comments concerning the plan. The managing agencies received almost 900 written responses during the public review period (including 600 "form" postcards). The plan was subsequently revised and the *Final Cooperative Management Plan/Environmental Impact Statement* was distributed in October 2000. About 475 copies of the final document were distributed in both paper and CD-ROM formats. The final plan/EIS also was available via the internet.

Because of irregularities in the distribution of the final document and because of reinitiation of consultation with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act, the managing agencies elected to extend the required 30-day "no action" period until January 31, 2001. This resulted in a no action period of more than 90 days. Notice of this decision was published in the *Federal Register* and in local papers; a letter explaining the extension also was sent to the project mailing list. Between release of the final plan and January 31, 2001, the managing agencies received 23 written responses from the public. Most of the responses repeated comments that already had been provided on the draft plan/EIS and responded to by the managing agencies. Concerns related to the following general topic areas were expressed: land use regulation guidelines, water surface use guidelines, regulatory uniformity between the states of Minnesota and Wisconsin, and geographic boundaries of land management areas. Many of the comments were about issues that are beyond the scope of the plan or that will be addressed in state rulemaking processes that will commence upon approval of this ROD.

CONCLUSION

The above factors and considerations justify selection of the alternative identified as the preferred alternative in the *Final Environmental Impact Statement*. The managing agency officials responsible for the approval of the selected action are the NPS' Midwest Regional Director, the Minnesota Department of Natural Resources Commissioner, and the Wisconsin Department of Natural Resources Secretary. By his signature, Secretary Bazzell is certifying WEPA compliance.

Recommended: Anthony L. Andersen **Date:** May 1, 2001
Anthony L. Andersen
Superintendent, Lower St. Croix National Scenic Riverway

Approved: William W. Schenk **Date:** 5/7/01
William W. Schenk
Regional Director, Midwest Region, National Park Service

Approved: Allen Garber **Date:** 5/2/01
Allen Garber
Commissioner, Minnesota Department of Natural Resources

Approved: Darrell Bazzell **Date:** 10/11/01
Darrell Bazzell
Secretary, Wisconsin Department of Natural Resources

APPENDIX A
ERRATA SHEET FOR THE
FINAL ENVIRONMENTAL IMPACT STATEMENT
COOPERATIVE MANAGEMENT PLAN

Lower St. Croix National Scenic Riverway
Minnesota / Wisconsin

The following list includes clarifications or corrections to the Final Cooperative Management Plan/Final Environmental Impact Statement (FEIS). The public brought many of the items forward in their comments on the final plan and FEIS. The National Park Service, Minnesota Department of Natural Resources, and Wisconsin Department of Natural Resources appreciate the comments and this opportunity to correct and improve the final document. None of the corrections listed below significantly affect the analyses or conclusions of the effect of the FEIS.

1. Page 16, Spread of Exotic Species, last two sentences are deleted. The sentences are replaced with a new paragraph that reads:

   "In late summer of 2000, divers determined that another species of concern, the zebra mussel, had become established in reproducing populations in the lower riverway. The divers found numerous young-of-the year zebra mussels at various locations between Hudson and Prescott. The location of the adult zebra mussels that are the source of these juveniles remains unknown. Prior to this finding, zebra mussels had only been found on boats entering or harbored on the lower riverway.

   The riverway's native species are being adversely affected by these exotic species."

   This change updates text to reflect a change in resource conditions identified after the FEIS was published.

2. Page 37, left column, last paragraph is deleted. The paragraph is replaced with text that reads,

   "On January 29, 2001, the state of Minnesota declared that the St. Croix River from its confluence with the Mississippi River to River Mile (RM) 25.4 (the Boom Site Recreation Area) is infested with zebra mussels. The declaration stemmed from research obtained in the late summer of 2000, when divers found clear evidence of significant reproduction of zebra mussels in the river. A zebra mussel action plan has been prepared by the interagency Zebra Mussel Task Force and is updated annually (see sample annual action plan in appendix G). The managing agencies would implement the recommendations of the Zebra Mussel Task Force, as identified in the current action plan and any future revisions that were within the authority of the agencies to carry out. The Zebra Mussel Task Force would continue to monitor the status of the zebra mussel, inform and educate the public about the mussel and the threat it poses, and take actions including regulations and enforcement to prevent zebra mussels from spreading further within the riverway. In addition, the states have received...[text continues as in FEIS]."

   This change updates text to reflect a change in resource conditions identified after the FEIS was published.

3. Pages 72-73, Island and Public Shoreline Management, is replaced in its entirety. The new text reads,

"North of Stillwater, public day use of publicly owned islands and shoreline areas would continue. Camping in the three state parks in this area would continue to be allowed only in designated campgrounds. On federal lands administered by the National Park Service camping would be at designated sites only as defined in a comprehensive camping management plan (to be prepared upon approval of this CMP).

This plan would provide specific management objectives for reducing trampling of vegetation, reducing shoreline and island erosion, reducing the impact of human waste, protecting and enhancing natural resource conditions, protecting cultural resources, reducing user conflicts, and protecting the rights of private land owners. An important element of the plan would be development of a monitoring plan aimed at maintaining specific resource conditions.

When demand for sites exceeded the number of available sites, an overnight use permit/reservation system could be instituted to allocate sites in advance. In addition, the National Park Service could institute at any time, in compliance with national policy and regulations, a camper user fee system.

Regardless of other management strategies, camping on National Park Service lands would be limited to a maximum seven-night limit at any one site and a 30-night limit for the entire summer season at all sites. These limits could be reduced in certain areas to increase space allocation for a greater number of users. At no time would camping equipment or beached vessels be allowed to be left unattended for more than 24 hours.

South of Stillwater, overnight use of the Hudson Islands and day use of publicly owned shoreline areas would continue to be minimally regulated. To resolve sanitation problems on the Hudson Islands, users would be required to have portable toilets to transport human wastes off the islands unless the managing agencies, local government, or volunteer organizations provided public facilities for this purpose. Camping in the two state parks and one regional park in the area would continue to be allowed only in designated areas."

This change responds to the comment of the United States Environmental Protection Agency in their comments on the *Draft Cooperative Management Plan/Environmental Impact Statement.* This response was inadvertently omitted from the *Final Cooperative Management Plan/Environmental Impact Statement.*

4. Page 125, left column, first paragraph, first sentence is changed to read,

   "Local governments would be required to adopt and enforce ordinances based on the states' rules (local ordinances could be more restrictive than state rules, but not less so); the departments of natural resources would have objection (in Wisconsin) or certification (in Minnesota) authority over local ordinances, amendments to those ordinances, and variances.

   This change makes the statement more consistent with state regulatory intent.

5. Page 176, right column, first paragraph is deleted. The following replacement text is inserted:

   "Zebra mussel sightings have been reported for the lower St. Croix since 1994. In July 1997, juvenile zebra mussels were found on a monitoring device in the St. Croix River (about 53 miles north of the confluence of the river with the Mississippi River). At that time, a search of the river substrate, native mussels, docks, boats, and dam breakwall was conducted, but no additional zebra mussels were found (NPS 1997b).

In late summer of 2000, divers for the first time found clear evidence of significant reproduction of zebra mussels resident in the St. Croix River (Karns 2000). Divers found numerous young-of-the year zebra mussels in the lower riverway between Prescott and the Kinnickinnic Narrows (approximately RM 6). Later, they found young-of-the year at various locations from Hudson downstream to the river mouth at Prescott (Karns 2001). The location of the adult zebra mussels that are the source of these juveniles is unknown. As a result of the year 2000 findings, on January 29, 2001 the state of Minnesota declared that the St. Croix River is infested with zebra mussels from its confluence with the Mississippi River to RM 25.4 (Boom Site Recreation Area)."

This change updates text to reflect a change in resource conditions identified after the FEIS was published. This change requires the following additions to the bibliography that begins on page 486 of the FEIS:

Karns, B. 2000. "2000 Zebra Mussel Response Plan, Final Report." National Park Service, St. Croix National Scenic Riverway, St. Croix Falls, WI. [Note that this resource is incorrectly cited as the "1999 Zebra mussel response plan, final report" in the U.S. Fish and Wildlife Service's revised biological opinion dated April 2, 2001.]

Karns, B. 2001. Personal communication. Biological Technician, St. Croix National Scenic Riverway. Conversation with P. Delphey, biologist, U.S. Fish and Wildlife Service. Cited in the U.S. Fish and Wildlife Service's revised Biological Opinion (April 2, 2001) regarding the Final Cooperative Management Plan/EIS for the Lower St. Croix National Scenic Riverway.

6. Page 183, left column, third paragraph, first sentence is misleading. The sentence is corrected to read,

"The Wild and Scenic Rivers Act included the stretch of the St. Croix River between the dam near Taylors Falls and its confluence with the Mississippi River as a "study river" (constituting a potential addition to the national wild and scenic rivers system). "

7. Page 215, right column, last paragraph. The text is modified to read,

"There is the potential that the federally listed Higgins' eye and winged mapleleaf mussels could be adversely effect in the following ways: People could inadvertently contribute to further spread of zebra mussels in the lower riverway;..." [text continues as in FEIS]

This change reflects updated knowledge about the presence of zebra mussels in the riverway.

8. Page 216, left column first paragraph. The last sentence of this paragraph is deleted. The following text is inserted:

"...The National Park Service consulted with the U.S. Fish and Wildlife Service regarding the potential effects the cooperative management plan would have on the listed mussel species. The U.S. Fish and Wildlife Service determined that the preferred alternative would not jeopardize the continued existence of the endangered winged mapleleaf or the Higgins' eye pearly mussel, although the preferred alternative could result in an "incidental take" of individual members of the species.

Upon the discovery that zebra mussels had established themselves in reproducing populations in the river, the NPS reinitiated consultation with the U.S. Fish and Wildlife Service (memorandum requesting reinitiation dated November 16, 2000). After re-reviewing the cooperative management plan in light of the new information regarding zebra mussels, the Fish and Wildlife Service affirmed that the preferred alternative would not jeopardize the continued existence of the winged mapleleaf or

the Higgins' eye pearly mussel. Some incidental take of individual members of the species is still possible."

This change documents the additional consultation between the National Park Service and the U.S. Fish and Wildlife Service.

9. Page 216, right column, first paragraph. The following underlined text is inserted into existing narrative:

"...and implementation of the zebra mussel action plan (see 'Management Directions Common to All Alternatives' section), including closure of the river to all upstream watercraft at river mile 28.5."

This change highlights an administrative direction of the current annual zebra mussel action plan.

10. Page 216, right column, Conclusion, last sentence. The following underlined text is inserted into the existing narrative:

"...and their original and revised biological opinions are included in appendix D."

This change incorporates the revised U.S. Fish and Wildlife Service biological opinion into the FEIS.

11. Page 432, right column, last paragraph. The following sentence is struck,

"In the small town-historic and small town districts, new commercial and multifamily uses will not be allowed, but commercial and multifamily uses will become conditionally permitted uses and not be 'nonconforming'."

In response to comments on the Draft Cooperative Management Plan and Environmental Impact Statement (DCMP/DEIS), text was added earlier in the cited paragraph that states, "...other uses permitted by the community's underlying zoning ordinance may be allowed as conditional uses." The planning team intended to strike the above sentence, as it conflicts with the added text. This correction was inadvertently omitted. Striking the text eliminates the inconsistency.

12. Page 431, right column. The following items are added to the list of definitions that all codes will include:

"*Nonconforming use* means any use of land that does not conform to the use restrictions of a particular zoning district.

Nonconforming or *substandard structures* are structures that contain a permitted use, but that do not comply with the dimensional standards of the riverway ordinance."

The following item is added to the list of standards that all codes will include:

"A **nonconforming** or **substandard structure** may be retained and maintained. A nonconforming or substandard structure may be expanded within state rule limitations if: 1) the addition is visually inconspicuous, 2) steps are taken to mitigate for visual impact and for adverse impacts to water quality and natural resources of the riverway, and 3) the addition neither creates a new nonconformity nor increases the degree of an existing nonconformity."

This change applies to the *suggested* zoning guidelines for lands within the riverway boundary. Definitions of nonconforming use and substandard structures and a standard for substandard structures were included in the draft cooperative management plan/EIS. They were removed from the FEIS because of concerns that the state of Wisconsin may not have been able to accommodate the substandard language under existing law. Upon further review of the issue, the state of Wisconsin now believes it can implement the language as written above. The change provides regulatory agencies with greater flexibility in managing improvements to existing dwellings.

The change also will be reflected in Table A-1 of appendix A.

13. Page 432, left column, **Minimum lot size**. The paragraph is replaced in its entirety by:

"In the river town, small town and small town historic districts, minimum lot size will be determined by the community's underlying zoning ordinance. In the rural residential and conservation districts, all lots will contain at least one acre of net project area. Where community sewage collection and treatment services are not available, each lot will have adequate land area for one principal dwelling structure and two on-site sewage treatment systems"

This change applies to the *suggested* zoning guidelines for lands within the riverway boundary. In reviewing the FEIS, the public expressed concerns about the additional requirement of a 2.5-acre minimum lot size. Almost all unincorporated areas in the riverway already have minimum lot size requirements equal to or greater than 2.5 acres. Furthermore, the net project area, principal dwelling, and on-site sewage treatment system requirements included in the standard provide adequate protection for the riverway.

The change also will be reflected in Table A-1 of appendix A.

14. Page 432, right column, **Structure height**. The last sentence is deleted and replaced with the following text:

"Structure height will be measured between the average ground elevation and the uppermost point of the structure."

This change applies to the *suggested* zoning guidelines for lands within the riverway boundary. In reviewing the FEIS, the public noted that changes made to the language regarding measurement of structure height would create more nonconforming structures in the riverway. The change reverts to language comparable to that included in the DEIS.

15. Page 437, right column, first paragraph, last sentence. The sentence is deleted and replaced with:

"The total number of watercraft must be served by common docks or piers located to avoid negative impact on land and water resources."

This change applies to the *suggested* water surface use guidelines. The change provides more flexibility for managing agencies in properly locating clusters of private docks.

16. Page 444 is replaced in its entirety. The new text inserted is s. 30.27 from the 1999-2000 Wisconsin Statutes. This change is necessary because of recent amendments to the statute.

APPENDIX B
U.S. FISH & WILDLIFE SERVICE
BIOLOGICAL OPINION
APRIL 2, 2001

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

APR - 2 2001

Mr. William W. Schenk
Regional Director
National Park Service
1709 Jackson Street
Omaha, Nebraska 68102

Dear Mr. Schenk:

This document transmits the U.S. Fish and Wildlife Service's (Service) amended biological opinion based on our review of the "Final Cooperative Management Plan, Environmental Impact Statement, Lower St. Croix National Scenic Riverway in the States of Minnesota and Wisconsin" and its effects on threatened and endangered species, in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

We first issued a biological opinion for this proposed action on June 8, 2000 (see Consultation History below). In this amended biological opinion, we have analyzed the effects of the preferred alternative to two listed mussel species and have found that this alternative will not jeopardize the continued existence of either winged mapleleaf mussel (*Quadrula fragosa*) or Higgins' eye pearlymussel (*Lampsilis higginsi*). This conclusion is due, in part, to key changes in the proposed action, most notably the proposed closure to upstream navigation at St. Croix River mile (SCRM) 28.5. This closure is of critical importance to preventing the further upstream spread of zebra mussels (Dreissena polymorpha). We have also analyzed the effect of the proposed action on bald eagles (*Haliaeetus leucocephalus*) and have concluded that the proposed action may affect, but is not likely to adversely affect this species.

Consultation History

The original biological opinion on the proposed action was based on information provided in the Cooperative Management Plan transmitted by memorandum dated September 16, 1999, discussions and correspondence between our respective staffs, and other sources of information. After that opinion was completed and submitted to the National Park Service (NPS) on June 8, 2000, however, divers found that the distribution and densities of zebra mussels (*Dreissena polymorpha*) in the St. Croix River had expanded significantly beyond that considered in our June 8, 2000 opinion. Therefore, on November 16, 2000, NPS requested that we reinitiate consultation on the proposed action. We responded with a letter on December 27, 2000 confirming our reinitiation of formal consultation on this action. On January 31, 2001, the Zebra

Mussel Task Force formally proposed that the Lower St. Croix Management Commission (Commission), which includes NPS and the two States, adopt specific management actions to prevent the further spread of zebra mussels in the St. Croix River (Appendix A). On that date, the Commission indicated their unanimous support for these recommendations, thereby changing the proposed action as described below. The most significant change is the closure to upstream navigation at SCRM 28.5 of the St. Croix River.

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Biological Opinion

Description of the Proposed Action

Action Area

The St. Croix River, bounded for much of its length by the states of Minnesota and Wisconsin, begins in Wisconsin and flows in a southerly direction for 154 miles until it joins the Mississippi River at Prescott, Wisconsin. The Lower St. Croix National Scenic Riverway (Riverway), the action area) is a narrow corridor that extends from St. Croix Falls, Wisconsin for 52 miles to the confluence with the Mississippi River at Prescott, Wisconsin. The Riverway passes through several land forms, including a deep, narrow gorge with basalt cliffs, pristine, undeveloped riparian areas, and highly-used, developed zones. The National Park Service (NPS) manages the upper 26-miles of the Riverway -- from St. Croix Falls to just upstream of Stillwater, MN at River Mile (SCRM) 26. From this point the Riverway is managed jointly by the States of Wisconsin and Minnesota.

Summary of Proposed Action

NPS, along with the States of Minnesota and Wisconsin, propose to adopt the "Final Cooperative Management Plan, Environmental Impact Statement, Lower St. Croix National Scenic Riverway in the States of Minnesota and Wisconsin" (Plan, USDI-NPS et al. 2000) that will "describe the direction the managing agencies intend to follow in managing the lower Riverway for the next 15 to 20 years while meeting the Riverway's stated purposes." The Plan includes five alternatives for managing land and water in the Riverway, including the Preferred Alternative and a no-action (status quo) alternative. (Our June 8, 2000 biological opinion contains a summary of each alternative. For a more complete description of each alternative, see the Plan (USDI-NPS 2000)).

This section contains a summary of the portions of the proposed action, the Plan's Preferred Alternative, that may directly or indirectly affect federally listed species. Aspects of this complex action that will not effect the listed species are excluded from this summary. The summary below primarily includes actions to be taken by the National Park Service, either solely or in conjunction with one or both of the states. In this opinion we also analyze the potential effects of non-Federal actions that are interrelated or interdependent to the proposed Federal action. Those are actions that would not occur, but for the Federal action.

Actions Authorized by the Plan

The Preferred Alternative would authorize a variety of actions, including those described below.

- Limited, planned development in municipalities that is consistent with the historic character of the Riverway's communities;
- Relocation of transportation corridors (e.g., bridges) that meet four stated criteria -- (1) the need for the project is clearly justified, (2) the project is consistent with the state and regional transportation plans, (3) there is no feasible and prudent alternative to relocating the corridor, and (4) all built elements of the existing corridor are removed and the corridor is restored to natural conditions;
- Expansion or relocation of submarine utility crossings and new submarine utility crossings;
- Camping within the Riverway; and,
- Maintenance of existing access to the Riverway (e.g., operation and maintenance of boat ramps).

Water Surface Use

The plan would authorize the division of the Riverway into three water surface use zones, (Fig. 1). Authorized boat speed limits would vary among zones, from slow-no-wake in Natural Waters to 40 miles per hour in Active Social Recreation zones, with greater restriction in some portions of the latter.

Actions Proposed for Implementation Under the Plan

In addition to the above authorizations, the Preferred Alternative would also include several actions that the NPS would carry out, including those described below.

The managing agencies will:

- Encourage local governments to cluster new developments;
- Enforce boat speed limits according to the authorized water use zones described above;
- Recommend that Congress deauthorize the 3-foot navigation channel between Taylors Falls, WI and the Arcola sandbar;
- Support the maintenance of the 9-foot navigation channel from Stillwater, MN to the Mississippi River, but recommend that the U.S. Army Corps of Engineers reduce the maintained channel width from 200 to 400 feet at the Kinnickinnic Narrows;

- Check and clean, if necessary, any watercraft entering the Riverway to conduct dredging or buoy-tending, "in a manner consistent with the zebra mussel prevention plan";

- Recommend the formation of the St. Croix water patrol;

- Consider renegotiating scenic easements where needed to include provisions for cultural and natural resource management; and,

- Consider modifying NPS ownership of lands to "improve administration."

Conservation Measures

To attempt to prevent the further upstream expansion of zebra mussels in the St. Croix River, NPS and the states propose prohibiting upstream navigation of boats past SCRM 28.5. In the Plan, NPS and the States stated that they would implement the Zebra Mussel Task Force Action Plan. On January 31, 2001 the Lower St. Croix Management Commission, which includes NPS and the two States, voted unanimously to adopt the recommendations of the St. Croix Zebra Mussel Task Force for implementation in 2001 (Appendix A). These recommendations, therefore, are now a part of the Zebra Mussel Task Force Action Plan and, thus, part of the proposed action. The explicit inclusion of these recommendations into the proposed action is the only significant change to the proposed action relative to the action that we addressed in our original (June 8, 2000) biological opinion.

Status of the Species

Bald Eagle

Bald eagle (*Haliaeetus leucocephalus*) populations in the lower 48 states have grown steadily and generally exceeded original recovery goals. The current nesting population in the lower 48 states constitutes more than a tenfold increase from the known population level in 1963. Fish and Wildlife Service (Service) estimated that the breeding population exceeded 5,748 occupied breeding areas in 1998 (USFWS 1999). The bald eagle population has essentially doubled every 7 to 8 years during the past 30 years. Moreover, recovery has been broadly distributed throughout the bald eagle's range. For a complete thorough, up-to-date description of the species, its life history, its status and distribution, see USFWS (1999).

Baker et al. (2000) found that Minnesota's bald eagle populations remain robust, although population growth has slowed somewhat compared to rates before 1995. This slowing growth rate may be caused by the near saturation of nesting habitat throughout the state, although recent large-scale blowdown in northern Minnesota may have degraded nesting habitat since 1994. Nevertheless, the species appears to be gradually expanding its nesting range in the southwestern portion of the state.

Bald eagles (*Haliaeetus leucocephalus*) regularly nest in the action area. As of 2000, there were five active nests along the Riverway between Stillwater and St. Croix Falls, including one nest in the State Zone. Of these, two nests fledged 4 young, two nests were out of sight due to low water, and the last (Stillwater) was not monitored (R. Maercklein, pers. comm. 2001).

Higgins' eye

Higgins' eye pearlymussel (hereafter, Higgins' eye) was listed as an endangered species by the Service on June 14, 1976 (Federal Register, 41 FR 24064). The major reasons for listing Higgins' eye were population declines and reductions in the distribution of the species. Higgins' eye were not abundant historically and Coker (1919) indicated it was becoming increasingly rare beginning in about 1900. Causes for the decline cited when the species was listed included commercial harvest, construction and operation of locks and dams on the Mississippi River, channel maintenance (dredging and disposal activities), changes in water quality due to municipal, industrial and agricultural pollutants, reductions in abundance and distribution of glochidial fish hosts, competition with exotic species, and disease (USFWS 1983).

Life History

The reproductive cycle of Higgins' eye is typical of the family Unionidae (Cummings and Mayer 1992). Males discharge sperm into the water column. Some sperm enter females via the incurrent aperture and fertilize eggs in the gill sacs (marsupia); females retain fertilized eggs in the marsupia. The embryos develop on the marsupia until the females release them to attach to a fish

host. To facilitate successful attachment to a suitable fish species, the posterior mantle edge resembles a small swimming fish that attracts host fish. Gill tissue containing glochidia protrudes between the mantle flaps. When the gill tissue is attacked by a fish, the glochidia are released. At least some of the released glochidia attach themselves to the gills of host fish. After further development, they fall off of the fish as juvenile mussels to inhabit the substrate. The species is bradytictic (*i.e.*, a long-term breeder), retaining developing glochidia throughout the year, except immediately following glochidial release. Females carry glochidia in the gill marsupia through winter and release them the following spring or summer (Baker 1928, Holland-Bartels and Waller 1988). Walleye (*Stizostedion vitreum*) and largemouth bass (*Micropterus salmoides*) are likely important glochidial hosts for Higgins' eye (Holland-Bartels and Waller 1988). Sauger (*Stizostedion canadense*) and smallmouth bass (*Micropterus dolomieui*) may also be important hosts for Higgins' eye (D. Waller, pers. comm. 1995).

Status and Distribution

Higgins' eye was historically distributed in appropriate habitat throughout the Upper Mississippi River and tributaries, but its range has declined significantly. It likely inhabited rivers historically in which it was never documented, but it was found in numerous Mississippi River tributaries, including the Ohio, Illinois, Sangamon, Iowa, Cedar, Wapsipinicon, Rock, Wisconsin, Black, Minnesota, and St. Croix Rivers (USFWS 1983). The range of Higgins' eye has been reduced by approximately 50 percent from its historic distribution and now occurs only in reaches of only four rivers within its historical range: (1) an approximately 302-mile reach of the Mississippi River (Havlik 1980, Havlik 1987) upstream of Lock and Dam 19 at Keokuk, Iowa, (2) in the St. Croix River between Wisconsin and Minnesota, (3) the Wisconsin River, Wisconsin, and (4) in the lower Rock River in Illinois (USFWS 1983).

Higgins' eye occurs most frequently in medium to large rivers with current velocities of 0.49 to 1.51 ft/sec and in depths of 3.3 to 19.7 ft. It appears to prefer water with dissolved oxygen greater than 5 ppm and calcium carbonate levels greater than 50 ppm. Hornbach *et al.* (1995a) found that the occurrence of Higgins' eye was significantly correlated with a firm, coarse sand substrate and was associated with areas of higher mussel species richness and generally higher mussel population densities.

The Higgins' Eye Pearlymussel Recovery Team designated seven Essential Habitat Areas[1] for Higgins' eye (USFWS 1983). The seven Essential Habitat Areas are (1) the St. Croix River at Hudson, Wisconsin (SCRM 16.2 - 17.6); (2) the UMR at Whiskey Rock, at Ferryville, Wisconsin, Pool 9 (SCRM 655.8 - 658.4); (3) the UMR at Harpers Slough, Pool 10 (SCRM 639.0 - 641.4); (4) the UMR Main and East Channel at Prairie du Chien, Wisconsin, and Marquette, Iowa, Pool 10 (SCRM 633.4 - 637); (5) the UMR at McMillan Island, Pool 10 (SCRM 616.4 - 619.1); (6) the UMR at Cordova, Illinois, Pool 14 (SCRM 503.0 - 505.5); and (7)

[1] Essential habitats are "Those localities where there is evidence that Higgins' eye is successfully reproducing. These habitats support populations that have the best chances for survival of the species" (USFWS 1983).

the UMR at Sylvan Slough, Quad Cities, Illinois, Pool 15 (SCRM 485.5 - 486.0). Three additional Essential Habitat Areas have been proposed more recently by the Higgins' Eye Pearlymussel Recovery Team; the St. Croix River at Prescott, Wisconsin, and near Franconia, Minnesota (Interstate Park), and the Wisconsin River near Muscoda, Wisconsin (Orion mussel assemblage, Hornbach 1999).

Effects of Zebra Mussels

Higgins' eye has been severely affected by zebra mussels after the invasion of the Upper Mississippi River in about 1991, as evidenced by impacts at the species' essential habitat areas. In 2000, zebra mussel densities were greater than 10/square meter (m^2) in six of the seven original essential habitats (U.S. Army Corps of Engineers, unpubl. data). Five of the essential habitat areas had zebra mussel densities greater than $100/m^2$; zebra mussel densities were approximately 10,000 - $16,000/m^2$ at two of the essential habitats -- East and West Channels at Prairie du Chien and Harpers Slough. In the East Channel essential habitat area it appears that reproduction of all unionids had virtually ceased by 1999 due to zebra mussels.

The recent invasion of the St. Croix River by zebra mussels poses a very significant challenge to the conservation of Higgins' eye. The only original essential habitat area with zebra mussel densities less than $10/m^2$ in 2000 was in the St. Croix River at Hudson (U.S. Army Corps of Engineers, unpubl. data). Shortly after this site was sampled, however, divers for the first time found evidence of significant zebra mussel reproduction in the St. Croix River approximately 10 River miles downstream of the Hudson population. The Hudson population of Higgins' eye is likely the largest remaining population of the species. The population in the East Channel of the Mississippi River at Prairie du Chien was likely the largest population before it was severely affected by zebra mussels (Hornbach 1995b).

Winged Mapleleaf Mussel

The Service listed winged mapleleaf mussel (hereafter, winged mapleleaf) in 1991 as endangered because (1) the species has been eliminated from nearly all of its original 12-state range, (2) only one local population remains, thereby making the species vulnerable to extinction due to random events, such as toxic spills, (3) infrequent reproduction that may be directly related to low densities in the remaining population, and (4) anticipated changes in land use practices in the watershed. The plan recognized zebra mussels as a critical potential threat. Zebra mussels are frequently found on recreational boats entering the St. Croix River from the Mississippi River and the reduction of the threat of zebra mussel invasion is a priority to the Winged Mapleleaf Recovery Team (USFWS 1997).

Life History

Although research in the past decade has improved our understanding of the ecology of winged mapleleaf, much remains unknown regarding the species' reproduction, feeding ecology, and specific habitat requirements (USFWS 1997). The brooding period for winged mapleleaf was

presumed to be late May to the middle of July (Baker 1928). Recent observations, however, have revealed that the brooding period extends from about mid-September to mid-October in the St. Croix River (Heath *et al.* 1999). Hove *et al.* (1999) have begun laboratory studies to determine the host fish species for winged mapleleaf. In 38 trials on 29 fish species and one species of mudpuppy (*Necturus maculosus maculosus*), they did not observe complete glochidial metamorphosis on any species tested. Although Hove (Univ. of Minn., pers. comm. 2000) recently observed two glochidia successfully transforming to independent juveniles from a channel catfish (*Ictalurus punctatus*) in the laboratory, the host glochidial species remains unknown.

Status and Distribution

The winged mapleleaf occurs only in a 8-mile stretch of the St. Croix River from St. Croix Falls to Osceola, Wisconsin (SCRM 44 to SCRM 52, Hornbach *et al.* 1998; USFWS 1997). Historically, winged mapleleaf was found in approximately 35 rivers in 13 states from Ohio to Kansas to South Dakota. There have been several recent reports of observations of live winged mapleleaf mussels outside of the St. Croix River, but none have been independently verified. Factors that may have contributed to the species' decline include habitat destruction, harvest by humans for consumption or bait, disturbance by humans while swimming or wading, physical disturbance of substrate by recreational and commercial boats, interspecific competition, parasites, disease, and predators (such as muskrat, mink, racoons, turtles, and waterbirds).

Winged mapleleaf occurs in riffles with clean gravel, sand, and rubble substrates in rivers with clear water (USFWS 1997) -- conditions that typically are associated with relatively diverse mussel communities. Hornbach *et al.* (1995a) found winged mapleleaf to be most abundant in shallow areas with fast current at an average depth of 3.0 ft (range 1.4-6.2 ft. Winged mapleleaf are associated with three mussel species, deertoe (*Truncilla truncata*), monkeyface (*Quadrula metanevra*), and fawnsfoot (*Truncilla donaciformis*) (Hornbach *et al.* 1996). They also found considerable variation in flow conditions where winged mapleleaf occurred. Water velocity ranged from 0.13 ft/s to 1.12 ft/s with a mean of 0.58 ft/s (Hornbach *et al.* 1995a).

In recent years, reproduction of winged mapleleaf has been very limited; the last significant reproduction event occurred in 1987 (Heath 1999). The apparently limited reproduction in other recent years is exemplified by observations made in 1997. In that year, researchers collected and examined approximately 250 adult females during biweekly surveys during summer and fall and found only one that exhibited evidence of successful reproduction.

Environmental Baseline

The environmental baseline is an analysis of effects of past and ongoing natural and human factors, excluding the proposed project, pertinent to the current status of the species and its habitat. The action area includes the Lower St. Croix National Scenic Riverway from the dam at St. Croix Falls, Wisconsin (SCRM 44) downstream to its confluence with the Mississippi River

at Prescott, Wisconsin.

Status of the Species in the Action Area

Higgins' Eye

Workers have described three distinct populations of Higgins' eye in the action area. The Prescott and Franconia populations are similar in size. Hornbach et al. (1995b) estimated the mean number of *Higgins' eye* in the Prescott population was approximately 4000 and that there were approximately 4000-10,000 in the Franconia population. The Hudson population, however is exceptionally larger. Hornbach et al. (1995b) estimated its size at 238,000-260,000 by multiplying the estimated area of probable habitat (991,000 m^2) by their density estimate for *Higgins' eye* (0.24/ m^2). Ecological Specialists, Inc. (1996) and Heath (unpubl. data 2000) also estimated the density of *Higgins' eye* in the Hudson population -- 0.3/m^2 and 0.09/m^2, respectively). Higgins' eye also occur in lower densities outside of these three populations in the St. Croix River.

In all cases, the number of *Higgins' eye* per square meter quadrat was high among samples relative to the mean, limiting our ability to precisely estimate population sizes, but it is clear that Hudson is a very significant population of *Higgins' eye*. Hornbach (1999) stated that it likely approaches the former size of the Prairie du Chien East Channel population, which was once the largest population of *Higgins' eye.* Zebra mussels, however, appear to have caused a virtual complete cessation of reproduction in the East Channel population of *Higgins' eye* and caused an almost or completely universal decline of native mussels. The devastation of the East Channel population of Higgins' eye has greatly increased the conservation importance of the Hudson population.

Currently, the Prescott population is likely the most vulnerable of the St. Croix populations to the effects of zebra mussels. It occurs at the mouth of the St. Croix River, approximately 6 River miles downstream of the upstream location at which significant settling of zebra mussels was detected in 2000 (R. Benjamin, Wisconsin Department of Natural Resources, pers. comm. 2001). Only the Franconia population occurs upstream of the portion of the river in which zebra mussels have been detected (Karns 2000). The current vulnerability of the Hudson population to zebra mussels is unclear. Young-of-the-year zebra mussels (i.e., < 1 cm) were found in 2000 on the left bank, across the river from the downstream portion of the Hudson essential habitat area. The densities of these newly settled zebra mussels ($\approx$ 0.05/m^2), however, does not appear to be indicative of a significant upstream reproducing population (R. Benjamin, pers. comm. 2001). Significant settlement of zebra mussel veligers does not begin to occur until approximately SCRM 7, 9 River miles downstream of the Hudson Higgins' eye population.

Winged Mapleleaf Mussel

The action area contains the entire range of the winged mapleleaf. Therefore, the general description of the status of the species (see above) also fully describes the status of the species in

the action area. Winged mapleleaf occurs downstream to SCRM 44, approximately 20 River miles upstream of the furthest upstream detection of zebra mussels.

Analysis of the Species Likely to be Affected by the Proposed Action

The proposed action is likely to adversely affect winged mapleleaf and Higgins' eye. We find that the action, as proposed, may affect, but is not likely to adversely affect bald eagles. NPS closely monitors the status and location of bald eagle nests in the action area. Most nest locations are sufficiently removed from significant human activity that disturbances to nesting birds are rare (R. Maercklein, National Park Service, pers. comm. 2001). When activities of Riverway visitors threaten to disturb nesting birds, NPS responds by removing or relocating the activity. As part of this action, NPS will fully implement the nesting habitat management guidelines found in the Bald Eagle Northen States Recovery Plan and will notify the Service if they find that the implementation of these guidelines is not sufficient to avoid adverse effects to nesting eagles in any specific situations. We had also considered effects to Karner blue butterfly (*Lycaeides melissa samuelis*) in the original biological opinion on this action. We found that the proposed action was not likely to adversely affect Karner blue. Because the reason for reinitiation of this consultation (zebra mussel infestation) does not effect Karner blue, we will not further consider this species in this biological opinion. Therefore, only winged mapleleaf and Higgins' eye will be considered in the rest of this biological opinion

Factors Affecting the Environment of the Species in the Action Area

Zebra Mussels

Life History

Adult zebra mussels attach themselves by byssal threads to hard substrates including rocks, native mussels, wood, aquatic plants, and other zebra mussels. Zebra mussels may also colonize soft substrates, such as aquatic vegetation or soft mud (Whitney *et al.* 1996). They also attach to man-made materials including fiberglass, iron, plastic, concrete, and other surfaces [U.S. Corps of Engineers (USACE) 1992]. Unlike native unionid mussels, fertilization of zebra mussel eggs occurs externally, in the water column. Large females can release up to one million eggs per season (USACE 1992), which then must make contact with sperm from male zebra mussels for fertilization to take place. Therefore, the chances of successful reproduction likely increases as adult densities increase. Eggs are released when water temperatures reach 52-54 °F. Before 2000, it appears that zebra mussel densities in the St. Croix River were low enough that the probability of contact between eggs and sperm was too low to cause detectable levels of reproduction. Immature zebra mussels (veligers) spread via passive drift on water currents. Adults and veligers attach to boat hulls, lower power drives, trim tabs, wet compartments, containers, and submerged boat equipment.

Lakes and run-of-river-reservoirs along large rivers are the primary habitats of zebra mussels.

Hunter *et al.* (1997 and references within) showed zebra mussel settlement is restricted by water velocity. Settlement is most successful in slow-moving water (<3.9 in/s), and, within velocity refuges from even such slow-moving water. Successful colonization of smaller river systems by zebra mussels may depend in part on lakes, large pools, and impoundments along the river's course where reproducing groups of zebra mussels can establish (Hunter *et al.* 1997). Impoundments along a smaller river enhance conditions for successful zebra mussel colonization, but the overall susceptibility of such a river to heavy infestation by zebra mussels is lower than for lakes and for long, low-velocity sections of large rivers. However, S.J. Nichols (date unavailable) reported that zebra mussel adults are attracted to water current and will colonize areas with water velocities up to 6.6 ft/s. He also reported that water velocities over 6.6 ft/s discourage the settling of veligers.

Effects on Native Mussels

Zebra mussels affect other mussels by competing for food and by attaching to mussels in such numbers that infested mussels cannot travel or burrow. When infested by approximately 100 or more zebra mussels, native mussels cannot open their shells to properly respire, feed, burrow, or move, nor can they close their shells for protection. Zebra mussels can build up on native mussels in such numbers that waves and currents can dislodge native mussels from the substrate. Recent observations suggest infested native mussels may remove themselves from the substrate to escape zebra mussels (Miller 1995). Any of these impacts, singly or in combination, can kill the affected mussel. Recreational and commercial water craft are the main vectors of this species throughout inland waters, while passive drift of veligers and juveniles facilitates downstream dispersal.

Zebra mussels reach a maximum length of about two inches, and hundreds of thousands can colonize a square meter. Up to 10,000 zebra mussels have been counted on a single native mussel (USACE 1992). In Michigan's Lakes Erie and St. Clair, where zebra mussels have existed for several years, native mussel populations have been devastated, and in some areas eradicated (Masteller and Schloesser 1991, Gillis and Mackie 1991). Gillis and Mackie (1991) found a positive correlation between large increases in the average number of zebra mussels attached to native mussel shells and a decline in live native mussel numbers in Lake St. Clair. They also found approximately 2,000 zebra mussels on a native mussel shell occluded the siphon region completely, affecting the infested mussel's ability to filter. Colonization rates of approximately 0.4 to 1.0 g of zebra mussels per g of native mussel (dry mass) were recorded in native mussels immediately before extirpation of native mussels from the Canadian side of the Detroit River (Ohnesorg *et al.* 1993).

Zebra mussels may have greater impact on some native mussel species than others, although this is not conclusive. Haag *et al.* (1993), in a test of six species, found species in the Anodontinae subfamily to be the most sensitive to zebra mussels, followed by Lampsilinae and Ambleminae. Winged mapleleaf is a member of the subfamily Ambleminae. Hunter *et al.* (1997 and references within) also found some species to be more sensitive than others. Giant floater (*Anodonta grandis*) was the most sensitive, followed by fragile papershell (*Leptodea fragilis*), fatmucket (*Lampsilis siliquoidea*), pink heelsplitter (*Potamilus alatus*), and black sandshell

(*Ligumia recta*).
Once firmly attached, adult zebra mussels can withstand water velocity up to approximately 6 ft/s (Claudi and Mackie 1994). They appear adapted to lentic conditions, but when the complete life history of zebra mussels is considered, its lotic (flowing water) adaptability is doubtful. Successful lotic mussels have internal fertilization, the females holding eggs in marsupial chambers in their gills, where the eggs are fertilized, and where development proceeds to the glochidial stage. The glochidia are released, attach to fish, develop, metamorphose, and drop from the fish to the river bottom. Reliance on external fertilization and planktonic larvae is not typical of mussels in lotic environments. Native mussels have possible advantages over zebra mussels in their ability to bury into the substrate -- longer life span, possibly greater energy reserves, thicker shells, and reproductive strategy suited for lotic habitats. The concern for the negative effects of zebra mussels on native riverine mussels may not be fully realized, as was the case with the Asian clam (Miller and Payne 1996), but this is by no means clear.

Winged mapleleaf is rare and sparsely distributed and may, therefore, be more vulnerable to population declines as a result of high zebra mussel densities than more common mussel species (Kjos, *et al.* 1998). Native mussels vary by species and size in their susceptibility to mortality and stress from zebra mussels, but these distinctions may not be important when zebra mussel densities exceed a certain threshold. Kjos et al. (1998) simulated the effects of a zebra mussel infestation on the sole remaining population of winged mapleleaf and found that direct impacts on female fecundity and adult mortality would likely cause winged mapleleaf to decline rapidly toward extinction.

Spread of Zebra Mussels Within and Among Water Bodies

Zebra mussels disperse by three natural mechanisms (water currents, birds, and other animals) and 20 human-related mechanisms (Carlton 1993; Schneider *et al.* 1998). Johnson *et al.* (1994) reported that although waterfowl can transport zebra mussels, the actual numbers of zebra mussels moved by ducks were quite low (0 to 0.25 zebra mussels/duck) and, thus, waterfowl may not represent a significant means of spreading zebra mussels.

Human mechanisms are predominantly important in the upstream and overland transport of zebra mussels and larvae. Carlton (1993) suggests zebra mussels on boats and other movable substrates leads to rapid "hopscotching" over suitable habitat, with "backfilling" likely to occur later. Johnson and Carlton (1992) state: 1) the introduction of only a few zebra mussels creates a low probability that a self-sustaining population will develop, 2) repeated introductions into a water body may be required for an outbreak, 3) overland transport requiring extended survival of mussels out of water is rarely successful, and 4) it is difficult to predict when invasion will occur, despite the high likelihood of eventual zebra mussel invasion -- it could require decades. Schneider *et al.* (1998) developed a transportation model for use in Illinois and found that the risk of spread of zebra mussels depends on the number of boat trips from infested waters, which in turn depends on the distance from an infested water, boat use at the site, and the position of a lake within a river system. They determined that the invasion of inland lakes and reservoirs in Illinois was predicted to occur first at areas of high boat use close to currently infested waters.

Zebra mussels have been documented to spread via divers through their gear (Kraft 1995, 1996). He found three inland lakes known to be colonized by zebra mussels in quarries frequented by divers. Kraft (1994) also reported that a 20-acre quarry, only few miles overland from Lake Michigan and frequented by divers near Racine, Wisconsin, had been infested with zebra mussels. The quarry has no public boat launch.

Zebra Mussels in the St. Croix River

Zebra mussels have been transported on recreational boats from the Mississippi River to the St. Croix River since at least 1994, but there was no evidence of a significant reproduction in the St. Croix River until 2000. The first zebra mussel collected from the Mississippi River was taken in 1991, south of La Crosse, Wisconsin (USACE 1999). The first discovery of zebra mussels on recreational boats in the St. Croix River was in 1994 and every year since then, boats have been observed with zebra mussels attached (Karns 2000). Zebra mussels have also been found attached to native mussels, rip rap, rock, refuse, and bridge piers. Before 2000, however, zebra mussel densities and sizes observed were always too low to suggest that reproduction was occurring in the St. Croix River. All zebra mussels observed were presumed to have been brought into the St. Croix River on recreational boats traveling upstream from the Mississippi River.

In 2000, divers for the first time found clear evidence of significant reproduction of zebra mussels resident in the St. Croix River (Karns 2000). On August 17, divers found numerous young-of-the-year zebra mussels (i.e., < 1 cm) in the St. Croix River between Prescott (mouth of St. Croix River) and Kinnickinnic Narrows (approx. SCRM 6). Later they found young-of-the-year at various locations from Hudson downstream to the river mouth at Prescott (B. Karns, pers. comm. 2001). Preliminary density estimates of zebra mussels <1 cm in diameter at Prescott were as high as 100/m^2 (Karns 2000). Densities and sizes of the zebra mussels observed in 2000 indicate that juveniles observed from Kinnickinnic Narrows downstream to Prescott were produced from a significant, resident population of adult zebra mussels in the St. Croix River, whereas the relatively low densities (approx. 0.05/m^2) observed at Hudson suggest that settlement there is from less significant reproducing populations (e.g., from one or more moored boats, R. Benjamin, pers. comm. 2001).

The location of the adult zebra mussels that are the source of these juveniles between River miles 0-7 is unknown. In 2000, divers found adult zebra mussels at various locations in the St. Croix River from Stillwater to the mouth. The furthest upstream location of adult zebra mussels was on the Wisconsin side, across from Stillwater, Minnesota at approximately SCRM 23.5.[2] Qualitative estimates of zebra mussel density at this site were less than 1/m^2 (Karns 2000). Divers also found adult zebra mussels, but no young-of-the-year, within the Higgins' eye essential habitat area at Hudson. The sparse population of newly settled zebra mussels at Hudson (see above) is directly

[2] Largely to facilitate efficient enforcement and management, the State of Minnesota has declared the St. Croix River infested by zebra mussels up to SCRM 25.4, the location of the St. Croix Boomsite Public Access, although zebra mussels have not yet been observed upstream of SCRM 23.5.

across the river from the downstream portion of the Higgins' eye essential habitat.

In lotic systems (streams and rivers), local zebra mussel populations are dependent upon upstream colonies as sources of veligers (Ecological Specialists 2001). Ecological Specialists, Inc. (2001) concisely summarized the basis for understanding downstream drift distances of larval zebra mussels:

> This (veliger dispersal) is a complex phenomenon that is potentially influenced by a large number of factors, the primary of which (as noted earlier), is the distance a veliger cohort will drift before settlement. Local recruitment is dependent upon the presence of pedi-veliger and plantigrade larvae (settling stage veligers) in the water column, and thus predictions of the magnitude of settlement events must take into account this factor (veliger dispersal). This distance will likely vary with discharge magnitude. Veligers will travel farther downstream before settlement under higher flows (faster velocities) than low-flows.

Estimated and observed distances of veliger drift before settlement vary and illustrate the need for basic hydrological information for the river in question to predict drift and settlement distances. Based on flow rates, Stoeckel et al. (1997) produced a distance estimate of minimum veliger cohort drift before settlement of 304.6 km (189 miles) for the Illinois River. Because the lower 25 miles of the St. Croix River is relatively lacustrine and because no zebra mussels have been observed in the entire watershed upstream of SCRM 23.5 (approximately Stillwater, MN), veliger transport distances are likely much lower. If, as it appears, the source adult population for the juvenile zebra mussels found near Kinnickinnic Narrows is at or below Stillwater, the greatest length of downstream transport is only 18 miles.

Besides monitoring for zebra mussels that have settled on natural and artificial substrates, sampling for veligers can also help detect the occurrence of reproduction in rivers, upstream of the monitoring station. The Wisconsin Department of Natural Resources and Illinois Natural History Survey have conducted surveys of zebra mussel veligers from the mouth of the St. Croix River (Benjamin per comm 1999). In 1998, no veligers were found coming from the St. Croix River. During August 1999, the Wisconsin Department of Natural Resources conducted another veliger survey in the St. Croix River and found 17 veligers in a sample taken from the mouth of the river just downstream of the railroad bridge at the City of Prescott (0.189 veligers per liter). These veligers were divided into two distinct size classes, indicating two distinct reproduction events (R. Benjamin, pers. comm 1999). Veliger samples in July 2000 were negative at Kinnickinnic Narrows and contained two veligers (0.022 per liter) at Prescott.

St. Croix Falls Dam

Currently, winged mapleleaf and Higgins' eye are located downstream of a peaking hydropower dam located in St. Croix Falls between Minnesota and Wisconsin. The facility is owned by Xcel Energy (Xcel). Xcel voluntarily releases a minimum discharge of 800 cfs from Nov. 1 through March 31. From April 1 through October 31 Xcel must maintain minimum flows of 1600 cfs to ensure navigable flows (Johnson 1995). At the request of USFWS, Xcel has maintained minimum flows of 1600 cfs since November 1, 2000. Johnson (1995) found that daily low flows during winter peaking operations subject mussels and other aquatic organisms to extreme habitat

conditions. He recommended that a run-of-the-river flow regime be implemented to protect and restore the habitat of winged mapleleaf and Higgins' eye and other aquatic organisms. Run-of-the-river flows are likely to increase the area of suitable habitat for both listed mussel species. It is unclear whether the current flow regimes described above are adversely affecting either listed species. The historic operation of the dam may have reduced available habitat to its current extent while continued operation under the peaking flow regime may preclude population growth in the portion of the river that is most acutely affected by this flow regime.

Recreation

There is evidence that recreational boats (large paddlewheel boats and smaller motorboats) may have caused significant local disturbance to mussel beds by physical disturbance of the substrate and by enabling boaters access to otherwise isolated mussel beds (USFWS 1997). Motorboat wakes may also be causing shoreline erosion, thereby increasing sediment loads that could adversely affect mussels. There has also been considerable wading and swimming activity in the vicinity of the mussel beds where both species are known to occur; people have been observed collecting mussels at some beach sites and indiscriminate collections may have included winged mapleleafs at some locations (Whiting 2000). Native mussels could also be illegally collected for personal use, including mussel bait.

Navigation Channel Maintenance

The U.S. Army Corps of Engineers (Corps) holds two overlapping authorities for dredging on the St. Croix River. The Corps is authorized to maintain a 3-foot navigation channel on the St. Croix River from Taylors Falls, WI to the Mississippi River. The Corps has not dredged the river between Taylors Falls and the Arcola sandbar since about 1915 (USDI-NPS et al. 2000). As a result, prevailing shallow water conditions at the Arcola Sandbar limit most motorboat use to downstream of the sandbar. The Corps is also authorized to maintain a 9-foot navigation channel from Stillwater, MN to the Mississippi River. Under this authority, historic dredging has occurred at three locations in the St. Croix downstream of Stillwater. Dredging may only be proposed at Kinnickinnic Narrows over the next 40 years, according to the *Upper Mississippi River Channel Maintenance Management Plan* (USACE 1997 *cited in* USDI-NPS 2000).

Effects of the Action

In this analysis, we mostly update the effects analysis contained in the June 8, 2000 biological opinion. The updates are based on the finding that zebra mussels are reproducing in the St. Croix River (i.e., a significant change in the environmental baseline) and changes in the proposed action (i.e., NPS's proposed adoption of the 2001 Zebra Mussel Task Force Action Plan). We will not address the effects of authorizing relocation of transportation corridors or expansion/relocation of submarine crossings because those will have to undergo Section 7 consultation when they are actually proposed for implementation. In addition, we do not here address components of the action (e.g., camping within the Riverway) whose effects or descriptions have not changed from those analyzed in the original biological opinion.

To better understand the analysis below, it is important to understand the spatial relationships among the Federal Zone, the proposed navigation closure, and the primary locations of the two mussel species. The Federal Zone/State Zone boundary is at SCRM 25 and the proposed closure to upstream navigation would be at SCRM 28.5 (approximately halfway between the Federal/State Zone boundary and the St. Croix Islands Wildlife Area, Fig. 1). Winged mapleleaf mussels currently occur only between St. Croix Falls, WI and Osceola, WI (i.e., approximately SCRM 52 to SCRM 44). The distribution of the winged mapleleaf roughly corresponds to the furthest upstream concentration of Higgins' eye (i.e., the Franconia population). Winged mapleleaf and the Franconia population of Higgins' eye, therefore, occur upstream of the closure, in the Federal Zone of the St. Croix River. Below the closure, in the State Zone, are the two lowermost populations of Higgins' eye – Hudson and Prescott. The Hudson population (essential habitat area) is approximately between SCRM 16 and SCRM 18. The Prescott population of Higgins' eye is at the mouth of the St. Croix River, where it joins the Mississippi River.

Higgins' eye

Whether and how severely zebra mussels will affect Higgins' eye and winged mapleleaf in the St. Croix River depends on whether and how densely veligers settle in habitats occupied by these two species. As stated above, there are three distinct populations of Higgins' eye in the river – Franconia, Hudson, and Prescott.

Franconia Population

Relative to zebra mussels, this action would affect the Franconia population (approx. SCRM 47.5, Hornbach et al. 1995b) if it indirectly led or significantly contributed to the establishment of an upstream, reproducing population of zebra mussels. Zebra mussels could become established upstream of this population in the St. Croix River or in one or more of the lakes in the St. Croix River watershed. Establishment of zebra mussels upstream of SCRM 47.5 or in lakes upstream of this point in the watershed would require (1) transport by boats traveling on the river upstream from infested waters, (2) overland transport by humans (e.g., in or on trailered boats, bait buckets, etc.), or (3) transport by highly mobile animals (e.g., waterfowl).

The closure to upstream navigation at SCRM 28.5 will greatly reduce the likelihood of upstream transport of zebra mussels attached to recreational boats, thus greatly limiting potential effects to Higgins' eye in the Franconia population. The Franconia population is approximately 25 River miles upstream of the furthest upstream documented occurrence of zebra mussels (SCRM 23.5). The probability that zebra mussels will become established upstream of the Franconia population as a result of instream transport of zebra mussels is, roughly, a product of the number of boats that will pass SCRM 28.5 going upstream that travel at least 19 River miles to reach the Higgins eye population and the probability that those boats are carrying zebra mussels. Each year, a few boats may travel upstream of this point because NPS will likely not staff the closure during every hour of the navigable season. In addition, boats (e.g., law enforcement craft) may be allowed to pass to address emergencies on the river. An estimate of the number of boats that are likely to carry zebra mussels upstream past SCRM 28.5 to SCRM 47.5 (i.e., the approximate location of

the Higgins' eye population) would be based on: (1) the number of boats that will pass the closure point each year and travel upstream to or above SCRM 47.5; (2) the proportion of these boats that will have zebra mussels attached; and, (3) the likelihood that zebra mussels attached to these boats will fall off at or above SCRM 47.5. The combination of the navigation closure and enforcement of the prohibition against having zebra mussels on boats above SCRM 25.4 will likely significantly reduce (1) and (2). In addition, it would likely take multiple incidents of zebra mussel transport to allow for the establishment of a reproducing population and veligers from such a population would likely be transported many miles downstream.

Based on this analysis the likelihood of upstream transport of zebra mussels leading to adverse effects to Higgins' eye at Franconia as a result of this action appears small. This likelihood would be minimized, however, by (1) maximizing the number of hours that the closure point is staffed (i.e., actually closed) during the navigable season, (2) minimizing the number of authorized boats traveling past the closure point (i.e., assuming that these points may have zebra mussels attached and would travel to SCRM 47.5), and (3) minimizing the proportion of boats in the river that have zebra mussels attached.

For a discussion of the potential influence of NPS boat launches on the distribution of zebra mussels in the Federal Zone, see the analysis of effects to winged mapleleaf below.

Hudson Population

Potential effects of this action to the Higgins' eye population at Hudson are difficult to assess because we cannot currently predict the potential spatial distribution of zebra mussels in the St. Croix River. The most important concern is the potential for establishment of additional source populations of zebra mussels at locations where veliger dispersal distances would deposit significant numbers of veligers in the Hudson Higgins' eye essential habitat. Larval zebra mussels (veligers) are evidently settling on the left bank of the St. Croix River, across from the lower end of the Hudson population. The densities of veligers found there in 2000 ($\approx 0.05/m^2$), however, suggest a minor source population that is different from the source of the veligers that are settling in significant numbers in the lower 6-7 miles of the St. Croix River (R. Benjamin, pers. comm. 2001). Only adult zebra mussels, but evidently not veligers, have been found in the habitat occupied by the Hudson Higgins' eye population. Therefore, it appears that there is no source population that is currently posing a significant threat to the Hudson population.

The action will not preclude transport of zebra mussels by recreational boats in the St. Croix River between the Mississippi River and the navigation closure (SCRM 28.5). NPS will enforce the prohibition against having zebra mussels on watercraft upstream of SCRM 25.4, but will place the navigation closure at SCRM 28.5, instead of placing it at the Federal Zone/State Zone boundary, where their jurisdiction begins. (During informal consultation, the Service agreed with NPS that SCRM 28.5 is the most feasible location for the navigation closure because the river widens significantly downstream of this point and neither winged mapleleaf nor Higgins' eye are known to occur between SCRM 28.5 and the Federal Zone/State Zone boundary. Nevertheless, we must assess the biological effects of that discretionary decision here.) Although both states

and NPS will enforce the States' prohibitions against having zebra mussels on boats in the Federal Zone, some proportion of boats will likely carry zebra mussels into the Federal Zone from the State Zone because resources will likely be insufficient to check and clean every boat. Of the 1919 dry-docked boats checked by inspectors in October 2000 between Stillwater and Afton, 116 (6%) had zebra mussels attached. Therefore, we assume that approximately 6% of the boats traveling upstream of SCRM 25.4 to SCRM 28.5 will have zebra mussels attached, given the current status and distribution of zebra mussels in the St. Croix River.

The risk posed by the proposed action to the Hudson population depends on (a) the likelihood of zebra mussels establishing a source population in the Federal Zone as a result of transport by boats and (b) the veliger dispersal distances from the Federal Zone. Data collection and analysis are needed to assess both of these factors. Transport of veligers is likely to be relatively rapid below the closure in the Federal Zone due to the lack of impounded water.

Prescott Population

The Prescott Population of Higgins' eye is clearly most at risk among the three populations to infestation by zebra mussels. As mentioned above, veligers are evidently settling in significant numbers in the St. Croix River from approximately SCRM 6 near Kinnickinnic Narrows to the mouth of the river at Prescott, the location of the Higgins' eye population. In 2000, divers found densities of zebra mussels >100/m^2 within the habitat occupied by this Higgins' eye population. If a significant population of zebra mussels becomes established between SCRM 7 and Prescott, as is indicated by 2000 monitoring data, this population could be severely affected, depending on the densities reached by zebra mussels here. Additional transport of zebra mussels by boats coming from the Mississippi River, especially from Lake Pepin, could also contribute to increased populations of adult zebra mussels upstream. NPS, however, only has jurisdiction over the Federal Zone, which begins at SCRM 25.4. Therefore, the proposed Federal action would only contribute to increase boat traffic from the Mississippi River into the St. Croix River if the proposed management of the Federal zone significantly affects the number of boats traveling from the Mississippi River into the St. Croix River.

Winged Mapleleaf Mussel

The proposed action is unlikely to have severe effects on winged mapleleaf in the St. Croix River. This action would severely effect winged mapleleaf in the St. Croix River if it significantly contributed to the establishment of a source population of zebra mussels between SCRM 44 and SCRM 52 whose veligers also settled within this reach. The likelihood of this, however, seems low because, in part, veligers would likely be transported many miles downstream before they became capable of settling. In addition, we do not anticipate that this action will significantly increase the rate of zebra mussel transport into this river reach.

There are two ways in which this action could conceivably contribute to the establishment of a source population of zebra mussels between SCRM 44 and SCRM 52 -- operation of NPS boat launches and allowing upstream navigation from SCRM 25.4 to 28.5 (i.e., between the State

Zone and the upstream navigation closure). NPS solely or jointly manages two public boat launches in the St. Croix River between St. Croix Falls and SCRM 28.5; both are upstream of the navigation closure and zebra mussel-infested reach -- the Osceola Public Access is at SCRM 44.4 and the Marine Ferry Landing is at SCRM 34.6. There are also seven launches managed by state or local authorities above the Boomsite Marina (i.e., above SCRM 25.4 - the upper extent of the portion of the river declared to be infested by zebra mussels by the Minnesota DNR).

We cannot predict the actual probability that operating these boat launches will lead to a zebra mussel infestation sufficient to harm winged mapleleaf at the individual or population level, but it is clear that the probability would increase with (a) the number of boats launched at these sites and (b) the proportion of those boats carrying live zebra mussels that are launched without having them removed. Technicians check at least some of the boats that are launched from these sites and have not, thus far, found zebra mussels on any of these boats. In 2000, 212 boats were checked during 140 staff hours and no zebra mussels were found.

The water use zones proposed by the managing agencies for the Federal zone are designed to maintain the current intensity (i.e., noise and speed) of boating activity, but will prohibit upstream navigation at SCRM 28.5. NPS could prohibit upstream navigation at the beginning of the Federal Zone (SCRM 25.4). Allowing navigation from the beginning of the Federal Zone to SCRM 28.5 will likely increase the likelihood that zebra mussels will become established in this reach. Indirect effects of this to winged mapleleaf are likely minimal, however, because this would still only facilitate transport of zebra mussels to within approximately 15 river miles of habitat occupied by winged mapleleaf.

In summary, the action may increase the likelihood that zebra mussels will be introduced into the St. Croix River above their current distribution (RM 23.5), but the resulting marginal increase in this likelihood may be low and the chance that such an introduction would lead to harm to winged mapleleaf is even lower. NPS has complete jurisdiction over one of the nine boat launches above the infested reach in the action area and partial jurisdiction over another (see above). Moreover, NPS sets water use zones in this portion of the Riverway that likely determine the number of boats that are launched in this reach. Even if zebra mussels are introduced to this portion of the river, they would only be likely to significantly affect winged mapleleaf if they were to establish a reproducing population whose veligers would settle into habitat that winged mapleleaf currently occupies or is likely to occupy. That would likely require introduction to the St. Croix River or lakes upstream of St. Croix Falls, outside of the action area.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The effects of State actions in the action area are likely to both positively and adversely affect the

listed mussel species. Although the Plan is a cooperative plan amongst the states and NPS, we construe the management of the lower 25.4 miles of the St. Croix River, the "State Zone", as an action administered by the two states. The number and size of boats is and will be greater in this area due to the width of the river and the Water Use designation in the Plan of "Active Social Recreation", which will allow for "large numbers" of mostly motorized watercraft. Large boats carrying zebra mussels from the Mississippi River will likely continue to occur in this reach on a fairly frequent basis as long as zebra mussel populations remain high in Lake Pepin. It is thought that relatively large recreational boats that travel between Lake Pepin and the St. Croix River are the primary source of zebra mussels.

The states are, in various ways, working to prevent the spread of zebra mussels. Minnesota prohibits the overland transport of zebra mussels, but there is no rule or statute against such transport in Wisconsin. Both states are also staffing boat launches in the action area where Department of Natural Resources staff educate boaters and other public about preventing the spread of zebra mussels.

The general consensus among biologists and managers indicates that the actions of the states and NPS has slowed the establishment of zebra mussels in the St. Croix River, but has obviously not prevented this establishment. We expect that the result of the combined state and federal actions will be to continue to minimize the rate of spread of zebra mussels in the St. Croix River, but that eventually, barring unforeseen developments (e.g., new control technologies), zebra mussels may continue to expand in the river.

Local and private actions that are likely to affect the dynamics of zebra mussels in the St. Croix River include boating, operation of boat docks, operation of boat launches, and dumping of water from bait buckets, live wells, and bilges. Travel of individual boats between waters that contain zebra mussels, especially waters with relatively high densities of zebra mussels (e.g., Pool 4 of the Mississippi River or the St. Croix River below SCRM 7), and portions of the St. Croix River with no (downstream of SCRM 23.5) or low (SCRM 7-23.5) densities of zebra mussels is most likely to adversely affect the listed mussel species. Moreover, large boats (e.g., cabin cruisers) with horizontal surfaces (e.g., trim tabs) likely transport a disproportionate number of zebra mussels. Boat docks may be a significant location at which live zebra mussels drop off boats. In addition, zebra mussels attach to boat docks. There are approximately 17 marinas or docks and 15 boat launches operating in the Riverway (Minnesota Department of Natural Resources 1994). There is no indication that current use will subside, and thus, these actions will continue to facilitate zebra mussel movement throughout the St. Croix River.

Conclusion

After reviewing the current status of winged mapleleaf and Higgins' eye, the environmental baseline for the action area and range of the species, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence and recovery of winged mapleleaf and Higgins' eye. No critical habitat has been designated for these species, therefore, none will be affected.

Higgins' eye

As stated above, there are three significant populations of Higgins' eye in the action area. Each is important for the continued survival and recovery of the species, especially in light of the decline of Higgins' eye populations in the Mississippi River; the Hudson population seems especially important (see below). The current threat of zebra mussels appears to vary among the three populations. Significant numbers of veligers began settling into the Prescott population in 2000, but young-of-the-year zebra mussels have not yet been detected within the Hudson population. The current distribution of zebra mussels appears to pose relatively little threat to the Franconia population.

To reiterate a key point mentioned above, our understanding of zebra mussel dynamics and impacts to native mussels in North American lotic systems indicates that zebra mussels profoundly impact populations of native mussels where the rate of veliger settlement is significant -- that is, at some distance downstream of source populations. Veligers evidently require at least one week of post-fertilization development to reach a size at which they are capable of settling. Therefore, the expected minimum veliger dispersal distances for zebra mussels in the St. Croix River is crucial for predicting the impacts of reproducing populations of adult zebra mussels in the river. (For this discussion, we will assume that zebra mussels are capable of significant reproduction when they occur in densities $>0.1/m^2$. We acknowledge that this figure may be low – it has, however, not been empirically demonstrated and may be this low or even lower in sparse, but contiguous populations of zebra mussels due to the large number of eggs and sperm released by each individual. The areal extent of such populations is likely also an important factor contributing to their impact on native mussels. For example, a small, but dense population of zebra mussels may be a less significant source of veligers than a sparse, but widespread population.)

In 2000, veligers were evidently settling into the portion of the St. Croix River occupied by the Prescott population, raising concern for the status of this population. The location of the source of these zebra mussel veligers is unknown, but is evidently downstream of SCRM 23.5. The Federal action will have little or no effects on activities downstream of SCRM 25.4 and, therefore, on the dynamics of the currently established source population (or populations). The proposed Federal action could further threaten this population if it facilitated the establishment of source populations in the Federal Zone, but the resulting marginal increase in threat to this population may not be significant. Moreover, we do not anticipate that the proposed action will lead to the establishment of source populations in the Federal Zone. Although there is significant concern among state and federal biologists regarding the fate of the Prescott population, the imminency and magnitude of the threat posed by zebra mussels is not yet sufficient to warrant translocation of Higgins' eye to areas free of zebra mussels. NPS and the Service will continue to cooperate with the states and other Federal agencies (e.g., the U.S. Army Corps of Engineers) to closely monitor the potential impacts of zebra mussels on the Prescott population of Higgins' eye.

The fate of the Hudson population of Higgins' eye may be crucial to the survival of the species

and, therefore, deserves special attention in this analysis. This population is currently very important for three main reasons: it may currently be the largest population of this species; it has evidently not yet been detrimentally affected by zebra mussels; and, it may be vulnerable to zebra mussels depending on the future population dynamics of zebra mussels in the St. Croix River. Although the location of the source populations in the St. Croix River are unknown, they are likely too far downstream to affect the Hudson population, because significant settling of veligers has thus far only been observed >10 miles downstream of this Higgins' eye population.

Upon the recommendation of the St. Croix Zebra Mussel Task Force, NPS will block upstream navigation except in the lower three miles of the Federal Zone. In addition, NPS proposes to use other means to limit transport of zebra mussels on boats within the three miles (SCRM 25.4-28.5) that will remain open to upstream boat traffic. The proposed Federal action is not likely to significantly increase the likelihood that the Hudson population will become infested by zebra mussels. In general, drift of veligers between the closure (SCRM 28.5) and the State Zone (SCRM 25.4) would be relatively rapid. Drift would slow markedly at the beginning of the State Zone where the river becomes much more lacustrine. This marked slowing of current velocities downstream of SCRM 25.4 is likely the crucial factor that risks the development of veligers to the stage at which they are capable of settling before they have reached the Mississippi River. Therefore, we find that the risk that zebra mussels pose to the Hudson population of Higgins' eye likely depends on the eventual expansion of zebra mussels throughout the relatively lacustrine portion of the St. Croix River and whether the structure and flow of the St. Croix River in this reach would result in significant settling of veligers in the Hudson essential habitat area.

The likelihood that this action will significantly affect the Franconia population of Higgins' eye is low and is likely dependent on overland transport of zebra mussels outside of the action area. As stated above, this action could facilitate transport of zebra mussels throughout the Federal Zone, although it is unclear whether that transport is likely to lead to establishment of zebra mussel populations. Assuming that establishment of an upstream source population is necessary for significant effects on local populations of unionids, zebra mussels would likely have to become established upstream of St. Croix Falls to severely affect the Franconia population. Some zebra mussels could be transported on boats that somehow get by the closure at SCRM 28.5, but their upstream navigation could only continue to St. Croix Falls at SCRM 52. The worst case scenario that could arise from such transport – the establishment of a source population just below the Falls – is unlikely to lead to severe impacts to the Franconia population. It would require the transport of a significant number of zebra mussels all the way to St. Croix Falls, their establishment there as a breeding population, and the subsequent settling of veligers within approximately 4 miles of the source population. The likelihood of each of these seems small. For comparison, Stoeckel et al. (1997) found that most veligers probably traveled a minimum of 304.6 km (189 miles) before settling in the Illinois River at an estimated flow velocity of 0.2 m/s (0.7 ft/s).

Winged Mapleleaf

Although we anticipate that this action could incidentally take winged mapleleaf (see Incidental Take Statement), we do not anticipate that zebra mussels will become established at densities sufficient to appreciably diminish the likelihood of survival and recovery of the species. The state of our current knowledge regarding the dynamics of zebra mussels in North American streams and rivers indicates that significant populations of zebra mussels are only established and maintained downstream of relatively large populations of reproducing adults. We do not anticipate that the proposed action will lead to the establishment of reproducing populations of zebra mussels upstream of the current distribution of winged mapleleaf.

The effects of this action on the continued survival and recovery of winged mapleleaf are similar to the potential effects on the survival of the Franconia population of Higgins' eye. This population and the sole remaining population of winged mapleleaf occupy approximately the same reach of the St. Croix River. Significant settling of zebra mussel veligers in this area would clearly jeopardize the continued existence of winged mapleleaf. This would depend on the establishment of a population of adult zebra mussels whose veliger dispersal distance would place them in this reach when they became capable of settling. As stated above, this would likely require overland transport of zebra mussels to the St. Croix River upstream of St. Croix Falls or to lakes upstream of this point. The likelihood of such overland transport leading to establishment of upstream populations of zebra mussels is likely low at this time, assuming that both states will continue to carry out boat checks and effective public education throughout the Riverway.

Incidental Take Statement

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by FWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by NPS so that they become binding conditions of any grant or permit issued to any applicant or permittee, as appropriate, for the exemption in section 7(o)(2) to apply. NPS has a continuing duty to regulate the activity covered by this incidental take statement. If NPS (1) fails to assume and implement the terms and conditions or (2), where appropriate, fails to require any applicant or permittee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to any permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, NPS must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

Amount or Extent of Take

We anticipate that take of Higgins' eye will occur as a result of the transport of zebra mussels by recreational boats within the Federal Zone. We anticipate that take may not be detected due to the areal extent and low densities of Higgins' eye in the St. Croix River and that take may occur within the Hudson or Prescott populations or outside of these populations. (Although distinct populations of Higgins' eye are identified in the attached biological opinion, Higgins' eye also occur in much lower densities in the St. Croix River outside of these populations.) We do not anticipate that this action will result in (a) detection of greater than 1 young-of-the-year zebra mussel/m^2 within the Hudson population, (b) the detection of zebra mussels above SCRM 28.5 on artificial (including boats) or natural substrate, or (c) reproducing populations of zebra mussels downstream of SCRM 28.5 in the Federal Zone. Although several factors likely affect the minimum density at which zebra mussels are able to effectively reproduce, we assume, for the purposes of implementing this incidental take statement, that zebra mussels are capable of effective reproduction at densities of 0.1/m^2.

The action could also indirectly lead to take of Higgins' eye and winged mapleleaf by facilitating recreational activities, including boating, throughout the Federal Zone. Recreational boats could increase shoreline erosion thus increasing sediments in the water; waders and swimmers could unknowingly collect or otherwise take either winged mapleleaf or Higgins' eye; and, poachers could adversely affect winged mapleleaf and Higgins' eye.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat. Despite zebra mussel occurrence in the St. Croix we expect that effects will occur sporadically to individuals of each listed species, but that population-level effects will not result from the Federal action, either solely or in combination with the cumulative effects.

Reasonable and Prudent Measures

The measures described below are non-discretionary, and must be implemented by the agency for the exemption in Section 7(o)(2) to apply. The NPS has a continuing duty to implement the activity covered by this incidental take statement. If the NPS fails to adhere to the terms and conditions of the incidental take statement, the protective coverage of Section 7(o)(2) may lapse.

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of winged mapleleaf mussel and Higgins' eye pearlymussel. These reasonable and prudent measures supersede those included in the June 8, 2000 biological opinion.

1. Implement feasible actions that are likely to reduce the further spread of zebra mussels in the St. Croix River.

2. Monitor the distribution of zebra mussels in the Federal Zone of the St. Croix River and support the monitoring of zebra mussels in the State Zone.

3. Support the development of an action plan by the U.S. Army Corps of Engineers to monitor and control the abundance and distribution of zebra mussels on the St. Croix River.

4. Take actions to reduce the impacts of recreational and tour boats, swimmers and waders on mussels in the vicinity of Wisconsin and Minnesota Interstate Parks.

Terms and Conditions

To be exempt from the prohibitions of Section 9 of the Act, the NPS must comply with the following terms and conditions that implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. The Reasonable and Prudent Measures are restated below with their implementing terms and conditions.

1. Implement feasible actions that are likely to reduce the further spread of zebra mussels in the St. Croix River.

    a. Provide an annual report to the Service, no later than January 31, that describes enforcement of the prohibition against having zebra mussels in or on boats in the Federal Zone. This report shall at least contain the following information:

        1. The number of boats checked.

        2. The number of boats with zebra mussels attached and the number of these boaters that received citations.

    b. Provide an annual report to the Service, no later than January 31, that describes the implementation of the closure at SCRM 28.5. This report shall at least contain the following information:

        1. The number of boats stopped at the closure.

        2. The dates and hours during which the closure was staffed by NPS or cooperators.

        3. The number of boats allowed to pass upstream of the closure (e.g., law enforcement boats), if any, whether these boats were checked for zebra mussels, and the number of these boats with zebra mussels attached.

    c. Prepare a plan to ensure that tour boats do not transport zebra mussels into the Federal Zone of the St. Croix River. Submit this plan to the Service no later than May 15, 2001.

2. Monitor the distribution of zebra mussels in the Federal Zone of the St. Croix River and support the monitoring of zebra mussels in the State Zone.

    a. Prepare a plan, for approval by the Service, to monitor the occurrence and abundance of zebra mussels in the Federal Zone of the St. Croix River. Deliver this plan to the Service no later than June 1, 2001.

b. Assist in state efforts to monitor the densities and occurrence of zebra mussels within the Hudson essential habitat area.

c. Report these survey and monitoring results annually to the Service, no later than January 31.

3. Support the development of an action plan by the U.S. Army Corps of Engineers to monitor and control the abundance and distribution of zebra mussels on the St. Croix River.

a. An action plan being developed by the Corps will include monitoring and controlling the abundance and distribution of zebra mussels on the St. Croix River. The action plan will be provided to the NPS by the Service. In developing and implementing the feasible provisions of a plan to protect live winged mapleleaf and Higgins' eye individuals from zebra mussels in the St. Croix River, the Corps will involve the NPS to determine the most efficient and cost effective combination of methods and measures.

4. Take actions to reduce the impacts of recreational and tour boats, swimmers and waders on mussels in the vicinity of Wisconsin and Minnesota Interstate Parks.

a. Cooperate with tour boat operators and with the operators of the St. Croix Falls Dam to ensure that tour boats do not come into contact with the river substrate at any time.

b. NPS shall post all public access sites to inform the public about the presence of winged mapleleaf and Higgins' eye in the states' respective Interstate Parks and provide literature to reduce the adverse effects of swimming, wading, and boating on winged mapleleaf and Higgins' eye.

c. NPS shall develop a plan to monitor these activities within the Federal Zone where they are likely to effect either mussel species. NPS shall deliver this plan to the Service no later than July 1, 2001 and shall report annually on the implementation of this plan no later than January 31.

The Service believes that winged mapleleaf mussels and Higgins' eye pearlymussels will be incidentally taken throughout the Riverway as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. As stated above, take will be difficult to monitor and is likely to go undetected. The incidental take that we anticipate as a result of the proposed action would be exceeded if any of the following occur: (a) detection of greater than 1 young-of-the-year zebra mussel/m^2 within the Hudson population, (b) the detection of zebra mussels above SCRM 28.5 on artificial (including boats) or natural

substrate, or (c) reproducing ≥ (i.e., 0.1/m^2) populations of zebra mussels downstream of SCRM 28.5 in the Federal Zone. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are activities to be conducted at your agency's discretion. They are designed to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Implement public outreach efforts, in coordination with the Service and other resource agencies, as a means to disseminate information on life history and distribution of zebra mussels, ecological importance of native mussels including winged mapleleaf and Higgins' eye, control measures to limit the spread of zebra mussels into and within the St. Croix River and tributaries, and status of mussel conservation efforts.

2. Cooperate with other State and Federal agencies to collect and analyze data (e.g., hydrologic data) to predict zebra mussel dynamics in the St. Croix River. Such analysis could help, for example, to reveal locations at which reproducing populations of zebra mussels would affect the Hudson population of Higgins' eye.

3. Implement actions to ensure that zebra mussels are not introduced into the St. Croix River upstream of St. Croix Falls.

4. Cooperate with the States on a plan to prevent the establishment of zebra mussels in lakes within the St. Croix River watershed.

5. Investigate the potential benefits and feasability of requiring the use of anti-fouling paints on boats and boat parts that are likely to transport zebra mussels.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Reinitiation Notice

This concludes formal consultation on the Draft Cooperative Management Plan, Environmental Impact Statement, Lower St. Croix National Scenic Riverway in the States of Minnesota and Wisconsin. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of incidental take (as minimized by the reasonable and prudent measure) is exceeded; (2) new information reveals effects of the agency

action that may affect listed species or critical habitat in the manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Sincerely,

Russell D. Peterson
Field Supervisor

cc: Elaine Rideout, National Park Service, Denver, CO
Anthony Andersen, National Park Service, St. Croix Falls, WI
Randy Thoreson, National Park Service, Stillwater, MN
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Terry Moe, Wisconsin Department of Natural Resources, La Crosse, WI
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Appendix A. Management Actions Recommended for Implementation in 2001 as part of the Zebra Mussel Action Plan by the National Park Service (NPS), Minnesota Department of Natural Resources, and Wisconsin Department of Natural Resources (Wisconsin Department of Natural Resources) for preventing the further spread of zebra mussels within the St. Croix River

The Task Force recommends that the Lower St. Croix Management Commission implement the following enforcement, education, and related actions to prevent the further spread of zebra mussels to uninfested areas of the St. Croix River and spread from the St. Croix River into inland Minnesota and Wisconsin waters. Some of these recommendations are currently part of the 2000 Zebra Mussel Action Plan and others have been added or revised based on the results of zebra mussel monitoring (dive monitoring, plate-sample monitoring, and veliger-tow sampling) during the past year. Past monitoring has documented settlement of juvenile zebra mussels in the lower section of the St. Croix River below the Hudson Narrows (Karns 2000).

Administrative Actions:

1. The NPS should close the St. Croix River at or near the Arcola Sandbar (SCRM 29) to all upstream watercraft coming from downstream of the NPS closure with only permitted exceptions.

2. Efforts should be made to address the use of raw infested surface water from the St. Croix River by retail bait shops and angler educational efforts should be expanded and focused on the St. Croix River.

Enforcement Actions:

3. Both the Minnesota Department of Natural Resources and Wisconsin Department of Natural Resources should continue to inspect watercraft leaving and/or entering at St. Croix and Mississippi River public access sites in Minnesota and Wisconsin under existing regulations.

4. The Wisconsin Department of Natural Resources should increase enforcement efforts upstream of SCRM 25.4 using the existing Wisconsin Statute 30.725. The NPS, Minnesota Department of Natural Resources, and Wisconsin Department of Natural Resources should continue to enforce infested watercraft laws by finding zebra mussels on watercraft in noninfested waters of the St. Croix River and responding with appropriate orders and citations to achieve compliance. The NPS has established threshold levels in their Integrated Pest Management Plan for zebra mussels and will use these levels to implement increased NPS actions in the federally managed zone above Stillwater.

5. The NPS, MNDNR and Wisconsin Department of Natural Resources should investigate and determine options, including but not limited to partnering with the

marina community, to continue to have attached zebra mussels removed from boats in the infested waters of the river.

The Task Force recommends that the following legislative actions be implemented to prevent the further upstream spread of zebra mussels within the St. Croix River and from of the St. Croix River into inland waters:

1. The State of Wisconsin should amend Wisconsin Statute 30.725 relating to the placing and using boats and boating equipment, and placing boat trailers, with zebra mussels attached in the Lower St. Croix River. With the lower 25.4 river miles declared as infested, the Wisconsin Department of Natural Resources can no longer issue citations thus making the Statute ineffective in the infested zone. The State of Wisconsin should also consider amended statutory approval, to promulgate rules similar to Minnesota Department of Natural Resources as it pertains to the transport of zebra mussels from infested to non-infested waters.

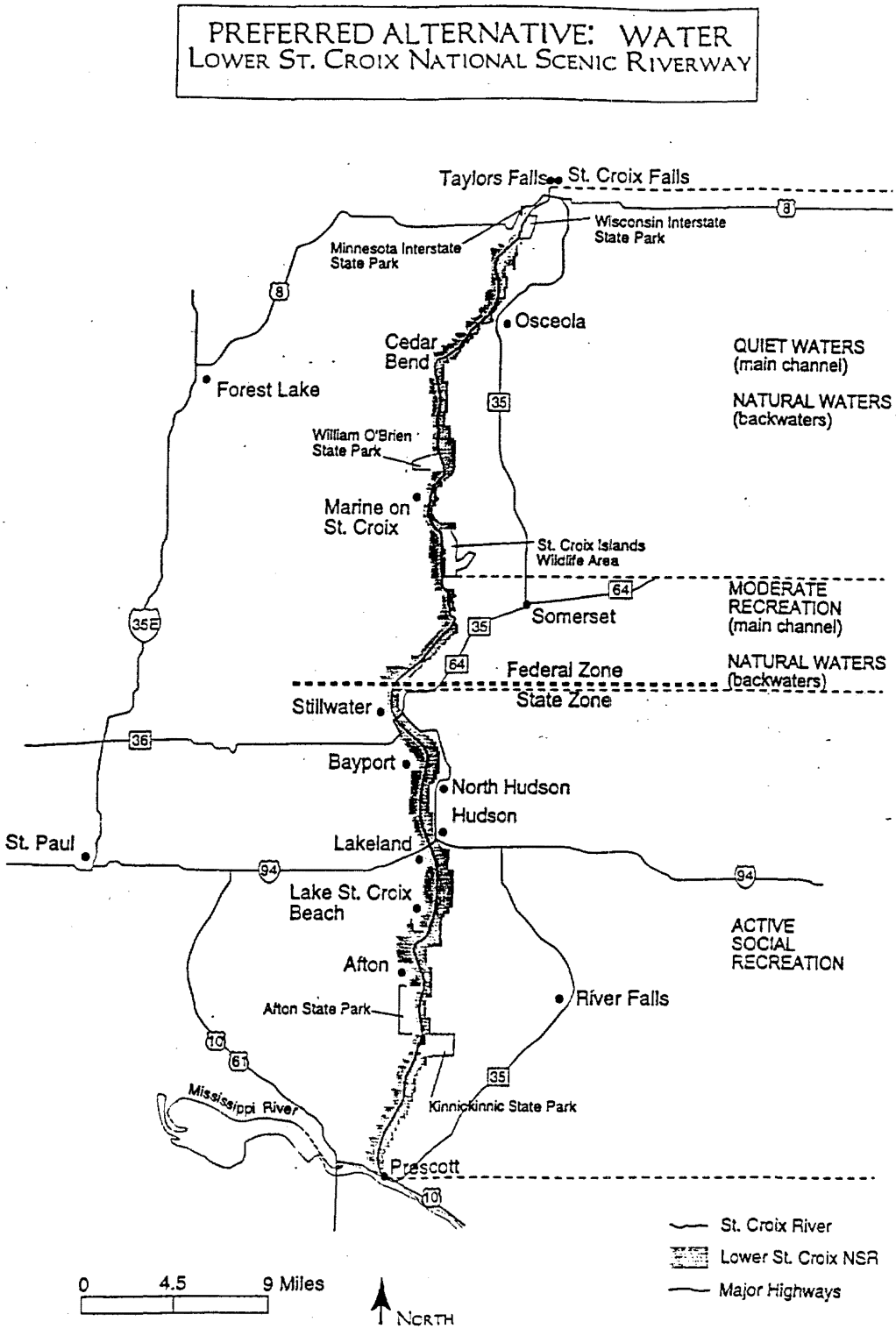

Fig. 1. Proposed water use zones in the action area.