APPENDIX 3.2.2-1 **Current Exhibit G**

T47N
T46N

R5W BAYFIELD COUNTY
R4W ASHLAND COUNTY

BENSON RD

CITY OF ASHLAND 5 MILES NORTH

31 | 32

6 | 5

LEGEND

- PUBLIC ROADWAYS
- TRANSMISSION POLE & LINE
- NSP LANDS
- WATER LINE
- SECTION LINE
- 1/4 SECTION LINE
- CANOE PORTAGE
- WETLANDS
- WETLAND LESS THAN 5 ACRES

PARKING AREA GRADED AND EXPANDED, 1992

CONCRETE PADS INSTALLED 1989

BOAT LANDING SITE

POWER SUB STATION

POWER HOUSE

WHITE RIVER

BURIED 84" PIPELINE

TAIL WATER ACCESS (STAIRS)

DAM

WATER ELEVATION 712.13

WHITE RIVER FLOWAGE

S.T.H. "112"

S3K

E2/5L

WHITE RIVER

NOTE: WETLAND CLASSIFICATIONS
S3K – SCRUB/SHRUB, BROAD-LEAVED DECIDUOUS, WET SOIL, POLUSTRINE.
E2/5L – EMERGENT/WET MEADOW, BROAD LEAVED PERSISTENT; NARROW-LEAVED NONPERSISTENT, STANDING WATER, LAKE.

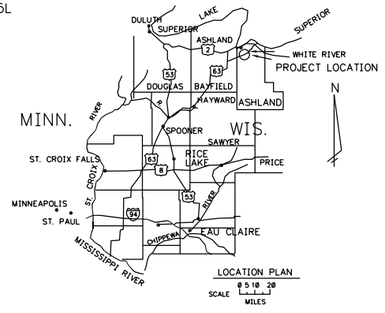
Ø°–30° E

TRUE NORTH

MAGNETIC NORTH (CALCULATED FROM WISCONSIN MAGNETIC DECLINATION – EPOCH 1985 MAP)

SCALE 1 = 400

Ø 400 800 1200



THIS DRAWING IS PART OF THE APPLICATION FOR LICENSE MADE BY THE UNDERSIGNED OF THIS ____ DAY OF _____

_____ VICE PRESIDENT POWER SUPPLY

I:\PROJECTS\HYDRO\WHITERIV

EXHIBIT G

NORTHERN STATES POWER CO. (WIS) EAU CLAIRE, WISCONSIN

WHITE RIVER DAM
FERC PROJECT NO. 2444
ASHLAND COUNTY, WISCONSIN

PROJECT MAP

SCALE SEE ABOVE DATE

APPENDIX 3.4.1-1 Current FERC License and Order on Rehearing

19950829-3038(1356301) Order approving license

UNITED STATES OF AMERICA 72 FERC ¶ 62,182
FEDERAL ENERGY REGULATORY COMMISSION

Northern States Power Company — Project No. 2444-002
Wisconsin

ORDER ISSUING SUBSEQUENT LICENSE
(Minor Project)
(Issued August 29, 1995)

INTRODUCTION

Northern States Power Company Wisconsin (Northern States or licensee) filed an application for a subsequent license under Part I of the Federal Power Act (FPA)1/ to continue to operate and maintain the 1.0 megawatt (MW) White River Project. The project is located on the White River in the Montreal River basin near Ashland, Wisconsin in Ashland County. The licensee proposes to continue to operate the project to provide power to either the local rural distribution system or to Northern States' interconnected transmission system that supplies electricity to customers in its five-state service territory.

The Federal Power Commission issued an original license for the project in 1966.2/ The current license expired on December 31, 1993, and since then the licensee has operated the project under an annual license.

BACKGROUND

Notice of the application was published in the Federal Register on August 5, 1992. On August 14, 1992, the Wisconsin Department of Natural Resources (Wisconsin DNR) filed a motion to intervene in the proceedings. No agency, organization, or individual filed a motion to intervene in opposition to the project. All comments received have been fully considered in determining whether, or under what conditions, to issue this license.

1/ 16 U.S.C. §§ 791(a)-825(r).

2/ The license was issued to the Lake Superior District Power Company, Northern States' predecessor-in-interest. See 35 FPC 671 (May 3, 1966). The White River is a navigable waterway of the United States (id. at pp. 572-73) and the project is therefore required to be licensed pursuant to Section 23(b)(1) of the FPA, 16 U.S.C. § 817.

The Commission s staff issued a draft environmental assessment (EA) for this project on February 17, 1995. Comments on the draft EA were received from the Department of the Interior-Fish and Wildlife Service, the Wisconsin DNR, the Izaak Walton League of America, the Great Lakes Indian Fish & Wildlife Commission, the Bad River Band of Lake Superior Tribe of Chippewa Indians, and Mr. Richard Spotts. Commission staff considered these comments in preparing the final EA. The final EA is attached to this license order and is issued concurrently. Staff also prepared a Safety and Design Assessment, which is available in the Commission s public file for this project.

I have fully considered the comments of the above-named organizations and persons in determining to issue the subsequent license for Project No. 2444-002.

PROJECT DESCRIPTION

The existing project consists of: two 48-foot-high earthen embankments approximately 700 ft. in total length, with a gated concrete spillway section; a reservoir with a surface area of 56 acres; a powerhouse containing two generating units with a total rated capacity of 1.0 MW; and appurtenant facilities. The bypassed reach extends approximately 1,300 feet below the dam. Northern States proposes no new capacity and no new construction.

A more detailed description of project facilities can be found in ordering paragraph B(2).

The White River Project is operated in run-of-river mode.3/ The present operational procedures were implemented during fall 1991. The hydroelectric generating equipment is set up for automatic operation based on headwater elevation. The annual maximum reservoir fluctuation is a 1-foot band between elevation 711.4 feet mean sea level (msl) and 710.4 feet msl.

Project lands are maintained in a natural state, and provide wildlife habitat and recreational opportunities. Northern States provides the following recreational facilities at the project site: (1) a boat launch and parking area north of the dam, (2) a canoe takeout and portage area, and (3) a tailwater fishing area.

3/ Run-of-river operation means that, at any point in time, the amount of water flowing into the project reservoir approximates the amount of water released by outflows discharged from the project reservoir.

APPLICANT S PLANS AND CAPABILITIES

Staff evaluated Northern States' record as a licensee in the areas of conservation efforts and compliance history. I accept the staff's findings, discussed below.

Section 10(a)(2)(C): Conservation Efforts

The Public Service Commission of Wisconsin (PSCW) has statutory and regulatory authority regarding least-cost planning and energy conservation in Wisconsin. The licensee promotes electricity conservation among its member systems in compliance

19950829-3038(1356301) Order approving license with the requirements and policies of the PSCW.

The licensee's plans and activities to promote and achieve conservation of electric energy and to reduce peak demand for generating capacity include: (1) automated control systems; (2) direct air-conditioning load control; (3) demand-side management programs; (4) energy-efficient technologies; (5) weatherization; and (6) bill-stuffing of conservation information to its customers.

The licensee is making a good faith effort to conserve electricity in compliance with the requirements of PSCW.

Compliance History

We have reviewed Northern States' compliance with the terms and conditions of the existing license. We find that Northern States' overall record of making timely filings and compliance with its license is satisfactory.

WATER QUALITY CERTIFICATION

Section 401(a)(1) of the Clean Water Act (CWA)4/ requires an applicant for a federal license or permit for any activity that may result in a discharge into navigable waters of the United States to provide the licensing or permitting agency a certification from the state in which the discharge originates that such discharge will comply with the CWA.

On August 28, 1990, the licensee applied to Wisconsin DNR for Section 401 water quality certification, as required by the CWA. In a letter dated December 3, 1990, Wisconsin DNR waived the need for water quality certification.

4/ 33 U.S.C. § 1341.

COASTAL ZONE MANAGEMENT ACT

Under Section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA)5/, the Commission cannot issue a license for a project within or affecting a state s coastal zone unless the state CZMA agency concurs with the license applicant s certification of consistency with the state s CZMA program, or the agency s concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant s certification.

In a letter dated October 19, 1993, the Wisconsin Department of Administration waived the right to review Northern States' consistency certification for the White River Project, and therefore, consistency with the state's CZMA program is presumed.

SECTION 18 OF THE FPA

Section 18 of the FPA authorizes the Secretary of the Interior to prescribe fishways at Commission-licensed projects.6/

In a letter dated September 10, 1993, the Department of the Interior (Interior) requested reservation of its authority to prescribe fishways pursuant to Section 18 of the FPA. Although fish passage facilities have not been prescribed by Interior at the time of project licensing, the Commission's practice has been to include a license article that reserves Interior's authority to prescribe fishways in the future. Therefore, Article 404 of this license reserves authority to the Commission to require the licensee to construct, operate, and maintain such fishways as may be prescribed by Interior pursuant to Section 18 of the FPA.

RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES

Section 10(j)(1) of the FPA7/ requires the Commission, when issuing a license, to include license conditions, based on recommendations of federal and state fish and wildlife agencies

5/ 16 U.S.C. § 1456 (3)(A).

6/ Section 18 of the FPA states "The Commission shall require the construction, maintenance, and operation by a licensee at its own expense of . . . such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate." See 16 U.S.C. § 811.

7/ 16 U.S.C. § 803(j).

submitted pursuant to the Fish and Wildlife Coordination Act8/, to "adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)" affected by the project.

If the Commission believes that any such recommendation may be inconsistent with the purposes and requirements of Part I of the FPA or other applicable law, Section 10(j)(2) requires the Commission and the agencies to attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agencies. If the Commission then does not adopt an agency recommendation, it must explain how the recommendation is inconsistent with applicable law and how the conditions selected by the Commission adequately and equitably protect, mitigate damages to, and enhance fish and wildlife.

In letters to Wisconsin DNR and Interior dated February 23, 1995, Commission staff made a preliminary determination that certain Wisconsin DNR and Interior recommendations maybe inconsistent with the comprehensive planning standard of Section 10(a)9/ and the public interest standard of Section 4(e)10/ of the FPA. In addition, certain recommendations by Wisconsin DNR were determined to be outside the scope of Section 10(j). These latter recommendations were considered by staff under Section 10(a) of the FPA.

In response to these determinations, comment letters were received from Wisconsin DNR and Interior. Additionally, comments on the draft EA were received from the Great Lakes Fish and Wildlife Commission, Bad River Band of Lake Superior Tribe of Chippewa Indians and Mr. Richard Spotts.

Commission staff held a Section 10(j) teleconference on

April 13, 1995, to attempt to resolve inconsistencies under Section 10(j) of the FPA. Representatives from the Department of the Interior-Fish and Wildlife Service, Wisconsin DNR and the licensee were present. Fish and wildlife concerns addressed in the 10(j) teleconference are summarized below. As a result of these discussions, several of staff's recommendations for the project have been modified as reflected in the final EA. Based on the proceeding, including the EA, I have made the following

8/ 16 U.S.C. § 661 et seq.

9/ 16 U.S.C. § 803(a).

10/ 16 U.S.C. § 797(e).

determinations with respect to the agency recommendations found by staff to be inconsistent with Section 10(j):

Minimum Flow Release

Northern States, the Wisconsin DNR, and Interior each submitted a different instream flow recommendation for the 1,300-foot-long bypassed channel, after jointly observing alternative instream flow releases into the bypassed channel during a qualitative study conducted in Spring 1994. Northern States proposed in its license application a flow of 5 cubic feet per second (cfs) (from Dec. 1-April 15 and June 1-Sept. 14) and 10 cfs (from April 15-May 30 and Sept. 15-Nov. 30). Pursuant to Section 10(j) of the FPA, Wisconsin DNR recommended a year-round flow of 16 cfs. In its Section 10(j) recommendations, Interior recommended a winter flow of 16 cfs (Dec. 1-March 31) and 27 cfs (April 1-Nov. 30) during the spring and fall fish spawning seasons and the summer growing season.

In its letters of February 23, 1995, staff made preliminary determinations that Wisconsin DNR and Interior's respective

instream flow recommendations maybe inconsistent with Section 10(a) of the FPA. Staff based the determinations on the grounds that the baseline condition (the 1-2 cfs instream flow to the bypassed reach from dam leakage and natural spring seepage) was adequately providing for an existing diverse fishery despite no flow augmentation; the recommended minimum flow releases would only marginally improve the habitat while the cost associated with the recommended flow releases would adversely affect the economic viability of the project; and the existing fisheries in the impoundment and upstream, and the downstream fishery provided adequate recreational angling opportunities.

Subsequent to the 10(j) teleconference, further analysis of hydrological records by staff biologists revealed that historically, in most years, the project spills about 200-300 cfs over the dam into the bypassed reach during spring and early summer. These flow releases are also coincidental with spawning seasons in the river. This flushing provides increased flows in the bypassed reach, which probably provides a better environment for fish communities in the downstream reach of the river and provides flows for spawning opportunities in the bypassed reach. This may account for the high diversity observed in the bypassed reach fish population. While no change in basic project operations is proposed, historical spillage is not mandated in the current license and there is no recognition of a minimum flow need to protect the baseline fishery. The resource agencies expressed concern that future operation at least guarantee continuation of existing environmental conditions. Inclusion of

a minimum flow requirement in the license would protect baseline environmental conditions.

Additional information provided by Wisconsin DNR at the 10(j) teleconference indicates that a minimum flow of 16 cfs or greater is necessary to allow fish to access all portions of the bypassed reach. Flows of 10 cfs, as proposed by Northern States, may sustain fish in isolated pools but would not allow fishes to

move freely throughout the riverine community for spawning. At 16 cfs, gravel and cobbles along the channel perimeter are inundated and fish would be attracted to the bypassed reach for spawning. Interior's recommended 27 cfs discharge from April to November offers greater habitat and water quality benefits than 16 cfs, and coincides with spring and fall spawning periods for warm water fishes and salmonids, respectively. For the fall season, to the extent that historical flows have not provided at least 27 cfs flow during that time, Interior's recommendation would result in a minor fishery enhancement.

The no-action alternative would maintain existing dam leakage and natural inflow to the bypassed reach but this would not guarantee maintenance of the existing baseline fishery.

Historical hydrological conditions have provided for an existing diverse fishery in the bypassed reach and it is appropriate that a license for the White River Project protect the existing fishery through inclusion of a minimum flow requirement.

Staff concurs with Interior that 27 cfs and 16 cfs seasonal minimum flows into the bypassed reach would adequately protect the existing fishery and perhaps provide a minor enhancement.

I am accepting Interior's 10(j) recommendation. Article 405 of this license requires a minimum flow into the bypassed channel of 27 cfs from April 1 to November 30, and 16 cfs from December 1 to March 31.

Run-of-River and Flow Fluctuation

Wisconsin DNR requests run-of-river operation, which it believes requires limiting pool fluctuation to no more than 0.5 feet. Specifically, Wisconsin DNR requested an operating band set at a maximum pool elevation of 711.45 feet mean sea level (msl) with a downward fluctuation of 0.5 feet.

The Commission and the fish and wildlife agencies agreed on the objective of enforcing run-of-river operations at the White River Project. Staff concluded that the objective of maintaining

a run-of-river project would be to benefit the good quality fishery in the impoundment and below the project. Article 401 of this license requires that the licensee operate the project in a run-of-river mode.

Historically, the applicant estimates that it has limited pool fluctuation to a range of 0.6 feet 75 percent of the time (i.e., during normal hydrological conditions).11/ This historical operation has not resulted in peaking, and the impoundment fishery and downstream fishery are considered to be of high quality.

The applicant states that a 1.0-foot operating band is needed to accommodate emergency hydrological conditions.12/ Constraining pool fluctuation to 0.5 feet 100 percent of the time would necessitate dam equipment improvements costing an estimated $50,000 to $250,000 in capital outlay plus an annualized $2,000 for operation and maintenance.

The agencies do not disagree fundamentally with how the licensee has been operating the project historically, but the agencies have no way of foreseeing future changes. Therefore, Wisconsin DNR recommended a more restrictive, enforceable band width. Wisconsin DNR states that its proposal offered a restrictive, enforceable limit with an allowance for circumstances that are beyond the control of the applicant. Wisconsin DNR notes that a more restrictive license article would clearly state how the project should be operated. They believe the recommendation in the draft EA is too permissive and would be difficult to enforce.

Staff has examined the issues and concludes that the historical reservoir operating regime forms an appropriate basis to establish an enforceable limit. First, a well-documented high quality fishery at the project and downstream indicates no adverse effects from historical operation.13/ Further, the operating regime already reflects the equipment limitations inherent to the project.

Northern States' current reservoir operating plan and the

11/ Application for a Subsequent License for a Minor Water

Power Project, White River Hydroelectric Project (FERC No. 2444), Northern States Power Company, WI, 1991, p. 9.

12/ id.

13/ See Section V.B.3.c. of the Final Environmental Assessment.

Wisconsin DNR proposal fulfill the intent of run-of-river objectives. Northern States has indicated that they maintain the reservoir elevation between 710.6 and 711.2 about 75 percent of the time, and between 710.4 and 711.4 feet msl the remainder of the time. This practice closely approximates the Wisconsin DNR proposal, and represents a favorable approach. However, the estimate of 75 percent of the time is not substantiated, nor is the Wisconsin DNR proposal based on an interpretation of actual operating data. Therefore, I have insufficient information to conclude that either case represents an operating regime that can be attained and documented. Thus, Wisconsin DNR's 10(j) recommendations for a 0.5 foot reservoir operating band and a maximum pool elevation of 711.45 feet msl with a downward fluctuation of 0.5 feet are inconsistent with the FPA's Section 313 requirements for substantial evidence.

I am requiring the licensee to develop and submit a reservoir operating plan to include historical operating data. Article 401 requires the licensee to submit to the Commission for analysis and approval within 120 days of license issuance a reservoir operating plan based on and documenting, at a minimum: historical gaging data for the period of the current license; a proposal for reservoir fluctuation operating level; a proposal for compliance monitoring and reporting; and documentation of agency consultation. The licensee shall consult with Wisconsin DNR in preparing the plan. Following the review and analysis of the operating plan, the Commission will establish a permanent reservoir fluctuation level specification. Until the permanent fluctuation level has been established, the project will be required to comply with an interim 1-foot band between elevations

710.4 and 711.4 feet msl.

Land Use

Wisconsin DNR recommended that the licensee retain ownership of lands in the project area and maintain those lands in their current undeveloped state. Wisconsin DNR expressed concern that land-disturbing activities could reduce available habitat for wildlife, including nesting sites for bald eagles. I conclude that this request would be beneficial to wildlife as well as visual resources in the area. Article 407 requires the preparation of a Land Management Plan in consultation with resource agencies, to be filed for Commission approval within one year after issuance of any license. The Land Management Plan must address allowed uses and activities on project lands, and set forth land management principles and practices that will be followed. The Land Management Plan must especially address these aspects in relation to minor conveyances that are exempt from prior Commission approval under the Commission's standard special

land use article. The Commission's standard special land use article otherwise adequately provides for prior agency consultation, notification to the Commission, and reserved Commission authority for all land uses and dispositions.

Dam Safety and Floodplain Zoning

Wisconsin DNR recommended that the licensee be subject to the floodplain zoning and dam safety standards contained in Chapters 30 and 31 of the Wisconsin State Statutes and portions of the Wisconsin Administrative Code (NR 330, NR 333, and NR 116). This request is outside the scope of Section 10(j) since it does not specifically provide for protection and enhancement of fish and wildlife resources. For issues of project safety, federal authority is preemptive. Commission regulations are sufficient to ensure safety at licensed projects.

No specific dam safety and floodplain zoning concerns were expressed by Wisconsin DNR. The White River Project has been classified by the Commission as having a low hazard potential, and its spillway capacity is able to pass the 1,000-year flood. I believe these factors, along with the other requirements of the license, preclude the need for a dambreak analysis and floodplain mapping.

COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA14/ requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. Under Section 10(a)(2), federal and state agencies filed 59 plans that address various resources in Wisconsin. Of these, staff identified 7 plans relevant to the project. 15/ The project license is consistent with these comprehensive plans.

14/ 16 U.S.C. § 803(a)(2).

15/ Wisconsin's Statewide Comprehensive Outdoor Recreation Plan, 1986 91 and 1991 96, Wisconsin DNR, Madison, Wisconsin; Lake Superior Basin Areawide Water Quality Management Plan, 1979, Wisconsin DNR, Madison, Wisconsin; Lake Superior Fisheries Management Plan, 1988-98, Wisconsin DNR, Madison, Wisconsin; Wisconsin Water Quality Assessment Report to Congress, 1986 and 1992, Wisconsin DNR, Madison, Wisconsin; The Nationwide Rivers Inventory, 1982, National Park Service, Washington, D.C.

COMPREHENSIVE DEVELOPMENT

Sections 4(e) and 10(a)(1) of the FPA, 16 U.S.C. §§ 797(e) and 803(a)(1), require the Commission, in acting on applications

for license, to give equal consideration to the power and development purposes and to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife, the protection of recreation opportunities, and the preservation of other aspects of environmental quality. Any license issued shall be in the Commission's judgment best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration. For the reasons discussed below, I conclude that the White River Project does not conflict with any planned or authorized development and that it is best adapted to a comprehensive plan for development of the waterway for beneficial public uses.

Recommended Alternative

The final EA analyzes the effects of the White River Project as proposed by the licensee, the Project with staff s recommended environmental measures, and the Project with no action taken. I selected issuing a subsequent license with staff s recommended measures as the preferred alternative because, overall, these measures, along with the standard articles, would protect or enhance environmental resources. Also, the electricity generated from the project would continue to offset the use of fossil-fueled, electrical generating plants, conserve non-renewable energy resources, and reduce atmospheric pollution.

The environmental measures included in this license require the licensee to:

- Prepare in consultation with Wisconsin DNR a reservoir operating plan to include, at a minimum: historical gaging data for the period of the original license; a proposal for reservoir fluctuation operating level; and a proposal for compliance monitoring and reporting. The Commission will establish a permanent reservoir fluctuation level on the basis of the operating plan. Until then the project will be required to comply with an interim 1-foot band between elevations 710.4 and 711.4 feet msl.

- Release a minimum flow of 27 cfs from April 1 through November 30, and 16 cfs from December 1 through March 31 to the bypassed reach.

- ù Modify the existing staff gage on the spillway according to agency recommendation.

- ù Implement a draw-down management plan in cooperation with Wisconsin DNR.

- ù Maintain project land in a natural state for fish and wildlife and aesthetic enhancement consistent with a Land Management Plan, to be approved by the Commission.

- ù Develop a plan to monitor for purple loosestrife in consultation with the Wisconsin DNR.

- ù Prepare a management plan outlining steps to enhance habitat and to protect threatened and endangered species if they become established within the project area in the future.

- ù Develop a plan to monitor and analyze fly ash/cinder used to seal spillway gates.

Developmental and Nondevelopmental Uses of the Waterway

The project would provide power in a region where there is an identified need. Projections for the Mid-Continent Area Power Pool (MAPP) indicate that load will grow faster than planned capacity. System load is projected to grow at 1.8 percent per year and planned capacity at only 0.3 percent (North American Electric Reliability Council, 1995). These projections support the long-term need for power produced from the White River Project. Further, the project promotes the displacement of fossil-fueled electric power generation to conserve fossil-fuels and reduce noxious emissions.

Staff evaluated the economic effects of the project alternatives, and the results of the analysis showed all alternatives, even no action, to yield negative net annual benefits. (The least costly alternative is continued operation at a negative net annual benefit of $84,000. The most expensive

19950829-3038(1356301) Order approving license alternative providng for continued operation is staff's recommendation at a negative net annual benefit $100,000.)16/ Because of the marginal economic conditions of the project, staff also examined decommissioning.

The decommissioning alternative considered a range of

16/ See Section VI.C., Table 4 of the final environmental assessment.

options from simple shut-down to complete project removal.17/ Staff concluded that partial or complete project removal would be undesirable for safety and environmental reasons. Further, staff concluded that partial or complete project removal would be more expensive compared to continued operation.18/ Staff examined simple shut-down in considerable detail, and the analysis showed a net annual benefit of -$144,000, considerably worse than continued operations. Also, decommissioning would terminate power generation with a value of $147,000 (as compared to the staff recommended plan), and forecasts show a need for power.

The White River offers significant aesthetic riverine values and fishery benefits. Maintenance of the dam structure is considered an environmental benefit by resource agencies and staff.19/

Staff evaluated Northern States' application, reviewed agency recommendations and assessed the environmental and economic effects of the project and its alternatives and concluded that the proposed project, with a minimum flow to the bypassed reach and staff's recommended enhancement measures would be best suited to a comprehensive plan for the development of the White River. I agree. The annualized net benefit of the proposed project is -$100,000, or -21 mills/kWh. However, as recently explained in Mead Corporation, 72 FERC ¶ 61,027 (1995) and Duke Power Co, 72 FERC ¶ 61,030 (1995), project economics is

only one of many public interest factors to be considered in determining whether to issue a license, and where, as here, the Commission concludes that licensing a project is in the public interest, the Commission will offer a license to the applicant, even though there appear to be negative economic benefits. Whether to accept a proffered license under these conditions is a decision to be made by Northern States Power.

PROJECT RETIREMENT

Izaak Walton League of America requested in a letter dated March 28, 1995, that a retirement fund be established for this project. Staff evaluated the need to require such a fund.

In its December 14, 1994, Policy Statement on project

17/ See Section V.C. of the Final Environmental Assessment.

18/ id.

19/ Wisconsin DNR letter dated September 3, 1993.

decommissioning (RM93-23-000),20/ the Commission stated as follows:

> In light of the practical problems involved in trying to deal with events far in the future, and because in many cases the time horizon and general financial strength of the licensee may be such that there is no substantial need for pre-retirement funding program, the Commission will not act generically to impose such programs on all licensees. . . There may be particular facts on the record in individual cases, however, that will justify license conditions requiring the establishment of decommissioning cost trust funds in order to assure the availability of funding when

 Order approving license decommissioning occurs. The Commission would consider, for example, whether there are factors suggesting that the life of the project may end within the next 30 years, and would also look at the financial viability of the licensee for indications that it would be unable to meet likely levels of expenditure without some form of advance planning. . . While the Commission has decided not to adopt any generic funding requirements, licensees should not view the Commission's decision as an impediment to ordering whatever decommissioning steps it deems appropriate when the time for decommissioning a particular project arrives. The licensee has the responsibility for project retirement.

No one has requested that the project be decommissioned on environmental grounds or any other grounds.

While staff analysis indicates that the project has negative economic benefits, an independent analysis by the applicant may show that continued operation may be financially desirable for system reliability, load regulation, or other service and financial reasons. It is Northern States' decision whether to continue to operate the project or to seek decommissioning and surrender of its license in light of the conditions of this license.

If the project were decommissioned, the resource agencies and Commission staff agree that the environmentally preferred decommissioning alternative is to leave the dam in place to prevent sea lamprey migration upstream. Therefore, project shutdown costs would be minimal. Northern States is a public utility with financial resources well able to cover estimated shutdown expenses without the administrative burden of

20/ 60 Fed. Reg. 339, at pp. 346-347 (footnote omitted)(January 4, 1995).

establishment of a project retirement fund for these costs. I conclude that the establishment of a project retirement fund is unwarranted in the circumstances of this case.

TERM OF LICENSE

In 1986, the Electric Consumers Protection Act (ECPA)21/ modified Section 15 of the FPA to specify that any license issued under Section 15 shall be for a term which the Commission determines to be in the public interest, but not less than 30 years, nor more then 50 years. We are following the same guidelines in issuing subsequent licenses.22/ Generally, we issue 30-year relicenses for projects that include no substantial new construction or power-generating expansion. We issue relicenses for 40 years or more for projects that include substantial new construction or capacity increases. We issue licenses of longer-duration to ease the economic impact of the new costs and to encourage better comprehensive development of the renewable power-generating resource. For the same reason, we may issue longer-duration licenses for projects that include substantial or costly environmental mitigation and enhancement measures. Licenses of longer duration in these instances encourage license applicants (1) to be better environmental stewards, and (2) to propose more balanced and comprehensive development of our river basins.

The licensee proposes no new construction nor does this license require enhancement measures that would justify a longer term. Accordingly, the license for the White River Project will be for a term of 30 years.

SUMMARY OF FINDINGS

A draft environmental assessment (EA) was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the final EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

21/ Pub.L. 102-486.

22/ A subsequent license is issued for a minor project whenever Sections 14 and 15 of the FPA were waived in the project's

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment. 23/

Based upon a review of the agency and public comments filed on the project, and on staff s independent analysis pursuant to Sections 4(e), 10(a)(1), and 10(a)(2) of the FPA, I conclude that issuing a license for the White River Project, with the required license conditions, would not conflict with any planned or authorized development, and would be best adapted to a comprehensive plan for development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to Northern States Power Company Wisconsin, for a period of 30 years, effective the first day of the month in which this order is issued, to operate and maintain the White River Hydroelectric Project. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

(1) All lands, to the extent of the licensee s interests in those lands, shown by Exhibit G, filed on December 20, 1991:

Exhibit	FERC No. 2444-002	Showing
G (Drawing 1 of 1)	4	Project Area

(2) Project works consisting of: (1) two earthen embankmentsÄ a 400-foot-long northern section and a 300-foot-long southern sectionÄ with a maximum height of 48 feet; (2) a reservoir with a surface area of 56 acres and an estimated 391 acre-feet of total storage volume at the normal maximum surface elevation of 711.2 feet above mean sea level; (3) a 70-foot-long reinforced concrete spillway section consisting of (a) a gated spillway section with two

23/ A Safety and Design Assessment was prepared for the White River Project, FERC No. 2444, and is available in the Commission s public file for this project.

25-foot-long by 26.5-foot-tall bays, each housing a steel radial gate, and (b) a reinforced concrete non-overflow section, about 20 feet long, with an intake structure for the 7-foot-diameter pipeline; (4) intake and outlet works consisting of (a) a 7-foot-diameter, 1,345 foot-long reinforced concrete pipeline, (b) a steel surge tank, 16 feet in diameter by 62 feet tall, and (c) a 54-inch-diameter steel Y-shaped penstock; (5) a single-story powerhouse constructed of reinforced concrete and brick masonry, 39 feet by 69 feet, containing (a) two horizontal Francis turbines with a combined hydraulic capacity of 280 cubic feet per second (cfs) and (b) two Westinghouse generators rated at 500 kilowatts each for a total of 1.0 megawatt; and (6) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F shown below:

Exhibit A--The following sections of Exhibit A filed December 20, 1991:

19950829-3038(1356301) Order approving license
Section 1, page 8, titled "Number of generating units, their capacities, and provisions for future units"; Section 2, page 8, titled "Type of hydraulic turbines"; and Section 8, pages 10 through 12, titled "Sizes, capacities and construction materials of project components".

Exhibit F--The following Exhibit F drawings filed December 20, 1991:

Exhibit	FERC No. 2444-002	Showing
F (1 of 3)	1	Plan profile and elevation of dam and sect. A-A, B-B, C-C
F (2 of 3)	2	Sect. E-E, F-F, G-G
F (3 of 3)	3	Powerhouse

(3) All structures, fixtures, equipment, or facilities used to operate or maintain the project and located in the project area; all portable property that may be employed in connection with the project and located within or outside the project area; and all riparian or other rights necessary or appropriate in the operation or maintenance of the project.

(C) The exhibits A, F, and G described above are approved and made part of the license.

(D) The following sections of the FPA are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates

19950829-3038(1356301) Order approving license to public notice and to the acceptance and expression in the license of terms and conditions of the FPA that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-9 (October 1975), titled "Terms and Conditions of License for Constructed Minor Project Affecting Navigable Waters of the United States" and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charges, effective as of the first day of the month in which this license is issued:

For the purpose of reimbursing the United States for the Commission's administrative costs, pursuant to Part I of the Federal Power Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for the purpose is 1,000 kilowatts. Under the regulations currently in effect, projects with authorized installed capacity of less than or equal to 1,500 kW will not be assessed an annual charge.

Article 401. The licensee shall operate the project in a run-of-river mode for the protection of fish in the project impoundment and downstream of the impoundment, riparian vegetation above and below the project, and recreational opportunities in the project impoundment on the White River. The licensee shall at all times act to minimize the fluctuation of the reservoir surface elevation by maintaining a discharge from the project so that, at any point in time, flows, as measured immediately downstream from the project tailrace, approximate the sum of inflows to the project reservoir.

To ensure run-of-river operation, the licensee shall file within 120 days of the license issuance a reservoir operating plan for Commission approval. The plan shall include at a

minimum:

(1) historical gaging data for the period of the current license;

(2) a proposal for reservoir fluctuation operating level;

(3) a plan for compliance monitoring and reporting, which shall at a minimum:

(a) describe how water surface elevations on the project reservoir and in the tailwater will be measured;

(b) provide for maintenance of a staff gage in the project reservoir visible to the public with the prescribed operating levels clearly marked;

(c) require the licensee to maintain records of the headwater and tailwater elevations in the form of daily operator logs and continuous circular chart recordings;

(d) provide for making operating records described in (c) above to agencies within 30 days upon request;

(e) provide for compliance monitoring and reporting as required in Article 406; and

(f) provide for the licensee's preparation of an annual operating report which shall be submitted to the Commission for approval.

(4) documentation of consultation with the U.S. Fish and Wildlife Service and Wisconsin Department of Natural Resources, which shall include:

(a) copies of agency comments and recommendations on the completed plan after it has been prepared and provided to the agencies;

(b) descriptions of how the agencies' comments are accommodated in the plan; and,

(c) the licensee's reasons (based on project-specific information) why any agency recommendation is not adopted in the plan;

(d) documentation that the licensee has allowed a

minimum of 30 days for the agencies to comment before filing the operating plan with the Commission.

The Commission will establish a permanent reservoir fluctuation level specification. The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Until a permanent fluctuation level is established, the project must maintain an interim 1-foot reservoir operating band between elevations 710.4 and 711.4 feet mean sea level, as measured immediately upstream from the project dam.

Run-of-river operation and reservoir water surface elevations may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods, upon mutual agreement between the licensee and the Wisconsin Department of Natural Resources (Wisconsin DNR). If the operation is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident. If run-of-river operation and reservoir water surface elevations are modified during an emergency, the licensee shall notify the Commission and the Wisconsin DNR within 24 hours.

Article 402. The licensee shall manage non-emergency draw-downs so that the project reservoir draw-down rate does not exceed 12 inches per 24 hours for the first 48 hours and 6 inches per 24 hours after that. The draw-down shall be evenly spread

such that a 12 inches per 24-hour draw-down rate occurs at 2 inches every 4 hours. The maximum rate of change may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods for project maintenance purposes, upon mutual agreement between the licensee and the Wisconsin Department of Natural Resources (Wisconsin DNR). If the reservoir draw-down rate is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

At least 90 days before any non-emergency draw-down, the licensee shall submit to the Wisconsin DNR a draw-down management plan for comment and recommendations. The licensee shall allow Wisconsin DNR at least 30 days for review and comment before filing the plan to the Commission for approval. The non-emergency draw-down plan filed with the Commission shall include documentation of consultation with Wisconsin DNR. The plan shall describe how the plan accommodates Wisconsin DNR's

recommendations, or provide the licensee's reasons, based on project-specific information, for not incorporating an agency recommendation. The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan.

Article 403. Within 180 days from the date of issuance of this license, the licensee shall file with the Commission, for approval, a plan to monitor the fly ash/cinders used during the "cindering" process for sealing the spillway gates.

To ensure that the fly ash/cinders used to seal the spillway gates do not introduce significant levels of contaminants to the White River, the plan shall include provisions for: (1) identifying the trace metals and other elements to be analyzed; (2) analyzing the fly ash/cinders prior to use each year; (3) submitting the results of the analysis to the Wisconsin Department of Natural Resources (Wisconsin DNR), the Bad River

Band of Lake Superior Tribe of Chippewa Indians and the Great Lakes Indian, Fish and Wildlife Commission; and (4) the preparation of any reasonable enhancement measures developed in consultation with the Wisconsin DNR to minimize, to the extent possible, the levels of trace metals and other elements introduced to the White River, and developing a schedule for implementing any or all of the enhancement measures identified in the plan.

The licensee shall prepare the plan after consultation with the Wisconsin DNR. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 404. Authority is reserved to the Commission to require the licensee to construct, operate and maintain, or arrange for the construction, operation and maintenance of, such fishway facilities as may be prescribed by the Secretary of the Interior pursuant to Section 18 of the Federal Power Act.

Article 405. Within one year of the date of this license the licensee shall release from the White River dam to the bypassed reach a minimum flow of 27 cubic feet per second from April 1 through November 30, and 16 cubic feet per second from December 1 through March 31 to allow for additional access into

the bypassed reach by all components of the fish community, to provide additional spawning habitat and recreational opportunity.

Article 406. If the flows through the project fail to meet run-of-river requirements provided under Article 401, or if the minimum flow in the bypassed reach fails to meet the requirements of Article 405, the licensee shall file a report with the Commission within 30 days of the incident. The report shall, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report shall also include: (1) operational data necessary to determine compliance with Articles 401 and 405; (2) a description of any corrective measures implemented at the time of occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and (3) comments or correspondence, if any, received from the resource agencies regarding the incident. Based on the report and the Commission's evaluation of the incident, the Commission reserves the right to require modifications to project facilities and operations to ensure future compliance.

Article 407. Within one year of the issuance date of this license, the licensee shall file with the Commission, for approval, a land management plan for all the licensee-owned land in the project area. This plan shall be prepared in consultation with the Wisconsin Department of Natural Resources. The licensee shall include with the plan: documentation of consultation; copies of comments and recommendations on the completed plan after it has been prepared and provided to the agency; and specific descriptions of how the agency's comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agency to comment and make recommendations before filing the plan with the Commission. If the licensee does not adopt an agency recommendation, the filing shall include the licensee's reasons.

The intent of the plan will be to maintain project lands in their natural state to provide aesthetic benefits and wildlife habitat. Any withdrawal of, or addition to, project lands will require an application for Commission approval of an amendment to this license with prior agency consultation. The plan must include, at a minimum:

(1) identification of all licensee-owned land in the project area;

(2) land management goals and objectives;

(3) allowed uses and activities; and,

(4) incorporation, as appropriate, of other management plans such as the threatened and endangered species management plan.

The land management plan shall also address these issues in relation to minor conveyances that are exempt from prior Commission approval under the Commission's standard special land use article (Article 411).

Article 408. The licensee shall, in consultation with the Wisconsin Department of Natural Resources (Wisconsin DNR), develop a plan to monitor purple loosestrife (Lythrum salicaria) in project waters. The plan shall include, but is not limited to: (a) the method of monitoring, (b) the frequency of monitoring, and (c) documentation of transmission of monitoring data to the Wisconsin DNR. The plan shall be filed with the Commission for approval. If at any time during the period of the license, the Wisconsin DNR deems it necessary to control or eliminate purple loosestrife, the licensee shall cooperate in this measure. The Commission reserves the right to require changes to the plan.

The licensee shall include documentation of consultation with the Wisconsin DNR before preparing the plan, copies of the Wisconsin DNR comments and recommendations on the completed plan after it has been prepared and provided to the Wisconsin DNR, and specific descriptions of how the Wisconsin DNR comments were accommodated by the plan. The licensee shall allow a minimum of 30 days for the Wisconsin DNR to comment and to make the recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

Article 409. Within two years of license issuance, the licensee shall file with the Commission, for approval, a plan to protect state and federally listed threatened or endangered species and their critical habitat. The plan shall include, but not be limited to, the following:

(1) measures to protect any listed species in the project area;

(2) an implementation schedule for the protective measures; and,

(3) a monitoring plan to identify when the listed species establish themselves on project lands and waters.

The licensee shall prepare the plan after consultation with the Wisconsin Department of Natural Resources. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agency, and specific descriptions of how the agency's comments and recommendations are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agency to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 410. Before the commencement of any construction or development of any project works or other facilities at the project, the licensee shall consult and cooperate with the Wisconsin State Historic Preservation Officer (SHPO) to determine the need for, and extent of, any archaeological or historic

resource surveys and any mitigating measures that may be necessary. The licensee shall provide funds in a reasonable amount for such activity. If any previously unrecorded archaeological or historic sites are discovered during the course of construction, construction activity in the vicinity shall be halted, a qualified archaeologist shall be consulted to determine the significance of the sites, and the licensee shall consult with the SHPO to develop a mitigation plan for the protection of significant archaeological or historic resources. If the licensee and the SHPO cannot agree on the amount of money to be expended on archaeological or historic work related to the project, the Commission reserves the right to require the licensee to conduct, at the licensee's own expense, any such work found necessary.

In addition, the licensee shall periodically search all eroded shoreline areas of the reservoir for any visible traces of artifacts, objects, or remains of potential archaeological significance. The surveys shall be completed 5 and 10 years after license issuance and the results forwarded to the SHPO for review within 3 months of survey completion. After the 10-year survey, the licensee and the SHPO shall evaluate the need to

continue the periodic surveys. Should any artifacts, objects, or remains of potential archaeological significance be discovered, the licensee shall employ the services of a professional archaeologist to survey the site and evaluate its significance pursuant to 36 C.F.R. § 800.4(c). Upon recommendation by the SHPO, the licensee shall take steps to protect, recover, or relocate any historic property that may be adversely affected by project operations.

Article 411. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior

Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article.

If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any noncomplying structures and facilities.

(b) The type of use and occupancy of project lands and water for which the licensee may grant permission without prior Commission approval are:

(1) landscape plantings;

(2) noncommercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings;

(3) embankments, bulkheads, retaining walls,

control to protect the existing shoreline; and

(4) food plots and wildlife enhancement.

To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall:

(1) inspect the site of the proposed construction;

(2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site; and

(3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline.

To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for:

(1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained;

(2) storm drains and water mains;

(3) sewers that do not discharge into project waters;

(4) minor access roads;

(5) telephone, gas, and electric utility distribution lines;

(6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary;

(7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and

(8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir.

No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for:

(1) construction of new bridges or roads for

which all necessary state and federal approvals have been obtained;

(2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained;

(3) other pipelines that cross project lands or waters but do not discharge into project waters;

(4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained;

(5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina;

(6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and

(7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project

waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year.

At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife

or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be

conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to insure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for

approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of this order, pursuant to 18 C.F.R. ▯▯ 385.713. The filing of a request for rehearing does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically ordered by the Commission. The licensee s failure to file a request for rehearing shall constitute acceptance of this order.

Fred E. Springer
Director, Office of
Hydropower License

FINAL ENVIRONMENTAL ASSESSMENT
FOR HYDROPOWER LICENSE

White River Hydroelectric Project

FERC Project No. 2444
Wisconsin

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Review
825 North Capitol Street, NE
Washington, D.C. 20426

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SUMMARY

Northern States Power Company Wisconsin (NSPW), applicant for a subsequent minor license, proposes to continue operation of its hydroelectric project on the White River, near Ashland in Ashland County, Wisconsin. The proposed project has an installed capacity of 1.0 megawatt (MW) and would generate about 5,190 megawatt-hours (MWh) of electrical energy annually.

In this final environmental assessment (EA) we look at the environmental and economic effects of (1) the project as proposed by NSPW, (2) the project as proposed by NSPW with additional staff-recommended enhancement measures, (3) decommissioning the project, and (4) taking no action. Under the no-action alternative the project would continue to operate under the terms and conditions of the existing license, and no new environmental protection or enhancement measures would be implemented. We evaluated project decommissioning because the project's net power benefits (the annual cost of the project's power compared with annual cost of alternative energy) under each alternative action are negative.

In the "Comprehensive Development and Recommended Alternative" section, we study both the environmental resources and the power and economic benefits of the project. We recommend that any license issued for the White River Project include the measures proposed by NSPW along with the following staff-recommended modifications:

- Prepare a reservoir operating plan. The Commission will establish a permanent reservoir fluctuation level on the basis of the operating plan. Until then, the project will be required to comply with an interim 1-foot reservoir operating band between elevations 710.4 and 711.4 feet msl.

- Release a minimum flow of 27 cfs from April 1 through November 30, and 16 cfs from December 1 through March 31 to the bypassed reach.

- Modify the existing staff gage on the spillway according to agency recommendation.

- Prepare a Land Management Plan with a specific objective to maintain project lands in a natural state for fish and wildlife and aesthetic enhancement.

- Develop a plan to monitor for purple loosestrife in consultation with the Wisconsin Department of Natural

Resources.

- Prepare a management plan outlining steps to enhance habitat and to protect threatened and endangered species if they become established in the project boundary in the future.

- Develop a plan to monitor and analyze fly ash/cinders used to seal the spillway gates.

Consistency with Fish and Wildlife Recommendations

There are two recommendations made by the Wisconsin Department of Natural Resources (WDNR) pursuant to Section 10(j) of the Federal Power Act (FPA) that we determined to be inconsistent with the FPA: run-of-river operation as defined by the WDNR; and that the reservoir water surface elevation be maintained at a target elevation of 711.2 feet msl with a fluctuation of ñ 0.25 feet (a 0.5-foot band). Further, WDNR requested an operating band based on a maximum pool elevation of 711.45 feet msl with a downward fluctuation of 0.5 feet. We treat these two 10(j) recommendations jointly.

The agencies, staff, and NSPW agree that historical operation satisfies run-of-river objectives. However, neither WDNR's recommendation nor NSPW's operating proposal are based on documented operating data. Therefore, we have insufficient information to conclude that either case represents an operating regime that can be attained and documented. Thus, we recommend that NSPW, within 120 days of the license issuance, submit to the Commission for analysis and approval a reservoir-operating plan based on documented historical operating data, to be developed in coordination with WDNR. Following Commission review and analysis of the plan, staff will establish a permanent reservoir operating level consistent with run-of-river objectives to protect aquatic systems. See Section V.B.2.

Conclusion

On the basis of our independent environmental analysis, we conclude that issuance of a license for the project would not constitute a major federal action significantly affecting the quality of the human environment.

FINAL ENVIRONMENTAL ASSESSMENT

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF HYDROPOWER LICENSING, DIVISION OF PROJECT REVIEW

White River Hydroelectric Project
FERC Project No. 2444 Wisconsin

I. APPLICATION

19950829-3038(1356301) Order approving license

On December 20, 1991, Northern States Power Company Wisconsin (NSPW) filed an application for a subsequent license for the existing White River Hydroelectric Project, a minor project with a generating capacity of 1.0 megawatt (MW). The White River Project is located on the White River near Ashland, in Ashland County, Wisconsin (Figure 1). It is the only hydropower project on the White River. The project does not occupy any United States lands.

II. PURPOSE AND NEED FOR ACTION

A. Purpose of Action

The Federal Power Act (FPA) provides the Federal Energy Regulatory Commission (FERC) with the exclusive authority to license nonfederal water power projects, such as the White River Project, on navigable waterways for a term of up to 50 years.1/ In deciding whether to issue a license, the Commission must determine that the project will be best adapted to a comprehensive plan for improving a waterway (Section 10(a) of the FPA). In addition to the power and developmental purposes for which licenses are issued, under Section 4(e) of the FPA the Commission must give equal consideration to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality.

This environmental assessment (EA) analyzes and evaluates the impacts associated with continued operation of the White River Hydroelectric Project, assesses alternatives to the proposed project, recommends whether the Commission should issue a license, and recommends terms and conditions to become part of any license issued. We, the Commission staff, provided a draft EA to agencies, tribes, and interested parties to ensure full public participation in the licensing process. We revised the draft EA in response to comments received. The Commission will consider the final EA and comments on the draft EA in its licensing decision.

1/16 U.S.C. Sec. 791(a)-825(r).

B. Need for Power

The North American Electric Reliability Council (NERC) annually forecasts electricity supply and demand within the region and the nation. The latest forecast spans a 10-year period from 1995 to 2004. The NERC consists of 10 regions that encompass the 48 contiguous states, Canada, and Alaska. The White River Hydroelectric Project is within the NERC's Mid-Continent Area Power Pool (MAPP). The annual supply and demand projections for the MAPP and the 48 states over the 10-year period indicate that loads will grow faster than planned capacity, reducing the reserve capacity margin. Within the MAPP region, system demand is projected to grow at 1.8 percent per year, whereas planned capacity will grow at only 0.3 percent (NERC 1995). These projections support the long-term need for the power produced by the White River Hydroelectric Project.

Energy from the White River Project is delivered to either the local rural distribution system or NSPW's interconnected transmission system that supplies electricity to customers in its five-state service territory. In either case, it helps to supply the demand in the MAPP. Power generation at the White River Project averaged 5,326 megawatt-hours (MWh) annually between 1981 and 1990.

III. PROPOSED ACTION AND ALTERNATIVES

A. Applicant's Proposal

1. Project Facilities

The White River Hydroelectric Project has been in operation since 1907. The dam originally was constructed before 1884 to provide power for a sawmill. The dam was reconstructed and a powerhouse was built in 1907 to produce electricity. A flood destroyed the dam in 1926, and it was rebuilt in 1927. NSPW operates the hydroelectric project in a run-of-river mode and plans to continue operation of the existing facilities with environmental enhancements.2

The project consists of: (1) two earthen embankments a 400-foot-long northern section and a 300-foot-long southern section with a maximum height of 48 feet; (2) a reservoir with a surface area of 56 acres and an estimated 391 acre-feet of total storage volume at the normal maximum surface elevation of

2Operating the project in a run-of-river mode minimizes the fluctuation of the reservoir surface elevation by maintaining a discharge from the project so that, at any point in time, flows, as measured immediately downstream from the project tailrace, approximate the sum of inflows to the project reservoir.

711.2 feet above mean sea level (msl);3 (3) a 70-foot-long reinforced concrete spillway section consisting of (a) a gated spillway section with two 25-foot-long by 26.5-foot-tall bays, each housing a steel radial gate, and (b) a reinforced concrete non-overflow section, about 20 feet long, with an intake structure for the 7-foot-diameter pipeline; (4) intake and outlet works consisting of (a) a 7-foot-diameter reinforced concrete pipeline, 1,345 feet long, (b) a steel surge tank, 16 feet in diameter by 62 feet tall, and (c) a 54-inch steel y-shaped penstock; (5) a powerhouse constructed of reinforced concrete and brick masonry, 39 feet by 69 feet and one story tall, containing (a) two horizontal Francis turbines with a combined hydraulic capacity of 280 cubic feet per second (cfs) and (b) two Westinghouse generators rated at 500 kilowatts (kW) each for a total of 1.0 MW; and (6) appurtenant facilities.

The physical configuration of the White River Project dewaters a 1300-foot reach of the river (referred to as the bypassed reach) between the dam and powerhouse (see Figure 1). In this reach the bottom substrate is predominantly bedrock and rubble which creates a series of small pools and riffles that are

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sustained by spillway gate leakage, natural seeps and springs along the bank.

The present operational procedures for run-of-river operation were implemented during fall 1991. The hydroelectric generating equipment is set up for automatic operation based on headwater elevation. The annual maximum reservoir fluctuation is a 1-foot band between elevation 711.4 feet mean sea level (msl) and 710.4 feet msl.

Project lands are maintained in a natural state, and provide wildlife habitat and recreational opportunities. NSPW provides the following recreational facilities at the project site: (1) a boat launch and parking area north of dam, (2) a canoe takeout and portage, and (3) a tailwater fishing area.

2. Proposed Environmental Measures

The applicant proposes, or has recently completed, the following project enhancements for recreation, aesthetic, and fishery resources:

- ù Release a minimum flow of 10 cfs from the project dam into the bypassed reach between April 15 and May 30 and between September 15 and November 30; and release 5 cfs between June 1 and September 14 and between December 1 and April 15.

3All elevations in this report are given as feet above mean sea level.

- ù Improve the existing boat landing and parking area upstream of the dam. [completed]
- ù Establish bald eagle management practices on project

lands if the species nests there in the future.

- ù Improve shoreline access in the powerhouse tailrace. [completed]

- ù Implement a draw-down management plan in cooperation with the WDNR.

We discuss these proposals under the individual resources in Section V.B.

B. Staff Recommended Modifications to Applicant's Proposal

An alternative to licensing the project as proposed is to license the project with additional measures for resource protection and enhancement. We recommend the following modifications to the applicant's proposal:

- ù Prepare a reservoir operating plan to include, at a minimum: historical gaging data for the period of the original license; a proposal for reservoir fluctuation operating level; and a proposal for compliance monitoring and reporting. The Commission will establish a permanent reservoir fluctuation level on the basis of the operating plan. Until then the project will be required to comply with an interim 1-foot reservoir operating band between elevations of 710.4 and 711.4 feet msl.

- ù Release a minimum flow of 27 cfs from April 1 through November 30, and 16 cfs from December 1 through March 31 to the bypassed reach.

- ù Modify the existing staff gage on the spillway according to agency recommendation.

- ù Prepare a Land Management Plan with a specific objective to maintain project land in a natural state for fish and wildlife and aesthetic enhancement.

- ù Develop a plan to monitor for purple loosestrife in consultation with WDNR.

- ù Prepare a management plan outlining steps to enhance habitat and to protect threatened and endangered species if they become established in the project area in the future.

ù Develop a plan to monitor and analyze fly ash/cinders used to seal the spillway gates.

These staff recommendations would supplement NSPW's proposal for recreational improvements (See III.A.2), and implementation of a reservoir draw-down management plan with WDNR.

We discuss each of these recommendations under the individual environmental resources in Section V.B.

C. Decommissioning

The existing White River Project's annualized cost of producing power exceeds the annualized cost of alternative energy (see Section VI.C.). Consequently, in light of the modest size of the project we have analyzed project decommissioning as a reasonable alternative to licensing.

The decommissioning alternative can range from a simple shut-down of the power operation to complete removal of the project works. The White River decommissioning alternative would involve project shut-down with measures to provide for facility maintenance and safety. Under this alternative, power generation would cease and the powerhouse would be secured to prevent entry and vandalism. The turbines and generators would be either removed or disabled. Similarly, the 7-foot-diameter pipeline connecting the dam and the powerhouse would be disabled and sealed with concrete plugs. The flow from the dam to the bypassed reach would be equal to the river flow into the reservoir. The electrical tie between the powerhouse and the nearby transmission line would be removed. Lastly, long-term maintenance would be provided to the dam embankments, spillway section, and radial gates.

In its December 14, 1994, Policy Statement on project decommissioning,4 the Commission states that the licensee is

responsible for project retirement. The licensee's estimated cost for the decommissioning alternative is presented in Section VI. Section V.C. addresses the environmental effects of the decommissioning alternative. Ultimately, the supervision of a decommissioned project would become the responsibility of a state or other governmental agency.

D. No-Action Alternative

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license, and no new environmental protection or enhancement

4 60 Fed. Reg. 339 (January 4, 1995).

measures would be implemented. We used this alternative to establish baseline environmental conditions for comparison with other alternatives.

E. Alternatives Considered but Eliminated from Detailed Study

In examining decommissioning alternatives for this uneconomical project, we analyzed and eliminated from further consideration complete or partial removal of project works.

In its December 14, 1994, Policy Statement on project decommissioning, the Commission declined to impose a generic decommissioning requirement and instead decided to address the issue on a case-by-case basis. In some cases there are compelling environmental or safety reasons for considering either complete or partial removal of hydroelectric project works.

For the White River Project, no agency, individual or interest group has recommended project decommissioning or dam removal.

Fish and wildlife resource agencies state that the dam serves as an important barrier to the migration of sea lamprey into the upper White River reach. Resource agencies value the upper reach as a good trout fishery that they believe has never been stocked; also it has "outstanding water quality". For these reasons the reach from the impoundment to the source is listed on the Department of the Interior's National Wild and Scenic Rivers Inventory, and the agencies believe retention of the dam would be desirable. In addition, the upstream and downstream fisheries are unrelated, both are good fisheries, and fishing, canoeing and other recreational opportunities are unimpaired by project works over the length of the river (see Sections V.B.3 and V.B.7). The aesthetic impacts of the powerhouse and dam are minor in this forested watershed. Natural flows to the dewatered bypassed reach would be reinstated with decommissioning.

This is a low hazard dam with no downstream development in the watershed. The project works are in safe condition and decommissioning would result in supervisory regulation of the project by a state or other governmental agency to ensure maintenance of safety.

We costed three different decommissioning scenarios: 1) Partial Removal involving removal of the pipeline and powerhouse; 2) Partial Removal involving removal of the pipeline, powerhouse, and concrete spillway section of the dam, and; 3) Complete Removal involving removal of the pipeline, powerhouse, dam embankments and concrete spillway section, and State Trunk Highway (STH) 112 restoration. We estimated the current cost of each alternative to be $340,000, $2,300,000, and $4,000,000 to $5,000,000, respectively. Each of these

alternatives is uneconomical compared to the no-action scenario (the project operating under the terms of the existing license), where the project's annualized cost of energy exceeds the annualized cost of alternative-fuels energy by $84,000. For

example, the annualized benefit of the scenario 1 alternative would be $-144,000, and significantly more uneconomical for scenarios 2 and 3.

We conclude that partial or complete removal of project works would be more expensive relative to shutdown or continued operation alternatives. More importantly, partial or complete removal is unnecessary and even undesirable from environmental or safety standpoints.

IV. CONSULTATION AND COMMENTS

A. Agency Consultation

The following agencies provided comments and recommended terms and conditions for the White River Hydroelectric Project in response to our notice that the application was ready for environmental analysis on July 13, 1993. All comments are part of the record for the project, and we considered them in our environmental analysis.

Commenting Agencies	Date of Letter
WDNR	9/3/93 and 8/5/94
U.S. Department of the Interior (DOI)	9/10/93 and 8/1/94

NSPW responded to the WDNR and DOI comments and recommendations in letters dated October 21, 1993, and September 9, 1994.

The Commission issued the draft environmental assessment (DEA) for comment on February 17, 1995. In letters to the agencies dated February 23, 1995, staff made a preliminary determination that certain recommendations made pursuant to Section 10(j) were inconsistent with the FPA. We considered all timely responses and comments on the DEA (see Appendix A) in preparing this environmental assessment.

The respondents commenting on the DEA are as follows:

Respondent	Date of Letter
Izaak Walton League of America	3/28/95
Great Lakes Fish and Wildlife Commission	4/3/95
Bad River Band of Lake Superior Tribe of Chippewa Indians	4/3/95
WDNR	4/5/95
DOI	4/7/95
Richard Spotts	4/7/95

Commission staff held a teleconference pursuant to Section 10(j) of the FPA with WDNR and DOI on April 13, 1995, to attempt to resolve preliminarily identified inconsistencies between the agencies' Section 10(j) recommendations and the FPA. A discussion of the results of this teleconference, and the inconsistencies remaining are contained in Section VII of this EA. This final environmental assessment reflects all timely additional information, comments and recommendations submitted within the 10(j) process.

B. Interventions

Organizations and individuals may petition the Commission to intervene and become a party to any subsequent licensing proceedings. On August 14, 1992, the WDNR filed a motion to intervene in the proceeding. The Commission granted intervenor status to the WDNR. No organization or individual filed a motion to intervene in opposition to the project.

C. Section 18 Fishway Prescription

In its letter of September 10, 1993, the DOI requested reservation of its authority to prescribe fishways pursuant to Section 18 of the FPA.5

Section 18 of the FPA, 16 U.S.C. §811, states that the Commission should require construction, maintenance, and operation by a licensee of such fishways as the Secretaries of the Commerce and the Interior may prescribe. Interior recommends that Northern States Power Company be required to provide fishways at the White River Project when prescribed by the Secretary of the Interior under Section 18 of the FPA. Although fishways have not been prescribed by Interior at this time for the project, the Commission has included a license article which reserves Interior's authority to prescribe fishways in the future. We recognize that future fish passage needs and

management objectives cannot always be predicted when the license is issued. Therefore, Article 404 would reserve Interior's authority to prescribe fishways.

5Section 18 of the FPA states "The Commission shall require the construction, maintenance, and operation by a licensee at its own expense of . . . such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate."

D. Water Quality Certification Conditions

Section 401(a)(1) of the Clean Water Act (CWA) requires an applicant for a federal license or permit for any activity that may result in a discharge into navigable waters of the United States to provide the licensing or permitting agency a certification from the state in which the discharge originates that such discharge will comply with the CWA.

On August 28, 1990, NSPW applied to the WDNR for Section 401 water quality certification, as required by the CWA. In a letter dated December 3, 1990, the WDNR waived the need for a water quality certificate.

E. Coastal Zone Management Act

Because the project lies in a coastal zone and may affect

coastal resources, the Wisconsin Department of Administration (WDA) reviews the proposed project for consistency with the Wisconsin Coastal Management Program. In its letter of October 19, 1993, the WDA waived the right to review the applicant's consistency certification for the White River Hydroelectric Project, and so state concurrence with the certification is presumed.

F. Scoping

We reviewed public and agency comments filed with the Commission; visited the project area on December 15, 1993; and issued a Scoping Document on January 13, 1994, describing the environmental issues we proposed to address in this EA. No agencies or individuals commented on the Scoping Document.

V. ENVIRONMENTAL ANALYSIS

A. General Description of the Locale

1. White River Basin

The project site is 4.5 miles directly south of the city of Ashland where State Trunk Highway (STH) 112 crosses the White River (see Figure 2). The dam is 13 miles upstream of the confluence of the White River with the Bad River and about 18 miles upstream from the mouth of the Bad River at Lake Superior. The White River flows for about 43 miles from its origin near the Village of Delta in Bayfield County, Wisconsin, to its confluence with the Bad River. The White River drains an area of 301 square miles above the project dam.

The river is free-flowing for 30 miles from its origin to the White River dam. At the dam a buried conduit conveys water

channel. The bypassed channel consists of a series of shallow riffles and pools created by leakage from the dam and natural seepage from the river bank. Downstream of the powerhouse, the river continues to flow freely for 13 miles to its confluence with the Bad River.

Upstream of the dam, the White River reservoir covers 56 acres at a normal full pool elevation of 711.2 feet. NSPW has flowage rights for the entire reservoir. The maximum width of the reservoir is 1,000 feet, the average depth is 7 feet, and the length of the reservoir is 1 mile. Because of its small size, the reservoir provides little to no flood control downstream of the dam.

The project area is primarily forest land. A few scattered dairy farms represent the only development in the area. Lands adjacent to the reservoir are entirely undeveloped. NSPW owns 101 acres adjacent to the reservoir, which represents roughly 25 percent of the shoreline. The rest of the land is privately owned, and NSPW has flowage rights to the high water mark. Most of NSPW's land is adjacent to the dam and powerhouse on the north side of the river. In addition to the project works, the project lands are primarily used for recreation and wildlife habitat.

The population of Ashland County in 1990 was 16,307, with 8,695 people residing in the city of Ashland. The only other city in the county is Mellen, with a population of 935.

2. Proposed and Existing Hydropower Development

There are no other existing or proposed hydropower projects in the White River Basin.

3. Cumulative Impacts

An action may cause cumulative impacts on the environment if its impacts overlap in space and/or time with the impacts of other past, present, or reasonable foreseeable future actions. Individual minor impacts of multiple actions, when added together in space and time, may amount to collectively significant cumulative impacts. The existing environment shows the effects of past and present actions and provides the context for determining cumulative impacts of future actions.

The White River Hydroelectric Project is the only hydropower project in the basin. The rest of the basin is generally undeveloped, primarily forest land with some scattered farm land. No other projects have been identified that could collectively

produce cumulative effects. Although there is potential for other activities, such as logging, specifics regarding their extent or location are unknown. Moreover, since no fundamental

change in project operations is being considered, the foreseeable cumulative impacts of the proposed project relicensing are very limited.

Our analysis of existing cumulative impacts shows a strong relationship between the White River Project and the fishery above the dam. The upstream fishery is a quality warmwater and coldwater fishery, and the dam keeps sea lamprey, which have invaded nearby Lake Superior, from damaging the fishery.

The project complements the low intensity, outdoor recreational opportunities in the basin. Recreational facilities at the project provide a convenient location for canoeists and kayakers to either access or leave the river. Similarly, the project provides fishermen with shoreline and boat fishing opportunities. The facilities adequately provide for the limited use that does occur.

B. Environmental Resources

We have reviewed the proposed project in relation to the environmental resources in the area affected by the project. We have considered comments and recommendations presented by the agencies and NSPW in our analysis below.

1. Geology and Soils

Affected Environment: The immediate project area is formed from flat glacial lake bottom deposits overlying sandstone and shale. The unconsolidated material is composed of red clay about 50 feet thick. The river has eroded through the clay layer, exposing hard sandstone and some underlying shale along the river bed.

Environmental Impacts and Recommendations: Erosion along the reservoir's shoreline occurs at a slow rate. The combination of dense vegetation and the reservoir operating regime have stabilized the banks and minimized erosion. Historically, there has been no record of significant erosion around the reservoir, nor have any erosion control measures ever been required. Further, no agencies have reported erosion as a concern.

The proposed project, with our recommendations, would maintain a reservoir operating regime with minimal water level fluctuation. Therefore, we do not expect any change in erosional activity along the reservoir shoreline. Thus, we recommend no specific protection or enhancement measures for erosion control.

Unavoidable Adverse Impacts: None.

2. Water Resources

Affected Environment: The WDNR classifies the White River from its mouth up to the dam as a Class II trout stream.6 In addition, the National Park Service (NPS) includes the White River, from the project impoundment at the STH 112 crossing to its source, on the Nationwide Rivers Inventory because of its scenic and recreational (canoeing and trout fishing) value. The NPS also describes the White River as having "outstanding water quality in upper reaches."

The U.S. Geological Survey (USGS) has maintained stream gage No. 04027500 at the downstream side of the project powerhouse since 1948. Mean annual river flow measured at the gage through September 1992 is 281 cfs. Peak runoff flows typically occur in April and May as winter snowmelt combines with spring rain. April has the highest mean monthly flow, 573 cfs. Flows are generally lowest in the winter. January has the lowest mean monthly flow, 188 cfs. The highest recorded instantaneous flow

(8,100 cfs7) at the project site occurred on July 1, 1953 (USGS 1993).

No flow is released to the bypassed natural channel unless the flow into the project exceeds the project's hydraulic capacity of 280 cfs. On average, flows at the project exceed the plant's hydraulic capacity 24 percent of the time (EarthInfo 1992). Historically, in most years, this has resulted in 200-300 cfs flow discharged over the dam into the bypassed reach during spring months. Leakage from the dam and seepage from the river bank produces a flow of about 1-2 cfs, which creates shallow riffles and pools in the bypassed reach when no flow is released from the dam.

The WDNR requires that the White River and its flowage meet state water quality standards for body-contact recreation, fish, and other aquatic life. In addition the project waters immediately downstream of the dam must meet the requirements for a Class II trout stream. These standards are published in Chapter NR 102 of the Wisconsin Administrative Code. The WDNR requires that dissolved oxygen in trout streams and coldwater fisheries be no lower than 6 milligrams per liter (mg/l) at all times and no lower than 7 mg/l during the fall spawning season. The WDNR also requires that temperature not be raised above natural background levels (levels if the dam were not present) to the extent that it adversely affects the trout population and that pH remain between 6.0 and 9.0. There are few historical

6Wisconsin trout streams are placed into three classes for fish management purposes. Class II streams may have some natural reproduction but not enough to utilize available food and space. Therefore, stocking is sometimes required to maintain a desirable sport fishery.

7Extrapolated from rating curve that extended above 3,000 cfs.

water quality data for the White River. Water quality in the project reservoir and tailrace measured between May 1989 and March 1990 meets state standards.

Water diverted through the turbines is used exclusively for hydropower generation and then returned to the White River. There are no consumptive uses of the project water. Therefore, the project does not affect any existing water rights.

Environmental Impacts and Recommendations:

a. Project operations

Operating the project in the run-of-river mode minimizes water level fluctuations upstream and downstream of the project and benefits aquatic resources in the river. NSPW and the WDNR believe the project should continue to operate in the run-of-river mode. We agree that run-of-river operation should continue.

The WDNR requested an operating band based on a maximum pool elevation of 711.45 feet msl with a downward fluctuation of 0.5 feet. It recommends that NSPW not operate over the full range of the band on a daily basis. The WDNR understands that the water level may fluctuate outside this range because of hydrological conditions beyond NSPW's control.

According to NSPW, limitations in the hydraulic capabilities of the turbines and load control equipment make it impossible to operate so that outflow from the project equals inflow on an instantaneous basis. Therefore, under normal operating conditions, the water surface elevation in the reservoir fluctuates. NSPW believes that WDNR's recommendation for reservoir fluctuation limits would be impossible to achieve with the existing project equipment. NSPW proposes to maintain a reservoir water surface elevation with a maximum operating range of 710.4 to 711.4 feet msl (1.0-foot operating band). NSPW points out that the 711.45 foot maximum normal operating level under the WDNR proposal is only 0.15 feet below the elevation at which the spillway gates are opened.

We agree the project should be operated in a run-of-river mode with an objective to protect the aquatic resources in the reservoir and downstream. We believe this objective is best accomplished with reservoir operations regulated by an enforceable fluctuation limit with allowances for circumstances

beyond the control of NSPW.

We have examined the issue and conclude the historical reservoir operating regime forms a basis to establish an enforceable limit. First, a well-documented high quality fishery at the project and downstream indicates no adverse effects from

historical operations. Further, the operating regime already reflects the equipment limitations inherent to the project.

In concept, NSPW's current reservoir operating plan and the WDNR proposal fulfill the intent of a run-of-river mode. NSPW has indicated they maintain the reservoir elevation between 710.6 and 711.2 feet msl about 75 percent of the time, and between 710.4 to 711.4 feet msl the remainder of the time. This practice closely approximates the WDNR proposal, and represents a favorable approach. We know, however, that the estimate of 75 percent of the time is not substantiated, nor is the WDNR proposal based on an interpretation of actual operating data. Therefore, we have insufficient information to conclude that either case represents an operating regime that can be attained and documented. Thus, we recommend that within 120 days of the license issuance, NSPW submit to the Commission for analysis and approval a reservoir-operating plan to include, at a minimum: historical gaging data for the period of the current license; a proposal for reservoir fluctuation operating level; a proposal for compliance monitoring and reporting; and documentation of agency consultation. The plan shall be coordinated with WDNR. Following the review and analysis of the operating plan, the Commission will establish a permanent reservoir fluctuation level.

b. Reservoir draw-down

Non-emergency draw-downs of the project reservoir for maintenance and other purposes can affect water quality if the reservoir is drawn down too quickly. The WDNR recommends that

the license require a draw-down management plan. The WDNR also recommends that complete draw-downs be avoided in the reservoir and provides ramping rates to be followed. The WDNR proposes the pond not be lowered more than 2 inches every 4 hours for the first 48 hours and no more than 6 inches per 24 hours after that. The WDNR requests that modifications to the draw-down plan be permitted only upon agency concurrence. NSPW has developed a draw-down management plan for inclusion in the license.

We agree with the WDNR and NSPW and recommend the draw-down management plan be included in the license. To protect water quality and prevent fish stranding during non-emergency draw-downs, the pond should not be lowered more than 2 inches every 4 hours for the first 48 hours and no more than 6 inches per 24 hours after that. We also recommend that modifications to the draw-down management plan for non-emergency draw-downs be permitted only after consultation with the WDNR and that the modifications be subject to Commission approval.

c. Gaging

NSPW maintains staff gages at the headwater and tailwater of

the project as recommended by the WDNR. Hourly water surface elevations are documented on a continuous recording circular chart. NSPW will forward this information to agencies upon request. In addition, there is a USGS stream gage located in the tailwater area of the powerhouse.

The WDNR requests that NSPW maintain a staff gage with its operating range clearly marked upstream of the project in a location easily visible to the public. NSPW agrees either to modify the existing headwater gage on the spillway to conform to the U.S. Fish and Wildlife Service (FWS) design, as recommended by the WDNR, or to indicate the operating range clearly on the existing gage. We recommend NSPW either modify the existing headwater gage to conform to the FWS design or to indicate the

operating range on the gage.

The current USGS gage and the existing headwater monitoring gage are adequate to ensure compliance with the operating levels recommended previously. Therefore, we recommend that NSPW continue to monitor headwater and tailwater surface elevations and provide records to agencies within 30 days upon request.

d. Spillway gate "cindering"

The highest leakage rates through the dam spillway gates occur when the gates are opened and then closed. NSPW adds cinders, or ashes, to the water upstream of the gates to reduce leakage through the gates by sealing the small holes. The WDNR has requested NSPW annually analyze a sample of the cinders for bulk chemistry of contaminants and submit the results to the WDNR. The WDNR states it may restrict the practice of cindering if environmental harm is likely. The WDNR also states that it is evaluating cindering as part of the operation of all dams, and that the state may soon regulate the practice to avoid the introduction of contaminants into state waterways. NSPW has submitted the results of a chemical analysis of the cinders used to reduce gate leakage to the WDNR's Bureau of Solid Waste for review. In letters dated April 3, 1995, the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and the Bad River Band of Lake Superior Tribe of Chippewa Indians also express concerns about the impact of cindering on water quality (see Appendix A).

The practice of cindering gates to prevent leakage is a long-established practice in the hydropower industry. Cindering is essential to the operation of many projects to prevent lost power generation and ice buildup due to leaking gates. Leakage from the radial gates can cause serious safety concerns if ice builds up on the gate mechanisms and access routes to the gates, rendering them inoperative. The practice of cindering is not currently regulated, nor are there any proven adverse effects to water quality. Nonetheless we recognize that the practice does introduce materials into the water and that the WDNR has a

legitimate regulatory responsibility to ensure that such materials do not impair water quality. Therefore we recommend that NSPW submit for Commission approval a plan for monitoring and analyzing fly ash/cinders used to seal the spillway gates. The plan shall provide for annual analysis of bulk chemistry of contaminants. We recommend that NSPW submit the results of the analysis to the Wisconsin Department of Natural Resources and a summary of the findings to the Bad River Band of Lake Superior Tribe of Chippewa Indians and the Great Lakes Indian, Fish and Wildlife Commission. The plan shall also provide for implementation of any reasonable enhancement measures to minimize, to the fullest extent possible, levels of trace metals and other elements.

Unavoidable Adverse Impacts: None.

3. Fishery Resources

Affected Environment: The impoundment and flowage above the dam provide good habitat for a mixed warmwater/coldwater fishery. Game species include northern pike, largemouth bass, bluegill, black crappie, pumpkinseed, and brown trout. The forage species consist mainly of white sucker, common shiner, bluntnose minnow, and young shorthead redhorse. The fisheries community in the impoundment and flowage is considered a natural reproducing population. There has been no known stocking of warmwater or coldwater species in this segment of the river. The habitat in the flowage is generally shallow, with a rock and cobble bottom, whereas that of the impoundment is shallow with softer sediments near shore that support an abundant growth of emergent and submergent vegetation. The rock and cobble areas and the vegetation provide spawning and nursery habitat for the fishery. Fishing occurs both in the reservoir and the river below the dam. The estimated fishing user-days at the project are low, about 200 annually.

The approximately 1,300-foot-long bypassed reach below the dam has a fairly steep gradient. Under spill flow conditions the reach produces many cascades and rapids. The composition of the bottom substrate is about 80 percent bedrock, 10 percent boulder, and only 10 percent gravel. Downstream of the plunge pool at the base of the dam, the irregular stream-channel bottom produces a number of small pools separated by shallow rivulets when no water is spilling from the dam, or about 76 percent of the time. During this time, the stream reach is maintained by about 0.5 cfs leakage from the dam, plus accretion from natural seeps and

springs along the channel, bringing the total estimated flow to 1 to 2 cfs. This reach supports many forage species such as longnose dace, white sucker, common shiner, creek chub, fathead minnow, horneyhead chub, and shorthead redhorse. Game species found but not common to this reach are brown trout, rainbow trout, largemouth bass, and northern pike. A high gradient

stream bed, lack of vegetation, and dewatering preclude the use of the area by game species most of the year. Small pools and rivulets in the reach are better suited for forage species such as chubs, daces, and shiners. Interestingly, when the WDNR sampled the White River Flowage, the bypassed reach, and the powerhouse tailwater areas in cooperation with NSPW in 1989 1990, the bypassed reach produced the highest diversity of fish species (21) of the sample location. Only three species of gamefish found downstream were not found in the bypassed reach. The fish included smallmouth bass, rock bass, and walleye, which generally require a more stable river environment than the bypassed reach offers.

The fishery in the river below the powerhouse is dominated by forage species such as common shiner, longnose dace, white sucker, and shorthead redhorse. Game species noted in the reach are brown trout, northern pike, smallmouth bass, pumpkinseed, and walleye. The fishery in the lower reach of the river is influenced by Lake Superior fish that may move up the river to spawn.

Overall, the WDNR characterizes the fishery above the White River Project as a quality warmwater and coldwater fishery. Further, the WDNR describes the fishery below the project as markedly different from the one above the project. The management goals for the river do not recommend the introduction of an anadromous fish run from Lake Superior. Therefore, WDNR does not desire fish passage at the project. It appears that the barrier-effect of the existing project best serves the management goals for either fishery.

Environmental Impacts and Recommendations:

a. Impoundment fluctuations

Under V.B.2.a Water Resources, we recommend NSPW submit to the Commission for analysis and approval within 120 days of the license issuance a reservoir-operating plan to include, at a minimum: historical gaging data for the period of the current license; a proposal for compliance monitoring and reporting; a proposal for reservoir fluctuation operating level; and documentation of agency consultation. The plan shall be developed in coordination with WDNR. Following the review and analysis of the operating plan, the Commission will establish a permanent reservoir fluctuation level specification.

b. Fish Passage

The White River dam acts as a barrier to upstream migration of walleye and several salmonid species. It is also an important barrier to migration of the sea lamprey, which the WDNR considers a nuisance species that has affected the lake trout population in

the Great Lakes. The WDNR considers restricting the sea lamprey from potential spawning areas as well as potential parasitic infestations in upstream waters desirable. Also, WDNR and DOI management goals for the White River do not call for the introduction of anadromous fish runs from Lake Superior. We agree with the WDNR and DOI that fish passage facilities are not appropriate at this time. Therefore we are not recommending the construction of fish passage facilities at the White River Project.

The DOI has requested that its authority be reserved to prescribe the installation of fishways pursuant to Section 18 of the FPA. We recognize that future fish passage needs and management objectives cannot always be predicted when a license

 Order approving license is issued. Although the DOI is not recommending that fish passage facilities be installed at this time, we recommend including a license article reserving the DOI's prescription authority under Section 18 of the FPA.

c. Fish entrainment

The WDNR describes the types of fisheries above and below the project as markedly different in character (WDNR, 1993). Further, they describe the fishery upstream as having good quality. For this reason, the WDNR has not requested a fish entrainment and mortality study in connection with the White River Project. They have stated that their management goals for the upstream fishery would not be served by a reduction in numbers of entrained fish. Other agencies such as DOI and U.S. Environmental Protection Agency in their correspondence dated March 31, 1990, and March 13, 1990, respectively, support a position for no fish entrainment and mortality study.

We concur with the agencies that project fishery goals would not be served by an entrainment/mortality study. Existing conditions provide a high quality fishery in the impoundment and upper and lower reaches of the river. There are no desirable anadromous fish species involved, and the upstream and downstream fisheries are unrelated.

d. Instream flows in the bypassed reach

NSPW, in consultation with the WDNR and DOI, performed a minimum flow study at the White River Project in spring 1994. The purpose of the study was to qualitatively evaluate a series of minimum flow releases and the effects on fishery resources. This study and other considerations were used by the resource agencies and NSPW to develop recommended minimum flow releases (Table 1).

Table 1. Comparison of minimum flow recommendations

Proposer	Flow Release	Annual Lost Power Generation (MWh)
NSPW	10 cfs (Apr. 15 May 30, Sep. 15 Nov. 30) 5 cfs (June 1 Sep. 14, Dec. 1 April. 15)	136
WDNR	16 cfs (year-round)	347
DOI	27 cfs (Apr. 1 Nov. 30) 16 cfs (Dec. 1 Mar. 31)	492
No-Action	Existing Dam Leakage <0.5 cfs with natural springs for a total of 1-2 cfs. 200-300 cfs spillage in spring and early summer.	Ä

In making a preliminary determination of inconsistency between WDNR and DOI's Section 10(j) minimum flow recommendations (letters dated February 23, 1995), we concluded that the no-action condition provided adequate protection for a diverse fishery in the bypassed reach and that the WDNR and DOI recommendations would result in only marginal enhancement of an existing marginal and limited fishery, while resulting in a significant cost to this already uneconomical project. However, as a result of discussions at the April 13, 1995, 10(j) teleconference, staff developed additional information based on further investigation into hydrological conditions at the project, and also WDNR provided additional information on the functional fishery impacts of each of the three recommended alterative minimum flows.

Additional staff analysis identified that, historically, in most years, the 1-2 cfs instream flow from dam leakage and natural spring seepage was augmented by spillage of between 200-300 cfs over the dam into the bypassed reach when flows exceeded the project's hydraulic capacity. This spillage historically has occurred during spring and early summer spawning months. While

similar hydrological conditions can be expected in the future, there is no flow guarantee for the bypassed reach in the existing license, and consequently, no protection or recognition of the baseline fishery condition. We conclude that a minimum flow guarantee for the bypassed reach is required to protect the baseline fishery condition.

We analyzed the alternative minimum flow recommendations and concluded that NSPW's proposal to release 10 cfs or less would not protect the existing fishery. At a flow of 10 cfs, the predominant substrate of the wetted channel is bedrock, which has marginal value as fish habitat. Additional information from WDNR indicates, according to their observations during the minimum flow study, that 10 cfs may be adequate to sustain fish in isolated pools, but is insufficient to allow fishes to move freely throughout the riverine community.

WNDR's recommendation for a continuous discharge of 16 cfs would allow fish to access all portions of the bypassed reach and the rest of the White River system. This would replicate historical spillage functions that promoted the mixing of fishery populations in various sections of the White River system with the bypassed reach fishery. Also, whereas historical flows provided sufficient discharge in spawning months to allow spawning, a 16 cfs minimum flow could inundate gravel and cobbles along the channel and fish could be expected to be attracted to the bypassed reach for spawning. A minimum flow of 16 cfs also provides significantly more wetted habitat for fish and invertebrates than 10 cfs.

DOI's proposal is the same as WDNR's except that it would provide 27 cfs discharge from April to November. These higher flows would coincide with the spring and fall spawning periods for warm water fishes and salmonids, respectively. DOI believes that these flows are most conducive to spawning, providing greater habitat and water quality benefits. DOI's recommendation

for 27 cfs discharge would guarantee adequate flows for spring spawning where historical spillage has provided such flows. The 27 cfs discharge for fall spawning would represent a minor enhancement over the no-action condition.

We have also examined the financial impact of the minimum flow releases to the project (see Section VI). The annual lost power generation (see Table 1) ranges from 136 to 496 MWh for the various flow proposals. The estimated impact to the project would be an annual cost of about $6,000 for the NSPW proposal, $10,000 for the WDNR proposal, and $16,000 for the DOI proposal.

We believe a minimum flow release requirement in any license issued for this project is necessary to protect the baseline fishery condition in the bypassed channel. We concur with DOI that a minimum flow of 27 cfs from April 1 through November 30, and 16 cfs from December 1 through March 31, would provide adequate protection of fishery resources in the bypassed channel.

Unavoidable Adverse Impacts: There would be unavoidable losses of fish to entrainment and turbine mortality. As discussed in Section V.B.3.c (above) we conclude these losses would have an insignificant effect on fishery resources.

4. Terrestrial Resources

Affected Environment: The terrestrial resources within the project area are typical of areas adjacent to Lake Superior. The forest land is dominated by mixed northern hardwoods with some scattered conifers. The principal hardwood species are sugar and red maple, large-toothed aspen, white birch, red oak, box elder, basswood, yellow birch, black ash, and some black cherry. Conifers include red and white pine, balsam fir, white and black spruce, eastern hemlock, and white cedar.

The riparian community adjacent to the water's edge is dominated by scrub/shrub vegetation. Riparian plant species

include tag alder, osier dogwood, willow species, and some sumac.

There are three wetland areas within the project area, two greater than 5 acres and one less than 5 acres. The two larger wetlands, 6 and 8 acres, encompass the upper one-third of the flowage and confluence with the river. The smallest wetland is about 400 feet downstream of the dam. It is a primarily scrub/ shrub and emergent aquatic community growing along the fringe of the river. The smaller wetland downstream of the dam is the only wetland on NSPW-owned lands.

Wildlife resources at the project site include species associated with undeveloped forested areas. Common mammals include white-tailed deer; black bear; red, gray, and fox squirrels; bobcat; coyote; red and gray fox; raccoon; woodchuck; short-tailed weasel; chipmunk; striped skunk; snowshoe hare; beaver; and river otter. Common birds include blue heron, crows, vireos, blue jays, woodpeckers, nuthatches, chickadees, migratory waterfowl, owls, woodcock, ruffed grouse, and raptors (e.g., broad-winged hawk, osprey, bald eagle). Many species of reptiles and amphibians inhabit the area including the state-threatened wood turtle.

DOI has identified the bald eagle (Haliaeetus leucocephalus) as a threatened (state and federal) species present in Ashland County. DOI has located a nesting site about 3 miles upstream of the project dam, outside the project area. The habitat in the area is conducive to nesting by bald eagles and ospreys (Pandion haliaetus) (state threatened). Habitat of the timber wolf (Canis lupus), state and federally endangered, also occurs within and adjacent to the project area, although no wolves have been observed. The wood turtle (Clemmys insculpta), a state threatened species, was observed downstream of the project area. The WDNR identified a triploid morph of the blue-spotted salamander, also known as Tremblay's salamander, in the project vicinity. Tremblay's salamander is not recognized as a distinct species, but has been considered a state threatened species in the past and could be again in the future.

Environmental Impacts and Recommendations:

a. Property ownership and development

NSPW currently owns 101 acres of undeveloped forest land bordering the reservoir and the river below the dam. Resource agencies have expressed concern that land-disturbing activities such as timber harvesting could reduce available habitat for wildlife, including nesting sites for bald eagles. The WDNR requests that NSPW retain ownership of lands in the project area and maintain those lands in their current undeveloped state. NSPW has agreed to comply with the WDNR request.

We conclude that maintaining project lands in their natural state would provide aesthetic benefits and suitable future wildlife habitat. Therefore, as discussed in Section III.B, we recommend that NSPW maintain its project lands in a natural state. Any withdrawal of, or addition to project lands would require an application for Commission approval of an amendment to the license with prior agency consultation. We recommend that NSPW prepare a Land Management Plan in consultation with resource agencies, to be filed for Commission approval within one year after issuance of any license. The Land Management Plan should address allowed uses and activities on project lands, and set forth land management principles and practices that will be followed. The Land Management Plan should especially address these aspects in relation to minor conveyances that are exempt under the Commission's standard land use article from prior Commission approval. The Commission's standard land use article otherwise adequately provides for prior agency consultation and Commission approval for all land uses and dispositions.

b. Purple loosestrife

Purple loosestrife (Lythrum salicaria and L. virgatum) is an introduced plant considered a nuisance weed. Loosestrife is generally found in wetlands where it crowds out more desirable native species that provide food and habitat for aquatic life. Loosestrife thrives in recently disturbed wetlands, which means that water level fluctuations may enhance the spread of purple loosestrife. The WDNR requests that the applicant monitor the project area for purple loosestrife and eradicate any plants within the project area using the best possible methods. Eradicating an established stand of purple loosestrife is difficult because each plant produces many seeds, and at this

time there is no effective method to eradicate an established stand. For small stands of purple loosestrife, uprooting the plant or using an herbicide is possible, but no proven eradication method exists.

NSPW agrees to monitor the project area for purple loosestrife and report any findings to the WDNR. NSPW does not

believe that implementation of a control plan for purple loosestrife should be included as a license article. NSPW recommends that the responsibility for eradicating purple loosestrife be assigned to an agency.

We recommend that NSPW develop a plan to monitor purple loosestrife in consultation with WDNR. This plan should include, but is not limited, to the method of monitoring, the frequency of monitoring, and the submission of monitoring data to WDNR.

c. Impoundment fluctuations

The WDNR and NSPW agree that reservoir fluctuations should be minimized to encourage a more diverse emergent and submergent aquatic plant community. In addition, minimizing water level fluctuations would provide resting, feeding, and brood habitat for waterfowl and enhance other components of the aquatic system.

We recommend the reservoir elevation strategy listed in Section V.B.2 Water Resources for minimizing water level fluctuations and effects on terrestrial resources.

d. Threatened and endangered species

NSPW proposes to maintain the project lands in their current undisturbed state, which would preserve large canopy trees that could provide future nesting areas for bald eagles. DOI has concluded that the proposed project will not affect the bald eagle or gray wolf. Thus it is not requesting Section 7

consultation under the Endangered Species Act.

We agree that proposed facility operations and resource management activities at the project site should not adversely affect any threatened or endangered species in the area. However, we recommend that NSPW prepare a management plan that includes maintaining and enhancing habitat at NSPW-owned lands in their current natural state and describes the steps that would be taken to protect state and federally listed threatened or endangered species, if they become established in the project area in the future.

Unavoidable Adverse Impacts: None.

5. Aesthetic Resources

Affected Environment: The project is in an area of northern Wisconsin of visual diversity and interest. The region offers moderate relief and forested areas with a mix of open landscape.

The White River reservoir is set in a well-defined river valley with an undeveloped shoreline forested with mature trees. The project area offers a pleasing setting with appealing land

and water relationships, although none of the project area scenic features are unique or unusual for northern Wisconsin. The site has visual appeal in spring with its rushing water through the bypassed reach, fall with the color change, and summer with full foliage.

The visual quality of the area is largely intact, interrupted only by the presence of the project dam, the powerhouse, the powerhouse access road, and STH 112. STH 112 traverses the project's dam and provides scenic views of the reservoir to passersby and recreationists using the area.

Environmental Impacts and Recommendations: The proposed

project with our recommendations would not change the visual character of the area. Although, the project features and operations generally blend with the surroundings, we examined possible visual enhancement opportunities at the project site. We concluded that there were two opportunities to potentially improve the visual quality of the area: enhancements to the powerhouse access road and the bypassed reach. Both share the same corridor and provide a long 1,300-foot axial view from STH 112 that lacks visual appeal.

The recommendation for minimum flows to the bypassed reach (see Section V.B.3) would create the sight and sound of a free-flowing river for those who might stop along STH 112 or visit the accompanying recreation areas. The costs of the minimum flow release are measured in terms of the value of lost power. A minimum flow of 27 cfs (Apr. 1 through Nov 30) and 16 cfs (Dec. 1 through Mar. 31) as the DOI and staff propose would have an annualized cost of $16,000.

We also considered enhancements for the access road that would soften its linear form, such as roadway realignment or well placed clusters of trees. We examined the merits of these enhancements by weighing their benefits against the potential costs. Landscaping and road realignment have estimated construction or installation costs of $25,000 and $50,000, respectively.

We considered the viewer population in the area to determine the potential benefits of visual enhancement. For example, we considered whether the viewers are stationary or transient, and whether there would be a notable viewer response to the improvements. The majority of viewers in the project area are transient predominantly in automobiles passing by on STH 112. Only about 300 individuals use the project area annually for recreational purposes, and they typically stay less than 6 hours. Also, the transient viewer, moving through the area at 50 miles per hour, forms an areawide impression rather than reacts to specific scenes.

We conclude, therefore, that improvements to either the bypassed reach or the access road would go unnoticed by the majority of the viewers in the area. For the remaining viewers, the visual resources in the area are generally common to northern Wisconsin. Therefore, we conclude that the costs of any further improvements far exceed the possible benefits. We recommend no visual improvements for the access road. We do, however, recommend retaining project-owned lands in a natural state, which would benefit the long-term visual quality of the project area see Section V.B.4.a.

Unavoidable Adverse Impacts: None.

6. Cultural Resources

Affected Environment: In 1991 NSPW retained the Burnett County Historical Society to survey and evaluate the project areas. It identified no significant cultural resources at that time. The Wisconsin State Historical Preservation Officer (SHPO) reviewed the study results submitted by NSPW in its application and concurred with the methods and conclusions.

The project facilities (i.e., the powerhouse, surge tank, pipeline, substation, and dam/highway bridge) are representative of the region's hydroelectric development history, but they are not unique. The integrity of the project works is poor historically because of various replacements and maintenance actions since the original construction in 1907.

The archaeological studies included a literature search and a field survey that encompassed relevant shoreline areas. The field survey identified some areas of potential archaeological importance, but it did not reveal any specific sites.

Environmental Impacts and Recommendations: The project would not affect any known potentially historic sites. Consistent with recommendations by the Wisconsin SHPO, we recommend that NSPW be required to consult and cooperate with the Wisconsin SHPO before undertaking any ground-disturbing activities or developing any project works or other facilities. Furthermore, we recommend that NSPW periodically search all eroded reservoir shoreline areas for visible traces of artifacts, objects, or remains of potential archaeological significance. We also recommend consultation with the state SHPO before construction or development activities are undertaken and

19950829-3038(1356301) Order approving license periodic surveys (at 5 and 10 years after relicensing) of eroded reservoir shoreline areas for cultural resources.

Unavoidable Adverse Impacts: None.

7. Recreation and Other Land and Water Uses

Affected Environment: The project site is within one of Wisconsin's prime recreation areas. Ashland County, along with nearby Bayfield and Iron counties, provides more than 200,000 acres of land for recreational use in the region, including large natural lakes and wetlands. Much of the undeveloped forest lands, which constitute the dominant land type in the area, are in public ownership and are used for recreational activities like camping, fishing, swimming, hunting, hiking, boating, skiing, snowmobiling, and sightseeing. In Ashland County, the primary recreational activities are boating, fishing, swimming, and sightseeing. On an average summer weekend, more than 24,000 people participate in these activities.

Recreational opportunities at the project are limited to two areas: the reservoir and the tailwater area below the powerhouse. The primary activities in these areas are fishing (shoreline and boat fishing) and canoeing/kayaking. NSPW provides a boat launch, canoe takeout, parking, and a canoe portage totaling about one acre on the north side of the dam. In the tailwater area, NSPW provides access for fishing and kayaking. Parking for the tailwater area is available at the boat launch and along the powerhouse access road.

Overall, the recreational usage in the project area is low. This is largely attributed to the availability of larger, more developed recreational resources in the area. The total number of recreational users observed by NSPW personnel in a 6-month period during 1989 was 160. We estimate the year-round user-days to be about 300. The NSPW user survey indicates that 65 percent

of the use is fishing. A small number of recreationists canoe in the area. Most canoeists who arrive at the project from upstream conclude their trip at the dam. NSPW provides a canoe portage trail, however, for those wishing to continue their trip below the dam.

Environmental Impacts and Recommendations:

a. Recreation facilities

Recently, NSPW provided recreational enhancements in the project area including: 1) improvements to the boat launch area in 1991 and 2) improved access to the tailwater area in 1992. These improvements are associated with the primary recreational activities at the project site.

NSPW also explored the possibility of providing sufficient flow in the bypassed reach to support canoeing. NSPW examined flows at 50, 100, and 628 cfs (total stream flow) and concluded that canoeing was unsuitable at any flow. At flows of 50 and 100 cfs, NSPW observed rocky areas with low depths that would require portaging, and at 628 cfs the rocks created rapids that would be extremely dangerous.

There is only a moderate amount of canoeing in the White River compared to other nearby rivers. Further, more than 20 miles of free-flowing river are both upstream and downstream of the bypassed reach. We conclude there is no justifiable reason to provide flows in the bypassed reach for canoeing considering the availability of canoeing waters in the area and the high cost in power benefits foregone that would result.

We have examined the demand for recreation in the project area and the capacity of present facilities to satisfy future demand. Recreational growth in Ashland County is increasing at a rate of about 3 percent yearly. Assuming a similar growth rate in recreational use at the project site, about 800 people would

visit the site annually at the end of this license period. The capacity of the resources and the facilities at the project site is estimated to be over 3,000 user-days annually, a figure that far exceeds the actual and forecasted use. The WDNR stated in its initial consultation with NSPW that "public usage of this small reservoir should not be encouraged much beyond present levels." We conclude that the present facilities with NSPW's recent improvements adequately meet current and future demand, and recommend no further recreational enhancements.

b. Access for the disabled

The NPS asked NSPW to consider the need for barrier-free access in a letter dated September 11, 1991. NSPW states that the boat launch on the site is barrier-free without improvement, and it has no plans to install additional barrier-free recreational facilities because of the site's low usage factor. We agree that the existing boat launch configuration appears to provide reasonable accommodation for people with disabilities; therefore we do not recommend additional barrier-free facilities.

Unavoidable Adverse Impacts: None.

C. Decommissioning Alternative

The White River decommissioning alternative would involve the shutdown of the power generation operation, with measures to provide for long term facility maintenance and safety. Under this alternative, power generation would cease, the powerhouse would be secured to prevent entry and vandalism, and the pipeline would be sealed. Long-term maintenance would be provided to ensure the integrity and operation of the dam embankments, spillway section, and radial gates see Section III.C. for details. The decommissioning alternative would reestablish natural flows to the bypassed reach; therefore, the flow to the bypassed reach would be equal to the river flow into the reservoir. Also, we would expect the long-term supervision of the project to be transferred to a responsible state agency. The costs of the decommissioning alternative are provided in Table 2.

Table 2. Summary of Decommissioning Alternative Costs

	1993 Capital Cost	1993 O&M Annual Cost	1996 30-year Annualized Value
Net Investment	$694,900		$82,300
Relicensing Cost	24,200		3,000
Plug Pipeline	50,000		6,200
Secure Powerhouse	100,000		12,500
Operation & Maintenance		$40,000	40,000
Total Cost	$869,100	$40,000	$144,000

The primary adverse impact of the decommissioning alternative would be the termination of power generation with an annual value of about $147,000 under staff's recommended proposal. The forecasts show a demonstrated need for the power. A source of replacement power, therefore, would be required. Replacement power from thermal generation would cost more and would have a greater adverse impact on the environment. Other cost impacts of the decommissioning alternative include amortizing the remaining project debt, providing long term maintenance, and securing the facilities. Our economic analysis shows a significant annualized cost of $144,000, or a net annual benefit equal to -$144,000. See Table 4 for a comparison of the decommissioning alternative to all other alternatives.

The decommissioning alternative would offer minor benefits to the environment including:

- ù Resumption of natural streamflow to the bypassed reach, providing limited benefit to the aquatic resources.

- ù Visual improvement to the bypassed reach provided by reestablishing the natural streamflow.

The decommissioning alternative would not include any resource enhancements, but several measures may be appropriate to ensure the long-term maintenance of the facility and protection of environmental resources:

- Maintenance of the reservoir level at approximately the existing normal pool elevation to minimize erosion, provide stable fish habitat, protect wetland habitat, and reduce the likelihood of purple loosestrife.

- A draw-down management plan to protect water quality and prevent fish stranding during periods of

maintenance.

- A plan to revegetate any areas disturbed by retirement construction activities.

- A management action plan to identify applicant and agency responsibilities for long-term maintenance and operation of the facility.

The most significant cost measure, maintaining the reservoir level, has been included in the operations and maintenance cost in Table 2. The cost to prepare the plans are not included in Table 2, however, the costs associated with these plans are minor and would not measurably increase the overall cost of the decommissioning alternative.

D. No-Action Alternative

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license. Therefore, this alternative would result in no changes to the existing environment. The project would continue to operate in a run-of-river mode that has had no significant adverse effect on shoreline erosion, fish habitat, or shoreline habitat. Under the no-action alternative, dam leakage would continue to provide about 0.5 cfs flow to the bypassed reach. Recreational enhancements that NSPW has already provided would serve the recreational demand for the long term, and the fishery above and below the dam would not be altered. Finally, this

alternative would continue to provide 5,326 MWh of needed power annually.

VI. COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When the Commission reviews a hydropower project, fish and wildlife and other nondevelopmental values of the waterway are considered equally with its electric energy and other developmental values. In deciding whether and under what conditions to issue a hydropower license, the Commission must weigh various economic and environmental tradeoffs involved in the decision.

A. Developmental Resources

The White River Project historically has generated an average of 5,326 MWh of electric energy annually. Given a generating capacity of 1.0 MW, the White River Project operates at a plant capacity factor of 0.61. The total hydraulic capacity

at the project is 280 cfs. The flow-duration curve for the White River at the project indicates that the White River exceeds 280 cfs about 24 percent of the time. It would not be economically feasible to increase the plant's capacity.

The White River Hydroelectric Project carries a relatively high undepreciated debt that limits its economic viability. Furthermore, it is not a large source of revenue relative to the cost of operation. Consequently the operating margin of revenue over cost is very narrow and the project economics are very sensitive to cost and economic assumptions. As shown in Table 4, even the no-action alternative (Case A) has a negative annualized net benefit of $84,000. As discussed in Mead Paper, 72 FERC 61,027 (1995), and Duke Power, 72 FERC 61,030 (1995), a finding

that a project has negative annual benefits does not preclude issuance of a license.

NSPW, the WDNR, DOI, and the Commission staff have proposed several environmental enhancements in conjunction with the licensing process. Table 3 lists the costs for the environmental measures. The costs for specific management plans and monitoring programs are not included in the table. See Section III.B for staff recommended enhancements.

Table 3. Costs for various proposed environmental measures (Source: staff and NSPW).

Proposed Enhancement	Proposer	1995 Capital Cost	30-Year Annualized Cost 1
Boat Landing Improvements	NSPW	$2,000	$200
Tailrace Fishing Improvements	NSPW	$5,000	$500
Minimum Flow Release 10 cfs (Apr. 15 May 30 and Sept. 15 Nov. 30) 5 cfs (June 1 Sept. 14 and Dec. 1 Apr. 15)	NSPW	$12,2002	$6,000
Minimum Flow Release 16 cfs (year-round)	WDNR	$12,2002	$10,000
Minimum Flow Release 27 cfs (Apr. 1 Nov. 30) 16 cfs (Dec. 1 Mar. 31)	DOI	$22,0002	$16,000

1 Annual cost for minimum flow releases is the cost of alternative power, which we estimate to currently be about 19 mills per kWh.

2 Installation cost for a minimum flow outlet facility.

B. Recommended Alternative

From our evaluation of NSPW's application, review of agency recommendations, and assessment of the environmental and economic effects of the project and its alternatives, we conclude that the proposed project with a minimum flow release to the bypassed reach and our recommended enhancement measures (see Section III.B) would be best suited to a comprehensive plan for the development of the White River. Therefore, we recommend that any new license issued for the White River Project include a minimum flow release of 27 cfs from April 1 through November 30, and 16 cfs from December 1 through March 31, the enhancements proposed by NSPW and the staff-recommended enhancement measures.

The proposed project with a minimum flow release and our recommended enhancements would provide several benefits. An estimated 4,834 MWh of relatively low-cost electrical energy worth about $147,000 annually would continue to be generated by a clean, domestic, reliable, and renewable energy resource for use

by electricity consumers. The electricity generated by the project would be equivalent to the energy produced by burning 8,100 barrels of oil or 2,300 tons of coal annually in a steam-electric power plant.

We recommend the following measures to protect and enhance the environment:

- ù Prepare a reservoir operating plan in coordination with WDNR. Following the review and analysis of the operating plan, the Commission will establish a permanent reservoir fluctuation level specification. Until then, the project should be required to comply with an interim 1-foot operating band between elevations 710.4 and 711.4 feet msl.

- ù Release a minimum flow of 27 cfs from April 1 through November 30, and 16 cfs from December 1 through March 31 to the bypassed reach.

- ù Modify the existing staff gage on the spillway according to agency recommendation.

- ù Maintain project land in a natural state for fish and wildlife and aesthetic enhancement consistent with a Commission approved Land Management Plan.

- ù Develop a plan to monitor for purple loosestrife in consultation with WDNR.

- Prepare a management plan outlining steps to enhance habitat and to protect threatened and endangered species if they become established within the project area in the future.

- Develop a plan to monitor and analyze fly ash/cinders used to seal the spillway gates.

In addition, we recommend that any license adopt NSPW's proposals for recreational improvements (see III.A.2), and implementation of a draw-down management plan with WDNR.

C. Developmental and Nondevelopmental Uses of the Waterway

We analyzed the economic effects of five scenarios containing varying environmental enhancements:

- Case A. No action

- Case B, NSPW proposal. Minimum flow release of 10 cfs (April 15 May 30, and September 15 November 30) and 5 cfs (June 1 September 14, and December 1 April 15)

- Case C, WDNR proposal. Minimum flow release of 16 cfs year-round

- Case D, Staff and DOI proposal. Minimum flow release of 27 cfs (April 1 November 30) and 16 cfs (December 1 March 31)

- Case E. Project decommissioning (includes shutdown of power operations with minimum expense at an estimated annualized cost of $144,000).

The results of our economic analysis are shown in Table 4. Case A is the baseline (no-action) case with no minimum flow

release. Cases B through D include minimum flow releases for the enhancement of the fishery in the bypassed reach. Case E, decommissioning, would have the greatest cost impact on the project's annualized benefit.

As shown, all cases yield negative net benefits. Case A provides no minimum flow release for the purposes of fishery enhancement. Cases B through D include variations in proposed flow releases, with lost energy reflected in reductions in power benefits. As expected, the net benefits decrease (become more negative), as the amount of the flow release increases. Implementing any of the minimum flow release recommendations would increase the net costs between 7 to 19 percent compared to Case A.

We concluded in our earlier analysis (Section V.B.3.d) that a guaranteed minimum flow is required to ensure the benefits of historical spillage into the bypassed channel and protect the baseline fishery condition. We determined on the basis of additional information provided by WDNR during the 10(j) meeting that 16 cfs was the minimum flow required to allow fishes free access to all parts of the bypassed reach. Historical spillage of 200 to 300 cfs has occurred during the critical spring spawning season. The spawning season for warm water fish and salmonids that presently inhabit the bypassed reach is in spring and fall, respectively. Therefore, we concur with DOI that a discharge of 27 cfs during spring and fall spawning seasons would adequately guarantee continuation of the benefits of historical spillage and protect the baseline fishery resources. We conclude that Case D (the staff and DOI recommendations) provides adequate protection for fish resources in the bypassed reach. The recommended minimum flow regime would reduce net benefits by an estimated $16,000 compared to the no-action alternative.

Despite the negative annualized benefit, we conclude that decommissioning is not warranted. The cost of the decommissioning alternative (Case E) is high, and that alternative would provide no apparent benefit. Based on the energy forecasts, we agree that the power can be used to meet

existing and anticipated demand.

Table 4. White River Hydroelectric Project summary of economic analysis in 1995 dollars. (Source: staff).

	No-Action Case A	NSPW Case B	WDNR Case C	USDOI/Staff Case D	Decomm. Case E
Annual Generation (MWh)	5,326	5,190	4,979	4,834	0
Annualized Alternative Power Cost ($1,000)	156	153	149	147	0
Annualized Project Cost ($1,000)	240	243	243	247	144
Net Annual Benefit ($1,000)	-84	-90	-94	-100	-144
Discount rate (cost of money)	10 percent				
Economic life	30 years				

D. Comprehensive Plans

Section 10(a)(2) of the FPA requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. Under Section 10(a)(2), 59 plans were filed by various federal and state agencies that address various resources in Wisconsin. Of those we identified, seven are relevant to the project.8 The recommended project is consistent with these comprehensive plans.

VII. RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES

Under the provisions of Section 10(j) of the FPA, as amended by the Electric Consumers Protection Act of 1986, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and

8Wisconsin's Statewide Comprehensive Outdoor Recreation Plan, 1986 91 and 1991 96, WDNR, Madison, Wisconsin; Lake Superior Basin Areawide Water Quality Management Plan, 1979, WDNR, Madison, Wisconsin; Lake Superior Fisheries Management Plan, 1988-98, WDNR, Madison, Wisconsin; Wisconsin Water Quality Assessment Report to Congress, 1986 and 1992, WDNR, Madison, Wisconsin; The Nationwide Rivers Inventory, 1982, National Park Service, Washington, D.C.

state fish and wildlife agencies for the protection, mitigation, and enhancement of such resources affected by the project.

Section 10(j) of the FPA further states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purpose and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

Recommendations considered to be outside the scope of Section 10(j) are considered under 10(a) of the FPA. Table 5 summarizes recommendations made pursuant to Section 10(j) and indicates whether they are within the scope of 10(j) and

whether they are adopted under the staff-recommended alternative.

Table 5. Analysis of fish and wildlife agency recommendations (Source: staff).

Recommendation	Agency	Within Scope of 10(j)	Conclusion
Run-of-river operation	WDNR	Yes	Partially adopted. Recommended 1.0 ft operating interim band until a permanent level is established.
Target reservoir operating levels	WDNR	Yes	Not adopted- Recommend an interim operating band of 710.4 to 711.4 feet msl until a permanent level is established.
Agency consultation during drought events	WDNR	Yes	Adopted
Headwater and tailwater gages	WDNR	Yes	Adopted
Draw-down management plan	WDNR	Yes	Adopted
Non-emergency draw-down rates	WDNR	Yes	Adopted

Table 5. Analysis of fish and wildlife agency recommendations (Source: staff).

Recommendation	Agency	Within Scope of 10(j)	Conclusion
Staff gage visible to public	WDNR	Yes	Adopted
Comprehensive plan compliance	WDNR	NoÄnot specific measure to protect fish and wildlife	Adopted
Minimum flow release	WDNR DOI	Yes	Adopted-see Section VI.D.
Chemical analysis of cinders	WDNR	Yes	Adopted
Retain land ownership and maintain land undeveloped	WDNR	Yes	Adopted as required under the standard license article, subject to Land Management Plan
Purple loosestrife monitoring and eradication	WDNR	No not specific measure to protect fish and wildlife	Adopted
Comply with	WDNR	No not specific	Not adopted

Chapters 30 and 31 of state statutes		measure to protect fish and wildlife	Commission's regulations are sufficient to ensure safety
Comply with portions of NR 330, NR 333, and NR 116 of Wisc. Admin. Code; perform dambreak analysis	WDNR	No not specific measure to protect fish and wildlife	Not adopted Commission's regulations are sufficient to ensure safety
Reopener clause	WDNR	No not specific measure to protect fish and wildlife	Adopted

We have identified two 10(j) agency recommendations that we consider inconsistent with the FPA: run-of-river operation as defined by the WDNR, and a target reservoir operating level. We reject two other recommendations relating to Wisconsin State Statutes that are outside the scope of Section

10(j). Following is a summary of our reasons for not adopting these recommendations.

WDNR requests run-of-river operation, which it believes requires limiting pool fluctuation to no more than 0.5 feet. Specifically, WDNR requested an operating band set at a

19950829-3038(1356301) Order approving license maximum pool elevation of 711.45 feet mean sea level (msl) with a downward fluctuation of 0.5 feet. We concur with the WDNR that the project should continue to operate in a run-of-river mode. We also agree with the WDNR that if the applicant were to use a wide operating band to peak the project operation, adverse effects on the downstream fishery may result. Therefore, we conclude that the objective of maintaining a run-of-river project would be to benefit the good quality fishery in the project impoundment and downstream of the project.

The historical reservoir operating regime forms a basis to establish an appropriate reservoir fluctuation limit. The well-documented high quality fishery at the project and downstream indicates no adverse effects from historical operations. Further, the operating regime already reflects the equipment limitations inherent to the project.

NSPW has indicated that they maintain the reservoir elevation between 710.6 and 711.2 feet msl about 75 percent of the time, and between 710.4 and 711.4 feet msl the remainder of the time. While this practice closely approximates the WDNR proposal, the estimate of 75 percent of the time is not substantiated, nor is the WDNR proposal based on actual operating data. Therefore, we have insufficient information to conclude that either case represents an operating regime that can be attained and documented.

We are recommending that NSPW develop and file with the Commission a reservoir operating plan to include: historical gaging data for the period of the current license; a proposal for reservoir fluctuation operating level; a proposal for compliance monitoring and reporting, and documentation of agency consultation. Following review and analysis of the operating plan, the Commission will establish a permanent reservoir fluctuation level specification (see Section V.B.2).

Due to the lack of substantial evidence that either reservoir fluctuation band can be attained, and the absence of any determination of a benefit to WDNR's recommended higher pool operating range, we find these 10(j) recommendations inconsistent with the Section 313 requirements for substantial evidence and the Section 10(a) comprehensive planning standard of the FPA.

The WDNR also recommended that NSPW be subject to the floodplain zoning and dam safety standards contained in Chapters 30 and 31 of the Wisconsin State Statutes and portions of the Wisconsin Administrative Code (NR 330, NR 333, and NR 116). This request is outside the scope of Section 10(j) since it does not specifically provide for protection and enhancement of fish and wildlife resources. For issues of project safety, federal authority is preemptive. We believe that Commission regulations are sufficient to ensure safety at its licensed projects.

VIII. FINDING OF NO SIGNIFICANT IMPACT

Implementing the staff-recommended enhancement measures described in this final environmental assessment would ensure that the environmental effects of continued project operation would be insignificant.

On the basis of our independent analysis, issuance of a license with conditions incorporating our environmental recommendations, would not constitute a major federal action significantly affecting the quality of the human environment.

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19950829-3038(1356301) Order approving license
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APPENDIX A

19950829-3038(1356301) Order approving license

UNITED STATES OF AMERICA 78 FERC ¶ 61,120
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Elizabeth Anne Moler, Chair;
Vicky A. Bailey, James J. Hoecker,
William L. Massey, and Donald F. Santa, Jr.

Northern States Power Company-Wisconsin	))	Project No. 2444-003

ORDER ON REHEARING

(Issued February 12, 1997)

On August 29, 1995, 1 the Director, Office of Hydropower Licensing (Director), issued a subsequent license to Northern States Power Company-Wisconsin (Northern States) for the continued operation and maintenance of the 1-megawatt (MW) White River Project No. 2444, located on the White River in Ashland County, Wisconsin. 2 On September 27, 1995, Northern States and the Wisconsin Department of Natural Resources (Wisconsin DNR), an intervenor in the relicensing proceeding, filed timely requests for rehearing. For the reasons discussed below, we are granting Northern States' rehearing request in part and denying Wisconsin DNR's rehearing request.

1 72 FERC ¶ 62,182.

2 The project, originally licensed in 1966 (35 FPC 671), has been in operation since 1907. The project includes two 48-foot-high earthen embankments with a total length of about 700 feet, with a gated concrete spillway section; a reservoir with a surface area of 56 acres; and a powerhouse. See 72 FERC at p. 64,352.

DISCUSSION

A. Northern States' Rehearing Request 3

1. Article 405: Minimum Flows

Article 405 requires Northern States to release a minimum flow to the 1,300-foot bypassed reach of 27 cubic feet per second (cfs) from April 1 through November 30, and 16 cfs from December 1 through March 31. 4 Northern States argues that, in requiring the minimum flows, the Director arbitrarily deferred to the recommendation of the U.S. Department of the Interior (Interior); there is ample existing flow in the bypassed reach for suitable aquatic habitat; the 27-cfs flows will not significantly expand spawning habitat; and the Director failed to consider the full adverse economic impact of the minimum flows on the project.

The prior project license did not require minimum flows. As

the project currently operates, one to two cfs enters the bypassed reach from dam leakage and natural spring seepage. For about three months a year, during spring and early summer, 200 to 300 cfs spills over the dam into the bypassed reach. The reach has a steep gradient that produces many cascades and rapids when there are spill flows at the dam. When no water is spilling from the dam, the irregular stream-channel bottom produces a number of

3 For maintenance of run-of-river operations, license Article 401 requires Northern States to maintain the project's reservoir level within a one-foot operating band between elevations 710.4 and 711.4 mean sea level (msl) on an interim basis until a permanent operating plan is approved. 72 FERC at p. 64,360. On rehearing, Northern States requests modification of the interim one-foot operating band to permit operations above the project's normal maximum headwater elevation of 711.6 feet msl, to accommodate heavy-flow events that exceed the hydraulic capacity of the project's turbines, rapidly raise the reservoir level, and cause overtopping of the dam's spillway. Northern States says that reservoir elevations can be lowered during such heavy-flow events through the use of the project's manually-operated spillway gates, but that the project is manned only eight hours a day on weekdays, and at other times back-up personnel require lead time to reach the project to remedy overtopping.

This is a matter that should be treated in Northern States' permanent operating plan. For interim operations prior to approval of the operating plan, we will consider Northern States' good faith efforts to stay within the one-foot operating band when flows are in excess of the project's hydraulic capacity to be in compliance with the requirements of the license.

4 72 FERC at p. 64,361.

small pools separated by shallow rivulets. 5 The bypassed reach supports many species of forage fish and small numbers of game fish such as brown trout and rainbow trout, largemouth bass, and northern pike.

Prior to relicensing, Northern States, Interior, and Wisconsin DNR jointly conducted a flow release study of the bypassed reach to determine whether greater flows would benefit aquatic habitat. Based on the study results and pursuant to Section 10(j) of the Federal Power Act (FPA), 6 Wisconsin DNR recommended a year-round flow of 16 cfs, and Interior recommended flows of 16 cfs for the winter (December 1 through March 31) and 27 cfs for the remainder of the year, to aid aquatic resources during the spring and fall spawning seasons and the summer maturing season. 7

Section 10(j) requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies for the protection of, mitigation of adverse impacts to, and enhancement of fish and wildlife. When the Commission believes that a recommendation is inconsistent with the purposes and requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. Any such inconsistency is usually with the Commission's determinations under the equal consideration/comprehensive development standards of FPA Sections 4(e) and 10(a)(1), in that the recommendation conflicts unduly with another project purpose or value (including the project's economic benefits). 8

The Commission staff's draft Environmental Assessment (draft EA) preliminarily rejected all minimum flow recommendations as unnecessary to sustain the aquatic habitat and as an undue

5 Id. at p. 64,377.

6 16 U.S.C. § 803(j).

7 See Wisconsin DNR's letter filed August 8, 1994, and Interior's letter filed September 28, 1994. Northern States recommended flows of 5 cfs from December 1 to April 15 and June 1-September 14, and 10 cfs April 15-May 30 and September 15-November 30. See Northern States' filing of May 24, 1994.

8 See Mead Corp., 72 FERC ¶ 61,027 at p. 61,071 (1995).

economic burden on the project, and therefore inconsistent with Sections 4(e) and 10(a)(1) 9

Pursuant to the dispute-resolution requirements of Section 10(j), Commission staff held teleconferences with Wisconsin DNR, Interior, and Northern States on April 13 and May 1, 1995. In light of these discussions, in the final EA staff revised its recommendation to concur with Interior's, 10 and the license order adopted that recommendation. 11

Northern States argues that there is no record support for imposing a 27-cfs minimum flow. It contends that the bypassed reach offers only one area of particularly suitable spawning habitat (a small pool about 300 feet upstream of the powerhouse), and that fish already have unrestricted access to this area at flows as low as 3.4 cfs. The Director found that flows of 16 cfs

are necessary to inundate gravel and cobbles along the channel, which would attract fish to the bypassed reach for spawning. The record, including the results of the flow release study, indicates that flows of either 16 cfs or 27 cfs would improve current conditions in the bypassed reach by allowing fish access to all portions of the reach during the entire year, and that the 27-cfs flow in the fall would represent a minor enhancement over the current (no minimum flow) regime. Interior expressed the belief, based on its observations during the flow release study, that a portion of the bypassed reach that might be used by salmonids during the fall spawning season was more suitable for spawning at a 27-cfs flow. 12

Northern States also contends that the Director failed to analyze the full economic impact on the project of providing the minimum flows, in that he failed to include in his analysis the costs of monitoring the flows and of the decrease in the project's reliable capacity. Northern States is correct. While the Director's analysis included a capital cost of $22,200 ($2,300 per year) for providing an additional outlet pipe to deliver the recommended minimum flow, 13 as well as the costs of lost generation ($9,400 per year annualized over the 30-year term of the license), it did not include the cost of the decrease in

9 See draft EA (issued February 17, 1995), sections V.B.3.D and VII.

10 72 FERC at pp. 64,365-88.

11 Id. at pp. 64,354-55.

12 Id. at pp. 64,354-55, 64,378-79, and 64,385. See also Interior's Section 10(j) letter, filed September 28, 1994.

13 See 72 FERC at p. 64,384 (Table 3).

the project's reliable capacity (the project's capacity rating would be reduced from 0.50 MW to 0.41 MW, resulting in lost revenues of approximately $9,800 per year) or the $2,100 annual cost for the purchase, installation, and maintenance of a flow meter. These figures result in an annual cost of $23,600. The annual costs of delivering the 16 cfs minimum flow recommended by Wisconsin DNR would be $15,500, and the cost of delivering the flows proposed by Northern States would be $8,200. 14

As noted above, the EA states that a discharge of 16 cfs would improve current conditions by allowing fish access to all portions of the bypassed reach and the rest of the White River system during the entire year. 15 With regard to the 27-cfs flow, the EA states that Interior "believes that these flows are most conducive to spawning," and concludes that a 27 cfs discharge for fall spawning would represent "a minor enhancement" over the no-action alternative. 16 The record does not reflect what, if any, benefit the 27 cfs flow would provide that the 16 cfs flow would not, and Interior's conclusion that fall salmonid spawning might be improved in one area of the reach at the higher flows is essentially speculation.

Based on the record, it appears at best uncertain that the higher flows will result in any improvement in the fishery. However, the 27-cfs flow regime would cost some $8,000 per year more than the 16 cfs alternative. We therefore find that Interior's minimum flow recommendation is inconsistent with Sections 4(e) and 10(a)(1) of the FPA, in that requiring those flows would not provide any definite environmental benefit, yet it would impose a significant additional cost on the project. In consequence, we will require Northern States to release 16 cfs from the project on a year-round basis.

2. Endangered Species Plan

14 The Director found that the project would be uneconomic under each project alternative he analyzed, due in part to the project's relatively high undepreciated debt. Even under the alternative of continued operations under the prior license, the project would have an annual negative economic benefit of $84,000. With the minimum flows recommended by Northern States, Wisconsin DNR, and Interior, over the

30-year license term the project would produce annual negative economic benefits of $90,000, $94,000, and $100,000, respectively. The Director also found that decommissioning the project by shutting down power operations with minimum expense would produce an annual negative economic benefit of $144,000. 72 FERC at pp. 64,384-86.

15 72 FERC at p. 64,379.

16 Id.

There are no threatened or endangered species known to be present in the project area. However, Interior has located a bald eagle nesting site about three miles upstream of the project dam, and the habitat in the project area is conducive to bald eagle and osprey nesting. Habitat of the timber wolf, which is state and federally endangered, occurs in and adjacent to the project area, although no wolves have been observed, and the wood turtle, a state threatened species, has been observed downstream of the project. 17

The final EA found that proposed project operations and resource management activities at the project site should not adversely affect any threatened or endangered species. 18

Nevertheless, Article 409 requires Northern States to file a plan for the protection of state- and federally-listed threatened or endangered species and their critical habitat. 19

Northern States notes that Article 409 is redundant to Article 407, which requires it to develop an overall land management plan under which it would maintain its property in the project area in an undeveloped state. 20 Northern States' point is well taken, and we are deleting Article 409 and modifying Article 407 to clarify that the land management plan is to explain how it will protect specific threatened or endangered species.

17 See final EA, id. at p. 64,380. Suitable habitat also exists at the project for the osprey and Tremblay's salamander.

18 Id. at p. 64,381.

19 Id. at p. 64,362.

20 Project No. 2444 is a minor project (installed capacity of 1.5 MW or less), and therefore does not include a project boundary. See 18 C.F.R. § 4.61(f)(3)(i)(C) (1996).

↑

B. Wisconsin DNR's Rehearing Request

1. Retirement Fund

Wisconsin DNR contends that the Director should have required the licensee to establish a project retirement fund, so that the State of Wisconsin does not run the risk of being burdened with the costs of decommissioning the project. Wisconsin DNR is concerned that, given the negative economic

benefits of the project, at some point Northern States may not have the financial ability to continue to operate the project. Wisconsin DNR therefore asks that Northern States be required to provide proof of financial responsibility (for example, a retirement fund) to ensure the continued maintenance, or possible removal, of the project works, including the dam. 21 The agency also expresses concern that Northern States may seek to transfer the project license to a party not financially capable of complying with the requirements of the license.

The Director specifically addressed the question of a retirement fund, concluding that if the project were decommissioned, the dam would probably be left in place, because it acts as a barrier to sea lamprey migration up from Lake Superior. Because project shut-down costs would therefore be minimal, he declined to impose a retirement fund requirement. 22

Our review of the record and Wisconsin DNR's rehearing request do not lead us to a different conclusion. 23 Should the licensee seek to transfer the license, we would scrutinize the proposed transferee's financial fitness in this regard. 24

2. Article 411: Standard Land Use Provision

License Article 411 is a standard requirement that gives Northern States the authority to grant permission for certain

21 Wisconsin DNR refers to the order approving decommissioning studies and funding for certain hydroelectric projects of the Consumers Power Company (68 FERC ¶ 61,077 (1994)). However, those measures were included pursuant to a settlement among all the parties, and therefore do not establish any precedent. See Michigan Dept. of Natural Resources v. FERC, 96 F.3d 1482, 1489-90 (D.C. Cir. 1996).

22 72 FERC at p. 64,358.

23 See also Michigan Dept. of Natural Resources v. FERC, supra n. 19, 96 F.3d at 1490 (theoretical risk of licensee's inability to pay for decommissioning is insufficient basis for requiring decommissioning fund).

24 See Policy Statement on Project Decommissioning at Relicensing, 60 Fed.

Reg. 339, 346 (January 4, 1995), FERC Stats. & Regs. Preambles ¶ 31,001
at pp. 31,232-33 (December 14, 1994).

types of use and occupancy of project lands and waters and to convey certain minor interests in project lands and waters without prior Commission approval. Wisconsin DNR asks that the Commission revise Article 411 to state that such proposals for use and occupancy must also obtain applicable state and local approvals. As we explained in response to Wisconsin DNR's concern on this point in the context of the relicensing proceedings for Project Nos. 2486 and 2431, 25 the license terms provide for the involvement of state and local regulatory bodies in a manner consistent with the Commission's authorities and responsibilities.

The Commission orders:

(A) Northern States Power Company's September 25, 1995 request for rehearing of the August 29, 1995 license order in this proceeding is granted to the extent described in this order, and is denied in all other respects.

(B) Article 405 of the license is amended to read as follows:

> Within one year of the date of this license the licensee shall release from the White River Dam to the bypassed reach a minimum flow of 16 cubic feet per second to allow for additional access into the bypassed reach by all components of the fish community, to provide additional spawning habitat and recreational opportunity.

(C) Article 409 of the license is deleted.

(D) Paragraph (4) of Article 407 is deleted and replaced

19970213-3071(1372036) order on rehearing
with the following text:

(4) provide a statement about how this plan would protect the bald eagle, osprey, timber wolf, wood turtle, and Tremblay's salamander.

(E) Wisconsin Department of Natural Resources' September 27, 1995 request for rehearing of the August 29, 1995 license order in this proceeding is denied.

By the Commission.

25 Wisconsin Electric Power Company, 75 FERC ¶ 61,011 at pp. 61,035-36 (1996), and Wisconsin Electric Power Company, 76 FERC ¶ 61,183 at pp. 62,019-20 (1996).

↑

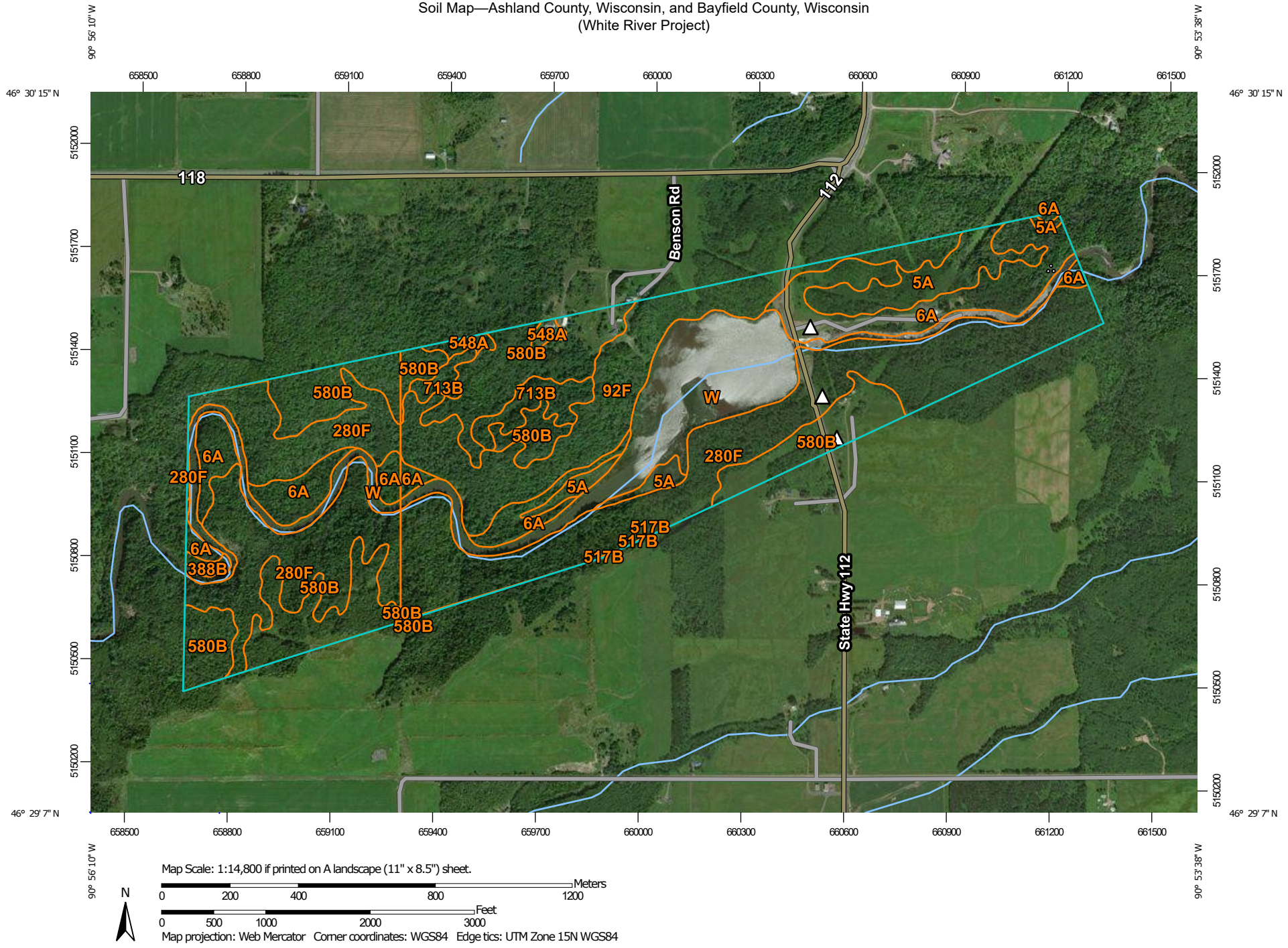
(S E A L)

Lois D. Cashell,
Secretary.

↑

APPENDIX 4.2.2-1 **White River Project Soils Report**

Soil Map—Ashland County, Wisconsin, and Bayfield County, Wisconsin
(White River Project)



Map Scale: 1:14,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 200 400 800 1200

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ashland County, Wisconsin
Survey Area Data: Version 18, Sep 10, 2019

Soil Survey Area: Bayfield County, Wisconsin
Survey Area Data: Version 21, Sep 10, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2010—Jul 27, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5A	Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded	21.0	4.9%
6A	Moquah fine sandy loam, 0 to 3 percent slopes, frequently flooded	36.5	8.5%
92F	Udorthents, ravines and escarpments, 25 to 60 percent slopes	51.2	11.9%
280F	Odanah silt loam, 25 to 60 percent slopes	82.6	19.3%
517B	Annalake fine sandy loam, lake terrace, 2 to 6 percent slopes	0.0	0.0%
548A	Pickford-Badriver complex, 0 to 3 percent slopes	3.1	0.7%
580B	Sanborg-Badriver complex, 0 to 6 percent slopes	45.8	10.7%
713B	Kellogg-Allendale-Ashwabay complex, 2 to 6 percent slopes	10.6	2.5%
W	Water	50.1	11.7%
Subtotals for Soil Survey Area		**301.0**	**70.2%**
Totals for Area of Interest		**428.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Moquah fine sandy loam, 0 to 3 percent slopes, frequently flooded	16.5	3.8%
280F	Odanah silt loam, 25 to 60 percent slopes	60.9	14.2%
388B	Pelkie, occasionally flooded-Dechamps, frequently flooded, complex, 0 to 4 percent slopes	1.4	0.3%
580B	Sanborg-Badriver complex, 0 to 6 percent slopes	38.6	9.0%
W	Water	10.3	2.4%
Subtotals for Soil Survey Area		**127.7**	**29.8%**
Totals for Area of Interest		**428.6**	**100.0%**

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- Sanitary Facilities
- **Soil Chemical Properties**
  - Chemical Soil Properties
- **Soil Erosion**
  - Conservation Planning
  - RUSLE2 Related Attributes

View Description | View Soil Report

Options

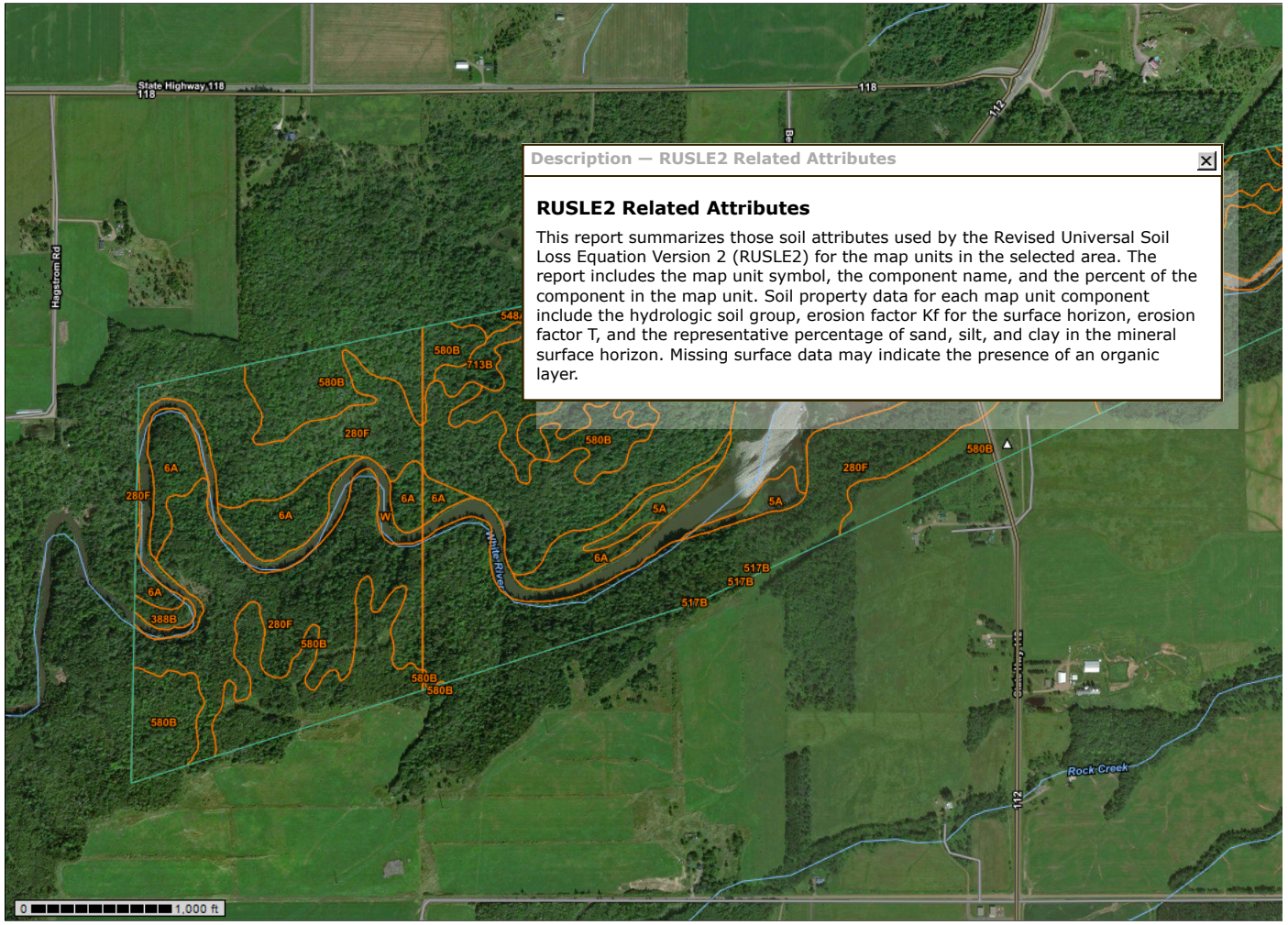
Include minor soils?

View Description | View Soil Report

  - Windbreaks and Environmental Plantings
- Soil Health
- Soil Physical Properties
- Soil Qualities and Features
- Vegetative Productivity
- Waste Management
- Water Features
- Water Management
- Wildlife Management

Soil Map

Scale (not to scale)



Description — RUSLE2 Related Attributes

RUSLE2 Related Attributes

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factor Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic layer.

Report — RUSLE2 Related Attributes

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed or the first mineral horizon below an organic surface horizon. Organic horizons are not displayed.

Ashland County, Wisconsin

Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
5A—Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded								
Arnheim	85	249	B/D	.32	5	30.1	54.9	15.0
6A—Moquah fine sandy loam, 0 to 3 percent slopes, frequently flooded								
Moquah	85	249	C	.15	5	70.9	16.6	12.5
280F—Odanah silt loam, 25 to 60 percent slopes								
Odanah	95	59	C/D	.37	5	28.7	51.3	20.0
517B—Annalake fine sandy loam, lake terrace, 2 to 6 percent slopes								
Annalake	85	200	C	.28	5	68.5	21.5	10.0
548A—Pickford-Badriver complex, 0 to 3 percent slopes								
Pickford	50	249	D	.28	5	16.9	48.1	35.0
Badriver	35	249	C/D	.17	5	34.2	32.3	33.5
580B—Sanborg-Badriver complex, 0 to 6 percent slopes								
Sanborg	50	200	C/D	.55	5	30.1	54.9	15.0
Badriver	30	249	C/D	.17	5	34.2	32.3	33.5
713B—Kellogg-Allendale-Ashwabay complex, 2 to 6 percent slopes								
Kellogg	35	200	C/D	.02	4	93.6	1.4	5.0
Allendale	25	200	D	.20	4	78.6	16.4	5.0
Ashwabay	20	200	A	.05	4	84.9	9.1	6.0

Bayfield County, Wisconsin

Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
6A—Moquah fine sandy loam, 0 to 3 percent slopes, frequently flooded								
Moquah	85	249	C	.15	5	70.9	16.6	12.5

Bayfield County, Wisconsin								
280F—Odanah silt loam, 25 to 60 percent slopes								
Odanah	95	59	C/D	.37	5	28.7	51.3	20.0
388B—Pelkie, occasionally flooded-Dechamps, frequently flooded, complex, 0 to 4 percent slopes								
Pelkie	50	249	A	.37	5	83.0	9.0	8.0
Dechamps	30	249	A/D	.17	5	71.3	17.7	11.0
580B—Sanborg-Badriver complex, 0 to 6 percent slopes								
Sanborg	50	200	C/D	.55	5	30.1	54.9	15.0
Badriver	30	249	C/D	.17	5	34.2	32.3	33.5

Description — RUSLE2 Related Attributes

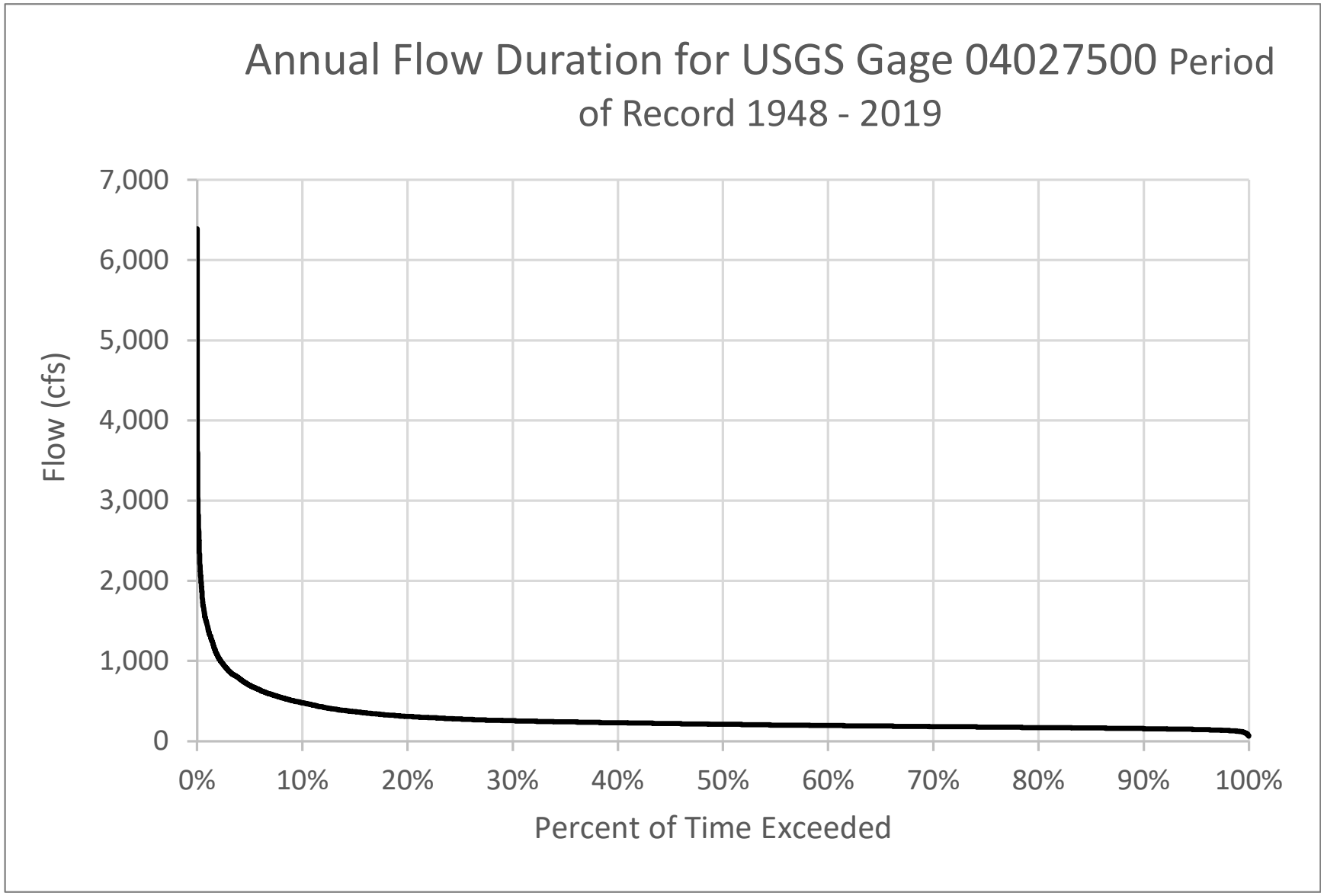
RUSLE2 Related Attributes

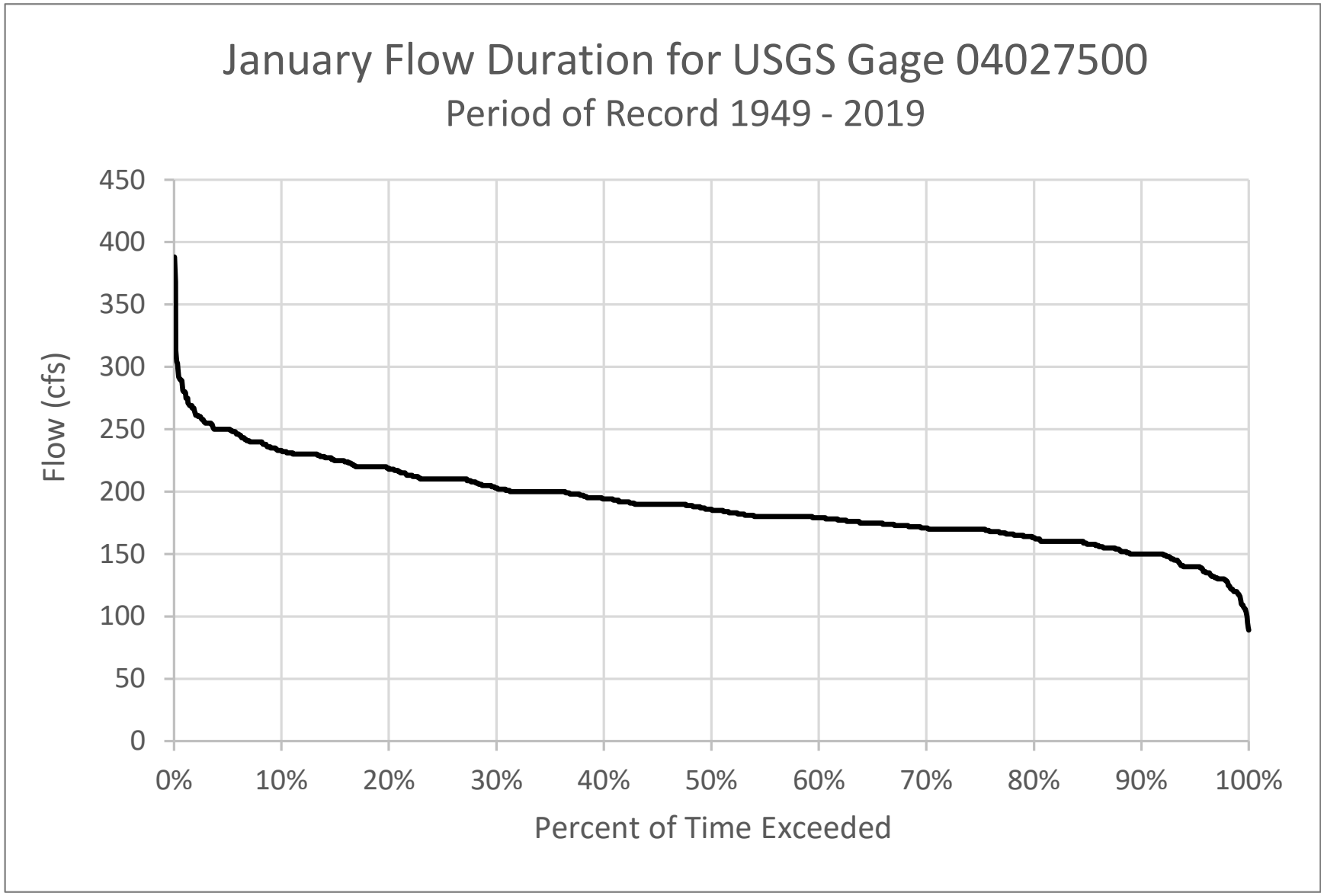
This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factor Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic layer.

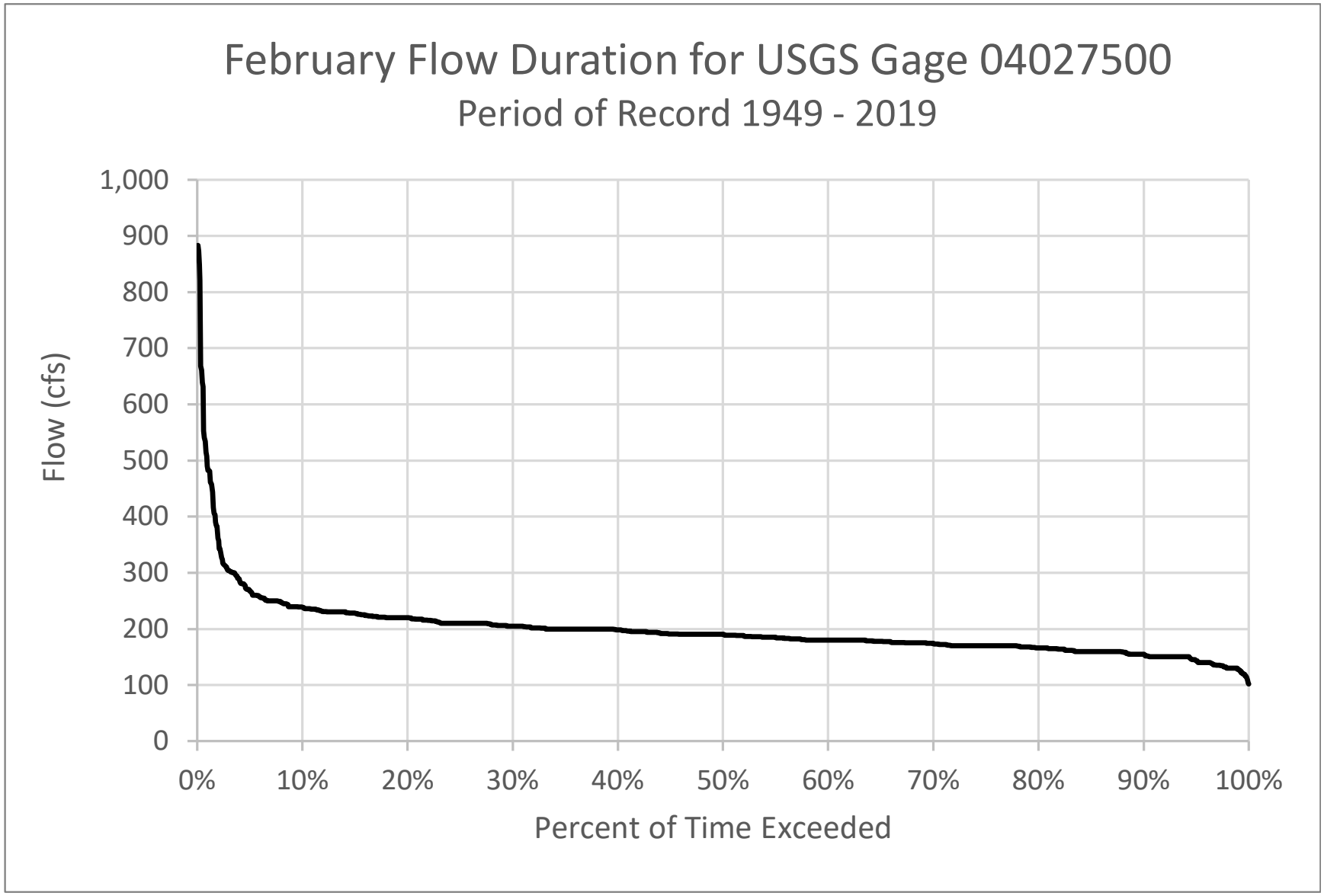
APPENDIX 4.3.2-1 **Flow Duration Curves and Exceedance Table**

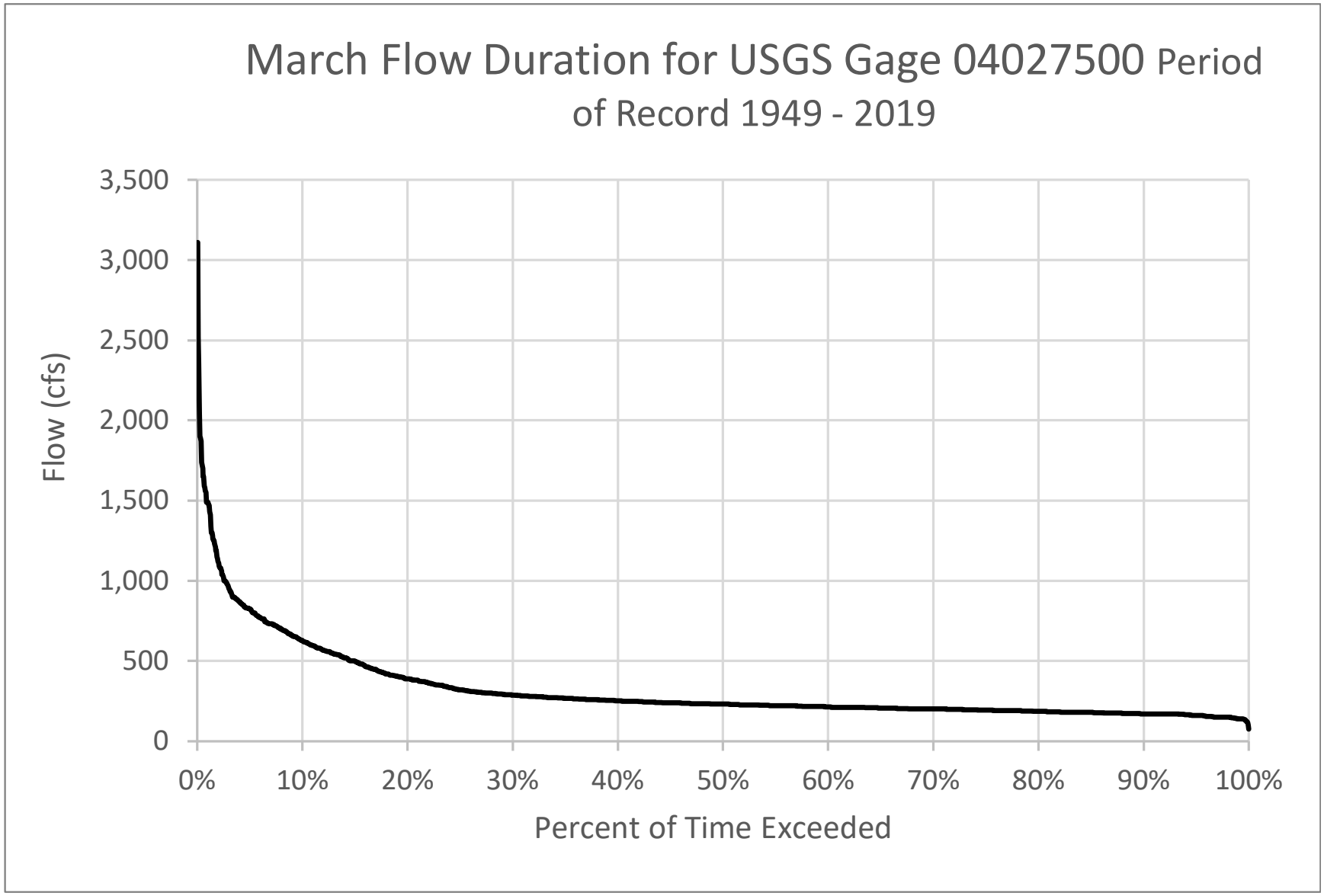
Flow Duration for USGS Gage 04027500 (Period of Record 1948 - 2019)

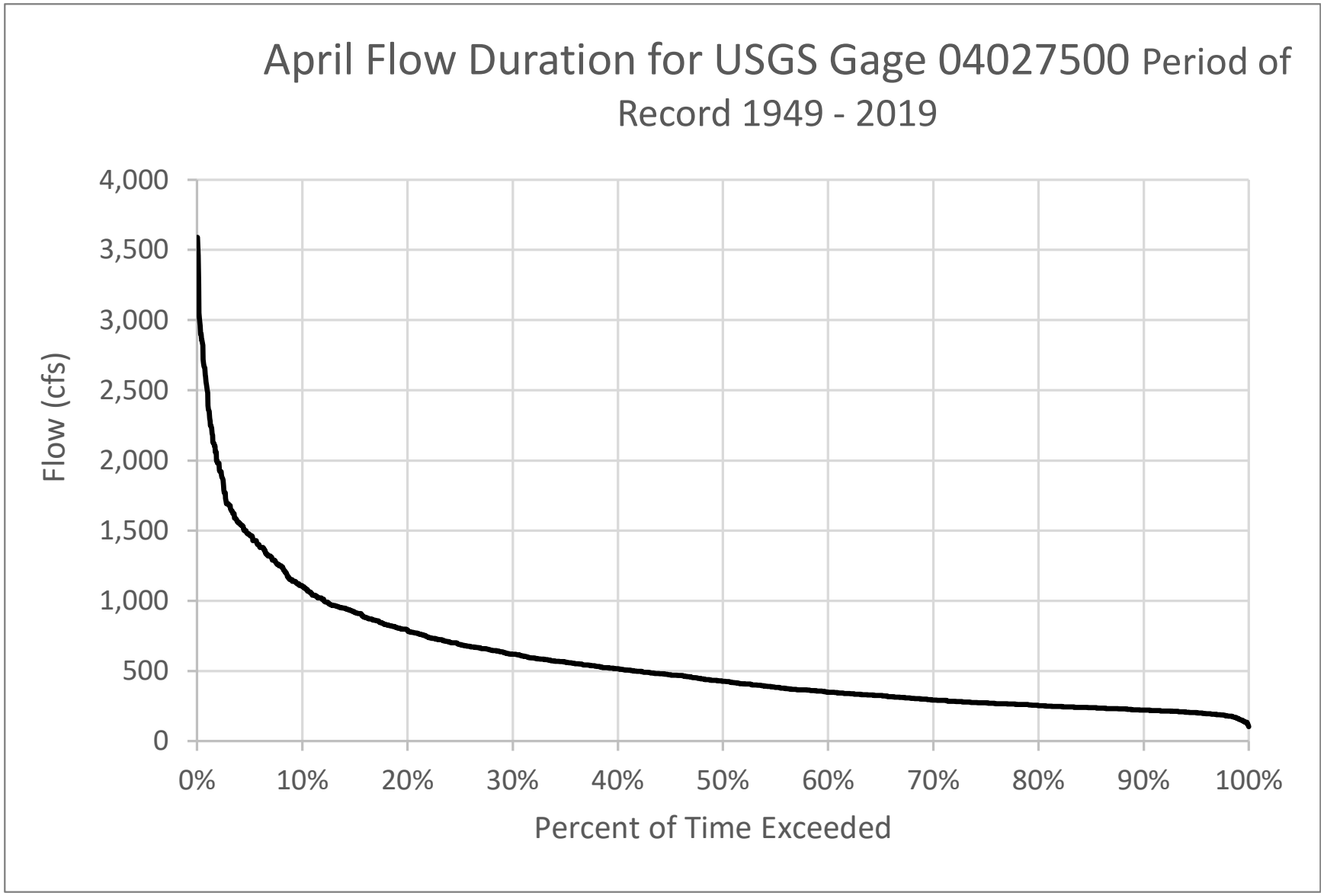
Percent of Time	January	February	March	April	May	June	July	August	September	October	November	December
95	140	144	160	202	172	153	141	144	142	152	149	122
90	150	155	170	221	186	164	148	151	149	159	161	140
85	158	160	180	239	197	173	156	157	157	164	169	152
80	163	166	186	254	207	179	164	161	161	168	174	160
75	170	170	193	272	215	186	170	164	166	172	181	170
70	171	174	200	294	223	193	175	169	170	176	186	174
65	175	178	207	324	232	200	180	172	174	182	190	179
60	179	180	214	350	243	209	185	176	179	189	197	185
55	180	185	221	384	254	218	190	180	185	196	203	190
50	186	190	230	427	268	227	195	185	191	201	212	197
45	190	191	240	474	285	236	202	192	199	210	220	202
40	194	198	251	515	306	246	209	200	210	220	231	210
35	200	200	268	564	331	260	220	209	219	228	239	218
30	203	205	288	620	366	278	230	218	230	238	249	226
25	210	210	321	689	406	300	240	231	240	253	262	236
20	218	220	389	790	470	340	264	246	255	273	285	243
15	225	228	500	918	545	390	291	264	282	302	305	255
10	233	239	627	1110	677	480	348	305	336	365	351	270

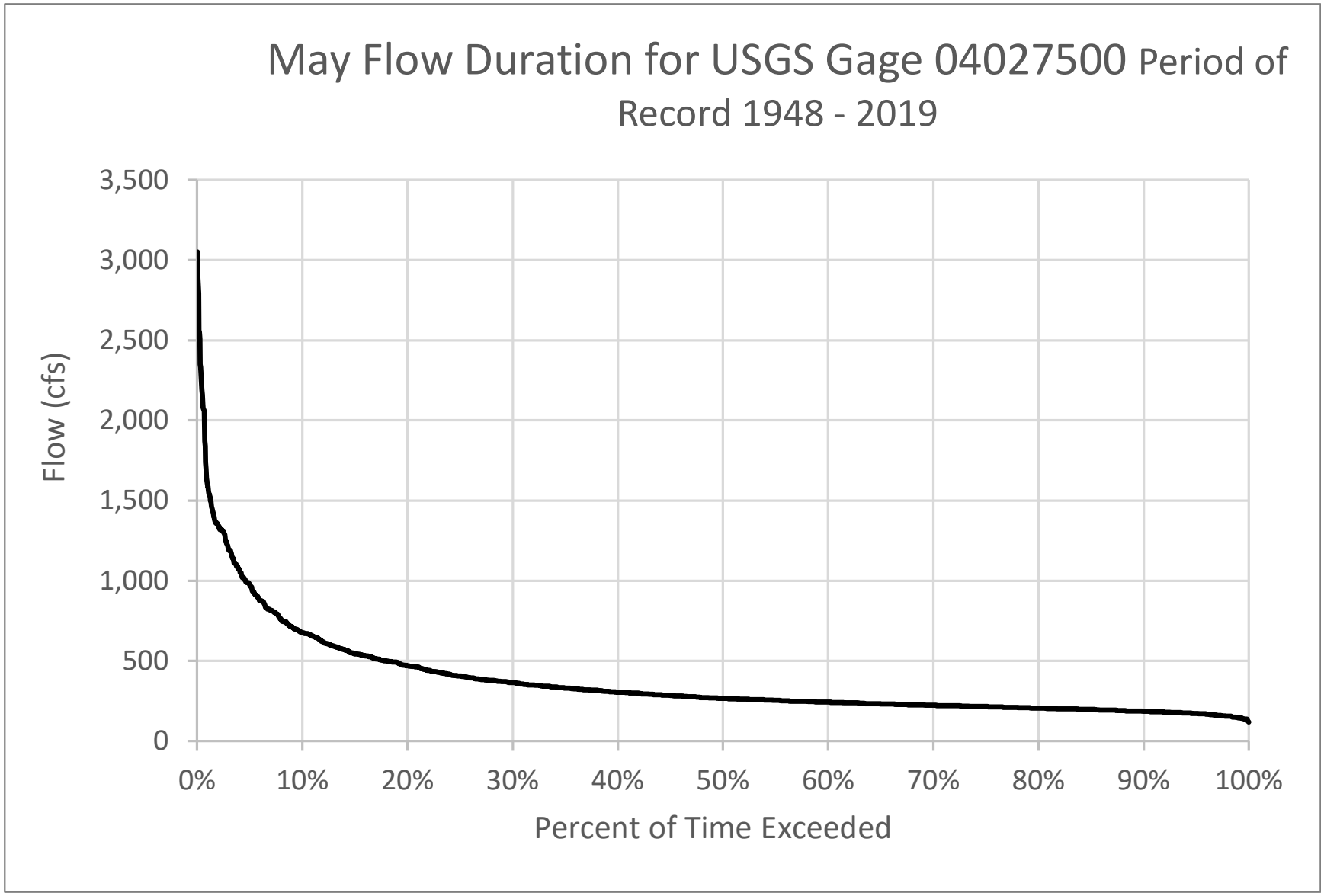

Annual Flow Duration for USGS Gage 04027500 Period of Record 1948 - 2019
Flow (cfs)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded

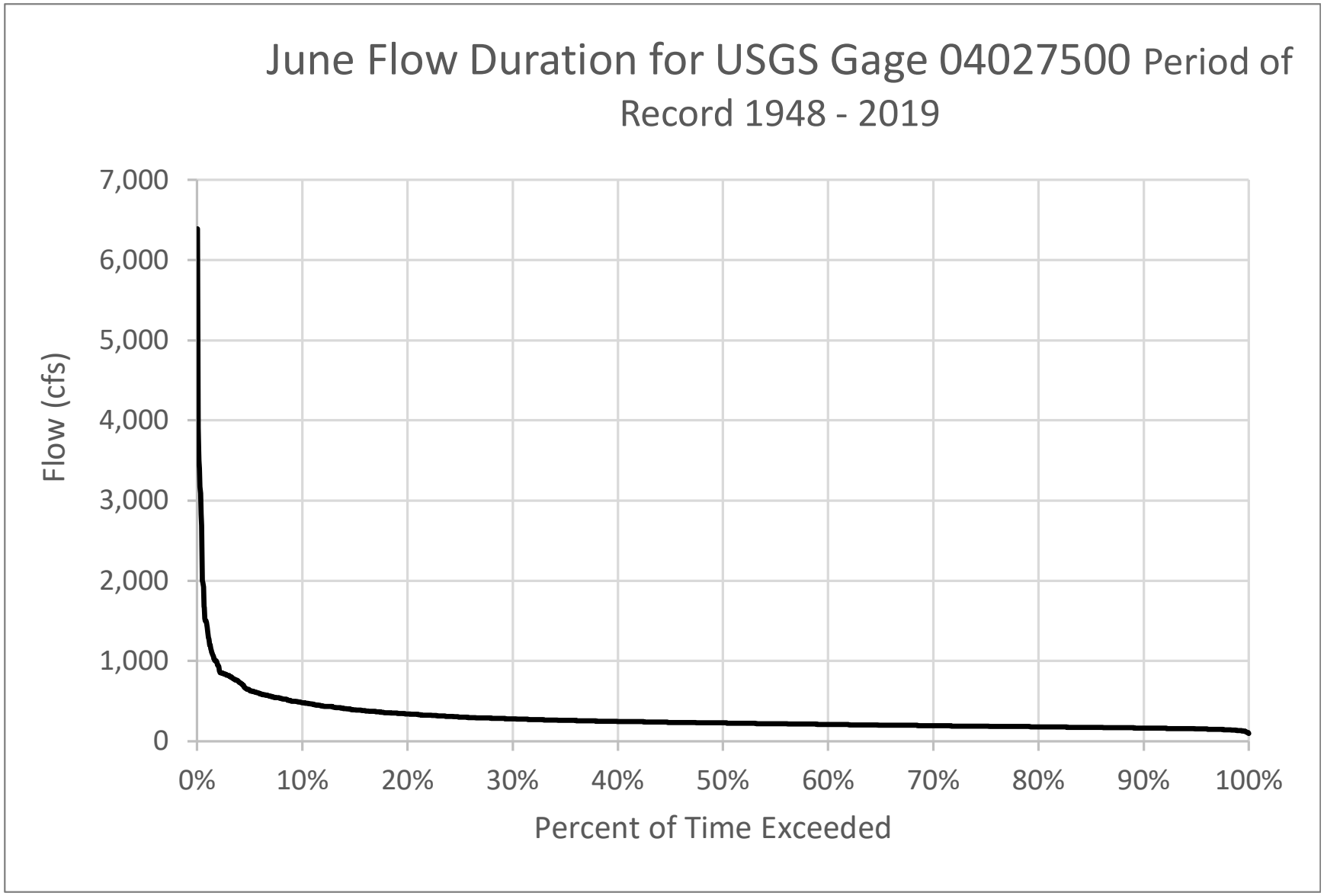

January Flow Duration for USGS Gage 04027500
Period of Record 1949 - 2019
Flow (cfs)
450
400
350
300
250
200
150
100
50
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded

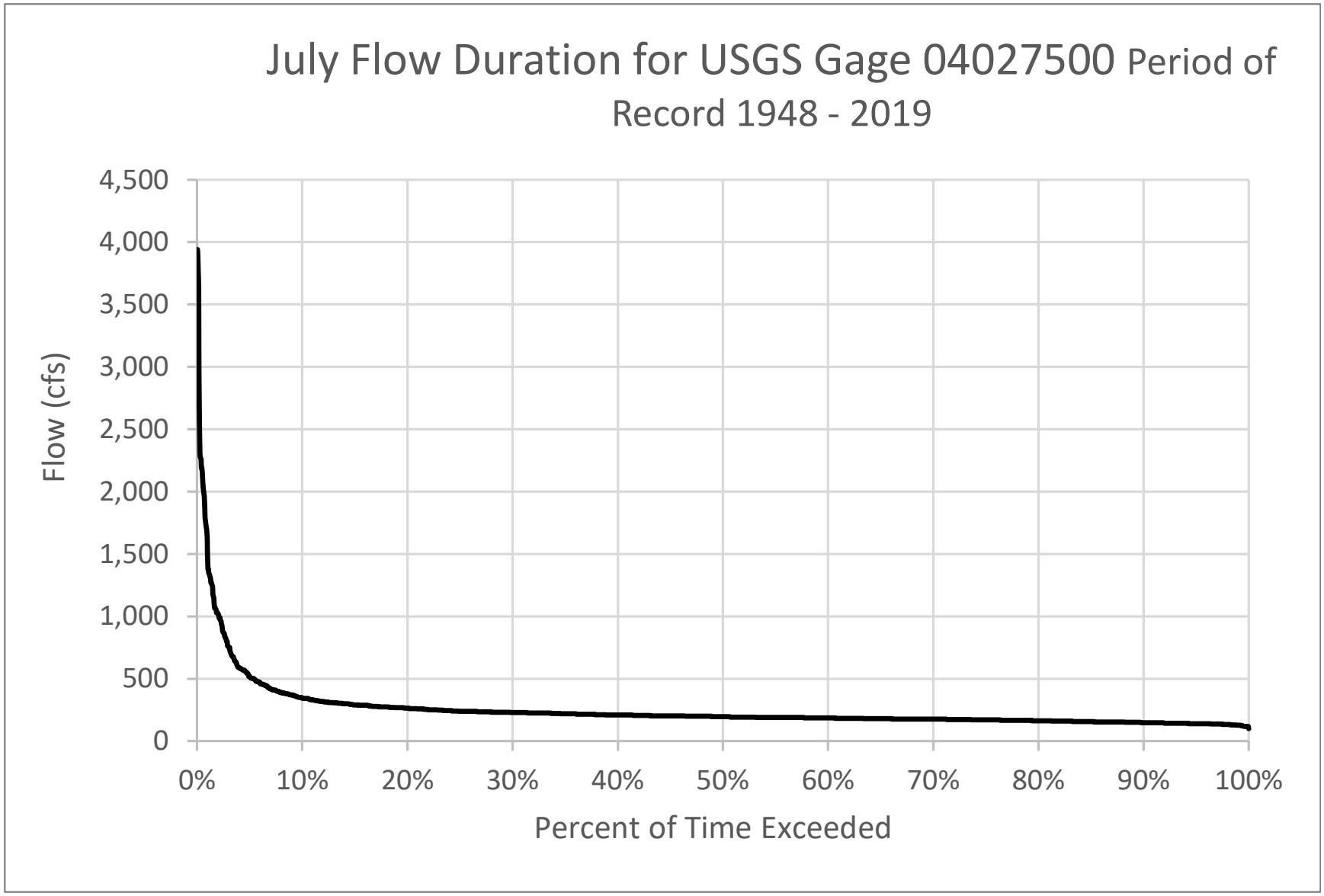

February Flow Duration for USGS Gage 04027500
Period of Record 1949 - 2019
Flow (cfs)
1,000
900
800
700
600
500
400
300
200
100
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded

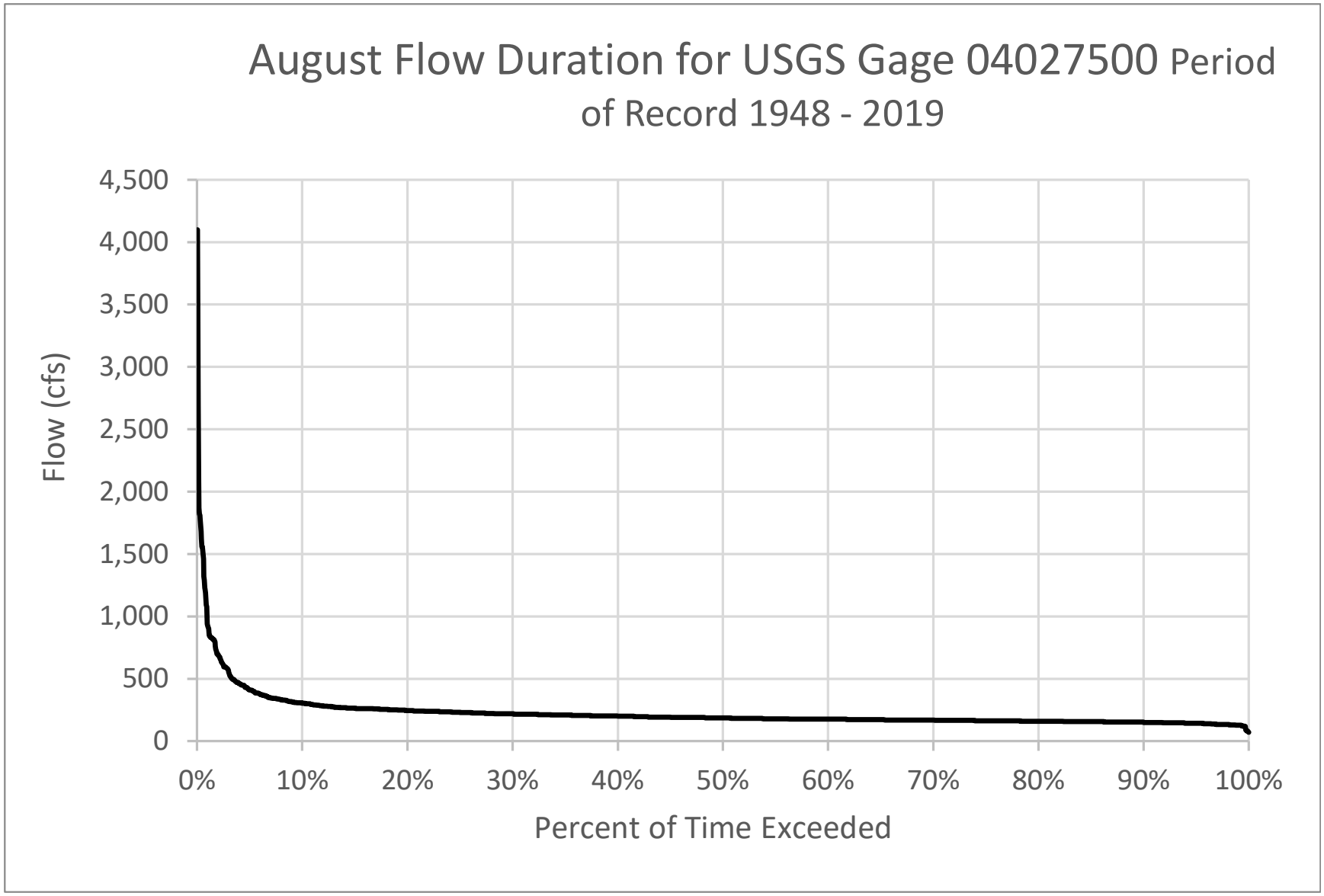

March Flow Duration for USGS Gage 04027500 Period of Record 1949 - 2019
Flow (cfs)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded

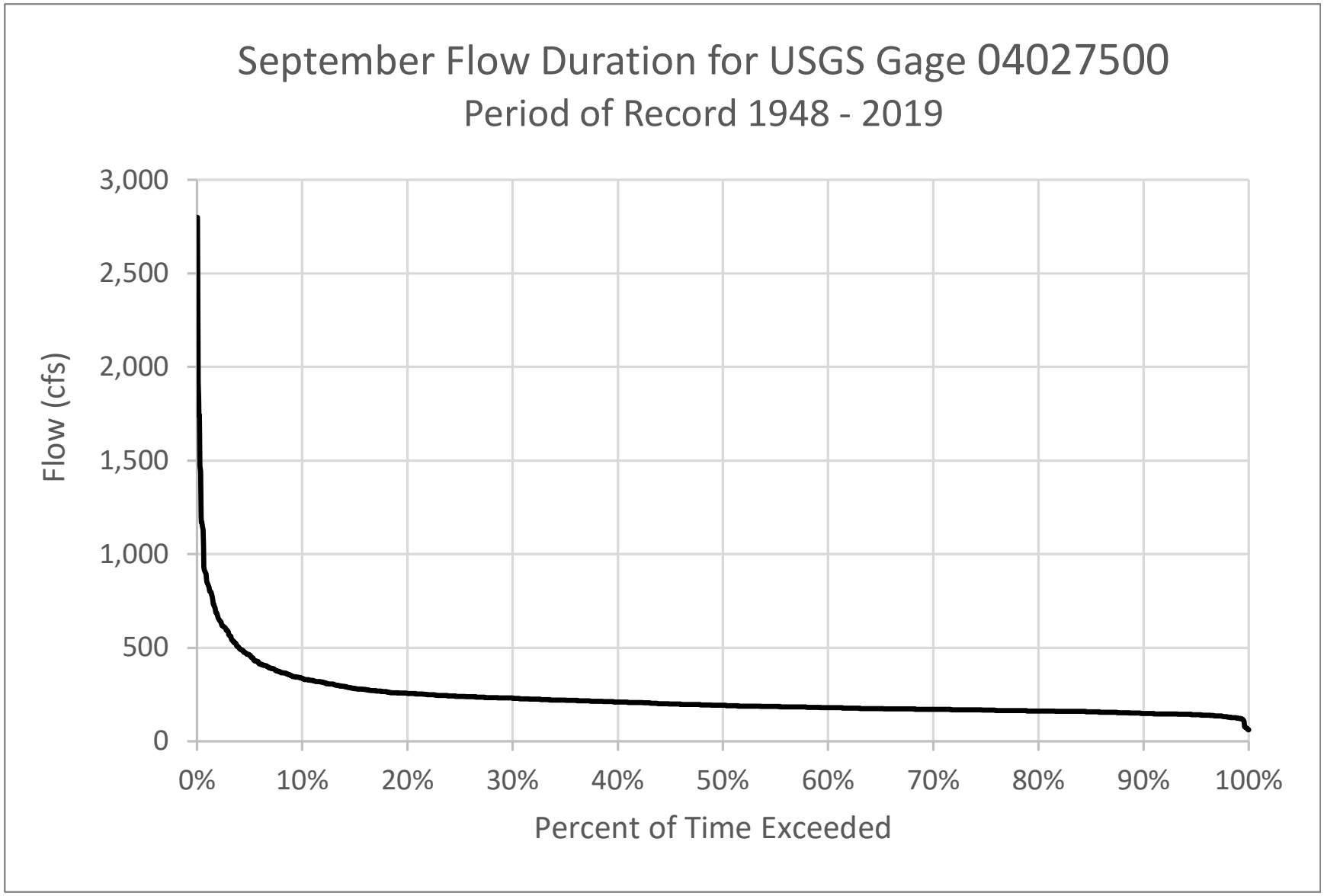

April Flow Duration for USGS Gage 04027500 Period of Record 1949 - 2019
Flow (cfs)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded

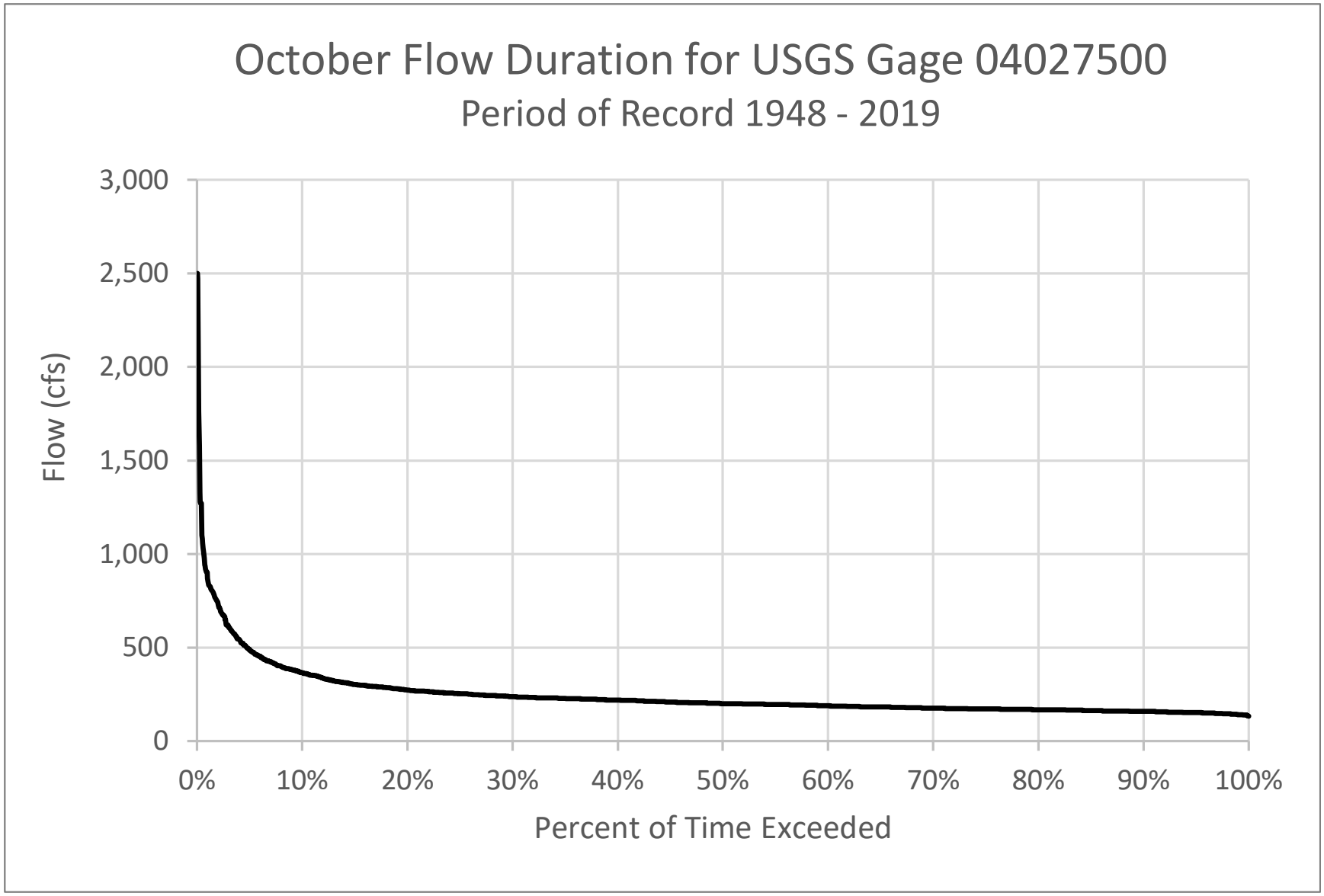

May Flow Duration for USGS Gage 04027500 Period of Record 1948 - 2019
Flow (cfs)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded

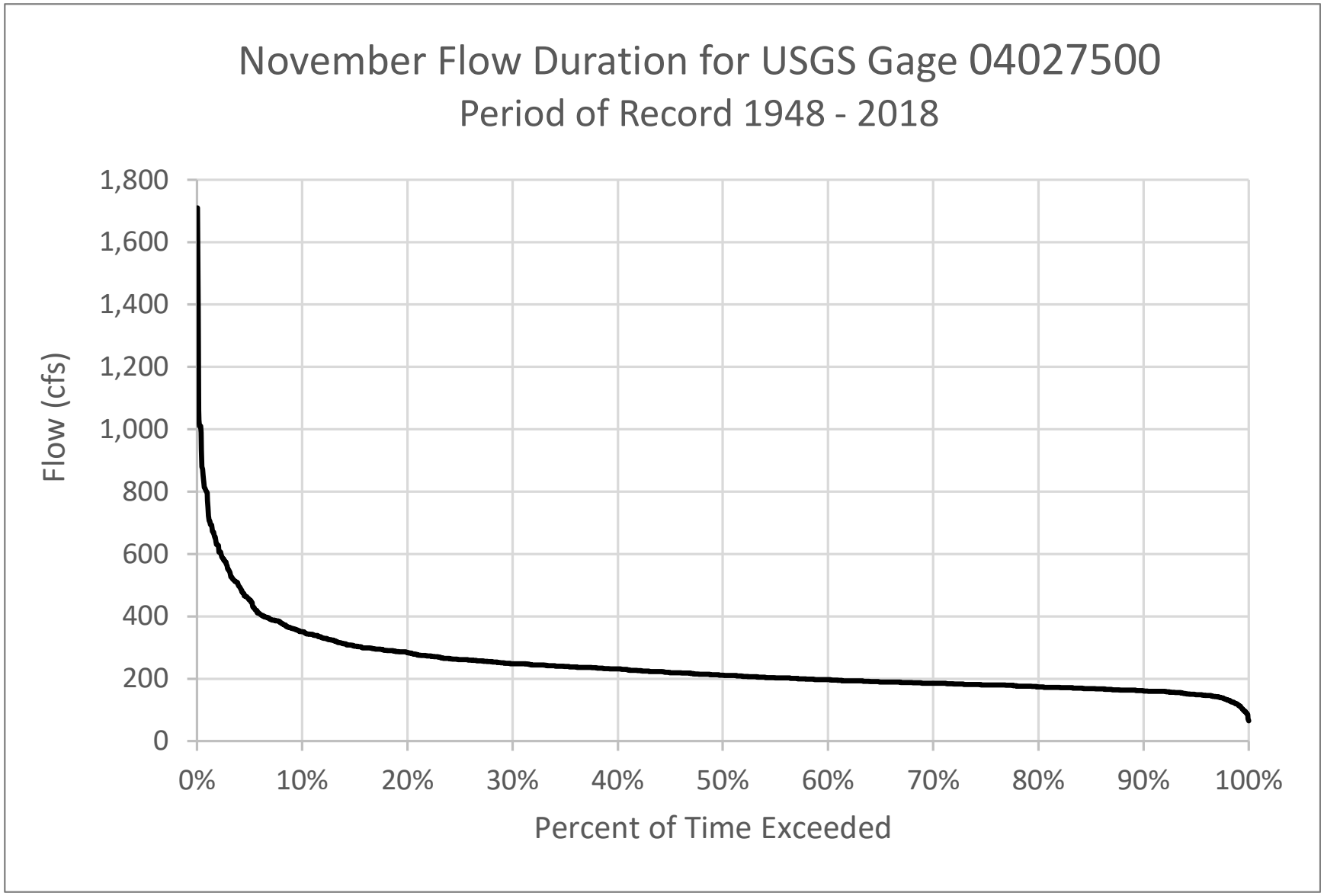

June Flow Duration for USGS Gage 04027500 Period of Record 1948 - 2019
Flow (cfs)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded

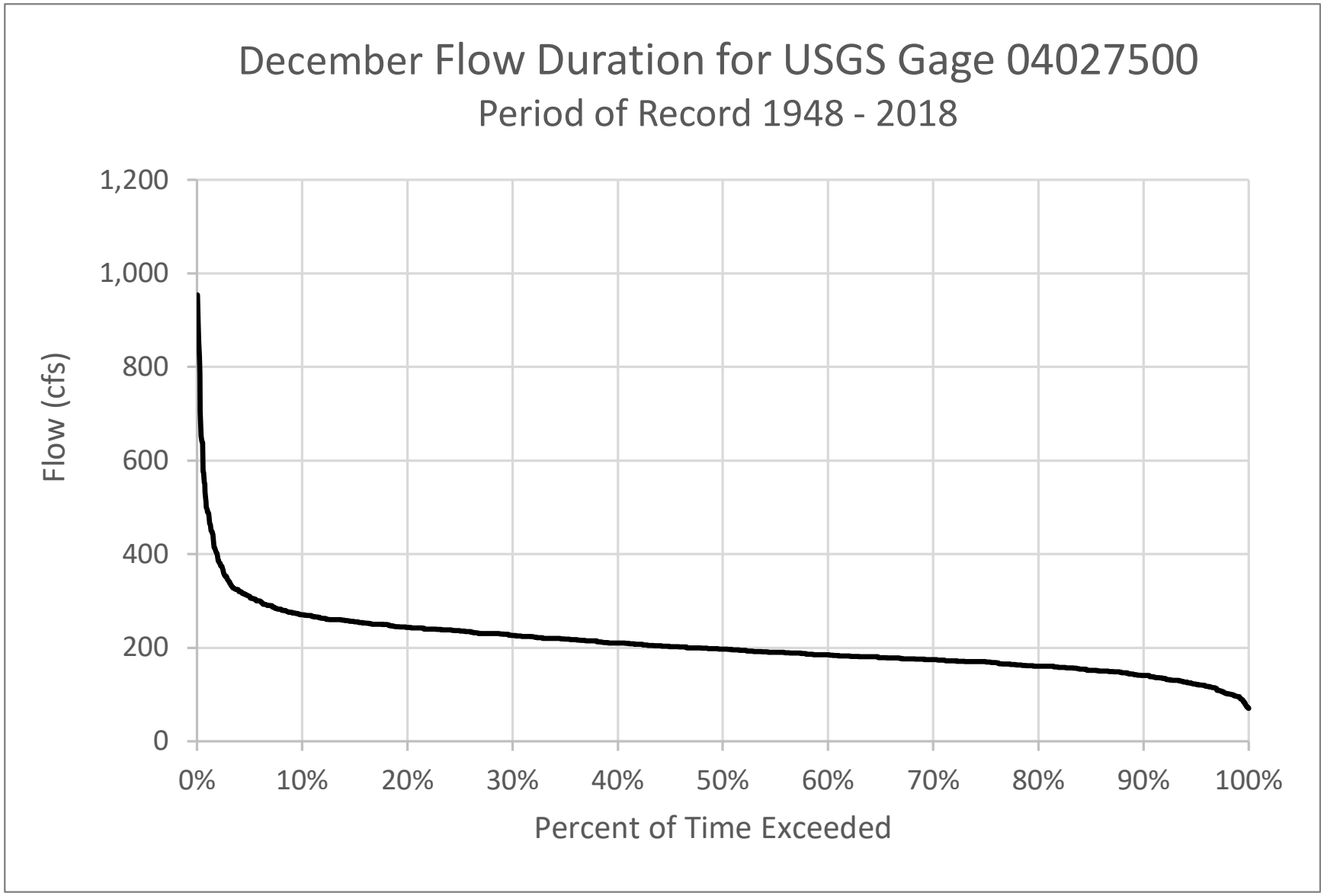

July Flow Duration for USGS Gage 04027500 Period of Record 1948 - 2019
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded


August Flow Duration for USGS Gage 04027500 Period of Record 1948 - 2019
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded


September Flow Duration for USGS Gage 04027500
Period of Record 1948 - 2019
Flow (cfs)
3,000
2,500
2,000
1,500
1,000
500
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded


October Flow Duration for USGS Gage 04027500
Period of Record 1948 - 2019
Flow (cfs)
3,000
2,500
2,000
1,500
1,000
500
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded


November Flow Duration for USGS Gage 04027500
Period of Record 1948 - 2018
Flow (cfs)
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded


December Flow Duration for USGS Gage 04027500
Period of Record 1948 - 2018
Flow (cfs)
1,200
1,000
800
600
400
200
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percent of Time Exceeded

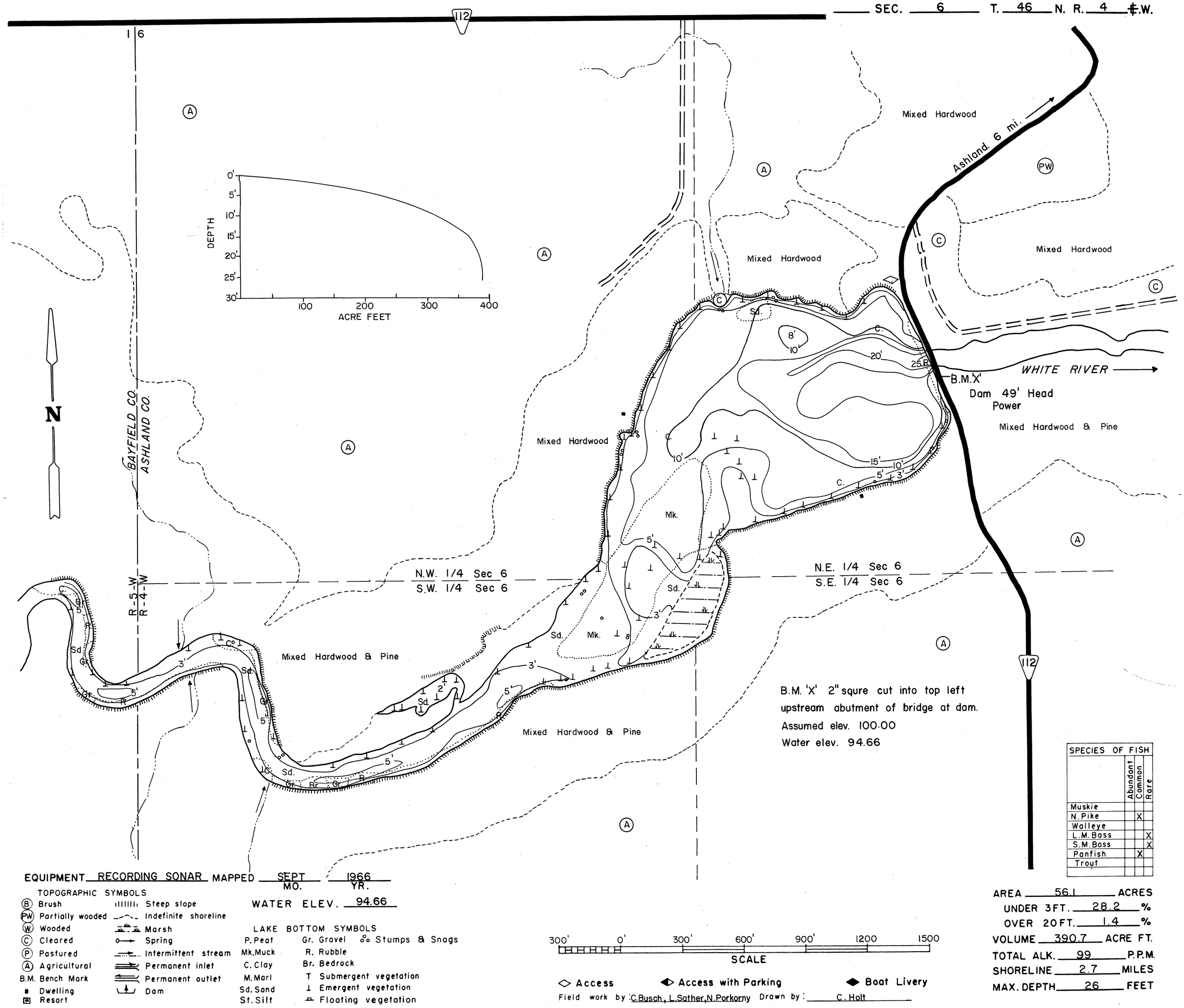
APPENDIX 4.3.6-1 **Bathymetric Map**

WISCONSIN CONSERVATION DEPARTMENT

LAKE SURVEY MAP

WHITE RIVER LAKE — ASHLAND COUNTY

SEC. 6 T. 46 N. R. 4 E.W.



B.M. 'X' 2" squre cut into top left upstream abutment of bridge at dam.
Assumed elev. 100.00
Water elev. 94.66

SPECIES OF FISH	Abundant	Common	Rare
Muskie			
N. Pike		X	
Walleye			
L.M. Bass			X
S.M. Bass			X
Panfish		X	
Trout			

EQUIPMENT RECORDING SONAR MAPPED SEPT (MO.) 1966 (YR.)

WATER ELEV. 94.66

TOPOGRAPHIC SYMBOLS

- (B) Brush
- (PW) Partially wooded
- (W) Wooded
- (C) Cleared
- (P) Pastured
- (A) Agricultural
- B.M. Bench Mark
- Dwelling
- Resort
- Steep slope
- Indefinite shoreline
- Marsh
- Spring
- Intermittent stream
- Permanent inlet
- Permanent outlet
- Dam

LAKE BOTTOM SYMBOLS

- P. Peat
- Mk. Muck
- C. Clay
- M. Marl
- Sd. Sand
- St. Silt
- Gr. Gravel
- R. Rubble
- Br. Bedrock
- T Submergent vegetation
- ⊥ Emergent vegetation
- Floating vegetation
- Stumps & Snags

300' 0' 300' 600' 900' 1200 1500

SCALE

◇ Access ◆ Access with Parking ◆ Boat Livery

Field work by: C. Busch, L. Sather, N. Porkorny Drawn by: C. Holt

AREA 56.1 ACRES
UNDER 3FT. 28.2 %
OVER 20FT. 1.4 %
VOLUME 390.7 ACRE FT.
TOTAL ALK. 99 P.P.M.
SHORELINE 2.7 MILES
MAX. DEPTH 26 FEET

Source: Wisconsin Department of Natural Resources 608-266-2621
White River Flowage – Ashland County, Wisconsin DNR Lake Map
Date – Sep 1966 - Historical Lake Map - Not for Navigation
A Public Document - Please Identify the Source when using it.

APPENDIX 4.3.7.1-1 Chapter NR 102 Water Quality Standards

Chapter NR 102

WATER QUALITY STANDARDS FOR WISCONSIN SURFACE WATERS

History: Chapter NR 102 as it existed on September 30, 1973 was repealed and a new chapter NR 102 was created, effective October 1, 1973. Corrections made under s. 13.93 (2m) (b) 7., Stats., Register, August, 1997, No. 500.

NR 102.01 Purpose. (1) The purpose of this chapter is to establish, in conjunction with chs. NR 103 to 105, water quality standards for surface waters of the state pursuant to s. 281.15 (2) (b), Stats. This chapter describes the designated use categories for such waters and the water quality criteria necessary to support these uses. This chapter and chs. NR 103 to 105 constitute the water quality standards for the surface waters of Wisconsin.

(2) Water quality standards shall protect the public interest, which includes the protection of public health and welfare and the present and prospective uses of all waters of the state for public and private water supplies, propagation of fish and other aquatic life and wild and domestic animals, domestic and recreational purposes, and agricultural, commercial, industrial, and other legitimate uses. In all cases where the potential uses are in conflict, water quality standards shall protect the general public interest.

(3) Water quality standards serve as a basis for developing and implementing control strategies to achieve legislative policies and goals. Water quality standards are the basis for deriving water quality based effluent limitations. Water quality standards also serve as a basis for decisions in other regulatory, permitting or funding activities that impact water quality.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89.

NR 102.02 Applicability. The provisions of this chapter are applicable to surface waters of Wisconsin.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89.

NR 102.03 Definitions. (1) "Mixing zone" means a region in which a discharge of different characteristics than the receiving water is in transit and progressively diluted from the source to the receiving system.

(2) "Natural conditions" means the normal daily and seasonal variations in climatic and atmospheric conditions, and the existing physical and chemical characteristics of a water or the course in which it flows.

(3) "Natural temperature" means the normal existing temperature of a surface water including daily and seasonal changes outside the zone of influence of any artificial inputs.

(4) "Resource management" means the application of control techniques to enhance or preserve a surface water in accordance with statutory provisions and in the general public interest.

(5) "Sanitary survey" means a thorough investigation and evaluation of a surface water including bacteriological sampling to determine the extent and cause of any bacterial contamination.

(6) "Surface waters" means all natural and artificial named and unnamed lakes and all naturally flowing streams within the boundaries of the state, but not including cooling lakes, farm ponds and facilities constructed for the treatment of wastewaters (the term waters as used in this chapter means surface waters).

(7) "Unauthorized concentrations of substances" means pollutants or other chemicals introduced into surface waters without prior permit or knowledge of the department, but not including accidental or unintentional spills.

(8) "Best practicable control technology" means that level of treatment established by the department under s. 283.13 (2) (a), Stats., for categories and classes of point sources to be achieved by not later than July 1, 1977.

(9) "Best available control technology" means that level of treatment established by the department under s. 283.13 (2) (b) 1., Stats., for categories and classes of point sources to be achieved by not later than July 1, 1983.

(10) Class I and Class II trout waters are as defined in s. NR 1.02 (7).

History: Cr. Register, September, 1973, No. 213, eff. 10−1−73; r. (1), renum. from NR 102.01, Register, February, 1989, No. 398, eff. 3−1−89; cr. (10), Register, May, 1993, No. 449, eff. 6−1−93.

NR 102.04 Categories of standards. (1) GENERAL. To preserve and enhance the quality of waters, standards are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all waters including the mixing zone and the effluent channel meet the following conditions at all times and under all flow conditions:

(a) Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.

(b) Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in waters of the state.

(c) Materials producing color, odor, taste or unsightliness shall not be present in such amounts as to interfere with public rights in waters of the state.

(d) Substances in concentrations or combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

(2) REVISED STANDARDS. It should be recognized that these standards will be revised as new information or advancing technology indicate that revisions are in the public interest. Water used for hydropower and commercial shipping depends mainly on quantity, depth and elevation; consequently, no specific quality standards for these uses have been prepared.

(3) FISH AND OTHER AQUATIC LIFE USES. The department shall classify all surface waters into one of the fish and other aquatic life subcategories described in this subsection. Only those use subcategories identified in pars. (a) to (c) shall be considered suitable for the protection and propagation of a balanced fish and other aquatic life community as provided in the federal water pollution control act amendments of 1972, P.L. 92−500; 33 USC 1251 et seq.

(a) *Cold water communities.* This subcategory includes surface waters capable of supporting a community of cold water fish and other aquatic life, or serving as a spawning area for cold water fish species. This subcategory includes, but is not restricted to, surface waters identified as trout water by the department of natural resources (Wisconsin Trout Streams, publication 6−3600 (80)).

(b) *Warm water sport fish communities.* This subcategory includes surface waters capable of supporting a community of warm water sport fish or serving as a spawning area for warm water sport fish.

(c) *Warm water forage fish communities.* This subcategory includes surface waters capable of supporting an abundant diverse community of forage fish and other aquatic life.

(d) *Limited forage fish communities.* (Intermediate surface waters). This subcategory includes surface waters of limited capacity and naturally poor water quality or habitat. These surface waters are capable of supporting only a limited community of forage fish and other aquatic life.

(e) *Limited aquatic life.* (Marginal surface waters). This subcategory includes surface waters of severely limited capacity and naturally poor water quality or habitat. These surface waters are capable of supporting only a limited community of aquatic life.

(4) STANDARDS FOR FISH AND AQUATIC LIFE. Except for natural conditions, all waters classified for fish and aquatic life shall meet the following criteria:

(a) *Dissolved oxygen.* Except as provided in par. (e) and s. NR 104.02 (3), the dissolved oxygen content in surface waters may not be lowered to less than 5 mg/L at any time.

(b) *Temperature.* 1. There shall be no temperature changes that may adversely affect aquatic life.

2. Natural daily and seasonal temperature fluctuations shall be maintained.

3. The maximum temperature rise at the edge of the mixing zone above the existing natural temperature shall not exceed 5º F for streams and 3º F for lakes.

4. The temperature shall not exceed 89º F for warm water fish.

(c) *pH.* The pH shall be within the range of 6.0 to 9.0, with no change greater than 0.5 units outside the estimated natural seasonal maximum and minimum.

(d) *Other substances.* Unauthorized concentrations of substances are not permitted that alone or in combination with other materials present are toxic to fish or other aquatic life. Surface waters shall meet the acute and chronic criteria as set forth in or developed pursuant to ss. NR 105.05 and 105.06. Surface waters shall meet the criteria which correspond to the appropriate fish and aquatic life subcategory for the surface water, except as provided in s. NR 104.02 (3).

(e) *Temperature and dissolved oxygen for cold waters.* Streams classified as trout waters by the department of natural resources (Wisconsin Trout Streams, publication 6−3600 (80)) or as great lakes or cold water communities may not be altered from natural background temperature and dissolved oxygen levels to such an extent that trout populations are adversely affected.

1. There shall be no significant artificial increases in temperature where natural trout reproduction is to be protected.

2. Dissolved oxygen in classified trout streams shall not be artificially lowered to less than 6.0 mg/L at any time, nor shall the dissolved oxygen be lowered to less 7.0 mg/L during the spawning season.

3. The dissolved oxygen in great lakes tributaries used by stocked salmonids for spawning runs shall not be lowered below natural background during the period of habitation.

(5) STANDARDS FOR RECREATIONAL USE. A sanitary survey and/or evaluation to assure protection from fecal contamination is the chief criterion in determining the suitability of a surface water for recreational use.

(a) *Bacteriological guidelines.* The membrane filter fecal coliform count may not exceed 200 per 100 ml as a geometric mean based on not less than 5 samples per month, nor exceed 400 per 100 ml in more than 10% of all samples during any month.

(b) *Exceptions.* Whenever the department determines, in accordance with the procedures specified in s. NR 210.06, that wastewater disinfection is not required to protect recreational uses, the recreational use criteria and classifications as established in this subsection and in chs. NR 103 and 104 do not apply.

(6) STANDARDS FOR PUBLIC HEALTH AND WELFARE. All surface waters shall meet the human threshold and human cancer criteria specified in or developed pursuant to ss. NR 105.08 and 105.09, respectively. The applicable criteria vary depending on whether the surface water is used for public drinking water supplies and vary with the type of fish and other aquatic life subcategory. All surface waters providing public drinking water supplies or classified as cold water or warm water sport fish communities as described in sub. (3) shall meet the taste and odor criteria specified in or developed pursuant to s. NR 102.14.

(7) STANDARDS FOR WILDLIFE. All surface waters shall be classified for wildlife uses and meet the wildlife criteria specified in or developed pursuant to s. NR 105.07.

History: Cr. Register, September, 1973, No. 213, eff. 10−1−73; am. (3), Register, December, 1977, No. 264, eff. 1−1−78; renum. from NR 102.02, r. (3) (d) 1. to 3., and (5), renum. (3) (intro.) to (d) (intro.) and (e) and (4) to be (4) (intro.) to (e) and (5) and am. (4) (a), (d), (e) (intro.) and (5), cr. (6) and (7), Register, February, 1989, No. 398, eff. 3−1−89; am. (3) (intro.), (6), (7), r. (3) (a), renum. (3) (b) to (f) to be (3) (a) to (e) and am. (3) (a), Register, August, 1997, No. 500, eff. 9−1−97.

NR 102.05 Application of standards. (1) ANTIDEGRADATION. (a) No waters of the state shall be lowered in quality unless it has been affirmatively demonstrated to the department that such a change is justified as a result of necessary economic and social development, provided that no new or increased effluent interferes with or becomes injurious to any assigned uses made of or presently possible in such waters.

(b) *Classification system.* For the purposes of this subsection, all surface waters of the state, or portions thereof, shall be classified as one of the following:

1. Outstanding resource waters as listed in s. NR 102.10,
2. Exceptional resource waters as listed in s. NR 102.11,
3. Great Lakes system waters as listed in s. NR 102.12 (1),
4. Fish and aquatic life waters as described in s. NR 102.13, or
5. Waters listed in tables 3 through 8 in ss. NR 104.05 to 104.10.

(2) STREAMFLOW. Water quality standards will not be maintained under all natural occurrences of flow, temperature, or other water quality characteristics. The determination of water quality based effluent limitations or other management practices shall be based upon the following conditions except as provided in ch. NR 106 for toxic and organoleptic substances and whole effluent toxicity:

(a) The average minimum 7−day low streamflow which occurs once in 10 years (7−day Q_{10}); or,

(b) In the case of dissolved oxygen and wherever sufficient data on streamflow and temperature are available, by application of a 0.274% level of nonattainment. This is equivalent to an expected nonattainment of the dissolved oxygen criterion of one day per year.

(3) MIXING ZONES. Water quality standards shall be met at every point outside of a mixing zone. The size of the mixing zone cannot be uniformly prescribed, but shall be based on such factors as effluent quality and quantity, available dilution, temperature, current, type of outfall, channel configuration and restrictions to fish movement. For toxic and organoleptic substances with water quality criteria or secondary values specified in or developed pursuant to chs. NR 102 and 105, allowable dilution shall be determined as specified in ch. NR 106 in addition to the requirements

specified in this subsection. As a guide to the delineation of a mixing zone, the following shall be taken into consideration:

(a) Limiting mixing zones to as small an area as practicable, and conforming to the time exposure responses of aquatic life.

(b) Providing passageways in rivers for fish and other mobile aquatic organisms.

(c) Where possible, mixing zones being no larger than 25% of the cross−sectional area or volume of flow of the stream and not extending more than 50% of the width.

(d) Final acute criteria and secondary values specified in or developed pursuant to s. NR 105.05 for the fish and aquatic life subcategory for which the receiving water is classified not being exceeded at any point in the mixing zone.

(e) Mixing zones not exceeding 10% of a lake's total surface area.

(f) Mixing zones not interfering with spawning or nursery areas, migratory routes, nor mouths of tributary streams.

(g) Mixing zones not overlapping, but where they do, taking measures to prevent adverse synergistic effects.

(h) Restricting the pH to values greater than 4.0 s.u. and to values less than 11.0 s.u. at any point in the mixing zone for the protection of indigenous fish and fish food organisms.

(4) EXEMPTIONS. The thermal mixing zone provisions of this chapter are not applicable to municipal waste and water treatment plants, to vessels, or to discharges to enclosed harbors.

(5) RESOURCE MANAGEMENT EXEMPTIONS. Application of chemicals for water resource management purposes in accordance with statutory provisions is not subject to the requirements of the standards except in case of water used for public water supply.

(6) ANALYTICAL PROCEDURES. (a) The criteria in the Radiation Protection Code, s. HFS 157.44, shall apply to the disposal and permissible concentrations of radioactive substances.

(b) Methods used for analysis of samples shall be as set forth in ch. NR 219 unless alternative methods are specified by the department.

History: Cr. Register, September, 1973, No. 213, eff. 10−1−73; renum. (5) and (6) to be (6) and (7), cr. (5), Register, July, 1975, No. 235, eff. 8−1−75; r. and recr. (3), Register, August, 1981, No. 308, eff. 9−1−81; correction in (7) made under s. 13.93 (2m) (b) 7., Stats., cr. (4) (h), Register, September, 1984, No. 345, eff. 10−1−84; renum. from NR 102.03, r. (1), cr. (1) (b), renum. (2) to (7) to be (1) (a) to (6) and am. (2), (3) (intro.) and (d) and (6), Register, February, 1989, No. 398, eff. 3−1−89; am. (1) (b) 3., (3) (intro.) and (d), Register, August, 1997, No. 500, eff. 9−1−97; correction in (6) (a) made under s. 13.93 (2m) (b) 7., Stats. Register July 2006 No. 607, eff. 8−1−06.

NR 102.06 Phosphorus. In addition to the requirements established in ch. NR 217, any wastewater discharger, regardless of population, volume or type of waste discharge, or geographic location, may be required to remove excess amounts of phosphorus. Effluent limitations for total phosphorus based on surface water quality may be established where, in the best professional judgment of the department, such limitations will result in an improvement in water quality, or preserve the quality of surface waters where long−term discharges may result in impairment of water quality. Such limitations for phosphorus shall include an evaluation of the discharges from point sources, nonpoint sources, background sources, tributaries, and a consideration of a margin of safety.

History: Cr. Register, July, 1975, No. 235, eff. 8−1−75; am. Register, October, 1986, No. 370, eff. 11−1−86; renum. from NR 102.04, Register, February, 1989, No. 398, eff. 3−1−89; am. Register, November, 1992, No. 443, eff. 12−1−92.

NR 102.07 Lake Michigan and Lake Superior thermal standards. For Lake Michigan and Lake Superior the following thermal standards are established so as to minimize effects on the aquatic biota in the receiving waters.

(1) (a) Thermal discharges shall not raise the receiving water temperature more than 3ºF above the existing natural temperature at the boundary of mixing zones established in pars. (b) and (c).

(b) 1. The mixing zone for a shoreline thermal discharge shall be the area included within the perimeter of a rectangular figure extending 1,250 feet in both directions along the shoreline from the outfall and 1,250 feet into the lake.

2. The mixing zone for an offshore thermal discharge shall be the area within a 1,000−foot radius circle with its center at the point of discharge.

(c) The department may, upon request from the owner of a source of thermal discharge, adjust the boundaries of the mixing zone established in par. (b) for that source. In no case may any mixing zone so established include an area greater than 72 acres nor may it include more than 2,800 feet of shoreline.

(2) In addition to the limitation set forth in sub. (1), but excepting the Milwaukee Harbor, Port Washington Harbor and the mouth of the Fox River, thermal discharges to Lake Michigan shall not raise the temperature of the receiving waters at the boundary of the established mixing zone above the following limits:

January	45°F
February	45°
March	45°
April	55°
May	60°
June	70°
July	80°
August	80°
September	80°
October	65°
November	60°
December	50°

History: Cr. Register, September, 1973, No. 213, eff. 10−1−73; r. and recr. Register, July, 1975, No. 235, eff. 8−1−75; renum. from NR 102.05, Register, February, 1989, No. 398, eff. 3−1−89.

NR 102.08 Mississippi river thermal standards. In addition to the standards for fish and aquatic life, the monthly average of the maximum daily temperature in the Mississippi river outside the mixing zone shall not exceed the following limits:

January	40°F
February	40°
March	54°
April	65°
May	75°
June	84°
July	84°
August	84°
September	82°
October	73°
November	58°
December	48°

History: Cr. Register, July, 1975, No. 235, eff. 8−1−75; renum. from NR 102.06, Register, February, 1989, No. 398, eff. 3−1−89.

NR 102.09 Review of thermal standards. (1) Whenever the owner of any source of thermal discharges that existed on or before July 31, 1975, in compliance with department guidelines and after opportunity for public hearing, can demonstrate to the satisfaction of the department that the mixing zone established pursuant to this chapter is more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the receiving water, the department may:

(a) Impose a mixing zone with respect to such thermal discharge that will assure the protection and propagation of such a population, or

(b) Exempt such thermal discharge from the thermal requirements of this chapter provided this exemption will not endanger the propagation of such a population.

(2) Any owner desiring a review pursuant to sub. (1) shall submit a demonstration to the department no later than June 30, 1976. The department shall reach a decision no later than December 31, 1976.

(3) In the event the owner fails to make a satisfactory demonstration pursuant to sub. (1), the department shall establish a compliance date for the thermal component to be achieved no later than July 1, 1979.

(4) Whenever the owner of any source of thermal discharges that commenced on or after August 1, 1975, in compliance with department guidelines and after opportunity for public hearing, can demonstrate to the satisfaction of the department that the mixing zone established pursuant to this chapter is more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the receiving water, the department may:

(a) Impose a mixing zone with respect to such thermal discharge that will assure the protection and propagation of such a population, or

(b) Exempt such thermal discharge from the thermal requirements of this chapter provided this exemption will not endanger the propagation of such a population.

(5) In the event an owner fails to make a satisfactory demonstration pursuant to sub. (4), the discharge shall be in compliance with the thermal requirements of this chapter upon commencement of the discharge.

(6) The department may require the reduction of thermal discharges or the size and configuration of a mixing zone if it finds that environmental damage is imminent or existent.

History: Cr. Register, July, 1975, No. 235, eff. 8−1−75; am. Register, February, 1977, No. 254, eff. 3−1−77; renum. from NR 102.07, Register, February, 1989, No. 398, eff. 3−1−89.

NR 102.10 Outstanding resource waters. (1) The following surface waters are designated as outstanding resource waters:

(a) *National wild and scenic rivers.* All rivers designated under the national wild and scenic rivers act, as amended, 16 USC 1271 to 1287, except those portions flowing through Indian reservations, including:

1. St. Croix river between the northern boundary of the Hudson city limits and the St. Croix flowage dam in Douglas county except that the portion of the St. Croix river from the northern boundary of the St. Croix Falls city limits to a distance one mile below the STH 243 bridge at Osceola shall be classified exceptional resource waters under s. NR 102.11.

2. Namekagon river between its confluence with the St. Croix river and the outlet of Lake Namekagon in Bayfield county.

(b) *State wild and scenic rivers.* All state wild and scenic rivers designated under s. 30.26, Stats., including:

1. Pike river in Marinette county.

2. Pine river and its tributary Popple river in Florence and Forest counties.

(c) Wolf river upstream of the northern Menominee county line.

(d) The following Class I trout waters:

1. Adams county — Big Roche−a−Cri creek

2. Barron county — Yellow river

3. Bayfield county — Flag river, Sioux river

4. Burnett county — North Fork Clam river, South Fork Clam river

5. Chippewa county — Duncan creek, Elk creek, McCann creek

6. Dane county — Black Earth creek above the easternmost CTY KP crossing

7. Door county — Logan creek

8. Douglas county — Bois Brule river and its tributaries including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth

9. Dunn county — Elk creek

10. Florence county — Brule river including Montagne creek and Riley creek tributaries; tributaries to the Pine−Popple rivers including Chipmunk, Cody, Haley, Haymarsh, LaMontagne, Lepage, Lunds, Martin, Olson, Patten, Pine, Riley, Rock, Simpson, Seven Mile, Wakefield and Woods creeks; Little Popple river

11. Forest county — Brule river

13. Kewaunee county — Little Scarboro creek

14. Langlade county — Clearwater creek, Drew creek, Evergreen river, South Branch Oconto river

15. Lincoln county — Center fork New Wood creek, Little Pine creek, Prairie river

16. Marathon county — Holt creek, Spranger creek, Plover river

17. Marinette county — Cedarville creek, Otter creek, Holmes creek, East Thunder creek, North fork Thunder river, Eagle creek, Little Eagle creek, Plumadore creek, Meadow brook, Upper Middle Inlet creek, Middle Inlet creek, Wausaukee river, Little Wausaukee creek, Coldwater brook, Medicine brook, South Branch Miscauno river, Miscauno river, Swede John creek, South Branch Pemebonwon river, Spikehorn creek, Silver creek, Little Silver creek, Sullivan creek; tributaries to the Pike river including Little South Branch Pike river, Camp D creek, Camp F creek, Camp 9 creek, Cole creek, Glen creek, Harvey creek, North Branch Harvey creek, South Branch Harvey creek, Hemlock creek, Holloway creek, K.C. creek, Little Harvey creek, Lost creek, MacIntire creek, Phillips creek, Sackerson creek, Shinns creek, Sidney creek, Smeesters creek, Springdale brook, Whiskey creek

18. Marquette county — Chaffee creek, Lawrence creek, Tagatz creek

19. Monroe county — Rullands Coulee creek

20. Oconto county — First South Branch Oconto river, Second South Branch Oconto river, South Branch Oconto river, Hills Pond creek

21. Polk county — Clam river, McKenzie creek

22. Portage county — Emmons creek, Radley creek, Sannes creek, Tomorrow river, Trout creek

23. Richland county — Camp creek

24. Sheboygan county — Nichols creek

25. St. Croix county — Kinnickinnic river above STH "35"

26. Vernon county — Rullands Coulee creek, Spring Coulee creek, Timber Coulee creek

27. Vilas county — Deerskin river, Plum creek

28. Walworth county — Bluff creek, Potawatomi creek, Van Slyke creek

29. Waupaca county — Emmons creek, Griffin creek, Jackson creek, Leers creek, Peterson creek, Radley creek, Sannes creek, Spaulding creek, Trout creek, Whitcomb creek, North Branch Little Wolf river

30. Waushara county — Willow creek north of Redgranite, Mecan river north of Richford, Little Pine creek, West Branch White river

(e) The following Class II trout waters:

1. Barron county — Yellow river

2. Burnett county — North Fork Clam river

3. Forest county — Brule river, Peshtigo river

4. Grant county — Big Green river, Castle Rock creek
5. Marinette county — Peshtigo river
6. Polk county — McKenzie creek
7. Vilas county — Plum creek

(f) The following cold or warm water streams and rivers or portions thereof:

1d.	Ashland	Bad River	SEG 1: Origin to Outfall in Mellen at NW¼SW¼ S6 T44N R2W
		Brunsweiler River	SEG 1: Origin to Inlet of Spider Lake
			SEG 2: Outlet of Moquah Lake to Inlet of Mineral Lake
			SEG 3: Outlet of Mineral Lake to Inlet of Beaverdam Lake
			SEG 4: Outlet of Beaverdam Lake (at the dam) to the Bad River Indian Reservation Boundary
1h.	Ashland & Bayfield	Marengo River	SEG 1: Origin to Inlet of Marengo Lake
			SEG 2: Outlet of Marengo Lake to Bad River Indian Reservation Boundary
1p.	Ashland & Sawyer	E. Fork Chippewa River	SEG1: T42N R1E S17/18 Line to Ashland County Highway "N" in Glidden
			SEG 6: Outlet of Barker Lake to Confluence with Chippewa Flowage
			SEG 3: Outlet of Pelican Lake to Inlet of Blaisdell Lake
			SEG 4: Outlet of Blaisdell Lake to Inlet of Hunter Lake
			SEG 5: Outlet of Hunter Lake to Inlet of Barker Lake
1t.	Barron	Engle Creek	Class I & II Portions
		Hickey Creek	Class I & II Portions
		Red Cedar River	SEG 1: Outlet of Red Cedar Lake to Inlet of Rice Lake
		Rock Creek	SEG 2: All within Barron County
		Upper Pine Creek	Above Dallas Flowage
2.	Bayfield	Bark River	All−Class I Portions including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth
		Big Brook	All
		Cranberry River & Tribs.	All−Class I Portion including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth.
		East Fork Iron River & Tribs.	All−Class I Portion
		East Fork White River	All−Class I Portion
		Eighteen Mile Cr. & Tribs.	All−Class I Portion
		Fish Creek (Main)	All including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth.
		Long Lake Branch & Tribs.	From below Drummond Lake to White River
			All−Class I Portions
		No. Fork Fish Creek & Tribs.	All−Class I & II Portions
		Onion River & Tribs.	All−Class I Portions including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth.
		Pikes Creek & Tribs.	All−Class I Portion including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth.

		Sioux River & Tribs.	All−Class I & II Portions including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth.
		So. Fork White River	All−Class I Portion
		Thompson Creek	All−Class I Portion
		Twenty Mile Creek	All−Class I & II Portions
		White River	All−Class I Portion
		Whittlesey Creek & Tribs.	All−Class I Portions including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth.
2d.	Bayfield & Ashland	Beartrap Creek	SEG 1: Origin to Bad River Indian Reservation Boundary
2h.	Bayfield, Ashland & Sawyer	West Fork Chippewa River	SEG 1: Origin (Outlet of Chippewa Lake) to Inlet of Day Lake
			SEG 2: Outlet of Day Lake to Inlet of Upper Clam Lake
			SEG 3: Outlet of Upper Clam Lake to Inlet of Lower Clam Lake
			SEG 4: Outlet of Lower Clam Lake to Inlet of Cattail Lake
			SEG 5: Outlet of Cattail Lake to Inlet of Meadow Lake
			SEG 6: Outlet of Meadow Lake to Inlet of Partridge Crop Lake
			SEG 7: Outlet of Partridge Crop Lake to Inlet of Moose Lake
			SEG 8: Outlet of Moose Lake to Sawyer County Highway “B”
2p.	Bayfield, Sawyer, Washburn, Douglas & Burnett	Totagatic River	SEG 1: Origin (Confluence of West Fork Totagatic River and East Fork Totagatic River) to Inlet of Nelson Lake
			SEG 2: Outlet of Totagatic Flowage to Inlet of Colton Flowage
			SEG 3: Outlet of Colton Flowage to Inlet of Minong Flowage
			SEG 4: Outlet of Minong Flowage to Confluence with Namekagon River
3.	Burnett	North Fork Clam River	County Highway “H” to Confluence with Clam River
		Tributaries to the N. & S. Forks of the Clam River	All−Class I & II Portions
4.	Dane	Mt. Vernon Creek	All−Class I Portion
5.	Door	Mink River	All
5m.	Douglas	Amnicon River	SEG 1: Origin (Outlet of Amnicon Lake) to Inlet of Lyman Lake
			SEG 2: Outlet of Lyman Lake to mouth at Lake Superior, including the waters of Lake Superior within a ¼ mile semi−circular arc centered at the middle of the river mouth.
		Moose River	All
		Spruce River	All
		St. Croix River	SEG 1: Outlet of Upper St. Croix Lake to Inlet of St. Croix Flowage
6.	Forest	Allen Creek	All
		Brule Creek	All
		Elvoy Creek	All
		Jones Creek	Class I & II portions
		North Otter Creek	All

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6m.	Forest & Langlade	Swamp Creek	SEG 1: Outlet of Lake Lucerne to Mole Lake Indian Reservation Boundary
			SEG 3: All below Mole Lake Indian Reservation Boundary to Confluence of Wolf River
7.	Grant	Little Green River	All
7m.	Iron & Ashland	Tyler Forks	SEG 1: Origin in Iron County to Bad River Indian Reservation Eastern Boundary in Ashland County
			SEG 3: From Bad River Indian Reservation Southern Boundary to Confluence with Bad River
		Potato River	SEG 1: Origin to Bad River Indian Reservation Boundary
8.	Iron, Ashland & Price	Flambeau River	SEG 1: Turtle−Flambeau Flowage (Outlet @ Turtle−Flambeau Dam) to Inlet of Upper Park Falls Flowage
		No. Fork Flambeau River	From Turtle−Flambeau Flowage Dam downstream to Park Falls
9.	LaCrosse	Berge Coulee Creek	All
10.	Langlade	Elton Creek	Class I Portion
		Little Evergreen Creek	All
		Mayking Creek	All
		Michelson Creek	All
		Mid Branch Embarrass River	Class I Portion
10m.	Lincoln	New Wood River	Origin (T33N R4E S14) to Confluence with Wisconsin River
11.	Marathon	Falstad Creek	Class II Portion
		So. Branch Embarrass River	Class I Portion
12.	Marinette	No. Branch Beaver Creek	Entire River & tributaries
13.	Oneida	Noisy Creek	Class II Portion
		Squirrel River	Outlet of Squirrel Lake to Confluence with Tomahawk River
		Tomahawk River	SEG 2: Outlet of Willow Flowage Dam to Inlet of Lake Nokomis
14.	Pierce	Kinnickinnic River	From Powell Dam to St. Croix River
15.	Polk	Sand Creek & Tribs	All−Class I & II Portions
15e.	Polk & Burnett	Clam River	SEG 1: Outlet of Clam Falls Flowage to Inlet of Clam Lake
			SEG 2: Outlet of Lower Clam Lake to Section Line @ T39N R16W S21/22
15m.	Price	Elk River	SEG 1: Headwaters to Inlet of Musser Lake
	Price & Lincoln	Spirit River	Outlet of Spirit Lake to Inlet of Spirit River Flowage
16.	Price, Rusk & Sawyer	So. Fork Flambeau River	All−Round L. Dam downstream to Jxn with No. Fork Flambeau R.
17.	Richland	Elk Creek	All
18.	Rusk	Devils Creek	All−Class I & II Portions
		Soft Maple Creek	SEG 1: Origin to Rusk County Highway “F”
		So. Fork Main Creek	Class I & II Portions (T35N R3W S28 downstream to T34N R4W S11)
		Swift Creek	Outlet of Island Lake to Inlet of Fireside Lake
19.	Sauk	Otter Creek	From headwaters to southern section line of T11N R6E S33
		Parfrey’s Glen	From headwaters to CTH DL
20.	Sawyer	Benson Creek	All−Class I Portion

		Couderay River	SEG 1: Origin at Outlet of Billy Boy Flowage to Inlet of Grimh Flowage (Including Waters within Lac Courte Oreilles Indian Reservation)
		Eddy Creek	All−Class I Portion
		Grindstone Creek	All−Class I Portion
		Knuteson Creek	SEG 1: Outlet of Wise Lake to Inlet of Knuteson Lake
			SEG 2: Outlet of Knuteson Lake to Inlet of Lake Chetek
		Little Weirgor Creek & Tribs	All−Class I & II Portions
		McDermott Creek	All
		Mosquito Brook	All−Class I Portion
		Teal River	Outlet of Teal Lake to Confluence with West Fork Chippewa River
20m.	Sawyer & Rusk	Thornapple River	SEG 1: Origin to Rusk County Highway "J"
		Chippewa River	SEG 1: Dam at Chippewa Flowage to Inlet of Radisson Flowage (T38N R7W S13)
21.	Shawano	Middle Br. Embarrass R.	Origin to but not including Homme Pond
		No. Br. Embarrass R.	Origin to CTH J
		So. Br. Embarrass R.	Origin to but not including Tigerton Pond
21g.	Taylor & Chippewa	Yellow River	SEG 1: Confluence with South Fork Yellow River to Inlet of Chequamegon Waters Flowage
			SEG 2: Outlet of Chequamegon Waters Flowage (at Miller Dam) to State Highway 64/73
21r.	Taylor & Price	Silver Creek	SEG 1: Origin to Westboro Sanitary District Outfall
22.	Vilas	Allequash Springs	Class I & II Portions
		Brule Creek	All
		East Br. Blackjack Cr.	All
		Elvoy Creek & Springs	Class I & II Portions
		Manitowish River	SEG 1: Adjacent to Dam Road Downstream to Inlet of Boulder Lake
			SEG 2: Outlet of Boulder Lake to Inlet of Island Lake
		Mishonagon Creek	Class I & II Portions
		Siphon Creek	All
		Spring Meadow Creek	Class I Portion
		Tamarack Creek	All
		Trout River	SEG 1: Outlet of Trout Lake to Lac Du Flambeau Indian Reservation Eastern Boundary
22m.	Vilas & Oneida	Wisconsin River	SEG 1: Orgin (Outlet of Lac Vieux Desert) to Inlet of Watersmeet Lake
23.	Washburn	Beaver Brook	All−Class I Portion
		Sawyer Creek	All−Class I & II Portions
		So. Fork Bean Brook	All−Class I Portion
		Stuntz Brook	Origin to Confluence with Namekagon River
23m.	Washburn & Barron	Bear Creek	SEG 1: Outlet of Kekegama Lake to Inlet of Bear Lake
			SEG 2: Outlet of Bear Lake to Inlet at Stump Lake

(1m) The following lakes are designated as outstanding resource waters:

1.	Ashland	Bad River Slough
		Kakagon Slough
		Lake Superior within ¼ mile of the shoreline of the islands within the Apostle Island National Lakeshore
2.	Barron	Bear Lake (T36N R12W S2)
		Red Cedar Lake
		Sand Lake
		Silver Lake
3.	Bayfield	Bark Bay Slough
		Diamond Lake
		Lake Superior within ¼ mile of the shoreline of the islands within the Apostle Island National Lakeshore
		Middle Eau Claire Lake

		Namekagon Lake
		Owen Lake
		Pike Chain of Lakes (Pike, Millicent, Buskey Bay, Hart, Twin Bear, Eagle, Flynn and Hildur Lakes)
		Star Lake
		Upper Eau Claire Lake
4.	Burnett	Big Mckenzie Lake
		Big Sand Lake
		Sand Lake (T40N R15W S25)
5.	Columbia	Crystal Lake
6.	Douglas	Bond Lake
		Lower Eau Claire Lake
		Nebagamon Lake
		St. Croix (Gordon) Flowage
		Upper St. Croix Lake
		Whitefish Lake (Bardon)
7.	Florence	Edith Lake
		Keyes Lake
		Lost Lake
		Perch Lake
		Riley Lake, South
8.	Forest	Butternut Lake
		Franklin Lake
		Lucerne Lake (Stone)
		Metonga Lake
9.	Iron	Catherine Lake
		Cedar Lake
		Gile Flowage
		Hewitt Lake
		Owl Lake
		Trude Lake
		Turtle−Flambeau Flowage
9m.	Marinette	Caldron Falls Flowage
10.	Oconto	Archibald Lake
		Bass Lake (T32N R15E S9)
		Bear Paw Lake
		Boot Lake
		Chain Lake
11.	Oneida	Big Carr Lake
		Clear Lake (T39N R7E S16)
		Little Tomahawk Lake
		Tomahawk Lake
		Two Sisters Lake
		Willow Flowage
12.	Polk	Pipe Lake
13.	Price	Cochram Lake
		Tucker Lake
14.	Rusk	Bass Lake (T34N R9W S16)
		Fish Lake
		Island Chains of Lakes (Chain, Clear, McMann, and Island Lakes)
		Three Lakes No. 1 (T36N R9W S25)
15.	St. Croix	Bass Lake (T30N R19W S23)
		Perch Lake
16.	Sauk	Devils Lake
17.	Sawyer	Barker Lake
		Blaisdell Lake
		Camp Smith Lake
		Evergreen Lake
		Grindstone Lake
		Lac Court Oreilles
		Lake Chippewa (Chippewa Flowage)
		Nelson Lake
		Osgood Lake
		Perch Lake (T42N R6W S25)
		Round Lake (Big Round)
		Sand Lake
		Spider Lake
		Teal Lake
		Whitefish Lake
18.	Vilas	Black Oak Lake
		Crab Lake
		Crystal Lake (T41N R7E S27)
		Lac Vieux Desert
		North Twin Lake
		Pallette Lake (Clear)
		Partridge Lake
		Plum Lake
		South Twin Lake
		Star Lake
		Stormy Lake
		Trout Lake
		White Sand Lake (T24N R7E S26)
19.	Walworth	Lulu Lake
20.	Washburn	Bass Lake (T40N R10W S17)
		Long Lake
		Middle McKenzie Lake
		Shell Lake
		Stone Lake (T39N R10W S24)
21.	Waukesha	Spring Lake (T5N R18E S9)
22.	Waupaca	Graham Lake (Nelson)
		North Lake
23.	Waushara	Gilbert Lake
		Lucerne Lake (Egans)
		Norwegian Lake
		Pine Lake (Springwater)

(2) The waters in sub. (1) and (1m) may not be lowered in quality.

(3) Surface waters, or portions thereof, may be added to, or deleted from, the outstanding resource waters designation through the rule making process under the provisions of ch. 227, Stats., and s. NR 2.03.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; am. (1) (d), cr. (1) (e), Register, July, 1989, No. 403, eff. 8−1−89; cr. (1) (f) and (1m), am. (2), Register, May, 1993, No. 449, eff. 6−1−93; am. (1m) 6., 9. and 11., cr. (1m) 9m., Register, February, 1998, No. 506, eff. 3−1−98; CR 05−089: am. (1) (d) 8., (f) 2., (1m) 1. and 3. Register July 2006 No. 607, eff. 8−1−06; CR 05−105: renum. (1) (f) 1. to be 1t. and am., cr. (1) (f) 1d., 1h., 1p., 2d., 2h., 2p., 5m., 6m.,. 7m., 10m., 15e., 15m., 15s., 20m., 21g., 21r., 22m., and 23m., am. (1) (f) 3., 8. 13., 18., 20., 22., and 23., Register November 2006 No. 611, eff. 12−1−06; **reprinted to correct error in (1) (d) 6. Register March 2008 No. 627.**

NR 102.11 Exceptional resource waters. (1) Surface waters which provide valuable fisheries, hydrologically or geologically unique features, outstanding recreational opportunities, unique environmental settings, and which are not significantly impacted by human activities may be classified as exceptional resource waters. All the following surface waters are designated as exceptional resource waters:

(a) Class I trout waters listed in Wisconsin Trout Streams publication 6−3600 (80) that are not listed in s. NR 102.10.

(b) Other Class I trout waters:

1. Abraham Coulee creek in section 29, township 20 north, range 8 west from its headwaters to the Abraham Coulee road bridge in Trempealeau county.

2. Bear creek originating in section 3, township 20 north, range 7 west in Trempealeau county.

3. Biser creek originating in section 19, township 12 north, range 3 west in Sauk county.

4. Bostwick creek from CTH M upstream 6.2 miles to the headwaters in LaCrosse county.

5. Bufton Hollow creek originating in section 23, township 12 north, range 2 west in Richland county.

6. Columbus creek originating in section 29, township 20 north, range 6 west in Jackson county.

7. Dutch creek originating in section 12, township 19 north, range 8 west in Trempealeau county.

8. Joe Coulee creek originating in section 1, township 20 north, range 7 west in Trempealeau county.

9. Little creek originating in section 21, township 20 north, range 6 west in Jackson county.

10. Marble creek originating in section 30, township 10 north, range 3 east in Sauk county.

11. Marshall creek originating in section 4, township 11 north, range 1 west in Richland county.

12. Martin creek originating in section 22, township 6 north, range 2 east in Iowa county.

13. South Bear creek originating in section 2, township 12 north, range 2 west in Richland county.

14. Spring brook downstream from CTH Y south of Antigo to its confluence with the Eau Claire river in Marathon county.

15. Spring Coulee creek from the headwaters to SE 1/4, SE 1/4, section 33, township 16 north, range 1 east in Monroe county.

16. Unnamed creek 2−12 originating in section 36, township 20 north, range 7 west of Trempealeau county.

17. Unnamed creek 4−9 originating in section 4, township 11 north, range 1 west in Richland county.

18. Unnamed creek 5−6 originating in section 6, township 19 north, range 8 west in Trempealeau county.

19. Unnamed creek 7−4 originating in section 6, township 20 north, range 7 west in Trempealeau county.

20. Unnamed creek 8−9 originating in section 5, township 20 north, range 7 west in Trempealeau county.

21. Unnamed creek 8−14 originating in section 1, township 20 north, range 8 west in Trempealeau county.

22. Unnamed creek 9−13 originating in section 4, township 20 north, range 6 west in Jackson county.

23. Unnamed creek 10−8 originating in section 10, township 11 north, range 1 west in Richland county.

24. Unnamed creek 10−10 originating in section 14, township 20 north, range 6 west in Jackson county.

25. Unnamed creek 11−4 originating in section 1, township 20 north, range 7 west in Trempealeau county.

26. Unnamed creek 11−7 originating in section 2, township 20 north, range 7 west in Trempealeau county.

27. Unnamed creek 13−3a originating in section 19, township 20 north, range 6 west in Trempealeau county.

28. Unnamed creek 13−3b originating in section 6, township 20 north, range 6 west in Trempealeau county.

29. Unnamed creek 15−13 originating in section 1, township 20 north, range 8 west in Trempealeau county.

30. Unnamed creek 15−4 originating in section 3, township 20 north, range 6 west in Trempealeau county.

31. Unnamed creek 16−2 originating in section 22, township 20 north, range 6 west in Jackson county.

32. Unnamed creek 17−5 originating in SE 1/4, section 5, township 20 north, range 6 west in Jackson county.

33. Unnamed creek 24−3a originating in section 24, township 11 north, range 1 west in Richland county.

34. Unnamed creek 26−7 originating in section 2, township 20 north, range 6 west in Jackson county.

35. Unnamed creek 34−2 originating in section 17, township 20 north, range 8 west in Trempealeau county.

36. Unnamed creek 34−15 originating in section 27, township 20 north, range 7 west in Trempealeau county.

37. Unnamed stream originating in section 29, township 10 north, range 3 east in Sauk county.

38. Washington Coulee creek originating in section 29, township 20 north, range 6 west in Jackson county.

(c) The following Class II trout waters:

1. Ashland county — White river above the Bad River Indian reservation

2. Bayfield county — White river

3. Dane county — Mt. Vernon creek

4. Forest county — North Branch Oconto river

5. Grant county — Blue river

6. Iowa county — Blue river

7. Langlade county — Prairie river, South Branch Oconto river

8. Lincoln county — Prairie river

9. Marquette county — Mecan river

10. Oconto county — North Branch Oconto river, South Branch Oconto river

11. Pierce county — Rush river

12. Portage county — Tomorrow river

13. Richland county — Willow creek

14. St. Croix county — Willow river, Race Branch

15. Waushara county — Mecan river

(d) The following cold or warm water streams and rivers or portions thereof:

1g.	Ashland	Bad River	SEG 2: Outfall in Mellen at NE¼SW¼ S6 T44N R2W to Bad River Indian Reservation Boundary
1r.	Ashland & Sawyer	East Fork Chippewa River	SEG 2: Ashland County Highway ”N” to Confluence of Rocky Run Creek (Includes Glidden POTW)
1t.	Barron	Brill River	All−Class II Portion
2.	Crawford	Copper Creek	All
		Plum Creek	All

		Sugar Creek	From headwaters to T10N R6W S10
		Tainter Creek	From Vernon County Line to CTH B
3.	Dane	Blue Mounds Branch	All
		Deer Creek	All
		Dunlap Creek	All
		Elvers Creek (Bohn Cr.)	All
		Flynn Creek	All
		Fryes Feeder Creek	All
		Garfoot Creek	All
		Milum Creek	All
		Rutland Branch	All
		Ryan Creek	All
		Schalpbach Creek	All
		Sixmile Creek	All
		Spring Creek (Lodi)	All
4.	Dane, Sauk, Iowa, Grant, Richland, Crawford	Wisconsin River	From below Prairie du Sac to Prairie du Chien
5.	Dane & Green	Little Sugar River	Above New Glarus
		Story Creek (Tipperary)	All, originating in T5N R8E S36
		Sugar Creek	All
6.	Dunn	Sand Creek	From Chippewa County Line to mouth
7.	Eau Claire	Lowes Creek	From Hwy 37 & 85 upstream to headwaters
8.	Fond du Lac	Feldner's Creek	From headquarters to Mischo's Millpond
		Lake Fifteen Creek	Entire Creek above & below Lake Fifteen
9.	Forest	Armstrong Creek	All
		Middle Br. Peshtigo R.	All
		North Br. Peshtigo R.	All
		North Br. Popple R.	All
		West Br. Armstrong Creek	Class II Portion
10.	Grant	Doc Smith Branch	All
		Little Platte River	From Arthur downstream to Platte River
11.	Grant & Iowa	Big Spring Branch	From Springhead to Blue River
12.	Green	Burgy Creek	All
		Gill Creek	All
		Hefty Creek, North Branch	All
		Hefty Cr., Center Branch	All
		Liberty Creek	All
		Norwegian Creek	All
		Richland Creek	All
		Ross Crossing	All
		Sylvester Creek	All
		Spring Valley Creek	All
		Ward Creek	All
13.	Green & Rock	Allen Creek	Below Evansville
14.	Iowa	Harker−Lee−Martin System	From headwaters to T6N R2ES10
15.	Iron	Maintowish River	All
15m.	Iron & Ashland	Vaughn Creek	SEG 1: Origin to Bad River Indian Reservation Boundary
16.	Jackson	Trempealeau River	From STH 95 at Hixton to CTHP at Taylor
17.	Jefferson	Allen Creek	All
18.	Kewaunee	Casco Creek	From T24N R24E S19 downstream of Rock Ledge to Kewaunee River
19.	La Crosse	Bostwick Creek	From headwaters to County Hwy 'O'
		Coon Creek	All
		Dutch Creek	From headwaters to Russian Coulee Road (section 8)
20.	Lafayette	Galena River	From headwaters to Buncombe Road
21.	Langlade	East Br. Eau Claire R.	From STH 64 upstream to firelane crossing in T33N R11E S35 SW1/4
		Hunting River	From Fitzgerald Dam Road downstream to T33N R11E S1
22.	Lincoln	North Br. Prairie River	From headwaters to CTHJ to T33N R8E
		Silver Creek	All
23.	Manitowoc	Branch River	All
24.	Monroe	Big Creek	From headwaters to Acorn Rd (S7)
		Farmers Valley Creek & Tribs	From headwaters to I−90 (S19)

		Soper Creek	All
25.	Oneida	Bearskin Creek	From Tomahawk River to Little Bearskin Lake
25m.	Oneida & Lincoln	Wisconsin River	SEG 2: Hat Rapids Dam to Lincoln County A crossing
			SEG 4: Grandfather Dam to Inlet of Alexander Lake
26.	Pierce	Big River	Class I Portion
		Cady Creek	From CTH P upstream
		Trimbelle River	All
26c.	Polk & Burnett	Clam River	SEG 3: Section Line @ T39N R16W S21/22 to Inlet of Clam River Flowage
			SEG 4: Outlet of Clam River Flowage to Confluence with St. Croix River
26g.	Price	North Fork Jump River	SEG 1: Origin (outlet of Cranberry Lake) to Inlet of Spring Creek Flowage
			SEG 2: Outlet of Spring Creek Flowage to Confluence with South Fork Jump River
26n.	Price, Rusk & Taylor	Jump River	SEG 1: Confluence of the North Fork Jump River and South Fork Jump River to the Village of Jump River
26r.	Price, Sawyer, Rusk	Flambeau River	SEG 2: Crowley Dam to Inlet of Big Falls Flowage
26w.	Price & Taylor	South Fork Jump River	Origin to Confluence with North Fork Jump River
27.	Richland	Babb Hollow	All−Trib to Mill Creek
		Hanzel Creek (Hansell)	All−Trib to Melancthon Cr.
		Melancthon Creek	Class II Section
		Coulter Hollow Creek	All−Trib to Mill Creek
		E. Branch Mill Creek	All
		Happy Hollow Creek	All−Trib to Willow Creek
		Higgins Creek	All−Trib to Mill Creek
		Hood Hollow Creek	All−Trib to Mill Creek
		Jacquish Hollow Creek	All−Trib to Willow Creek
		Kepler Branch	All−Trib to Mill Creek
		Mill Creek	From headwaters to above Boaz
		Miller Branch	All−Trib to Mill Creek
		Pine Valley Creek	All−Trib to Mill Creek
		Ryan Hollow	All−Trib to West Branch Mill Creek
		Wheat Hollow Creek	All
		W. Branch Mill Creek	All
28.	Rock	Bass Creek	All
		East Fork Raccoon Cr.	All
		Little Turtle Creek	All
		Raccoon Creek	All
		Spring Brook	All
		Turtle Creek	All
		Unnamed Creek T2N R14E S31	All
29.	Rusk	Big Weirgor Creek	All−Class III Portion
		Main Creek	Rusk County Highway P to Inlet of Holcombe Flowage
		Soft Maple Creek	SEG 2: Rusk County Highway “F” to Confluence with Chippewa River
30.	Rusk, Taylor & Chippewa	Jump River	From Village of Jump River downstream to Holcombe Flowage
31.	Sauk	Beaver Creek (Trib to Dell Creek)	All
		Camels Creek (Trib to Dell Creek)	All
		Dell Creek	All
31m.	Sawyer	Couderay River	SEG 2: Dam at Grimh Flowage to Confluence with Chippewa River
32.	Shawano	Kroenke Creek	Class II Portion
		Red River	From Lower Red Lake Dam to Wolf River
		West Br. Red River	Class II Portion

33.	Sheboygan	Ben Nutt Creek	Class II Portion to Junction with Mill Creek
34.	St. Croix	Apple River	From NSP plant below CTH I to Mouth
		Cady Creek	All
		Willow River	Extend Class II Portion into Delta in Lake Mallileau
35.	St. Croix & Pierce	St. Croix River	From No. Boundary of Hudson City limits to the river mouth in Pierce Co.
35m.	Taylor & Price	Silver Creek	SEG 2: Westboro Sanitary District Outfall to Confluence with South Fork Jump River
36.	Trempealeau	Buffalo River	From Hwy 53 to Strum Pond
37.	Vernon	Bishop Branch	All
		Cheyenne Valley Creek	All
		Coon Creek	From La Crosse county line to Chaseburg
		Frohock Valley Creek	All
		Hornby Creek	All
		Reads Creek	All
		Tainter Creek	All
38.	Vilas	Manitowish River	From Rest Lake Dam downstream to Iron County line
38m.	Vilas & Oneida	Wisconsin River	SEG 2: State Highway 70 to Inlet at Rainbow Flowage (Oneida County Line)
			SEG 3: Outlet of Rainbow Flowage (Oneida County Highway "D" to Inlet of Rhinelander Flowage (T37N R8E S8 SE¼NE¼)
39.	Washington	E. Branch Milwaukee R.	From Long Lake outlet to STH 28
40.	Waukesha	Genesee Creek	Above STH 59
		Mukwonago River	From Eagle Springs Lake to Upper Phantom Lake
		Oconomowoc River	From below North Lake to Okauchee Lake
41.	Waupaca	Blake Brook & Branches	Class II Portion
		Little Wolf River	From junction with Wolf River upstream to Manawa Dam
		Waupaca River	Class II portion
42.	Waupaca & Shawano	Embarrass River	From Wolf River upstream to dam at Pella
43.	Waushara	Lower Pine River	From below Wild Rose Mill pond to dam at Poy Sippi

(2) The waters identified in sub. (1) may not be lowered in quality except as provided in ch. NR 207.

(3) Surface waters, or portions thereof, may be added to, or deleted from, the exceptional resource waters designation through the rule making process under the provisions of ch. 227, Stats., and s. NR 2.03.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; cr. (1) (c), Register, July, 1989, No. 403, eff. 8−1−89; cr. (1) (d), Register, May, 1993, No. 449, eff. 6−1−93;CR 05−105: renum. (1) (d) 1. to be 1t., cr. 1g., 1r., 15m., 25m., 26c., 26n., 26r., 26w., 31m., 35m., and 38m., am. 29., Register November 2006 No. 611, eff. 12−1−06.

NR 102.12 Great Lakes system. (1) The Great Lakes system includes all the surface waters within the drainage basin of the Great Lakes.

(2) For the purpose of administering ch. NR 207 and consistent with chs. NR 105 and 106, the waters identified in sub. (1) are to be protected from the impacts of persistent, bioaccumulating toxic substances by avoiding or limiting to the maximum extent practicable increases in these substances.

(3) The waters of the Lake Superior basin shall be managed to prevent any new or increased discharges of the following pollutants: DDT, DDE and metabolites, chlordane, toxaphene, hexachlorobenzene, 2,3,7,8 TCDD, octachlorostyrene, mercury and PCB's. For purposes of administering ch. NR 207, new or increased discharges of these pollutants shall be prohibited unless the applicant certifies at time of application, that the new or increased discharge is necessary after utilization of best technology in process or control using waste minimization, pollution prevention, municipal pretreatment programs, material substitution or other means of commercially available technologies which have demonstrated capability for similar applications.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; r. and recr. (1), am. (2), Register, August, 1997, No. 500, eff. 9−1−97; CR 05−089: cr. (3) Register July 2006 No. 607, eff. 8−1−06.

NR 102.13 Fish and aquatic life waters. All surface waters not included in s. NR 102.05 (1) (b) 1., 2., 3. or 5. are fish and aquatic life waters.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89.

NR 102.14 Taste and odor criteria. (1) At certain concentrations, substances may not be toxic to humans, but may impart undesirable taste or odor to water or aquatic organisms ingested by humans. The taste and odor criterion is derived to prevent substances from concentrating in surface waters or accumulating in aquatic organisms to a level which results in undesirable tastes or odors to human consumers.

(2) The taste and odor criterion is derived as follows:

(a) For substances which impart tastes and odors to waters, the taste and odor criterion shall equal that threshold concentration (TC_w) below which objectionable tastes or odors to human con-

sumers do not occur. Threshold concentrations for substances imparting tastes and odors to water are listed in Table 1.

Table 1
Threshold Concentrations (TC_w) for Substances Causing Taste and Odor in Water

Substance	Threshold Concentration (ug/L)1
Acenaphthene	20
Chlorobenzene	20
2−Chlorophenol	0.1
3−Chlorophenol	0.1
4−Chlorophenol	0.1
Copper	1000
2,3−Dichlorophenol	0.04
2,4−Dichlorophenol	0.3
2,5−Dichlorophenol	0.5
2,6−Dichlorophenol	0.2
3,4−Dichlorophenol	0.3
2,4−Dimethylphenol	400
Hexachlorocyclopentadiene	1
2−Methyl−4−Chlorophenol	1800
3−Methyl−4−Chlorophenol	3000
3−Methyl−6−Chlorophenol	20
Nitrobenzene	30
Pentachlorophenol	30
Phenol	300
2,3,4,6−Tetrachlorophenol	1
2,4,5−Trichlorophenol	1
2,4,6−Trichlorophenol	2
Zinc	5000

[1] A threshold concentration expressed in micrograms per liter (ug/L) can be converted to milligrams per liter (mg/L) by dividing the threshold concentration by 1000.

(b) For substances which impart tastes or odors to aquatic organisms, the taste and odor criterion shall be calculated as follows:

$$TOC = \frac{TC^1}{BAF}$$

Where:
- TOC = Taste and odor criterion in milligrams per liter (mg/L).
- TC = Threshold concentration in milligrams of substance per kilogram of wet tissue weight (mg/kg) of the aquatic organism being consumed below which undesirable taste and odor is not detectable to human consumers as derived in par. (d).
- BAF = Aquatic life bioaccumulation factor with units of liter per kilogram (L/kg) as derived in s. NR 105.10.

(c) The lower of the taste and odor criteria derived as specified in pars. (a) and (b) is applicable to surface waters classified as public water supplies. The taste and odor criteria derived as specified in par. (b) are applicable to cold water and warm water sport fish communities.

(d) Threshold concentrations for substances imparting tastes or odors to water (TC_w) other than those listed in Table 1 and threshold concentrations for substances imparting tastes or odors to aquatic organisms (TC_f) shall be selected by the department using its best professional judgment.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; am. (2) (b) and (c), Register, August, 1997, No. 500, eff. 9−1−97.

APPENDIX 4.3.7.1-2 Chapter NR 105 Surface Water Quality Criteria and Secondary Values for Toxic Substances

Chapter NR 105

SURFACE WATER QUALITY CRITERIA AND SECONDARY VALUES FOR TOXIC SUBSTANCES

NR 105.01 Purpose. The purpose of this chapter is to establish water quality criteria, and methods for developing criteria and secondary values for toxic substances to protect public health and welfare, the present and prospective use of all surface waters for public and private water supplies, and the propagation of fish and aquatic life and wildlife. This chapter also establishes how bioaccumulation factors used in deriving water quality criteria and secondary values for toxic and organoleptic substances shall be determined. Water quality criteria are a component of surface water quality standards. This chapter and chs. NR 102 to 104 constitute quality standards for the surface waters of Wisconsin.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89.; am. Register, August, 1997, No. 500, eff. 9−1−97.

NR 105.02 Applicability. The provisions of this chapter are applicable to surface waters of Wisconsin as specified in chs. NR 102 to 104 and in this chapter.

(1) SITE SPECIFIC CRITERIA AND SECONDARY VALUES. A criterion contained within this chapter or a secondary value calculated pursuant to this chapter may be modified for a particular surface water segment or body. A criterion or secondary value may be modified if specific information is provided which shows that the data used to derive the criterion or secondary value do not apply and if additional information is provided to derive a site−specific criterion or secondary value. Site−specific criteria are intended to be applicable to a specific surface water segment. Criteria may be modified for site−specific considerations according to the USEPA "Water Quality Standards Handbook" Second Edition, revised 1994. Any criterion modified for site−specific conditions shall be promulgated in ch. NR 104 before it can be applied on a site−specific basis. Site−specific modifications of criteria and secondary values shall be consistent with the procedures described in 40 CFR Part 132, Appendix F, Procedure 1: Site−specific modifications to criteria and values. 40 CFR Part 132, Appendix F, Procedure 1 as stated on September 1, 1997 is incorporated by reference.

Note: Copies of 40 CFR Part 132 Appendix F, Proc. 1 are available for inspection in the offices of the department of natural resources, secretary of state and the legislative reference bureau, Madison, WI or may be purchased from the superintendent of documents, US government printing office, Washington, D.C. 20402.

(2) STATEWIDE CRITERIA. (a) The department may promulgate a less stringent criterion or remove a criterion from this chapter when the department determines that the previously promulgated criterion is more stringent than necessary, or unnecessary for the protection of humans, fish and other aquatic life or wildlife. The modification shall assure that the designated uses are protected and water quality standards continue to be attained.

(b) The department may promulgate a more stringent criterion in this chapter when the department determines that the previously promulgated criterion is inadequate for the protection of humans, fish and other aquatic life or wildlife.

(3) DETERMINATION OF SECONDARY VALUES FOR EFFLUENT LIMITATIONS. If a discharge contains a toxic substance, and if data to calculate a water quality criterion for that substance are not available, then, on a case−by−case basis, the department may calculate a secondary value as defined in this chapter and establish an effluent limitation for the toxic substance if the conditions contained in s. NR 106.05 (1) (b) are met.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; am. (1) and (2), cr. (3), Register, August, 1997, No. 500, eff. 9−1−97.

NR 105.03 Definitions. (1) "Acute toxicity" means the ability of a substance to cause mortality or an adverse effect in an organism which results from a single or short−term exposure to the substance.

(2) "Acute toxicity criterion" or "ATC" means the maximum daily concentration of a substance which ensures adequate protection of sensitive species of aquatic life from the acute toxicity of that substance and will adequately protect the designated fish and aquatic life use of the surface water if not exceeded more than once every 3 years. If the available data indicate that one or more life stages of a particular species are more sensitive to a substance than other life stages of the same species, the ATC shall represent the acute toxicity of the most sensitive life stage.

(3) "Adequate protection" means a level of protection which ensures survival of a sufficient number of healthy individuals in a population of aquatic species to provide for the continuation of an unreduced population of these species.

(4) "Adverse effect" means any effect resulting in a functional impairment or a pathological lesion, or both, which may affect the performance of the whole organism, or which contributes to a reduced ability to respond to an additional challenge. Adverse effects include toxicant−induced mutagenic, teratogenic, or carcinogenic effects or impaired, developmental, immunological or reproductive effects.

(5) "Baseline BAF" means for organic chemicals, a bioaccumulation factor normalized to 100% lipid that is based on the concentration of a freely dissolved chemical in the ambient water and takes into account the partitioning of the chemical within the organism. For inorganic chemicals, a bioaccumulation factor is based on the wet weight of the tissue.

(6) "Baseline BCF" means for organic chemicals, a bioconcentration factor normalized to 100% lipid that is based on the concentration of freely dissolved chemical in the ambient water and takes into account the partitioning of the chemical within the organism. For inorganic chemicals, a bioconcentration factor is based on the wet weight of the tissue.

(7) "Bioaccumulation" means the net accumulation of a substance by an organism as a result of uptake from all environmental sources.

(8) "Bioaccumulation factor" or "BAF" means the ratio (in L/kg) of a substance's concentration in the tissue of an aquatic organism to its concentration in the ambient water, in situations where both the organism and its food are exposed to the substance and where the ratio does not change substantially over time.

(9) "Bioaccumulative chemical of concern" or "BCC" means any substance that has the potential to cause adverse effects which, upon entering the surface waters, accumulates in aquatic organisms by a human health or wildlife bioaccumulation factor greater than 1000.

(10) "Bioconcentration" means the net accumulation of a substance by an aquatic organism as a result of uptake directly from the ambient water through its gill membranes or other external body surfaces.

(11) "Bioconcentration factor" or "BCF" means the ratio (in L/kg) of a substance's concentration in the tissue of an aquatic organism to its concentration in the ambient water, in situations where the organism is exposed through the water only and where the ratio does not change substantially over time.

(12) "Biota−sediment accumulation factor" or "BSAF" means the ratio (in kg of organic carbon/kg of lipid) of a substance's lipid−normalized concentration in the tissue of an aquatic organism to its organic carbon−normalized concentration in surface sediment, in situations where the ratio does not change substantially over time, both the organism and its food are exposed, and where the surface sediment is representative of the average surface sediment in the vicinity of the organism.

(13) "Carcinogen" means any substance listed in Table 9 or a substance for which the induction of benign or malignant neoplasms has been demonstrated in:

(a) Humans; or

(b) Two mammalian species; or

(c) One mammalian species, independently reproduced; or

(d) One mammalian species, to an unusual degree with respect to increased incidence, shortened latency period, variety of site, tumor type, or decreased age at onset; or

(e) One mammalian species, supported by reproducible positive results in at least 3 different types of short−term tests which are indicative of potential oncogenic activity.

(14) "Chronic toxicity" means the ability of a substance to cause an adverse effect in an organism which results from exposure to the substance for a time period representing that substantial portion of the natural life expectancy of that organism.

(15) "Chronic toxicity criterion" or "CTC" means the maximum 4−day concentration of a substance which ensures adequate protection of sensitive species of aquatic life from the chronic toxicity of that substance and will adequately protect the designated fish and aquatic use of the surface water if not exceeded more than once every 3 years.

(16) "Depuration" means the loss of a substance from an organism as a result of any active or passive process.

(17) "EC_{50}" means a concentration of a toxic substance which causes an adverse effect including mortality in 50% of the exposed organisms in a given time period.

(18) "Food−chain multiplier" or "FCM" means the ratio of a BAF to an appropriate BCF.

(19) "LC_{50}" means a concentration of a toxic substance which is lethal to 50% of the exposed organisms in a given time period.

(20) "LD_{50}" means a dose of a toxic substance which is lethal to 50% of the exposed organisms in a given time period.

(21) "Lipid−soluble substance" means a substance which is soluble in nonpolar organic solvents and which tends to accumulate in the fatty tissues of an organism exposed to the substance.

(22) "Lowest observable adverse effect level" or "LOAEL" means the lowest tested concentration that caused an adverse effect in comparison with a control when all higher test concentrations caused the same effect.

(23) "No observable adverse effect level" or "NOAEL" means the highest tested concentration that did not cause an adverse effect in comparison with a control when no lower test concentration caused an adverse effect.

(24) "Octanol/water partition coefficient" or "K_{OW}" means the ratio of the concentration of a substance in the octanol phase to its concentration in the aqueous phase in an equilibrated 2−phase octanol−water system. For log K_{OW}, the log of the octanol−water partition coefficient is a base 10 logarithm.

(25) "Secondary value" means a temporary value that represents the concentration of a substance which ensures adequate protection of sensitive species of aquatic life, wildlife or human health from the toxicity of that substance and will adequately protect the designated use of the surface water until database requirements are fulfilled to calculate a water quality criterion.

(26) "Steady state" means that an equilibrium condition in the body burden of a substance in an organism has been achieved and is assumed when the rate of depuration of a substance matches its rate of uptake.

(27) "Toxic substance" means a substance or mixture of substances which through sufficient exposure, or ingestion, inhalation or assimilation by an organism, either directly from the environment or indirectly by ingestion through the food chain, will cause death, disease, behavioral or immunological abnormalities, cancer, genetic mutations, or developmental or physiological malfunctions, including malfunctions in reproduction or physical deformations, in such organisms or their offspring.

(28) "Trophic level" means a functional classification of taxa within a community that is based on feeding relationships (e.g., aquatic plants comprise the first trophic level, herbivores comprise the second, small fish comprise the third, predatory fish the fourth, etc.).

(29) "Uptake" means the acquisition of a substance from the environment by an organism as a result of any active or passive process.

(30) "Water quality parameter" means one of the indicators available for describing the distinctive quality of water including, but not limited to, hardness, pH, or temperature.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; renum. (5) to (19) to be (11), (13) to (15), (17), (19) to (24), (26), (27) and (30), cr. (5) to (7), (9), (10), (12), (16), (18), (25), (28) and (29) and am. (8), (11) and (24), Register, August, 1997, No. 500, eff. 9−1−97.

NR 105.04 Determination of adverse effects. **(1)** Substances may not be present in surface waters at concentrations which adversely affect public health or welfare, present or prospective uses of surface waters for public or private water supplies, or the protection or propagation of fish or other aquatic life or wild or domestic animal life.

(2) A substance shall be deemed to have adverse effects on fish or other aquatic life if it exceeds any of the following more than once every 3 years:

(a) The acute toxicity criterion as specified in s. NR 105.05, or

(b) The chronic toxicity criterion as specified in s. NR 105.06.

(c) The acute and chronic toxicity criteria for ammonia nitrogen shall be determined on a case−by−case basis by the department for the appropriate aquatic life use category.

(3) A substance shall be deemed to have adverse effects on wildlife if it exceeds the wildlife criterion as specified in s. NR 105.07.

(4) A substance shall be deemed to have adverse effects on public health and welfare if it exceeds any of the following:

(a) The human threshold criterion as specified in s. NR 105.08; or

(b) The human cancer criterion as specified in s. NR 105.09; or

(c) The taste and odor criterion as specified in s. NR 102.14.

(5) A substance shall be deemed to have adverse effects or the reasonable potential to have adverse effects on aquatic life, wildlife or human health, if it exceeds a secondary value determined according to the procedures in ss. NR 105.05 to 105.08.

(6) The determination of the criteria or secondary values for substances as calculated under ss. NR 105.05 to 105.09 shall be based upon the available scientific data base. References to be used in obtaining scientific data may include, but are not limited to:

(a) "Water Quality Criteria 1972", EPA−R3−73−033, National Academy of Sciences, National Academy of Engineering, United States Government Printing Office, Washington, D.C., 1974.

(b) "Quality Criteria for Water", EPA−440/9−76−003, United States Environmental Protection Agency, Washington, D.C., 1976.

(c) October 1980 and January 1985 U.S. Environmental Protection Agency (EPA) ambient water quality criteria documents.

(d) "Public Health Related Groundwater Standards: Summary of Scientific Support Documentation for NR 140.10", Wisconsin Department of Health and Social Services, Division of Health, September 1985.

(e) "Public Health Related Groundwater Standards − 1986: Summary of Scientific Support Documentation for NR 140.10", Wisconsin Department of Health and Social Services, Division of Health, June 1986.

(f) Health advisories published on March 31, 1987 by EPA, Office of Drinking Water.

(g) Any other reports, documents or information published by EPA or any other federal agency.

(h) Any other reports, documents or information that the department, deems to be reliable.

(7) When reviewing any of the references in sub. (6) to determine the effect of a substance, the department:

(a) Shall use scientific studies on the toxicity of a substance to fish and other aquatic life and wild and domestic animals, indigenous to the state;

(b) May use scientific studies on the toxicity of a substance to fish or other aquatic life, plant, mammalian, avian, and reptilian species not indigenous to the state; and

(c) May consider biomonitoring information to determine the aquatic life toxicity of complex mixtures of toxic substances in addition to the chemical specific criteria specified in this chapter.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; am. (3), renum. (5) and (6) to be (7) and am. (6) (intro.) and (7) (intro.), cr. (5), Register, August, 1997, No. 500, eff. 9−1−97.

NR 105.05 Acute toxicity criteria and secondary acute values for aquatic life. (1) MINIMUM DATABASE FOR ACUTE CRITERION DEVELOPMENT. (a) To derive an acute toxicity criterion for aquatic life, the minimum information required shall be the results of acceptable acute toxicity tests with one or more species of freshwater animal in at least 8 different families provided that of the 8 species:

1. At least one is a salmonid fish in the family Salmonidae in the class Osteichthyes,

2. At least one is a non−salmonid fish from another family in the class Osteichthyes, preferably a commercially or recreationally important warmwater species,

3. At least one is a planktonic crustacean (e.g., cladoceran, copepod),

4. At least one is a benthic crustacean (e.g., ostracod, isopod, amphipod, crayfish),

5. At least one is an insect (e.g., mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge),

6. At least one is a fish or amphibian from a family in the phylum Chordata not already represented in one of the other subdivisions.

7. At least one is an organism from a family in a phylum other than Arthropoda or Chordata (e.g., Rotifera, Annelida, Mollusca), and

8. At least one is an organism from a family in any order of insect or any other phylum not already represented in subds. 1. to 7.

9. If all 8 of the families in subds. 1. to 8. are represented, an acute toxicity criterion may be developed for surface waters classified as cold water using information on all of those families. If an acute toxicity criterion is developed for surface waters classified as cold water, acute toxicity criteria may also be developed for any of the surface water classifications in s. NR 102.04 (3) (b) to (e) using the procedure in sub. (2) or (3) and data on families in subds. 1. to 8. which are representative of the aquatic life communities associated with those classifications. For each substance, in no case may the criterion for a lower quality fish and aquatic life subcategory as defined in s. NR 102.04 be less than the criterion for a higher quality fish and aquatic life subcategory.

10. For a substance, if all of the families in subds. 1. to 8. are not represented, an acute toxicity criterion may not be developed for that substance. Instead, any available data may be used to develop a secondary acute value (SAV) for that substance according to s. NR 105.02 (3) and sub.(4).

(b) The acceptability of acute toxicity test results shall be judged according to the guidelines in section IV of the United States environmental protection agency's 1985 "Guidelines for Deriving National Numerical Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" or 40 CFR Part 132, Appendix A. II, IV and V, as stated on September 1, 1997, is incorporated by reference.

Note: Copies of 40 CFR Part 132, Appendix A Sections II, IV and V are available for inspection in the offices of the department of natural resources, secretary of state and the legislative reference bureau, Madison, WI or may be purchased from the superintendent of documents, US government printing office, Washington, D.C. 20402.

(2) ACUTE TOXICITY CRITERIA FOR SUBSTANCES WITH TOXICITY UNRELATED TO WATER QUALITY PARAMETERS. If the acute toxicity of a substance has not been adequately shown to be related to a water quality parameter (i.e., hardness, pH, temperature, etc.), the acute toxicity criterion (ATC) is calculated using the procedures specified in this subsection.

(a) 1. For each species for which at least one acute value is available, the species mean acute value (SMAV) is calculated as the geometric mean of all acceptable acute toxicity tests using the guidelines in sub. (1) (b).

2. For each genus for which one or more SMAVs are available, the genus mean acute value (GMAV) is calculated as the geometric mean of the SMAVs available for the genus.

(b) The GMAVs are ordered from high to low.

(c) Ranks (R) are assigned to the GMAVs from 1 for the lowest to N for the highest. If 2 or more GMAVs are identical, successive ranks are arbitrarily assigned.

(d) The cumulative probability (P) is calculated for each GMAVs as P=R/(N + 1).

(e) The 4 GMAVs are selected which have P closest to 0.05. If there are less than 59 GMAVs, these will always be the lowest GMAVs.

(f) Using the selected GMAVs and Ps, the ATC is calculated using the following:

1. Let EV = sum of the 4 ln GMAVs,
   EW = sum of the 4 squares of the ln GMAVs,
   EP = sum of the 4 P values,
   EPR = sum of the 4 square roots of P, and
   JR = square root of 0.05.
2. $S = ((EW - (EV)^2/4)/(EP-(EPR)^2/4))^{0.5.}$
3. $L = (EV - S(EPR))/4.$
4. $A = (JR)(S) + L.$
5. Final Acute Value (FAV)= e^A.
6. ATC = FAV/2.

(g) If, for a commercially, recreationally or ecologically important species, the geometric mean of the acute values from flow−through tests in which the concentration of test material was measured is lower than the calculated ATC [FAV], then that geometric mean is used as the ATC [FAV] instead of the calculated one.

(h) Table 1 contains the acute toxicity criteria for fish and aquatic life subcategories listed in s. NR 102.04 (3) that are calculated using the procedures described in this subsection for substances meeting the database requirements indicated in sub. (1) (a).

(3) ACUTE TOXICITY CRITERIA FOR SUBSTANCES WITH TOXICITY RELATED TO WATER QUALITY PARAMETERS. If data are available on a substance to show that acute toxicity to 2 or more species is similarly related to a water quality parameter (i.e., hardness, pH, temperature, etc.), the acute toxicity criterion (ATC) is calculated using the procedures specified in this subsection.

(a) For each species for which acceptable acute toxicity tests using the guidelines in sub. (1) (b) are available at 2 or more different values of the water quality parameter, a least squares regression of the acute toxicity values on the corresponding values of the water quality parameter is performed to obtain the slope of the curve that best describes the relationship. Because the most commonly documented relationship is that between hardness and acute toxicity of metals and a log−log relationship fits these data, geometric means and natural logarithms of both toxicity and water quality are used in the rest of this subsection to illustrate this method. For relationships based on other water quality parameters, no transformation or a different transformation might fit the data better, and appropriate changes shall be made as necessary throughout this subsection.

(b) For each species, the geometric mean of the available acute values (W) is calculated and then each of those acute values is divided by the mean for that species. This normalizes the acute values so that the geometric mean of the normalized values for each species individually and for any combination of species is 1.0.

(c) For each species, the geometric mean of the available corresponding water quality parameter values (X) is calculated and then each of those water quality parameter values is divided by the mean for that species. This normalizes the water quality parameter values so that the geometric mean of the normalized values for each species individually and for any combination of species is 1.0.

(d) A least squares regression of all the normalized acute values on the corresponding normalized values of the water quality parameter is performed to obtain the pooled acute slope (V). If the coefficient of determination, or r value, calculated from that regression is found not to be significant based on a standard F−test at a 0.05 level, then the pooled acute slope shall be set equal to zero.

(e) For each species the logarithmic intercept (Y) is calculated using the equation: $Y = \ln W - V(\ln X)$.

(f) 1. For each species the species mean acute intercept (SMAI) is calculated as e^Y.

2. For each genus for which one or more SMAIs are available, the genus mean acute intercept (GMAI) is calculated as the geometric mean of the SMAIs available for the genus.

(g) The GMAIs are ordered from high to low.

(h) Ranks (R) are assigned to the GMAIs from 1 for the lowest to N for the highest. If 2 or more GMAIs are identical, successive ranks are arbitrarily assigned.

(i) The cumulative probability (P) is calculated for each GMAI as P=R/(N+1).

(j) The 4 GMAIs are selected which have P closest to 0.05. If there are less than 59 GMAIs, these will always be the lowest GMAIs.

(k) Using the selected GMAIs and Ps, the ATC is calculated using the following:

1. Let EV = sum of the 4 ln GMAIs,
   EW = sum of the 4 squares of the ln GMAIs,
   EP = sum of the 4 P values,
   EPR = sum of the 4 square roots of P, and
   JR = square root of 0.05.
2. $S = ((EW - (EV)^2/4) / (EP - (EPR)^2/4))^{0.5}$.
3. $L = (EV - S(EPR))/4$.
4. $A = (JR)(S) + L$.
5. Final Acute Intercept (FAI) = e^A.
6. Acute Criterion Intercept (ACI) = FAI/2.

(L) The acute toxicity equation (ATE) is written as:

$ATC = {}_e(V \ln(\text{water quality parameter}) + \ln ACI)$.

The ATE shall be applicable only over the range of water quality parameters equivalent to the mean plus or minus 2 standard deviations using the entire fresh water acute toxicity data base and the water quality parameter transformation employed in par. (a). If the value at a specific location is outside of that range, the endpoint of the range nearest to that value shall be used to determine the criterion. Additional information may be used to modify those ranges. The final acute value (FAV) equals 2 times the ATC (acute toxicity criterion) calculated using the formula in this paragraph.

(m) If, for a commercially, recreationally or ecologically important species, the SMAI is lower than the calculated ACI, then that SMAI is used as the ACI instead of the calculated one.

(n) Table 2 contains the acute toxicity criteria for the fish and aquatic life subcategories listed in s. NR 102.04 (3) that are calculated using the procedures described in this subsection for substances meeting the database requirements indicated in sub. (1) (a). Table 2A contains the water quality parameter ranges calculated in par. (L).

(4) SECONDARY ACUTE VALUES. If all 8 minimum data requirements for calculating acute toxicity criteria in sub. (1) (a) are not met, secondary acute values (SAVs) shall be determined using the procedure in this subsection.

(a) In order to calculate a SAV, the database shall contain, at a minimum, a genus mean acute value (GMAV) for one of the following 3 genera in the family Daphnidae − *Ceriodaphnia sp.*, *Daphnia sp.*, or *Simocephalus sp.* To calculate a SAV, the lowest GMAV in the database is divided by the Secondary Acute Factor (SAF). The SAF is an adjustment factor corresponding to the number of satisfied minimum data requirements, listed in sub. (1) (a). SAFs are listed in Table 2B.

(b) Whenever appropriate, the effects of variable water quality parameters shall be considered when calculating a SAV, consistent with the procedures described in sub. (3).

(c) Whenever, for a commercially, recreationally or ecologically important species, the SMAV is lower than the calculated SAV, that SMAV shall be used as the SAV instead of the calculated SAV.

(5) ACUTE TOXICITY CRITERIA EXPRESSED IN THE DISSOLVED FORM. Acute water quality criteria may be expressed as a dissolved concentration. The conversion of an acute water quality criterion expressed as a total recoverable concentration, to an acute water quality criterion expressed as a dissolved concentration, the portion of the substance which will pass through a 0.45 um filter, shall be done using the equations in pars. (a) and (b). Substances which may have criteria expressed as a dissolved concentration are listed in par. (a) with corresponding conversion factors.

(a) The conversion of the water quality criterion expressed as total recoverable ($WQC_{Total\ R.}$) to the water quality criterion expressed as dissolved (WQC_D) shall be performed as follows:

$WQC_D = (CF)(WQC_{Total\ R.})$

Where: $WQC_{Total\ R.}$ = Criteria from NR 105, Table 1 or 2.
CF = Conversion factor for total recoverable to dissolved.

Conversion factors are as follows:

Arsenic	1.000
Cadmium	0.850
Chromium (III)	0.316
Chromium (VI)	0.982
Copper	0.960
Lead	0.875
Mercury	0.850
Nickel	0.998
Selenium	0.922
Silver	0.850
Zinc	0.978

(b) The translation of the WQC_D into the water quality criterion which accounts for site−specific conditions (WQC_{TRAN}) shall be performed as follows:

$WQC_{TRAN} = (Translator)(WQC_D)$

Where: Translator (unitless) = $((M_P)(TSS) + M_D)/M_D$

M_P = Particle−bound concentration of the pollutant (ug/g) in receiving water.

M_D = Dissolved concentration of the pollutant in receiving water (ug/L).

TSS = Total Suspended Solids (g/L) concentration in receiving water.

(c) The procedures in pars. (a) and (b) may also be used for the conversion of secondary values from total recoverable to dissolved.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; am. (1) (a) 1. to 5., (1) (b), (2) (a) to (f), (3) (a) and (f) to (L), r. and recr. (1) (a) 6., cr. (1) (a) 7. to 10., (4) and (5), Register, August, 1997, No. 500, eff. 9−1−97; CR 03−050: am. (3) (L) and (m) Register February 2004 No. 578, eff. 3−1−04.

NR 105.06 Chronic toxicity criteria and secondary chronic values for fish and aquatic life. (1) MINIMUM DATABASE FOR CHRONIC CRITERION DEVELOPMENT. (a) To derive a chronic toxicity criterion for aquatic life, the minimum information required shall be results of acceptable chronic toxicity tests with one or more species of freshwater animal in at least 8 different families provided that of the 8 species:

1. At least one is a salmonid fish, in the family Salmonidae in the class Osteichthyes,

2. At least one is a non−salmonid fish, from another family in the class Osteichthyes, preferably a commercially or recreationally important warmwater species,

3. At least one is a planktonic crustacean (e.g., cladoceran, copepod),

4. At least one is a benthic crustacean (e.g., ostracod, isopod, amphipod, crayfish),

5. At least one is an insect (e.g., mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge),

6. At least one is a fish or amphibian from a family in the phylum Chordata not already represented in one of the other subdivisions,

7. At least one is an organism from a family in a phylum other than Arthropoda or Chordata (e.g., Rotifera, Annelida, Mollusca), and

8. At least one is an organism from a family in any order of insect or any other phylum not already represented in subds. 1. to 7.

9. If all 8 of the families in subds. 1. to 8. are represented, a chronic toxicity criterion may be developed for surface waters classified as cold water using information on all of those families. If a chronic toxicity criterion is developed for surface waters classified as cold water, chronic toxicity criteria may also be developed for any of the surface water classifications in s. NR 102.04 (3) (b) to (e) using the procedure in sub. (2) or (3) and data on families in subds. 1. to 8. which are representative of the aquatic life communities associated with those classifications. For each substance, in no case may the criterion for a lower quality fish and aquatic life subcategory as defined in s. NR 102.04 be less than the criterion for a higher quality fish and aquatic life subcategory.

10. For a substance, if all the families in subds. 1. to 8. are not represented, acute−chronic ratios as calculated in sub. (5) may be used to generate the chronic toxicity values necessary to calculate a chronic toxicity criterion.

11. For a substance, if all of the families in subds. 1. to 8. are not represented, a chronic toxicity criterion may not be developed for that substance except as provided in subd. 10. Instead, any available data may be used to develop a secondary acute value (SAV) for that substance according to sub. (4).

(b) The acceptability of chronic toxicity test results shall be judged according to the guidelines in section VI of the United States environmental protection agency's 1985 "Guidelines for Deriving National Numerical Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" or 40 CFR Part 132 Appendix A, sections VI and VII as stated on September 1, 1997, is incorporated by reference.

Note: Copies of 40 CFR Part 132, Appendix A, Sections VI and VII are available for inspection in the offices of the department of natural resources, secretary of state and the legislative reference bureau, Madison, WI or may be purchased from the superintendent of documents, US government printing office, Washington, D.C. 20402.

(2) CALCULATION OF A CHRONIC CONCENTRATION. A chronic concentration is obtained by calculating the geometric mean of the chronic lowest observable adverse effect level and the chronic no observable adverse effect level.

(3) CHRONIC TOXICITY CRITERIA FOR SUBSTANCES WITH TOXICITY UNRELATED TO WATER QUALITY PARAMETERS. If the chronic toxicity of a substance has not been adequately shown to be related to a water quality parameter, i.e., hardness, pH, temperature, etc., the chronic toxicity criterion (CTC) is calculated using the procedures specified in this subsection.

(a) 1. For each species for which at least one chronic value is available, the species mean chronic value (SMCV) is calculated as the geometric mean of all acceptable chronic toxicity tests using the guidelines in sub. (1) (b).

2. For each genus for which one or more SMCVs are available, the genus mean chronic value (GMCV) is calculated as the geometric mean of the SMCVs available for the genus.

(b) The GMCVs are ordered from high to low.

(c) Ranks (R) are assigned to the GMCVs from 1 for the lowest to N for the highest. If 2 or more GMCVs are identical, successive ranks are arbitrarily assigned.

(d) The cumulative probability (P) is calculated for each GMCVs as P=R/(N + 1).

(e) The 4 GMCVs are selected which have P closest to 0.05. If there are less than 59 GMCVs, these will always be the lowest GMCVs.

(f) Using the selected GMCVs and Ps, the final chronic value (FCV) is calculated using the following:

1. Let EV = sum of the 4 ln GMCVs,
EW = sum of the 4 squares of the ln GMCVs,
EP = sum of the 4 P values,
EPR = sum of the 4 square roots of P, and
JR = square root of 0.05.
2. $S = ((EW - (EV)^2/4)/(EP-(EPR)^2/4))^{0.5}$
3. $L = (EV - S(EPR))/4$.
4. $A = (JR)(S) + L$.

5. FCV = e^A.

(g) If, for a commercially, recreationally or ecologically important species, the geometric mean of the chronic values is lower than the calculated FCV then that geometric mean is used as the FCV instead of the calculated one.

(h) The chronic toxicity criterion (CTC) equals the lower of the FCV and the final plant value calculated using the procedure in s. NR 105.11.

(i) Table 3 contains the chronic toxicity criteria for the fish and aquatic life subcategories listed in s. NR 102.04 (3) that are calculated using the procedures described in this subsection for substances meeting the database requirements indicated in sub. (1).

(4) CHRONIC TOXICITY CRITERIA FOR SUBSTANCES WITH TOXICITY RELATED TO WATER QUALITY PARAMETERS. (a) If data are available on a substance to show that chronic toxicity to 2 or more species is similarly related to a water quality parameter (i.e., hardness, pH, temperature, etc.), the chronic toxicity criterion (CTC) is calculated using the procedures specified in this paragraph.

1. For each species for which acceptable chronic toxicity tests using the guidelines in sub. (1) (b) are available at 2 or more different values of the water quality parameter, a least squares regression of the chronic toxicity values on the corresponding values of the water quality parameter is performed to obtain the slope of the curve that best describes the relationship. Because the most commonly documented relationship is that between hardness and the chronic toxicity of metals and a log−log relationship fits these data, geometric means and natural logarithms of both toxicity and water quality are used in the rest of this subsection to illustrate this method. For relationships based on other water quality parameters, no transformation or a different transformation might fit the data better, and appropriate changes shall be made as necessary throughout this subsection.

2. For each species, the geometric mean of the available chronic values (W) is calculated and then each of the chronic values is divided by the mean for that species. This normalizes the chronic values so that the geometric mean of the normalized values for each species individually and for any combination of species is 1.0.

3. For each species, the geometric mean of the available corresponding water quality parameter values (X) is calculated and then each of the water quality parameter values is divided by the mean for that species. This normalizes the water quality parameter values so that the geometric mean of the normalized values for each species individually and for any combination of species is 1.0.

4. A least squares regression of all the normalized chronic values on the corresponding normalized values of the water quality parameter is performed to obtain the pooled chronic slope (V). If the coefficient of determination, or r value, calculated from that regression is found not to be significant based on a standard F−test at a 0.05 level, then the pooled chronic slope shall be set equal to zero.

5. For each species the logarithmic intercept (Y) is calculated using the equation: Y = ln W − V(ln X).

6. a. For each species the species mean chronic intercept (SMCI) is calculated as e^Y.

b. For each genus for which one or more SMCIs are available, the genus mean chronic intercept (GMCI) is calculated as the geometric mean of the SMCIs available for the genus.

7. The GMCIs are ordered from high to low.

8. Ranks (R) are assigned to the GMCIs from 1 for the lowest to N for the highest. If 2 or more GMCIs are identical, successive ranks are arbitrarily assigned.

9. The cumulative probability (P) is calculated for each GMCI as P=R/(N + 1).

10. The 4 GMCIs are selected which have P closest to 0.05. If there are less than 59 GMCIs, these will always be the lowest GMCIs.

11. Using the selected GMCIs and Ps, the final chronic value (FCV) is calculated using the following:

a. Let EV = sum of the 4 ln GMCIs,
EW = sum of the 4 squares of the ln GMCIs,
EP = sum of the 4 P values,
EPR = sum of the 4 square roots of P, and
JR = square root of 0.05.

b. $S = ((EW-(EV)^2/4)/(EP-(EPR)^2/4))^{0.5}$

c. L = (EV − S(EPR))/4.

d. A = (JR)(S) + L.

e. Final Chronic Intercept (FCI) = e^A.

12. The final chronic equation (FCE) is written as:

FCV = $_e$(V ln(water quality parameter) + ln FCI).

The FCE shall be applicable only over the range of water quality parameters equivalent to the mean ± 2 standard deviations using the entire freshwater chronic toxicity data base and the water quality parameter transformation employed in subd. 1. If the value at a specific location is outside of that range, the endpoint of the range nearest to that value shall be used to determine the criterion. Additional information may be used to modify those ranges.

13. If, for a commercially, recreationally or ecologically important species, the SMCI is lower than the calculated FCI, then that SMCI is used as the FCI instead of the calculated one.

(b) At a value of the water quality parameter, the chronic toxicity criterion (CTC) equals the lower of the FCV and the final plant value calculated using the procedure in s. NR 105.11.

(c) Table 4 contains the chronic toxicity criteria for the fish and aquatic life subcategories listed in s. NR 102.04 (3) that are calculated using the procedures described in this subsection for substances meeting the database requirements indicated in sub. (1). Table 4A contains the water quality parameter ranges calculated in par. (a) 1.

(5) ACUTE−CHRONIC RATIOS. (a) The acute−chronic ratio is used to estimate the chronic toxicity of a substance to fish or other aquatic species when the database of sub. (1) (a) is not satisfied.

(b) The acute−chronic ratio for a species equals the acute concentration from data considered under s. NR 105.05 (1) divided by the chronic concentration from data calculated under sub. (1), subject to the following conditions:

1. If the acute toxicity of a substance is related to any water quality parameter, the acute−chronic ratio shall be based on acute and chronic toxicity data obtained from organisms exposed to test water with similar, if not identical, values of those water quality parameters. Preference under this paragraph shall be given to data from acute and chronic tests done by the same author or reference in order to increase the likelihood of comparable test conditions.

2. If the acute and chronic toxicity data indicate that the acute−chronic ratio varies with changes in the values of the water quality parameters, the acute−chronic ratio used at specified values of the water quality parameters shall be based on the ratios at values closest to that specified.

3. If the acute toxicity of a substance is unrelated to water quality parameters, the acute−chronic ratio may be derived from any acute and chronic test on a species regardless of the similarity in values of those parameters. Preference under this paragraph shall be given to data from acute and chronic tests done by the same author or reference to increase the likelihood of comparable test conditions.

(c) A final chronic value shall be calculated for a substance under this subsection only if at least one acute−chronic ratio is available for at least one species of aquatic animal in at least 3 different families, provided that of the 3 species, one is a fish, one is an invertebrate, and the third is a relatively sensitive freshwater

species on an acute toxicity basis. The other 2 may be saltwater species.

(d) The geometric mean acute−chronic ratio is calculated for each species using the available acute−chronic ratios for that species. That mean ratio shall be called the species mean acute−chronic ratio (SMACR).

(e) For a given substance, if the SMACR appears to increase or decrease as the species or genus mean acute values (SMAVs or GMAVs) calculated for that substance using the procedure described in s. NR 105.05 increase, the final acute−chronic ratio (FACR) shall be equal to the geometric mean of the SMACRs for species with SMAVs closest to the final acute value.

(f) For a given substance, if no trend is apparent regarding changes in SMACRs and GMAVs, the FACR shall be equal to the geometric mean of all SMACRs available for that substance.

(g) For a given substance, the final chronic value (FCV) shall be equal to the final acute value (FAV) divided by the final acute−chronic ratio (FACR). The chronic toxicity criterion shall be equal to the lower of the FCV and the final plant value as calculated using the procedure in s. NR 105.11, if available.

(h) Chronic toxicity criteria for the fish and aquatic life subcategories listed in s. NR 102.04 (3) that are calculated using acute−chronic ratios are listed in Table 5 for substances with acute toxicity unrelated to water quality parameters and in Table 6 for substances with acute toxicity related to water quality parameters. Equations listed in Table 6 are applicable over the same range of water quality parameters as contained in Table 2A.

(6) SECONDARY CHRONIC VALUES. If all 8 minimum data requirements for calculating FCVs in sub. (1) (a) are not met for a substance, secondary chronic values (SCVs) shall be calculated for that substance using the procedure in this subsection.

(a) If any one of the combinations of information in subds. 1. to 3. is available, a SCV may be calculated. To calculate a SCV for a substance, the acute value from subds. 1. to 3. is divided by the applicable acute−chronic ratio in the same subdivision.

1. Calculate a FAV using the procedure in s. NR 105.05 (2) and divide it by a secondary acute−chronic ratio (SACR) using the procedure in sub. (7).

2. Calculate a SAV using the procedure in s. NR 105.05 (4) and divide it by a final acute−chronic ratio (FACR) using the procedure in sub. (5).

3. Calculate a SAV using the procedure in s. NR 105.05 (4) and divide it by a SACR using the procedure in sub. (7).

(b) If appropriate, the SCV shall be made a function of a water quality characteristic in a manner similar to that described in sub. (4) (a).

(c) If, for a commercially, recreationally or ecologically important species, the SMCV is lower than the calculated SCV, that SMCV shall be used as the SCV instead of the calculated SCV.

(d) If there is an FPV available using the procedure in s. NR 105.11 which is lower than the calculated SCV, that FPV shall be used as the SCV instead of the calculated SCV.

(7) SECONDARY ACUTE−CHRONIC RATIOS. (a) If a FACR cannot be calculated using the procedure in sub. (5) because SMACRs are not available for a fish, an invertebrate or an acutely sensitive freshwater species, a secondary acute−chronic ratio (SACR) may be calculated using the procedure in this subsection.

(b) The SACR shall be equal to the geometric mean of 3 acute−chronic ratios. Those ratios consist of the SMACRs available for the species in sub. (5) (c). When SMACRs are not available for the species in par. (a), the default acute−chronic ratio to be used is 18. Use of a SACR will result in the calculation of a secondary chronic value.

(8) CHRONIC TOXICITY CRITERIA EXPRESSED IN THE DISSOLVED FORM. Chronic water quality criteria may be expressed as a dissolved concentration. The conversion of a chronic water quality criterion expressed as a total recoverable concentration to a chronic water quality criterion expressed as a dissolved concentration, the portion of the substance which will pass through a 0.45 um filter, shall be done using the equations in pars. (a) and (b). Substances which may have criteria expressed as a dissolved concentration are listed in par. (a) with corresponding conversion factors.

(a) The conversion of the water quality criterion expressed as total recoverable ($WQC_{Total\ R.}$) to the water quality criterion expressed as dissolved (WQC_D) shall be performed as follows:

$$WQC_D = (CF)(WQC_{Total\ R.})$$

Where: $WQC_{Total\ R.}$ = Criteria from NR 105, Table 5 or 6.
CF = Conversion factor for total recoverable to dissolved.

Conversion factors are as follows:

Arsenic	1.000
Cadmium	0.850
Chromium (III)	0.860
Chromium (VI)	0.962
Copper	0.960
Lead	0.792
Nickel	0.997
Selenium	0.922
Zinc	0.986

(b) The translation of the WQC_D into the water quality criterion which accounts for site−specific conditions (WQC_{TRAN}) shall be performed as follows:

$$WQC_{TRAN} = (Translator)(WQC_D)$$

Where: $Translator\ (unitless) = ((M_P)(TSS) + M_D)/M_D$

M_P = Particle−bound concentration of the pollutant (ug/g) in receiving water.

M_D = Dissolved concentration of the pollutant in receiving water (ug/L).

TSS = Total Suspended Solids (g/L) concentration in receiving water.

(c) The procedures in pars. (a) and (b) may also be used for the conversion of secondary values from total recoverable to dissolved.

Table 1
Acute Toxicity Criteria for Substances With Toxicity Unrelated to Water Quality
(in ug/L except where indicated)

Substance	Cold Water	Warm Water Sportfish, Warm Water Forage, and Limited Forage Fish	Limited Aquatic Life
Arsenic (+3)*	339.8	339.8	339.8
Chromium (+6)*	16.02	16.02	16.02
Mercury (+2)*	0.83	0.83	0.83
Cyanide, free	22.4	45.8	45.8
Chloride	757,000	757,000	757,000
Chlorine*	19.03	19.03	19.03
Gamma − BHC	0.96	0.96	0.96
Dieldrin	0.24	0.24	0.24
Endrin	0.086	0.086	0.12
Toxaphene	0.73	0.73	0.73
Chlorpyrifos	0.041	0.041	0.041
Parathion	0.057	0.057	0.057

Note: * − Criterion listed is applicable to the "total recoverable" form except for chlorine which is applicable to the "total residual" form.

Table 2
Acute Toxicity Criteria for Substances With Toxicity Related to Water Quality
(all in ug/L)

Water Quality Parameter: Hardness (in ppm as $CaCO_3$)

$ATC = e^{(V \text{ in hardness}) + \ln ACI)}$

Substance	V	ln ACI	ATC at Various Hardness (ppm) Levels 50	100	200
Total Recoverable Cadmium:					
Cold Water	1.147	−3.8104	1.97	4.36	9.65
Warm Water Sportfish, Warm Water Forage and Limited Forage Fish	1.147	−2.9493	4.65	10.31	22.83
Limited Aquatic Life	1.147	−1.9195	13.03	28.87	63.92
Total Recoverable Chromium (+3):					
All Surface Waters	0.819	3.7256	1022	1803	3181
Total Recoverable Copper:					
All Surface Waters	0.9436	−1.6036	8.07	15.51	29.84
Total Recoverable Lead:					
All Surface Waters	0.9662	0.2226	54.73	106.92	208.90
Total Recoverable Nickel:					
All Surface Waters	0.846	2.255	261	469	843
Total Recoverable Zinc:					
All Surface Waters	0.8745	0.7634	65.66	120.4	220.7

Water Quality Parameter: pH

$ATC = e^{(V(pH) + \ln ACI)}$

Substance	V	ln ACI	6.5	7.8	8.8
Pentachlorophenol:					
All Surface Waters	1.0054	−4.877	5.25	19.40	53.01

Table 2A
Water Quality Parameter Ranges for Substances With Acute Toxicity Related to Water Quality

Substance	Parameter	Applicable Range
Cadmium	Hardness (ppm)	6 − 457
Chromium (+3)	Hardness (ppm)	13 − 301
Copper	Hardness (ppm)	13 − 495
Lead	Hardness (ppm)	12 − 356
Nickel	Hardness (ppm)	13 − 268
Zinc	Hardness (ppm)	12 − 333
Pentachlorophenol	pH (s.u.)	6.6 − 8.8

Table 2B
Secondary Acute Factors

Number of minimum data requirements satisfied	Adjustment factor
1	21.9
2	13.0
3	8.0
4	7.0
5	6.1
6	5.2
7	4.3

Table 2C
Acute Toxicity Criteria for Ammonia With Toxicity Related to Water Quality(all in mg/L)

Cold Water (CW) Categories 1−5 are applicable only to ammonia criteria.[1]

Water Quality Parameter: pH

ATC (in mg/L) = $[A / (1 + 10^{(7.204 - pH)})] + [B /(1 + 10^{(pH - 7.204)})]$

Substance	**A**	**B**	**7.5**	**8.0**	**8.5**
Ammonia (as N) in mg/L:					
CW Category 1 & 4	0.275	39.0	13.28	5.62	2.14
CW Category 2 & 3	0.343	48.7	16.59	7.01	2.67
CW Category 5, Warm Water Sport Fish, Warm Water Forage, and Limited Forage Fish	0.411	58.4	19.89	8.41	3.20
Limited Aquatic Life	0.633	90.0	30.64	12.95	4.93

[1] For ammonia, along with data on all warm water fish species and invertebrates, the cold water criteria are calculated using data on all cold water fish species with the following exceptions:

CW Category 1 = Default category of cold water classification. This category includes all fish. [Note: CW Category 1 is always applicable in Lake Superior, Lake Michigan, and Green Bay north of 44° 32' 30" north latitude.]

CW Category 2 = Inland lakes with populations of cisco, lake trout, brook trout or brown trout, but no other trout or salmonid species. This category excludes data on genus *Onchorhynchus*.

CW Category 3 = Inland lakes with populations of cisco, but no trout or salmonid species. This category excludes data on genera *Onchorhynchus*, *Salmo*, and *Salvelinus*.

CW Category 4 = Inland trout waters with brook, brown, or rainbow trout, but no whitefish or cisco. This category excludes data on genus *Prosopium*.

CW Category 5 = Inland trout waters with brook and brown trout, but no whitefish, cisco, or other trout or salmonid species. This category excludes data on genera *Prosopium* and *Onchorhynchus*.

Table 3
Chronic Toxicity Criteria for Substances With Toxicity Unrelated to Water Quality(all in ug/L)

Substance	Cold Water	Warm Water Sportfish, Warm Water Forage and Limited Forage Fish	Limited Aquatic Life

(Reserved)

Note: This table is reserved for criteria that USEPA has indicated may be available in the near future.

Table 4
Chronic Toxicity Criteria for Substances With Toxicity Related to Water Quality (all in ug/L)

Water Quality Parameter: Hardness (in ppm as $CaCO_3$

$CTC = e^{(V \ln(hardness) + \ln CCI)}$

Substance	V	ln CCI	CTC at Various Hardness (ppm) Levels 50	100	175
Total Recoverable Cadmium:					
All Surface Waters	0.7852	−2.7150	1.43	2.46	3.82

Table 4A
Water Quality Parameter Ranges for Substances With Chronic Toxicity Related to Water Quality

Substance	Parameter	Applicable Range
Cadmium	Hardness (ppm)	18−175

Table 4B
Chronic Toxicity Criteria for Ammonia with Toxicity Related to Water Quality (all in mg/L)

Substance: Ammonia (as N)
Water Quality Parameters: Temperature in degrees Celsius, pH

30−Day CTC:

$CTC = E \times ((0.0676/(1 + 10^{(7.688 - pH)})) + (2.912/(1 + 10^{(pH - 7.688)}))) \times C$

4−Day CTC = 30−Day CTC X 2.5

Cold Water (all periods), Warm Water Sport Fish and Warm Water Forage Fish (periods with Early Life Stages Present):

C = minimum of (2.85) or $(1.45 \times 10^{(0.028 \times (25 - T))})$

T = Temperature in degrees Celsius

$E = 0.854$

Warm Water Sport Fish and Warm Water Forage Fish (periods with Early Life Stages Absent):

$C = (1.45 \times 10^{(0.028 \times (25 - T))})$

T = Maximum of (actual temperature in degrees Celsius) and (7)

$E = 0.854$

Limited Forage Fish (periods with Early Life Stages Present):

C = minimum of (3.09) or $(3.73 \times 10^{(0.028 \times (25 - T))})$

T = temperature in degrees Celsius

$E = 1$

Limited Forage Fish (periods with Early Life Stages Absent):

$C = (3.73 \times 10^{(0.028 \times (25 - T))})$

T = Maximum of (actual temperature in degrees Celsius) and (7)

$E = 1$

Limited Aquatic Life (all periods):

$C = (8.09 \times 10^{(0.028 \times (25 - T))})$

T = temperature in degrees Celsius

$E = 1$

	30−day CTC in mg/L @ pH of:		
	7.5	8.0	8.5
Cold Water, Warm Water Sport Fish (Early Life States Present), and Warm Water Forage Fish (Early Life Stages Present):			
@ 25 degrees Celsius	2.22	1.24	0.55
@ 14.5 degrees Celsius or less	4.36	2.43	1.09
Warm Water Sport Fish (Early Life Stages Present), and Warm Water Forage Fish (Early Life Stages Absent):			
@ 25 degrees Celsius	2.22	1.24	0.55
@ 7 degrees Celsius or less	7.09	3.95	1.77
Limited Forage Fish (Early Life Stages Present):			
@ 27 degrees Celsius or less	5.54	3.09	1.38
Limited Forage Fish (Early Life Stages Absent):			
@ 25 degrees Celsius	6.69	3.73	1.67
@ 7 degrees Celsius or less	21.34	11.90	5.33
Limited Aquatic Life:			
@ 25 degrees Celsius	14.50	8.09	3.62
@ 7 degrees Celsius or less	46.29	25.82	11.56

Note: The terms “early life stage present” and “early life stage absent” are defined in subch. III of ch. NR 106.

Table 5

Chronic Toxicity Criteria Using Acute−Chronic Ratios for Substances with Toxicity Unrelated to Water Quality (all in ug/L)

Substance	Cold Water	Warm Water Sportfish and Warm Water Forage	Limited Forage Fish and Limited Aquatic Life
Arsenic (+3)*	148	152.2	152.2
Chromium (+6)*	10.98	10.98	10.98
Mercury (+2)*	0.44	0.44	0.44
Cyanide, free	5.22	11.47	11.47
Chloride	395,000	395,000	395,000
Selenium	5.0	5.0	46.5
Chlorine[1]	7.28	7.28	7.28
Dieldrin	0.055	0.077	0.077
Endrin	0.036	0.050	0.050
Parathion	0.011	0.011	0.011

Note: [1]Criterion listed is applicable to the "total recoverable" form except for chlorine which is applicable to the "total residual" form.

Table 6

Chronic Toxicity Criteria Using Acute−Chronic Ratios for Substances With Toxicity Related to Water Quality (all in ug/L)

Water Quality Parameter: Hardness (in ppm as $CaCO_3$)

$CTC=e^{(V \ln(hardness) + \ln CCI)}$

Substance	V	ln CCI	CTC at Various Hardness (ppm) Levels 50	100	200
Total Recoverable Chromium (+3):					
Cold Water	0.819	0.6851	48.86	86.21	152.1
Warm Water Sportfish	0.819	1.112	74.88	132.1	233.1
All others	0.819	1.112	74.88	132.1	233.1
Total Recoverable Copper:					
All Surface Waters	0.8557	−1.6036	5.72	10.35	18.73
Total Recoverable Lead:					
All Surface Waters	0.9662	−1.1171	14.33	28.01	54.71
Total Recoverable Nickel:					
Cold Water, Warm Water Sportfish, Warm Water Forage, and Limited Forage Fish	0.846	0.059	29.0	52.2	93.8
Limited Aquatic Life	0.846	0.4004	40.8	73.4	132.0
Total Recoverable Zinc					
All Surface Waters	0.8745	0.7634	65.66	120.4	220.7

Water Quality Parameter: pH

$CTC=e^{(V(pH) + \ln CCI)}$

Substance	V	ln CCI	CTC at Various pH (s.u.) Levels 6.5	7.8	8.8
Pentachlorophenol:					
Cold Water	1.0054	−5.1468	4.43	14.81	40.48
All Other Surface Waters	1.0054	−4.9617	5.33	17.82	48.70

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; am. (5) (f) and Tables 2, 2a, 4, 4a and 6, Register, July, 1995, No. 475, eff. 8−1−95; am. (1) (a) 1., 2., 4., and 5., (1) (b), (3) (intro.), (a) to (g), (4) (a) 1., 7. to 13., (5) (c), renum. (1) (a) 6. to be (1) (a) 10. , (3) (h) to be (3) (i) and am. (1) (a) 10, (4) (a) 6. to be (4) (a) 6. a., (4) (b) to be (4) (c), (5) (e) to (i) to be (5) (d) to (h) and am. (5) (e) to (g), cr. (3) (h), (4) (a) 6. b., (4) (b), (5) (b) 3., (6) to (8), r. and recr., Tables 1 to 2a, 3 to 6, r. (5) (d)**;** am. Tables 1 and 5, Register, January, 2000, No. 529, eff. 2−1−00**;** CR 03−050: am. Tables 2 and 6, cr. Tables 2C and 4B Register February 2004 No. 578, eff. 3−1−04; **CR 07−110: am Tables 2, 2A, 5 and 6 Register November 2008 No. 635, eff. 12−1−08**.

NR 105.07 Wildlife criteria. (1) The wildlife criterion is the concentration of a substance which if not exceeded protects Wisconsin's wildlife from adverse effects resulting from ingestion of surface waters of the state and from ingestion of aquatic organisms taken from surface waters of the state.

(a) For any substance not shown in Table 7, the wildlife criterion (WC) is the lower of the available mammalian or avian wildlife values (WVs) calculated pursuant to sub. (2). A wildlife criterion protective of Wisconsin's reptile fauna may be calculated pursuant to sub. (2) whenever data specific to reptiles are available.

(b) Table 7 contains the wildlife criteria calculated according to the procedures of this chapter.

Table 7
Wildlife Criteria

Substance	Criteria (in ng/L, except where indicated)
DDT & Metabolites	0.011
Mercury	1.3
Polychlorinated Biphenyls	0.12
2,3,7,8 − TCDD	0.003 (pg/L)

(2) (a) Mammalian and avian wildlife values shall be calculated as follows using information available from scientifically acceptable studies of animal species exposed repeatedly to the substance via oral routes including gavage:

$$WV = \frac{NOAEL \times Wt_A \times SSF}{W + \Sigma[F_{TLi} \times BAF_{TLi}]}$$

Where:
- WV= Wildlife value in milligrams per liter (mg/L).
- NOAEL= No observed adverse effect level in milligrams of substance per kilogram of body weight per day (mg/kg−d) as derived from subchronic or chronic mammalian or avian studies or as specified in subs. (3) to (5).
- Wt= Average weight in kilograms (kg) of the representative species.
- W= Average daily volume of water in liters consumed per day (L/d) by the representative species or as specified in sub. (6).
- SSF= Species sensitivity factor, ranging between 0.01 and 1 to account for interspecies differences in sensitivity.
- F_{TLJ}= Average daily amount of food consumed from trophic level i by the representative species in kilograms per day (kg/d) or as specified in sub. (6).
- BAF_{TLJ}= Bioaccumulation factor for wildlife food in trophic level i with units of liter per kilogram (L/kg) as derived in s. NR 105.10. For consumption of piscivorous birds by other birds (e.g., herring gull by eagles), the BAF is derived by multiplying the trophic level 3 BAF for fish by a biomagnification factor to account for the biomagnification from fish to the consumed birds.

(b) The selection of the species sensitivity factor (SSF) shall be based on the available toxicological data base and available physicochemical and toxicokinetic properties of the substance and the amount and quality of available data.

(c) The bald eagle, kingfisher, herring gull, mink and otter are representative of avian and mammalian species to be protected by wildlife criteria. A NOAEL specific to each taxonomic class is used to calculate WVs for each of the 5 representative species. The avian WV is the geometric mean of the WVs calculated for the 3 representative avian species. The mammalian WV is the geometric mean of the WVs calculated for the 2 representative mammalian species.

(d) In those cases in which more than one NOAEL is available, the following shall apply:

1. If more than one NOAEL is available within a taxonomic class, based on the same endpoint of toxicity, the NOAEL from the most sensitive species shall be used.

2. If more than one NOAEL is available for a given species, based on the same enpoint of toxicity, the NOAEL for that species shall be calculated using the geometric mean of those NOAELs.

(e) Because wildlife consume fish from both trophic levels 3 and 4, baseline BAFs shall be available for both trophic levels 3 and 4 to calculate either a criterion or secondary value for a chemical. When appropriate, ingestion through consumption of invertebrates, plants, mammals and birds in the diet of wildlife species to be protected shall be included.

(3) In those cases in which a no observed adverse effect level (NOAEL) is available from studies of mammalian or avian species exposed repeatedly to the substance via oral routes including gavage, but is available in units other than mg/kg−d as specified in sub. (2), the following procedures shall be used to express the NOAEL prior to calculating the wildlife value:

(a) If the NOAEL is given in milligrams of toxicant per liter of water consumed (mg/L), the NOAEL shall be multiplied by the daily average volume of water consumed by the test animals in liters per day (L/d) and divided by the average weight of the test animals in kilograms (kg).

(b) If the NOAEL is given in milligrams of toxicant per kilogram of food consumed (mg/kg), the NOAEL shall be multiplied by the average amount of food in kilograms consumed daily by the test animals (kg/d) and divided by the average weight of the test animals in kilograms (kg).

(4) In those cases in which a NOAEL is unavailable and a lowest observed adverse effect level (LOAEL) is available from studies of animal species exposed repeatedly to the substance via oral routes including gavage, the LOAEL may be substituted with proper adjustment to estimate the NOAEL. An uncertainty factor of between one and 10 may be applied to the LOAEL, depending on the sensitivity of the adverse effect, to reduce the LOAEL into the range of a NOAEL. If the LOAEL is available in units other than mg/kg−d, the LOAEL shall be expressed in the same manner as that specified for the NOAEL in sub. (3).

(5) In instances where a NOAEL is based on subchronic data, an uncertainty factor may be applied to extrapolate from subchronic to chronic levels. The value of the uncertainty factor may not be less than 0.1 and may not exceed 1.0. This factor is to be used when assessing highly bioaccumulative substances where toxicokinetic considerations suggest that a bioassay of limited length underestimates chronic effects.

(6) If drinking or feeding rates are not available for representative species, drinking (W) and feeding rates (F_{TLi}) shall be calculated for representative mammalian or avian species by using the allometric equations given in pars. (a) and (b).

(a) For mammalian species the allometric equations are as follows:

1. $F_{TLi}=0.0687 \times (Wt)^{0.82}$

Where: F_{TLi} = Feeding rate of mammalian species in kilograms per day (kg/d).

Wt = Average weight in kilograms (kg) of the test animals.

2. $W=0.099 \times (Wt)^{0.90}$

Where: W = Drinking rate of mammalian species in liters per day (L/d).

Wt = Average weight in kilograms (kg) of the test animals.

(b) For avian species the allometric equations are as follows:

1. $F_{TLi} = 0.0582\ (Wt)^{0.65}$

Where: F_{TLi} = Feeding rate of avian species in kilograms per day (kg/d).

Wt = Average weight in kilograms (kg) of the test animals.

2. $W= 0.059 \times (Wt)^{0.67}$

Where: W = Drinking rate of avian species in liters per day (L/d).

Wt = Average weight in kilograms (kg) of the test animals.

Note: Criteria to protect domestic animals will be considered on an as needed basis using a model that accounts for domestic animal exposure through drinking water. Because domestic animals do not regularly consume aquatic organisms, the wildlife exposure model is not appropriate.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; am. table 7, Register, July, 1991, No. 427, eff. 8−1−91; am. (1), (2) (a), (b), (3) (intro.), (6) (intro.), r. and recr. (2) (c), (5), cr. (2) (d), (e), r. (6) (a), renum. (6) (b) and (c) to be (6) (a) and (b) and am., Register, August, 1997, No. 500, eff. 9−1−97.

NR 105.08 Human threshold criteria. (1) The human threshold criterion (HTC) is the maximum concentration of a substance established to protect humans from adverse effects resulting from contact with or ingestion of surface waters of the state and from ingestion of aquatic organisms taken from surface waters of the state. Human threshold criteria are derived for those toxic substances for which a threshold dosage or concentration can be estimated below which no adverse effect or response is likely to occur.

(2) For noncarcinogenic components of mixtures in effluents, interactions among substances may be additive, antagonistic or synergistic and may be accounted for by a model that is supported by credible scientific evidence. The risks are assumed to be additive when substances are members of the same structural class and cause potential adverse effects via the same mechanism of action, influencing the same kind of endpoint, and shall be accounted for by a model that is supported by credible scientific evidence.

(3) Human threshold criteria are listed in Table 8. Criteria for the same substance may be different depending on the surface water classification, due to the lipid value of representative fish, a component of the BAF, and whether or not the water may be a source of drinking water. Further application of these criteria to protect drinking water and downstream uses in the Great Lakes system shall be according to s. NR 106.06 (1)

(4) To derive human threshold criteria for substances not included in Table 8 the following methods shall be used:

(a) The human threshold criterion shall be calculated as follows:

$$HTC = \frac{ADE \times 70\ kg \times RSC}{W_H + (F_H \times BAF)}$$

Where: HTC = Human threshold criterion in milligrams per liter (mg/L).

ADE = Acceptable daily exposure in milligrams toxicant per kilogram body weight per day (mg/kg−d) as specified in sub. (5).

70 kg = Average weight of an adult male in kilograms (kg).

RSC = Relative source contribution factor used to account for routes of exposure other than consumption of contaminated water and aquatic organisms. In the absence of sufficient data on alternate sources of exposure, including but not limited to non−fish diet and inhalation, the relative source contribution factor shall be set equal to 0.8.

W_H = Average per capita daily water consumption of 2 liters per day (L/d) for surface waters classified as public water supplies or, for all other surface waters, 0.01 liters per day (L/d) for exposure through body contact or ingestion of small volumes of water during swimming or other recreational activities.

F_H = Average per capita daily consumption of sport−caught fish by Wisconsin anglers equal to 0.02 kilograms per day (kg/d).

BAF = Aquatic organism bioaccumulation factor with units of liter per kilogram (L/kg) as derived in s. NR 105.10.

Table 8
Human Threshold Criteria
(ug/L unless specified otherwise)

		Public Water Supply		Non−Public Water Supply		
	Substance	Warm Water Sport Fish Communities	Cold Water[4] Communities	Warm Water Forage, Limited Forage, and Warm Water Sport Fish Communities	Cold Water Communities	Limited Aquatic Life
1.	Acrolein	7.2	3.4	15	4.4	2,800
2.	Antimony[2]	5.6	5.6	373	373	1,120
3.	Benzene[2]	5	5	610	260	4,000
4.	Bis(2−chloroisopropyl) ether	1,100	1,100	55,000	34,000	220,000
5.	Cadmium[2]	4.4	4.4	370	370	880
6.	*Chlordane (ng/L)	2.4	0.70	2.4	0.70	310,000
7.	Chlorobenzene[2]	100	100	1,210	400	28,000
8.	Chromium, total[2]	100	100			
9.	Chromium (+3)	41,750	41,750	3,818,000	3,818,000	8,400,000
10.	Chromium (+6)	83.5	83.5	7,636	7,636	16,800
11.	Cyanide, Total[2]	138.6	138.6	9,300	9,300	28,000
12.	*4.4'−DDT (ng/L)	3.0	0.88	3.0	0.88	2800000
13.	1,2−Dichlorobenzene[2]	446	273	1,509	481	126,000
14.	1,3−Dichlorobenzene	1,400	710	3,300	1,000	500,000
15.	cis−1,2−Dichloroethene[2]	70	70	14,000	9,000	56,000
16.	trans−1,2−Dichloroethene[2]	100	100	24,000	13,000	110,000
17.	Dichloromethane[2] (methylene chloride)	5	5	95,000	72,000	328,000
18.	2,4−Dichlorophenol	74	58	580	180	17,000
19.	Dichloropropenes[3] (1,3−Dichloropropene)	8.3	8.2	420	260	1,700
20.	*Dieldrin (ng/L)	0.59	0.17	0.59	0.17	280,000
21.	2,4−Dimethylphenol	450	430	11,000	4,500	94,000
22.	Diethyl phthalate[2]	5,000	5,000	68,000	21,000	4,500,000
23.	Dimethyl phthalate (mg/L)	241	184	1,680	530	56,000
24.	4,6−Dinitro−o−cresol	100	96	1,800	640	22,000
25.	Dinitrophenols[3] (2,4−Dinitrophenol)	55	55	2,800	1,800	11,000
26.	2,4−Dinitrotoluene	0.51	0.48	13	5.3	110
27.	Endosulfan	87	41	181	54	33,600
28.	Ethylbenzene[2]	567	401	2,920	931	140,000
29.	Fluoranthene	890	610	4,300	1,300	220,000
30.	*Hexachlorobenzene	0.075	0.022	0.075	0.022	4,500
31.	Hexachlorocyclopentadiene	34.7	25.6	195	65.3	8,400
32.	Hexachloroethane	8.7	3.3	13	3.7	5,600
33.	*gamma−BHC (lindane)	0.20	0.20	0.84	0.25	1,900
34.	Isophorone	5,500	5,300	180,000	80,000	1,100,000
35.	Lead	10	10	140	140	2,240
36.	*Mercury[5]	0.0015	0.0015	0.0015	0.0015	336
37.	Nickel[2]	100	100	43,000	43,000	110,000
38.	*Pentachlorobenzene	0.46	0.14	0.47	0.14	4,500
39.	Selenium[2]	50	50	2,600	2,600	28,000
40.	Silver	140	140	28,000	28,000	28,000
41.	*2,3,7,8−TCDD (pg/L)	0.11	0.032	0.11	0.032	7,300
42.	*1,2,4,5−Tetrachlorobenzene	0.54	0.17	0.58	0.17	1,700
43.	Tetrachloroethene	5.8	4.6	46	15	1,300
44.	Toluene[2]	1,000	1,000	15,359	5,201	280,000
45.	1,1,1−Trichloroethane[2]	200	200	270,000	110,000	2,000,000
46.	2,4,5−Trichlorophenol	1,600	830	3,900	1,200	560,000

* Indicates substances that are BCCs.

[1] A human threshold criterion expressed in micrograms per liter (ug/L) can be converted to milligrams per liter (mg/L) by dividing the criterion by 1000.

[2] For this substance the human threshold criteria for public water supply receiving water classifications equal the maximum contaminant level pursuant to s. NR 105.08 (4) (b).

[3] The human threshold criteria for this chemical class are applicable to each isomer.

4 For BCCs, these criteria apply to all water of the Great Lakes system.

[5] The mercury criteria were calculated using 20 g/day fish consumption and the human non−cancer criteria derivation procedure in 40 CFR Part 132, Appendix C. For these criteria, 40 CFR Part 132, Appendix C as stated on September 1, 1997 is incorporated by reference.

(b) For surface waters classified as public water supplies, if the human threshold criterion for a toxic substance as calculated in par. (a) exceeds the maximum contaminant level (MCL) for that substance as specified in ch. NR 809 or the July 8, 1987 Federal Register (52 FR 25690), the MCL shall be used as the human threshold criterion.

(5) The acceptable daily exposure (ADE) referenced in sub. (4) represents the maximum amount of a substance which if ingested daily for a lifetime results in no adverse effects to humans. Paragraphs (a) to (c) list methods for determining the acceptable daily exposure.

(a) The department shall review available references for acceptable daily exposure or equivalent values, such as a reference dose (RfD) as used by the U.S. environmental protection agency, and for human or animal toxicological data from which an acceptable daily exposure can be derived. Suitable references for review include, but are not limited to, those presented in s. NR 105.04 (5).

(b) When human or animal toxicological data are available, the department may derive an acceptable daily exposure by using as guidance procedures presented by the U.S. environmental protection agency in "Water Quality Criteria Documents; Availability" (45 FR 79318, November 28, 1986). Additional guidance for deriving acceptable daily exposures from toxicological data are given in subds. 1. to 4. Alternate procedures may be used if supported by credible scientific evidence.

1. No observable adverse effect levels (NOAELs) and lowest observable adverse effect levels (LOAELs) from studies of humans or mammalian test species shall be divided by an uncertainty factor to derive an acceptable daily exposure. Uncertainty factors reflect uncertainties in predicting acceptable exposure levels for the general human population based upon experimental animal data or limited human data. Factors to be considered when selecting an uncertainty factor include, but are not limited to, interspecies and individual variations in response and susceptibility to a toxicant, and the quality and quantity of the available data. The following guidelines shall be considered when selecting an uncertainty factor:

a. Use an uncertainty factor of 10 when extrapolating from valid experimental results from studies on prolonged ingestion by humans. This 10−fold factor protects sensitive members of the human population.

b. Use an uncertainty factor of 100 when extrapolating from valid results of long−term feeding studies on experimental animals with results of studies of human ingestion not available or insufficient (e.g., acute exposure only). This represents an additional 10−fold uncertainty factor in extrapolating data from the average animal to the average human.

c. Use an uncertainty factor of 1000 when extrapolating from less than chronic results on experimental animals with no useful long−term or acute human data. This represents an additional 10−fold uncertainty factor in extrapolating from less than chronic to chronic exposures.

d. Use an additional uncertainty factor of between 1 and 10 depending on the severity of the adverse effect when deriving an acceptable daily exposure from a lowest observable adverse effect level (LOAEL). This uncertainty factor reduces the LOAEL into the range of a no observable adverse effect level (NOAEL).

e. Use an additional uncertainty factor of 10 when deriving an acceptable daily exposure for a substance which the U.S. environmental protection agency classifies as a "group C" carcinogen, but which is not defined as a carcinogen in s. NR 105.03 (13).

2. Results from studies of humans or mammalian test species used to derive acceptable daily exposures shall have units of milligrams of toxicant per kilogram of body weight per day (mg/kg−d). When converting study results to the required units, a water consumption of 2 liters per day (L/d) and a body weight of 70 kilograms (kg) is assumed for humans. The following examples and procedures illustrate the conversion of units:

a. Results from human studies which are expressed in milligrams of toxicant per liter of water consumed (mg/L) are converted to mg/kg−d by multiplying the results by 2 L/d and dividing by 70 kg.

b. Results from animal studies which are expressed in milligrams of toxicant per liter of water consumed (mg/L) are converted to mg/kg−d by multiplying the results by the daily average volume of water consumed by the test animals in liters per day (L/d) and dividing by the average weight of the test animals in kilograms (kg).

c. Results from animal studies which are expressed in milligrams of toxicant per kilogram of food consumed (mg/kg) are converted to mg/kg−d by multiplying the results by the average amount of food consumed daily by the test animals in kilograms per day (kg/d) and dividing by the average weight of the test animals in kilograms (kg).

d. If a study does not specify water or food consumption rates, or body weight of the test animals, standard values taken from appropriate references, such as the National Institute of Occupational Safety and Health, 1980, Registry of Toxic Effects of Chemical Substances, may be used to convert units.

e. Results from animal studies in which test animals were not exposed to the toxicant each day of the test period shall be multiplied by the ratio of days that the test animals were dosed to the total days of the test period. For the purposes of this adjustment, the test period is defined as the interval beginning with the administration of the first dose and ending with the administration of the last dose, inclusive.

3. When assessing the acceptability and quality of human or animal toxicological data from which an acceptable daily exposure can be derived, the department may use the following documents as guidance:

a. "Guidelines for Mutagenicity Risk Assessment", (51 FR 34006, September 24, 1986).

b. "Guidelines for the Health Risk Assessment of Chemical Mixtures", (51 FR 34014, September 24, 1986).

c. "Guidelines for the Health Assessment of Suspect Development Toxicants", (51 FR 34028, September 24, 1986).

d. "Guidelines for Exposure Assessment", (51 FR 34042, September 24, 1986).

e. Any other documents that the department deems reliable.

4. When the available human or animal toxicological data contains conflicting information, the department may consult with experts outside of the department for guidance in the selection of the appropriate data.

(c) Using sound scientific judgment, the department shall select an acceptable daily exposure as derived in pars. (a) and (b) for calculation of the human threshold criterion. When selecting an acceptable daily exposure, the department shall adhere to the following guidelines unless a more appropriate procedure is supported by credible scientific evidence:

1. Acceptable daily exposures based on human studies are given preference to those based on animal studies.

2. When deriving an acceptable daily exposure from animal studies preference is given to chronic studies involving oral routes of exposure, including gavage, over a significant portion of the animals' life span. If acceptable studies using oral exposure routes are not available, acceptable daily exposures derived from studies using alternate exposure routes, such as inhalation, may be used.

3. When 2 or more acceptable daily exposure values are available and have been derived from studies having equal preference as defined in subds. 1. and 2., the lowest acceptable daily exposure is generally selected. If the acceptable daily exposure values differ significantly, the department may consult with experts outside of the department for guidance in the selection of the more appropriate acceptable daily exposure.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; correction in (3) (b) made under s. 13.93 (2m) (b) 7., Stats., Register, September, 1995, No. 477; renum. (2) to (4) to be (3) to (5) and am., cr. (2), r. and recr. Table 8, am. (5) (intro.), 1. (intro.),

d., e., 2 (intro.) and (c) and am., Register, August, 1997, No. 500, eff. 9−1−97; CR 03−050: am. Table 8 Register February 2004 No. 578, eff. 3−1−04; **CR 07−110: am. Table 8 Register November 2008 No. 635, eff. 12−1−08**.

NR 105.09 Human cancer criteria. (1) The human cancer criterion (HCC) is the maximum concentration of a substance or mixture of substances established to protect humans from an unreasonable incremental risk of cancer resulting from contact with or ingestion of surface waters of the state and from ingestion of aquatic organisms taken from surface waters of the state. Human cancer criteria are derived for those toxic substances which are carcinogens as defined in s. NR 105.03 (13).

(2) For any single carcinogen or any mixture of carcinogens the incremental cancer risk from exposure to surface waters and aquatic organisms taken from surface waters may not exceed one in 100,000. The combined cancer risk of individual carcinogens in a mixture is assumed to be additive unless an alternate model is supported by credible scientific evidence.

(3) Human cancer criteria are listed in Table 9. Criteria for the same substance may be different depending on the surface water classification, due to the lipid value of representative fish, a component of the BAF, and whether or not the water may be a source of drinking water. Further application of these criteria to protect drinking water and downstream uses in the Great Lakes system shall be according to s. NR 106.06 (1).

Table 9
Human Cancer Criteria
(ug/L unless specified otherwise[1])

		Public Water Supply		Non−Public Water Supply		
	Substance	Warm Water Sport Fish Communities	Cold Water[4] Communities	Warm Water Forage, Limited Forage, and Warm Water Sport Fish Communities	Cold Water Communities	Limited Aquatic Life
1.	Acrylonitrile	0.57	0.45	4.6	1.5	130
2.	Arsenic[2]	0.2	0.2	13.3	13.3	40
3.	*alpha−BHC	0.012	0.0037	0.013	0.0039	11
4.	*gamma−BHC (lindane)	0.052	0.018	0.064	0.019	54
5.	*BHC, technical grade	0.038	0.013	0.047	0.014	39
6.	Benzene[2]	5	5	140	45	1300
7.	Benzidine (ng/L)	1.5	1.5	81	55	300
8.	Beryllium	0.054	0.054	0.33	0.33	16
9.	Bis(2−chloroethyl) ether	0.31	0.29	7.6	3.0	64
10.	Bis(chloromethyl) ether (ng/L)	1.6	1.6	96	79	320
11.	Carbon tetrachloride	2.5	2.1	29	9.5	540
12.	*Chlordane (ng/L)	0.41	0.12	0.41	0.12	54000
13.	Chloroethene (vinyl chloride)	0.18	0.18	10	6.8	37
14.	Chloroform (trichloromethane)	55	53	1960	922	11200
15.	*4,4'−DDT (ng/L)	0.22	0.065	0.22	0.065	206000
16.	1,4−Dichlorobenzene	14	12	163	54	2940
17.	3,3'−Dichlorobenzidine	0.5	0.3	1.3	0.4	140
18.	1,3−Dichloropropene	3.4	3.4	173	108	700
19.	1,2−Dichloroethane	3.8	3.8	217	159	770
20.	Dichloromethane[2] (methylene chloride)	5	5	2700	2100	9600
21.	*Dieldrin (ng/L)	0.0091	0.0027	0.0091	0.0027	4400
22.	2,4−Dinitrotoluene	0.51	0.48	13	5.3	110
23.	1,2−Diphenylhydrazine	0.38	0.31	3.3	1.04	88
24.	Halomethanes[3]	55	53	1960	922	11200
25.	*Hexachlorobenzene (ng/L)	0.73	0.22	0.73	0.22	44000
26.	*Hexachlorobutadiene	0.59	0.19	0.69	0.2	910
27.	Hexachloroethane	7.7	2.9	11	3.3	5000
28.	N−Nitrosodiethylamine (ng/L)	2.3	2.3	150	140	460
29.	N−Nitrosodimethylamine	0.0068	0.0068	0.46	0.46	1.4
30.	N−Nitrosodi−n−butylamine	0.063	0.062	2.5	1.3	13
31.	N−Nitrosodiphenylamine	44	23	116	34	13000
32.	N−Nitrosopyrrolidine	0.17	0.17	11	11	34
33.	*Polychlorinated biphenyls (ng/L)	0.01	0.003	0.01	0.003	9100
34.	*2,3,7,8−Tetrachlorodibenzo−p−dioxin (pg/L)	0.014	0.0041	0.014	0.0041	930
35.	1,1,2,2−Tetrachloroethane	1.7	1.6	52	22	350
36.	Tetrachloroethene	5.8	4.6	46	15	1300
37.	*Toxaphene (ng/L)	0.11	0.034	0.14	0.034	63600
38.	1,1,2−Trichloroethane[2]	6.0	6.0	195	87	1200
39.	Trichloroethene[2]	5	5	539	194	6400
40.	2,4,6−Trichlorophenol	29	24	300	97	6400

* Indicates substances that are BCCs.

[1] A human cancer criterion expressed in micrograms per liter (ug/L), nanograms per liter (ng/L) or picograms per liter (pg/L) can be converted to milligrams per liter (mg/L) by dividing the criterion by 1000, 1,000,000 or 1,000,000,000, respectively.

[2] For this substance the human cancer criteria for public water supply receiving water classifications equal the maximum contaminant level pursuant to s. NR 105.09 (4) (b).

[3] Human cancer criteria for halomethanes are applicable to any combination of the following chemicals: bromomethane (methyl bromide), chloromethane (methyl chloride), tribromomethane (bromoform), bromodichloromethane (dichloromethyl bromide), dichlorodifluoromethane (fluorocarbon 12) and trichlorofluoromethane (fluorocarbon 11).

[4] For BCCs, these criteria apply to all waters of the Great Lakes system.

(4) To derive human cancer criteria for substances not included in Table 9 the following methods shall be used:

(a) The human cancer criterion shall be calculated as follows:

$$HCC = \frac{RAD \times 70\ kg}{W_H + (F_H \times BAF)}$$

Where:

- HCC = Human cancer criterion in milligrams per liter (mg/L).
- RAD = Risk associated dose in milligrams toxicant per kilogram body weight per day (mg/kg−d) that is associated with a lifetime incremental cancer risk equal to one in 100,000 as derived in sub. (5).
- 70 kg = Average weight of an adult male in kilograms (kg).
- W_H = Average per capita daily water consumption of 2 liters per day (L/d) for surface waters classified as public water supplies or, for other surface waters, 0.01 liters per day (L/d) for exposure through contact or ingestion of small volumes of water during swimming or during other recreational activities.
- F_H = Average per capita daily consumption of sport−caught fish by Wisconsin anglers equal to 0.02 kilograms per day (kg/d).
- BAF = Aquatic life bioaccumulation factor with units of liter per kilogram (L/kg) as derived in s. NR 105.10.

(b) For surface waters classified as public water supplies, if the human cancer criterion for a toxic substance as calculated in par. (a) exceeds the maximum contaminant level (MCL) for that substance as specified in ch. NR 809 or the July 8, 1987 Federal Register (52 FR 25690), the MCL shall be used as the human cancer criterion.

(5) The risk associated dose (RAD) referenced in sub. (4) represents the maximum amount of a substance which if ingested daily for a lifetime of 70 years has an incremental cancer risk equal to one case of human cancer in a population of 100,000. Methods for deriving the risk associated dose are specified in pars. (a) to (d).

(a) The department shall review available references for acceptable human and animal studies from which the risk associated dose can be derived. The department shall use sound scientific judgment when determining the acceptability of a study and may use the U.S. environmental protection agency's "Guidelines for Carcinogen Risk Assessment" (FR 51 33992, September 24, 1986) as guidance for judging acceptability. Suitable references for review include, but are not limited to, those presented in s. NR 105.04 (5).

(b) If an acceptable human epidemiologic study is available, contains usable exposure data, and indicates a carcinogenic effect, the risk associated dose shall be set equal to the lifetime average exposure which would produce an incremental cancer risk of one in 100,000 based on the exposure information from the study and assuming the excess cancer risk is proportional to the lifetime average exposure. If more than one human epidemiologic study is judged to be acceptable, the most protective risk associated dose derived from the studies is generally used to calculate the human cancer criterion. If the risk associated dose values differ significantly, the department may consult with experts outside of the department for guidance in the selection of the more appropriate value.

(c) In the absence of an acceptable human epidemiologic study, the risk associated dose shall be derived from available studies which use mammalian test species and which are judged acceptable. Methods for deriving the risk associated dose are specified in subds. 1. to 4.

1. A linear, non−threshold dose−response relationship as applied by the U.S. environmental protection agency in "Water Quality Criteria Documents; Availability" (45 FR 79318, November 28, 1980) shall be assumed unless a more appropriate dose−response relationship or extrapolation model is supported by credible scientific evidence.

Note: The linear non−threshold dose−response model used by the U.S. environmental protection agency provides an upper−bound estimate (i.e., the one−sided 95% upper confidence limit) of incremental cancer risk. The true cancer risk is unknown. While the true cancer risk is not likely to be greater than the upper bound estimate, it may be lower.

2. When a linear, non−threshold dose−response relationship is assumed, the risk associated dose shall be calculated using the following equation:

$$RAD = \frac{1}{q_1^*} \times 0.00001$$

Where:

- RAD = Risk associated dose in milligrams toxicant per kilogram body weight per day (mg/kg−d).
- 0.00001 = Incremental risk of human cancer equal to one in 100,000.
- q_1^* = Upper 95% confidence limit (one−sided) of the carcinogenic potency factor in days per milligram toxicant per kilogram body weight (d−kg/mg) as derived from the procedures referenced in subd. 1. and the guidance presented in subd. 3.

3. The department shall adhere to the following guidance for deriving carcinogenic potency factors, or corresponding values if an alternate dose−response relationship or extrapolation model is used, unless more appropriate procedures are supported by credible scientific evidence:

a. If 2 or more mammalian studies are judged acceptable, but vary in either species, strain or sex of the test animals, or in tumor type or site, the study giving the greatest carcinogenic potency factor shall be used. Studies which produce a spuriously high carcinogenic potency factor due to the use of a small number of test animals may be excluded.

b. If 2 or more mammalian studies are judged acceptable, are comparable in size and are identical in regard to species, strain and sex of the test animals and to tumor sites, the geometric mean of the carcinogenic potency factors derived from each study shall be used.

c. If in an acceptable study, tumors were induced at more than one site, the number of animals with tumors at one or more of the sites shall be used as incidence data when deriving the cancer potency factor.

d. The combination of benign and malignant tumors shall be used as incidence data when deriving the cancer potency factor.

e. Calculation of an equivalent dose between animal species and humans using a surface area conversion, and conversion of units of exposure to milligrams of toxicant per day (mg/d) shall be performed as specified by the U.S. environmental protection agency in "Water Quality Criteria Documents; Availability" (45 FR 79318, November 28, 1980).

f. If the duration of the mammalian study (D) is less than the natural life span of the test animal (LS), the carcinogenicity potency factor is multiplied by the factor (D/LS)3.

4. When available mammalian studies contain conflicting information, the department shall consult with the department of health and social services and may consult with experts outside of the department for guidance in the selection of the appropriate study.

(d) If both a human epidemiologic study and a study of mammalian test species are judged reliable but only the animal study indicates a carcinogenic effect, it is assumed that a risk of cancer to humans exists but that it is less than could have been detected in the epidemiologic study. An upper limit of cancer incidence may be calculated assuming that the true incidence is just below the level of detection in the cohort of the epidemiologic study. The department may consult with experts outside of the department for guidance in the selection of the appropriate study.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; am. table 9 and (6), Register, July, 1991, No. 427, eff. 8−1−91; correction in (4) (b) made under s. 13.93 (2m) (b) 7., Stats., Register, September, 1995, No. 477; am. (1), (3), r. and recr. Table 9, am. (4) (a), (b), (5) (intro.), (a) (b), (c) (intro.) and 2., r. (6), Register, August, 1997, No. 500, eff. 9−1−97; CR 03−050: am. Table 9 Register February 2004 No. 578, eff. 3−1−04; **CR 07−110: am. Table 9 Register November 2008 No. 635, eff. 12−1−08**.

NR 105.10 Bioaccumulation factor. (1) The bioaccumulation factor used to derive wildlife, human threshold, human cancer and taste and odor criteria or secondary values is determined from a baseline BAF using the methodology provided in Appendix B to 40 CFR part 132. 40 CFR part 132, Appendix B as stated on September 1, 1997, is incorporated by reference. BAFs shall be used to calculate criteria and secondary values for human health and wildlife. Use of a BAF greater than 1000, as determined from either of the methods referred to in sub. (2) (c) or (d) for organic substances, will result in the calculation of a secondary value. The baseline BAF is based on the concentration of freely dissolved substances in the ambient water to facilitate extrapolation from one water to another.

(2) Baseline BAFs shall be derived using one of the following 4 methods, which are listed from most preferred to least preferred.

(a) A measured baseline BAF for an organic or inorganic substance derived from a field study of acceptable quality;

(b) A predicted baseline BAF for an organic substance derived using field−measured BSAFs of acceptable quality;

(c) A predicted baseline BAF for an organic or inorganic substance derived from a BCF measured in a laboratory study of acceptable quality and a food−chain multiplier. Food−chain multipliers are provided in 40 CFR part 132, Appendix B; or

(d) A predicted baseline BAF for an organic substance derived from a K_{OW} of acceptable quality and a food−chain multiplier.

(3) REVIEW AND SELECTION OF DATA. Measured BAFs, BSAFs and BCFs shall meet the quality assurance requirements provided in 40 CFR part 132, Appendix B and shall be obtained from available sources including the following:

(a) EPA Ambient Water Quality Criteria documents issued after January 1, 1980.

(b) Published scientific literature.

(c) Reports issued by EPA or other reliable sources.

(d) Unpublished data.

(4) HUMAN HEALTH AND WILDLIFE BAFS FOR ORGANIC SUBSTANCES. (a) To calculate human health and wildlife BAFs for organic substances, the K_{OW} of the substance shall be used with a POC concentration of 0.00000004 kg/L and a DOC concentration of 0.000002 kg/L to yield the fraction freely dissolved:

$$f_{fd} = \frac{1}{1 + \frac{(DOC)(K_{ow})}{10} + (POC)(Kow)}$$

$$= \frac{1}{1 + \frac{(0.000002\ kg/L)(K_{ow})}{10} + (0.00000004\ kg/L)(Kow)}$$

$$= \frac{1}{1 + (0.00000024\ kg/L)(K_{ow})}$$

Where:

DOC = concentration of dissolved organic carbon, kg of dissolved organic carbon/L of water.

POC = concentration of particulate organic carbon, kg of particulate organic carbon/L of water.

(b) The human health BAFs for an organic substance shall be calculated using the following equations:

For warm water communities:

Human Health BAF = $[(\text{baseline BAF})(0.013)+ 1](f_{fd})$

For cold water communities:

Human Health BAF = $[(\text{baseline BAF})(0.044)+ 1](f_{fd})$

Where: 0.013 and 0.044 are the fraction lipid values for warm and cold water fish and aquatic life communities, respectively, that are required to derive human health criteria and secondary values.

baseline BAF = the baseline BAF calculated according to 40 CFR part 132, Appendix B.

(c) The wildlife BAFs for an organic substance shall be calculated using the following equations:

1. For trophic level 3:
   Wildlife BAF = $[(\text{baseline BAF})(0.0646)+ 1](f_{fd})$
2. For trophic level 4:
   Wildlife BAF = $[(\text{baseline BAF})(0.1031)+ 1](f_{fd})$

Where: 0.0646 and 0.1031 are the standardized fraction lipid values for dietary consumption from trophic level 3 and 4 fish taxa, respectively, that are required to derive wildlife criteria and secondary values.

baseline BAF = the baseline BAF calculated according to 40 CFR part 132, Appendix B.

(5) HUMAN HEALTH AND WILDLIFE BAFS FOR INORGANIC SUBSTANCES. (a) *Human health.* 1. Measured BAFs and BCFs used to determine human health BAFs for inorganic substances shall be based on edible tissue (e.g., muscle) of freshwater fish. If it is demonstrated that whole−body BAFs or BCFs are similar to edible−tissue BAFs or BCFs, then these data are acceptable. BCFs and BAFs based on measurements of aquatic plants and invertebrates may not be used in the derivation of human health criteria and values.

2. If one or more field−measured baseline BAFs for an inorganic substance are available from studies conducted in the Great Lakes system with the muscle of fish, the geometric mean of the species mean baseline BAFs shall be used as the human health BAF for that substance.

3. If an acceptable measured baseline BAF is not available for an inorganic substance and one or more acceptable edible−portion BCFs are available for the substance, a predicted baseline BAF shall be calculated by multiplying the geometric mean of the BCFs times a FCM. The FCM will be 1.0 unless chemical−specific biomagnification data support using a multiplier other than 1.0. The predicted baseline BAF shall be used as the human health BAF for that substance.

(b) *Wildlife.* 1. Measured BAFs and BCFs used to determine wildlife BAFs for inorganic substances shall be based on whole−body freshwater fish and invertebrate data. If it is demonstrated that edible−tissue BAFs or BCFs are similar to whole−body BAFs or BCFs, then these data are acceptable.

2. If one or more field−measured baseline BAFs for an inorganic substance is available from studies conducted in the Great Lakes system with whole body of fish or invertebrates, then the following apply:

a. For each trophic level, a species mean measured baseline BAF shall be calculated as the geometric mean if more than one measured BAF is available for a given species.

b. For each trophic level, the geometric mean of the species mean measured baseline BAFs shall be used as the wildlife BAF for that substance.

3. If an acceptable measured baseline BAF is not available for an inorganic substance and one or more acceptable whole−body BCFs are available for the substance, a predicted baseline BAF shall be calculated by multiplying the geometric mean of the BCFs times a FCM. The FCM shall be 1.0 unless chemical−specific biomagnification data support using a multiplier other than 1.0. The predicted baseline BAF shall be used as the wildlife BAF for that substance.

Note: Copies of 40 CFR Part 132, Appendix B are available for inspection in the offices of the department of natural resources, secretary of state and the legislative reference bureau, Madison, WI or may be purchased from the superintendent of documents, US government printing office, Washington, D.C. 20402.

History: Cr. Register, February, 1989, No. 398, eff. 3−1−89; r. and recr., Register, August, 1997, No. 500, eff. 9−1−97.

NR 105.11 Final plant values. (1) A Final Plant Value (FPV) is the lowest plant value that was obtained with an important aquatic plant species in an acceptable toxicity test for which the concentrations of the test substance were measured and the adverse effect was biologically important. Appropriate measures of the toxicity of the substance to aquatic plants are used to compare the relative sensitivities of aquatic plants and animals.

(2) A plant value is the result of a 96−hour test conducted with an algae or a chronic test conducted with an aquatic vascular plant. A test of the toxicity of a metal to a plant may not be used if the medium contained an excessive amount of a complexing agent, such as EDTA, that might affect the toxicity of the metal. Concentrations of EDTA above 200 μg/L should be considered excessive.

(3) The FPV shall be established by selecting the lowest result from a test with an important aquatic plant species in which the concentrations of test material are measured and the endpoint is biologically important.

Note: Although procedures for conducting and interpreting the results of toxicity tests with plants are not well advanced, results of tests with plants usually indicate that criteria which adequately protect aquatic animals and their uses will, in most cases, also protect aquatic plants and their uses.

History: Cr. Register, August, 1997, No. 500, eff. 9−1−97.

APPENDIX 4.3.8.2-1 WDNR White River Project Water Quality Monitoring Data

Monitoring Station

Station ID 023127
Station Name White River Downstream Hwy 112 Near Ashland WI

Show specific parameter: <Show All> ▼

Sample Results

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PLECOPTERA PERLIDAE ACRONEURIA		9			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	EPHEMEROPTERA BAETIDAE BAETIS		2			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	EPHEMEROPTERA HEPTAGENIIDAE		2			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	EPHEMEROPTERA LEPTOPHLEBIIDAE		23			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	TRICHOPTERA HYDROPSYCHIDAE CHEUMATOPSYCHE		9			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	TRICHOPTERA HYDROPSYCHIDAE CERATOPSYCHE		4			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	TRICHOPTERA HYDROPSYCHIDAE CERATOPSYCHE MOROSA MOROSA FORM SCHMUDE, HILSENHOFF 1986		11			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	TRICHOPTERA HYDROPTILIDAE HYDROPTILA		32			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	TRICHOPTERA POLYCENTROPODIDAE NEURECLIPSIS		1			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA EMPIDIDAE HEMERODROMIA		3			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA TIPULIDAE ANTOCHA		12			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA CHIRONOMIDAE		1			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA TANYPODINAE 0		21			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA TANYPODINAE 0 CONCHAPELOPIA		53			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA TANYPODINAE 0 MEROPELOPIA		15			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA TANYPODINAE 0 NILOTANYPUS		9			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA TANYPODINAE 0 ZAVRELIMYIA		1			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA ORTHOCLADIINAE 1		6			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA ORTHOCLADIINAE 1 PARAKIEFFERIELLA		15			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CORYNONEURA		6			

Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CRICOTOPUS (CRICOTOPUS) BICINCTUS GROUP CRANSTON ET AL. 1983	8
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CRICOTOPUS (CRICOTOPUS) TRIFASCIA GROUP CRANSTON ET AL. 1983	1
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CRICOTOPUS -- PUPA	3
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA ORTHOCLADIINAE 1 NANOCLADIUS	13
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA ORTHOCLADIINAE 1 ORTHOCLADIUS (ORTHOCLADIUS)	15

Monitoring Station

Station ID 023127
Station Name White River Downstream Hwy 112 Near Ashland WI

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Sample Results

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA CHIRONOMINAE 4 PARATANYTARSUS LONGISTYLUS		10			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	HILSENHOFF'S BIOTIC INDEX (HBI)		5.948			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	FAMILY-LEVEL BIOTIC INDEX (FBI)		6.006			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	HBI Max 10		5.304			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	SPECIES RICHNESS		40			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	GENERA RICHNESS		36			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT EPT INDIVIDUALS		16			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT EPT GENERA		22			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT CHIRONOMIDAE INDIVIDUALS		81			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	SHANNON'S DIVERSITY INDEX		4.078			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT SCRAPERS		2			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT FILTERER		35			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT SHREDDERS		6			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT GATHERERS		28			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 1		CHIRONOMIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 2		HYDROPTILIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 3		HYDROPSYCHIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 4		LEPTOPHLEBIIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 5		HEPTAGENIIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 1		RHEOTANYTARSUS			

Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 2	PARATANYTARSUS
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 3	CONCHAPELOPIA
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 4	HYDROPTILA
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 5	DICROTENDIPES
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Mean Pollution Tolerance Value	5.556

Monitoring Station

Station ID 023127
Station Name White River Downstream Hwy 112 Near Ashland WI

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Sample Results

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DIPTERA CHIRONOMINAE 4 PARATANYTARSUS LONGISTYLUS		10			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	HILSENHOFF'S BIOTIC INDEX (HBI)		5.948			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	FAMILY-LEVEL BIOTIC INDEX (FBI)		6.006			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	HBI Max 10		5.304			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	SPECIES RICHNESS		40			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	GENERA RICHNESS		36			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT EPT INDIVIDUALS		16			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT EPT GENERA		22			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT CHIRONOMIDAE INDIVIDUALS		81			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	SHANNON'S DIVERSITY INDEX		4.078			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT SCRAPERS		2			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT FILTERER		35			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT SHREDDERS		6			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	PERCENT GATHERERS		28			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 1		CHIRONOMIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 2		HYDROPTILIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 3		HYDROPSYCHIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 4		LEPTOPHLEBIIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Family Rank 5		HEPTAGENIIDAE			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 1		RHEOTANYTARSUS			

Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 2	PARATANYTARSUS
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 3	CONCHAPELOPIA
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 4	HYDROPTILA
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Genus Rank 5	DICROTENDIPES
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Mean Pollution Tolerance Value	5.556

Monitoring Station

Station ID 023127
Station Name White River Downstream Hwy 112 Near Ashland WI

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Macroinvertebrate Index of Biotic Integrity (IBI), Non-Wadable		70			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DEPO Percent Individuals (DEP_PC_CNT)		20.64			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DEPO Genera (DEPO_G)		13			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	DEPO, percent genera (DEP_PC_GEN)		33.333			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	EPT Genera (EPT_GENERA)		8			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	EPT Individuals (EPT_COUNT)		103			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	EPT Percent Individuals (EPT_PC_CNT)		16.48			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Amph Percent Individuals (AMP_PC_CNT)		0			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	EPT Percent Genera (EPT_PC_GEN)		22.857			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Isop Percent Individuals (ISO_PC_CNT)		0			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Isop Genera (ISOP_G)		0			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Isop Percent Genera (ISO_PC_GEN)		0			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Dipt Percent Genera (DIP_PC_GEN)		77.143			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Dipt Percent Individuals (DIP_PC_CNT)		83.52			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Chir Percent Individuals (CHI_PC_CNT)		81.12			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Chir Percent Genera (CHI_PC_GEN)		71.429			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Gatherers Percent Individuals (GAT_PC_CNT)		28.015			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Gatherers Percent Genera (GAT_PC_GEN)		35.484			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Scrapers Percent Individuals (SCR_PC_CNT)		2.226			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Shredders Percent Individuals (SHR_PC_CNT)		5.937			

Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Insect Taxa (INSECT_T)	39
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Insect Percent Individuals (INSECT_PI)	99.84
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	EPT Taxa (EPT_T)	8
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Dominance 3 Percent Individuals (DOM3_PI)	38.978
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Intolerant EPT 2 Percent Individuals (INTOL_EPT2_PI)	4.792

Monitoring Station

Station ID 023127
Station Name White River Downstream Hwy 112 Near Ashland WI

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Tolerant Chir Percent Individuals (TOL_CHIR8_PI)		13.578			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Functional Trait Niches (ECOFTN)		8			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Amph Isop Percent Individuals (A_I_PC_CNT)		0			
Large River Macroinvertebrate Sampling	09/17/2015 12:00 AM	Species Richness (Wadable IBI Intermediate)		40			
2018 CWA Impairment Assessments	09/17/2015 12:00 AM	Non-Wadeable Stream 10 Year Mean mIBI Assessment Value		70			
2018 CWA Impairment Assessments	09/17/2015 12:00 AM	Assessment River Station Natural Community		LARGE RIVER			
AIS Incident Reports - Bayfield County	09/01/2008 12:00 AM	Which aquatic invasive did you find?		Rusty Crayfish			
AIS Incident Reports - Bayfield County	09/01/2008 12:00 AM	Did you collect a sample and bring it to a DNR office? If so, which office?		Rhinelander			
AIS Incident Reports - Bayfield County	09/01/2008 12:00 AM	Observer Name (if not already recorded)		Tracely Ledder			
AIS Incident Reports - Bayfield County	09/01/2008 12:00 AM	Observer Phone Number		715-682-2003			
AIS Incident Reports - Bayfield County	09/01/2008 12:00 AM	Observer Email		tledder@charter.net			
AIS Incident Reports - Bayfield County	09/01/2008 12:00 AM	Person who verified occurence		Craig Roesler (Crayfish)			
AIS Incident Reports - Bayfield County	09/01/2008 12:00 AM	Second person who verified occurence		Jim Klosiewski (Crayfish)			
AIS Incident Reports - Bayfield County	09/01/2008 12:00 AM	If not the suspected invasive species, what was it?		Orconectes propinquus			
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	TEMPERATURE FIELD		15.7	C		
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	AMBIENT AIR TEMPERATURE - FIELD		8.0	C		
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	CLOUD COVER		10	%		
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	CONDUCTIVITY FIELD		184	UMHOS/CM		
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	TEMPERATURE AT LAB		ICED	C		
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	DISSOLVED OXYGEN FIELD		9.8	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	PH FIELD		8.0	SU		
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	RESIDUE TOTAL NFLT (TOTAL SUSPENDED SOLIDS)		*9	MG/L		MATRIX DUPLICATE QC EXCEEDED

NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	NITROGEN NH3-N DISS	ND	MG/L
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	NITROGEN KJELDAHL TOTAL	ND	MG/L
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	NITROGEN NO3+NO2 DISS (AS N)	ND	MG/L

Monitoring Station

Station ID 023127
Station Name White River Downstream Hwy 112 Near Ashland WI

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	PHOSPHORUS TOTAL		0.035	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	09/26/2007 01:52 PM	TRANSPARENCY TUBE MEASUREMENT		51.8	CM		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	TEMPERATURE FIELD		18.4	C		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	AMBIENT AIR TEMPERATURE - FIELD		25.0	C		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	CLOUD COVER		1	%		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	TEMPERATURE AT LAB		ICED	C		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	DISSOLVED OXYGEN FIELD		8.7	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	PH FIELD		7.7	SU		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	RESIDUE TOTAL NFLT (TOTAL SUSPENDED SOLIDS)		14.	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	NITROGEN NH3-N DISS		ND	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	NITROGEN KJELDAHL TOTAL		0.18	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	PHOSPHORUS TOTAL		0.039	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	08/30/2007 12:56 PM	TRANSPARENCY TUBE MEASUREMENT		31.3	CM		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	TEMPERATURE FIELD		24.2	C		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	AMBIENT AIR TEMPERATURE - FIELD		18.0	C		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	CLOUD COVER		2	%		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	CONDUCTIVITY FIELD		187	UMHOS/CM		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	TEMPERATURE AT LAB		ICED	C		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	DISSOLVED OXYGEN FIELD		8.8	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	PH FIELD		7.9	SU		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	RESIDUE TOTAL NFLT (TOTAL SUSPENDED SOLIDS)		11.	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	NITROGEN NH3-N DISS		0.029	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	NITROGEN KJELDAHL TOTAL		*ND	MG/L		MATRIX DUPLICATE QC EXCEEDED
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		

Monitoring Station

Station ID 023127
Station Name White River Downstream Hwy 112 Near Ashland WI

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Sample Results

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	PHOSPHORUS TOTAL		0.042	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	06/27/2007 10:47 AM	TRANSPARENCY TUBE MEASUREMENT		39.8	CM		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	TEMPERATURE FIELD		11.6	C		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	AMBIENT AIR TEMPERATURE - FIELD		24.0	C		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	CLOUD COVER		20	%		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	CONDUCTIVITY FIELD		110	UMHOS/CM		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	TEMPERATURE AT LAB		ICED	C		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	DISSOLVED OXYGEN FIELD		10.9	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	PH FIELD		7.6	SU		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	RESIDUE TOTAL NFLT (TOTAL SUSPENDED SOLIDS)		10.	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	NITROGEN NH3-N DISS		ND	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	NITROGEN KJELDAHL TOTAL		0.56	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	NITROGEN NO3+NO2 DISS (AS N)		0.042	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	PHOSPHORUS TOTAL		0.044	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	04/24/2007 12:00 AM	TRANSPARENCY TUBE MEASUREMENT		32.9	CM		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	TEMPERATURE FIELD		3.6	C		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	AMBIENT AIR TEMPERATURE - FIELD		15.0	C		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	CLOUD COVER		0	%		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	CONDUCTIVITY FIELD		98	UMHOS/CM		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	TEMPERATURE AT LAB		ICED	C		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	DISSOLVED OXYGEN FIELD		12.7	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	PH FIELD		6.9	SU		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	RESIDUE TOTAL NFLT (TOTAL SUSPENDED SOLIDS)		45.	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	NITROGEN NH3-N DISS		0.043	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	NITROGEN KJELDAHL TOTAL		0.93	MG/L		

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	NITROGEN NO3+NO2 DISS (AS N)		0.159	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	PHOSPHORUS TOTAL		0.143	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	03/26/2007 01:35 PM	TRANSPARENCY TUBE MEASUREMENT		10.5	CM		
NPS-MASTER MONITORING FY04	10/15/2003 11:35 AM	TEMPERATURE AT LAB		ICED	C		
NPS-MASTER MONITORING FY04	10/15/2003 11:35 AM	NITROGEN NH3-N DISS		ND	MG/L		
NPS-MASTER MONITORING FY04	10/15/2003 11:35 AM	NITROGEN KJELDAHL TOTAL		0.26	MG/L		
NPS-MASTER MONITORING FY04	10/15/2003 11:35 AM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		
NPS-MASTER MONITORING FY04	10/15/2003 11:35 AM	PHOSPHORUS TOTAL		0.028	MG/L		
NPS-MASTER MONITORING FY04	10/15/2003 11:35 AM	PHOSPHORUS TOTAL DISS		0.013	MG/L		
NPS-MASTER MONITORING FY04	10/15/2003 11:35 AM	SUSPENDED SEDIMENT		7.	MG/L		
NPS-MASTER MONITORING FY04	09/17/2003 11:37 AM	TEMPERATURE AT LAB		ICED	C		
NPS-MASTER MONITORING FY04	09/17/2003 11:37 AM	NITROGEN NH3-N DISS		0.017	MG/L		
NPS-MASTER MONITORING FY04	09/17/2003 11:37 AM	NITROGEN KJELDAHL TOTAL		0.27	MG/L		
NPS-MASTER MONITORING FY04	09/17/2003 11:37 AM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		
NPS-MASTER MONITORING FY04	09/17/2003 11:37 AM	PHOSPHORUS TOTAL		0.036	MG/L		
NPS-MASTER MONITORING FY04	09/17/2003 11:37 AM	PHOSPHORUS TOTAL DISS		0.014	MG/L		
NPS-MASTER MONITORING FY04	09/17/2003 11:37 AM	SUSPENDED SEDIMENT		9.	MG/L		
NPS-MASTER MONITORING FY04	08/20/2003 12:25 PM	TEMPERATURE AT LAB		ICED	C		
NPS-MASTER MONITORING FY04	08/20/2003 12:25 PM	NITROGEN NH3-N DISS		0.041	MG/L		
NPS-MASTER MONITORING FY04	08/20/2003 12:25 PM	NITROGEN KJELDAHL TOTAL		0.17	MG/L		
NPS-MASTER MONITORING FY04	08/20/2003 12:25 PM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		
NPS-MASTER MONITORING FY04	08/20/2003 12:25 PM	PHOSPHORUS TOTAL		0.050	MG/L		
NPS-MASTER MONITORING FY04	08/20/2003 12:25 PM	PHOSPHORUS TOTAL DISS		0.016	MG/L		
NPS-MASTER MONITORING FY04	08/20/2003 12:25 PM	SUSPENDED SEDIMENT		16.	MG/L		
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	PLECOPTERA PERLIDAE ACRONEURIA		2			

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA		1			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA BAETIDAE BAETIS		1			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA BAETIDAE BAETIS INTERCALARIS		2			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA BAETIDAE PLAUDITUS PUNCTIVENTRIS		1			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA HEPTAGENIIDAE		3			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA HEPTAGENIIDAE STENACRON INTERPUNCTATUM		2			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA HEPTAGENIIDAE MACCAFFERTIUM		5			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA HEPTAGENIIDAE MACCAFFERTIUM VICARIUM		10			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA HEPTAGENIIDAE LEUCROCUTA HEBE		1			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPHEMEROPTERA ISONYCHIIDAE ISONYCHIA		5			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	TRICHOPTERA HYDROPSYCHIDAE		9			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	TRICHOPTERA HYDROPSYCHIDAE CHEUMATOPSYCHE		2			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	TRICHOPTERA HYDROPSYCHIDAE CERATOPSYCHE		4			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	TRICHOPTERA HYDROPSYCHIDAE CERATOPSYCHE MOROSA BIFIDA FORM SCHMUDE, HILSENHOFF 1986		6			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	TRICHOPTERA HYDROPTILIDAE HYDROPTILA		74			

Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	TRICHOPTERA HYDROPTILIDAE -- PUPA	1
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	TRICHOPTERA PHILOPOTAMIDAE	1
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA TANYPODINAE 0	1
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA TANYPODINAE 0 CONCHAPELOPIA	1
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA TANYPODINAE 0 ARCTOPELOPIA	2
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA DIAMESINAE 2 POTTHASTIA LONGIMANA GROUP OLIVER 1983	2
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1	19
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1	4
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CARDIOCLADIUS	1
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CORYNONEURA	3

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Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CRICOTOPUS (CRICOTOPUS) BICINCTUS GROUP CRANSTON ET AL. 1983		27			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CRICOTOPUS (CRICOTOPUS) TREMULUS GROUP CRANSTON ET AL. 1983		11			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 CRICOTOPUS (CRICOTOPUS) TRIFASCIA GROUP CRANSTON ET AL. 1983		64			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 NANOCLADIUS (NANOCLADIUS) CF. RECTINERVIS EPLER 2001		4			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 ORTHOCLADIUS (ORTHOCLADIUS)		14			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 PARAMETRIOCNEMUS		6			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 RHEOCRICOTOPUS		9			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 THIENEMANNIELLA		4			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 TVETENIA BAVARICA GROUP BODE 1983		2			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA CHIRONOMINAE 4		1			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA CHIRONOMINAE 4 RHEOTANYTARSUS		157			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA CHIRONOMINAE 4 TANYTARSUS		5			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA CHIRONOMINAE 4 MICROTENDIPES RYDALENSIS GROUP PINDER, REISS 1983		7			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	BASOMMATOPHORA ANCYLIDAE LAEVAPEX		1			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	HAPLOTAXIDA NAIDIDAE		1			

Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA CHIRONOMINAE 4 SUBLETTEA	13
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA CHIRONOMINAE 4 POLYPEDILUM (POLYPEDILUM) ILLINOENSE GROUP EPLER 2001	1
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA CHIRONOMINAE 4 POLYPEDILUM (URESIPEDILUM)	8
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA ORTHOCLADIINAE 1 TVETENIA DISCOLORIPES GROUP BODE 1983	12
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DIPTERA CHIRONOMIDAE -- PUPA	1
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	HILSENHOFF'S BIOTIC INDEX (HBI)	5.903
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	FAMILY-LEVEL BIOTIC INDEX (FBI)	5.836
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	HBI Max 10	5.377
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	SPECIES RICHNESS	34
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	GENERA RICHNESS	31

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Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	PERCENT EPT INDIVIDUALS		26			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	PERCENT EPT GENERA		35			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	PERCENT CHIRONOMIDAE INDIVIDUALS		74			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	SHANNON'S DIVERSITY INDEX		3.138			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	PERCENT SCRAPERS		4			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	PERCENT FILTERER		40			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	PERCENT SHREDDERS		23			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	PERCENT GATHERERS		17			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Mean Pollution Tolerance Value		5			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Macroinvertebrate Index of Biotic Integrity (IBI), Non-Wadable		75			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DEPO Percent Individuals (DEP_PC_CNT)		39.641			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DEPO Genera (DEPO_G)		11			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	DEPO, percent genera (DEP_PC_GEN)		34.375			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPT Genera (EPT_GENERA)		11			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPT Individuals (EPT_COUNT)		129			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPT Percent Individuals (EPT_PC_CNT)		25.697			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Amph Percent Individuals (AMP_PC_CNT)		0			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPT Percent Genera (EPT_PC_GEN)		37.931			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Isop Percent Individuals (ISO_PC_CNT)		0			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Isop Genera (ISOP_G)		0			

Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Isop Percent Genera (ISO_PC_GEN)	0
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Dipt Percent Genera (DIP_PC_GEN)	62.069
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Dipt Percent Individuals (DIP_PC_CNT)	74.303
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Chir Percent Individuals (CHI_PC_CNT)	74.303
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Chir Percent Genera (CHI_PC_GEN)	62.069

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Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Gatherers Percent Individuals (GAT_PC_CNT)		16.598			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Gatherers Percent Genera (GAT_PC_GEN)		39.286			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Scrapers Percent Individuals (SCR_PC_CNT)		3.893			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Shredders Percent Individuals (SHR_PC_CNT)		22.746			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Insect Taxa (INSECT_T)		32			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Insect Percent Individuals (INSECT_PI)		99.603			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	EPT Taxa (EPT_T)		11			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Dominance 3 Percent Individuals (DOM3_PI)		58.532			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Intolerant EPT 2 Percent Individuals (INTOL_EPT2_PI)		3.571			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Tolerant Chir Percent Individuals (TOL_CHIR8_PI)		0			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Functional Trait Niches (ECOFTN)		11			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Amph Isop Percent Individuals (A_I_PC_CNT)		0			
Large River Macroinvertebrate Sampling 2003-2006, 2009 , UW Stevens Point Macroinvertebrate Analyses	08/06/2003 12:00 AM	Species Richness (Wadable IBI Intermediate)		34			
NPS-MASTER MONITORING FY04	07/16/2003 03:50 PM	TEMPERATURE AT LAB		ICED	C		
NPS-MASTER MONITORING FY04	07/16/2003 03:50 PM	NITROGEN NH3-N DISS		0.022	MG/L		
NPS-MASTER MONITORING FY04	07/16/2003 03:50 PM	NITROGEN KJELDAHL TOTAL		0.26	MG/L		
NPS-MASTER MONITORING FY04	07/16/2003 03:50 PM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		
NPS-MASTER MONITORING FY04	07/16/2003 03:50 PM	PHOSPHORUS TOTAL		0.046	MG/L		
NPS-MASTER MONITORING FY04	07/16/2003 03:50 PM	PHOSPHORUS TOTAL DISS		0.018	MG/L		
NPS-MASTER MONITORING FY04	07/16/2003 03:50 PM	SUSPENDED SEDIMENT		12.	MG/L		
NPS-MASTER MONITORING FY04	07/16/2003 03:37 PM	TEMPERATURE AT LAB		ICED	C		
NPS-MASTER MONITORING FY04	07/16/2003 03:37 PM	NITROGEN NH3-N DISS		0.029	MG/L		
NPS-MASTER MONITORING FY04	07/16/2003 03:37 PM	NITROGEN KJELDAHL TOTAL		0.25	MG/L		

NPS-MASTER MONITORING FY04	07/16/2003 03:37 PM	NITROGEN NO3+NO2 DISS (AS N)	ND	MG/L
NPS-MASTER MONITORING FY04	07/16/2003 03:37 PM	PHOSPHORUS TOTAL	0.045	MG/L

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
NPS-MASTER MONITORING FY04	07/16/2003 03:37 PM	PHOSPHORUS TOTAL DISS		0.018	MG/L		
NPS-MASTER MONITORING FY04	07/16/2003 03:37 PM	SUSPENDED SEDIMENT		11.	MG/L		
NPS-MASTER MONITORING FY03	06/19/2003 02:00 PM	TEMPERATURE AT LAB		ICED	C		
NPS-MASTER MONITORING FY03	06/19/2003 02:00 PM	NITROGEN NH3-N DISS		0.035	MG/L		
NPS-MASTER MONITORING FY03	06/19/2003 02:00 PM	NITROGEN KJELDAHL TOTAL		0.22	MG/L		
NPS-MASTER MONITORING FY03	06/19/2003 02:00 PM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		
NPS-MASTER MONITORING FY03	06/19/2003 02:00 PM	PHOSPHORUS TOTAL		0.045	MG/L		
NPS-MASTER MONITORING FY03	06/19/2003 02:00 PM	PHOSPHORUS TOTAL DISS		0.017	MG/L		
NPS-MASTER MONITORING FY03	06/19/2003 02:00 PM	SUSPENDED SEDIMENT		16.	MG/L		
NPS-MASTER MONITORING FY03	05/22/2003 07:58 AM	TEMPERATURE AT LAB		ICED	C		
NPS-MASTER MONITORING FY03	05/22/2003 07:58 AM	NITROGEN NH3-N DISS		0.020	MG/L		
NPS-MASTER MONITORING FY03	05/22/2003 07:58 AM	NITROGEN KJELDAHL TOTAL		0.86	MG/L		
NPS-MASTER MONITORING FY03	05/22/2003 07:58 AM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		
NPS-MASTER MONITORING FY03	05/22/2003 07:58 AM	PHOSPHORUS TOTAL		0.054	MG/L		
NPS-MASTER MONITORING FY03	05/22/2003 07:58 AM	PHOSPHORUS TOTAL DISS		0.020	MG/L		
NPS-MASTER MONITORING FY03	05/22/2003 07:58 AM	SUSPENDED SEDIMENT		20.	MG/L		

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Signage Installation - Ashland County	11/05/2019 02:27 PM	Observer Name (if not already recorded)		Scott Caven			
Signage Installation - Ashland County	11/05/2019 02:27 PM	Observer Email		scott.caven@co.ashland.wi.us			
Signage Installation - Ashland County	11/05/2019 02:27 PM	What type of access point was this?		Carry-in			
Signage Installation - Ashland County	11/05/2019 02:27 PM	The location that best represents where the sign is currently located		On a post at pier/dock			
Signage Installation - Ashland County	11/05/2019 02:27 PM	Did you take a photo?		Yes			
Signage Installation - Ashland County	11/05/2019 02:27 PM	Organization		Ashland County LWCD			
Signage Installation - Ashland County	11/05/2019 02:27 PM	Waterbody Type		River/Stream			
Signage Installation - Ashland County	11/05/2019 02:27 PM	Purpose of AIS Sign Visit?		Inspection			
Signage Installation - Ashland County	11/05/2019 02:27 PM	AIS Sign Type		Prevent the Spread boat launch sign			
Signage Installation - Ashland County	11/05/2019 02:27 PM	AIS Sign Condition		Adequate			
Signage Installation - Ashland County	11/05/2019 02:27 PM	Which direction is the sign facing?		Facing Launch Area (Upland) - Sign seen as boater is launching			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	FISHHOOK WATER FLEA		No			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	SPINY WATER FLEA		No			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Species Name		Narrow-leaf cattail (Typha angustifolia)			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Species Name		Narrow-leaf cattail (Typha angustifolia)			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Species Name		Unknown Species			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Species Name		Narrow-leaf cattail (Typha angustifolia)			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Species Name		Narrow-leaf cattail (Typha angustifolia)			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	ZEBRA MUSSEL, VELIGER		No			
Aquatic Invasive Species Early Detection 2018, AIS	07/12/2018 12:00 AM	Diameter of zooplankton net opening		50	CM		

Occurrence Records - 'Other' Records Reviewed			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you find what you suspect are Spiny Water Fleas in this waterbody?	No
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you find what you suspect are Fishhook Water Fleas in this waterbody?	No
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample	46.49823
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample	46.49666
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample	46.49842

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample		46.49413			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample		46.49666			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample		46.49823			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample		46.49843			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample		46.49842			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Latitude of sample		46.49240			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		-90.91210			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		-90.92008			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		-90.91626			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		-90.91483			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		-90.91395			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		-90.91255			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		90.91438			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		-90.90997			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Longitude of sample		-90.90953			

Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Have you consolidated all of your samples into one composite bottle?	Yes	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Volume of sample that was analyzed (ml)	50	ML
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Date sample was analyzed	11/20/2018	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Date sample was analyzed	12/18/2018	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Name of plankton sample analyst	Shelby Kail	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Name of plankton sample analyst	Shelby Kail	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Total Paid Hours Spent	6	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Total Volunteer Hours Spent	0	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Additional Comments about Aquatic Invasives Monitoring	Unkown species is a kind of snail, Native iris (Iris versicolor) present at this site. No AIS found	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Additional Comments about Aquatic Invasives Monitoring	No AIS found	

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Additional Comments about Aquatic Invasives Monitoring		Unkown species is a kind of snail, Native iris (Iris versicolor) present at this site. No AIS found			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Additional Comments about Aquatic Invasives Monitoring		No AIS found			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Additional Comments about Aquatic Invasives Monitoring		No AIS found			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Additional Comments about Aquatic Invasives Monitoring		No AIS found			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Japanese Knotweed?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for purple loosestrife?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Phragmites?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Japanese Hops?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Flowering Rush?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Hydrilla?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Brazilian waterweed?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Eurasian Water-Milfoil?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Curly-Leaf Pondweed?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Yellow Floating Heart?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Didymo?		YES			

Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Quagga Mussels?	YES	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Zebra Mussels?	YES	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for New Zealand Mudsnails?	YES	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Red Swamp Crayfish?	YES	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Faucet Snails?	YES	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 1 - Latitude	46.29860	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 1 - Latitude	46.29860	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 1 - Longitude	-90.54595	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 1 - Longitude	-90.54595	
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 1 - Secchi Depth	0.25	METERS

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 1 - Number of net tows		1	TOWS		
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 1 - Number of net tows		1	TOWS		
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 1 - Depth of tows		2	METERS		
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 2 - Latitude		46.29869			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 2 - Longitude		-90.54632			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 2 - Number of net tows		1	TOWS		
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 3 - Latitude		46.29864			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 3 - Longitude		-90.54616			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site 3 - Number of net tows		1	TOWS		
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Boat Landing 1			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Search Site 1			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Search Site 4			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Meander Survey 1			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Meander Survey 2			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Meander Survey 3			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Search Site 3			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Search Site 5			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Site Number		Search Site 2			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Density of Aquatic Invasive Species (1)		3-many small beds or scattered plants or colonies of invertebrates			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Density of Aquatic Invasive Species (1)		4-dense plant, snail or mussel growth in a while bay or portion of the lake			

Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Density of Aquatic Invasive Species (1)	2-one or a few plant beds or colonies of invertebrates
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Density of Aquatic Invasive Species (1)	4-dense plant, snail or mussel growth in a while bay or portion of the lake
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Density of Aquatic Invasive Species (1)	5-dense plant, snail or mussel growth covering most shallow areas
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Species Name (2)	Unknown Species
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Density of Aquatic Invasive Species (2)	2-one or a few plant beds or colonies of invertebrates

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Chinese mystery snails?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Banded mystery snails?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you snorkel the search sites?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	If you did not snorkel, why not?		Water clarity too poor			

Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Asiatic clam (Corbicula)?	YES
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Rusty crayfish?	YES
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you collect a specimen sample?	NO
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you collect a specimen sample?	NO
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you collect a specimen sample?	NO

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Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you collect a specimen sample?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you collect a specimen sample?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you take a photo?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you take a photo?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you take a photo?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you take a photo?		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you take a photo?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for European frogbit		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Fanwort?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Parrot Feather?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Water Hyacinth?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Water Lettuce?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Yellow Flag Iris?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Water Chestnut?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Spiny Waterfleas?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Fishhook Waterfleas?		YES			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you collect a specimen sample? (2)		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you take a photo? (2)		NO			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Was the aquatic invasive species found live or dead?		Live			
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Was the aquatic invasive species found live or dead?		Live			

Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Was the aquatic invasive species found live or dead?	Live
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Was the aquatic invasive species found live or dead?	Live
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Was the aquatic invasive species found live or dead?	Live
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Was the aquatic invasive species found live or dead? (2)	Live
Aquatic Invasive Species Early Detection 2018, AIS Occurrence Records - 'Other' Records Reviewed	07/12/2018 12:00 AM	Did you look for Starry stonewort?	YES

Monitoring Station

Station ID 10019547
Station Name White River Flowage -- Access - STH 112

Show specific parameter: <Show All>

Sample Results

Previous 151-169 of 169 Next

Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Signage Installation - Ashland County	06/28/2011 12:00 AM	What type of access point was this?		Ramp			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Before you installed the new AIS sign (Prevent the Spread), were there other AIS signs at the access point? - Yellow "Exotic Species Advisory" sign		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Before you installed the new AIS sign (Prevent the Spread), were there other AIS signs at the access point? - Green and white "Help Prevent the Spread sign"		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Before you installed the new AIS sign (Prevent the Spread), were there other AIS signs at the access point? - Green, white and red stop sign "Please Stop and"		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Before you installed the new AIS sign (Prevent the Spread), were there other AIS signs at the access point? - County ordinance sign		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Before you installed the new AIS sign (Prevent the Spread), were there other AIS signs at the access point? - Lake Association sign		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Before you installed the new AIS sign (Prevent the Spread), were there other AIS signs at the access point? - Other		Hydro Dam Sign explaining lake, pushed over by bull dozer.			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Did you remove any of these signs during your visit, or do you have plans in the near future? - Yellow "Exotic Species Advisory" sign		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Did you remove any of these signs during your visit, or do you have plans in the near future? - Green and white "Help..Prevent the Spread" sign		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Did you remove any of these signs during your visit, or do you have plans in the near future? - Green, white and red stop sign "Please Stop and..."		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Did you remove any of these signs during your visit, or do you have plans in the near future? - County ordinance sign		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Did you remove any of these signs during your visit, or do you have plans in the near future? - Lake Association Sign		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	When installing the sign, were you able to reuse the post from previous DNR signs?		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	If the waterbody was known to contain invasive species, was the red sticker "This Waterbody Is Known to Contain Invasive Species" applied to the bottom of the sign?		NO			
Signage Installation - Ashland County	06/28/2011 12:00 AM	Was the sign installed facing the water so people leaving the water could read it or facing the launching area so people could read it?		Land			

Signage Installation - Ashland County	06/28/2011 12:00 AM	The location that best represents where the sign is currently located	Next to access point, facing launch area
Signage Installation - Ashland County	06/28/2011 12:00 AM	Does the access point appear to be in proper working order?	YES
Signage Installation - Ashland County	06/28/2011 12:00 AM	How many people assisted in the sign installation?	2
Signage Installation - Ashland County	06/28/2011 12:00 AM	How would you describe yourself (affiliation)?	County employee

Monitoring Station

Station ID 10020884
Station Name White River At Sth 112

Show specific parameter: <Show All> ▼

Sample Results

Previous 1-25 of 26 Next

Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	TEMPERATURE FIELD		24.2	C		PH METER MALFUNCTION
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	AMBIENT AIR TEMPERATURE - FIELD		27.0	C		PH METER MALFUNCTION
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	CLOUD COVER		10	%		PH METER MALFUNCTION
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	CONDUCTIVITY FIELD		193	UMHOS/CM		PH METER MALFUNCTION
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	TEMPERATURE AT LAB		10.	C		
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	DISSOLVED OXYGEN FIELD		8.0	MG/L		PH METER MALFUNCTION
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	PH FIELD		**	SU		PH METER MALFUNCTION
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	RESIDUE TOTAL NFLT (TOTAL SUSPENDED SOLIDS)		*10	MG/L		SAMPLE RECEIVED WITH ICE MELTED
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	NITROGEN NH3-N DISS		*0.017	MG/L		SAMPLE RECEIVED WITH ICE MELTED
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	NITROGEN KJELDAHL TOTAL		*0.30	MG/L		2ND SOURCE EXCEEDED LIMITS; REC'D W/ICE MELTED
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	NITROGEN NO3+NO2 DISS (AS N)		*ND	MG/L		SAMPLE RECEIVED WITH ICE MELTED
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	PHOSPHORUS TOTAL		*0.041	MG/L		SAMPLE RECEIVED WITH ICE MELTED
NOR Watershed Rotation Sites (Non_LTT)	07/31/2007 12:29 PM	TRANSPARENCY TUBE MEASUREMENT		46.2	CM		PH METER MALFUNCTION
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	TEMPERATURE FIELD		15.1	C		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	AMBIENT AIR TEMPERATURE - FIELD		21.0	C		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	CLOUD COVER		90	%		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	CONDUCTIVITY FIELD		182	UMHOS/CM		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	TEMPERATURE AT LAB		ICED	C		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	DISSOLVED OXYGEN FIELD		9.0	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	PH FIELD		7.2	SU		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	RESIDUE TOTAL NFLT (TOTAL SUSPENDED SOLIDS)		10.	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	NITROGEN NH3-N DISS		0.017	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	NITROGEN KJELDAHL TOTAL		0.45	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	NITROGEN NO3+NO2 DISS (AS N)		ND	MG/L		
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	PHOSPHORUS TOTAL		0.040	MG/L		

Monitoring Station

Station ID 10020884
Station Name White River At Sth 112

Show specific parameter: <Show All> ▼

Sample Results

Previous 26-26 of 26 Next

Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
NOR Watershed Rotation Sites (Non_LTT)	05/29/2007 12:31 PM	TRANSPARENCY TUBE MEASUREMENT		51.3	CM		

Monitoring Station

Station ID 10034360
Station Name White River Flowage - Flowage at Hwy 112 near Harley Hagstrom Rd

Show specific parameter: <Show All> ▼

Sample Results

Previous 1-23 of 23 Next

Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Waterbody Name		White River			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Start Latitude		46.49860			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Start Longitude		90.90998			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Description of Start Location		The Boat Launch/Canoe Portage at the White River Flowage, off Highway 112.			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	End Latitude		46.49437			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	End Longitude		90.93237			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Description of End Location		No obvious landmark: use listed GPS coordinates.			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Japanese Knotweed?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for purple loosestrife?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Phragmites?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Japanese Hops?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Flowering Rush?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Hydrilla?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Brazilian waterweed?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Eurasian Water-Milfoil?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Curly-Leaf Pondweed?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Yellow Floating Heart?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Didymo?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Quagga Mussels?		YES			
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Zebra Mussels?		YES			

Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for New Zealand Mudsnails?	YES
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Red Swamp Crayfish?	YES
Project Riverine Early Detectors (Project RED)	09/15/2011 12:35 PM	Did you look for Faucet Snails?	YES

APPENDIX 4.4.1.1-1 WDNR White River Fish Mapper Data

COMMON_NAME	SCIENTIFIC_NAME	FISH_COUNT	SAMPLE_DATE	ROW_WATERBODY_NAME	GEAR_TY	WBIC_CO	LATITUDE	LONGITUDE	TOWNSHI	RANGE	SECTION	QUARTER	QUARTER
BLACK BULLHEAD	Ameiurus melas	3	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLACK BULLHEAD	Ameiurus melas	19	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLACK CRAPPIE	Pomoxis nigromaculatus	11	1966-06-21	WHITE R FL	UNKNOW	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLACK CRAPPIE	Pomoxis nigromaculatus	2	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLACK CRAPPIE	Pomoxis nigromaculatus	24	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLACK CRAPPIE	Pomoxis nigromaculatus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLACK CRAPPIE	Pomoxis nigromaculatus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLACK CRAPPIE	Pomoxis nigromaculatus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLACK CRAPPIE	Pomoxis nigromaculatus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLACK CRAPPIE	Pomoxis nigromaculatus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLACKNOSE SHINER	Notropis heterolepis	98	1980-05-13	WHITE R FL	SMALL-ME	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLUEGILL	Lepomis macrochirus	19	1966-06-21	WHITE R FL	UNKNOW	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLUEGILL	Lepomis macrochirus	5	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLUEGILL	Lepomis macrochirus	9	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUEGILL	Lepomis macrochirus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BLUNTNOSE MINNOW	Pimephales Notatus	58	1980-05-13	WHITE R FL	SMALL-ME	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BROOK TROUT	Salvelinus fontilalis	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BROWN BULLHEAD	Ameiurus nebulosus	7	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BROWN BULLHEAD	Ameiurus nebulosus	6	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BROWN TROUT	Salmo trutta	2	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
BROWN TROUT	Salmo trutta	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
BULLHEADS	Ameiurus spp.	260	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
COMMON SHINER	Luxilus cornutus		1980-05-13	WHITE R FL	SMALL-ME	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
CRAPPIES	Pomoxis spp.	13	1966-06-21	WHITE R FL	UNKNOW	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
GOLDEN SHINER	Notemigonus crysoleucas	17	1980-05-13	WHITE R FL	SMALL-ME	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
GOLDEN SHINER	Notemigonus crysoleucas	1	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
LARGEMOUTH BASS	Micropterus salmoides	1	1966-06-21	WHITE R FL	UNKNOW	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
LARGEMOUTH BASS	Micropterus salmoides	6	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
LARGEMOUTH BASS	Micropterus salmoides	1	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
NORTHERN PIKE	Esox lucius	9	1966-06-21	WHITE R FL	UNKNOW	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
NORTHERN PIKE	Esox lucius	137	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
NORTHERN PIKE	Esox lucius	28	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW

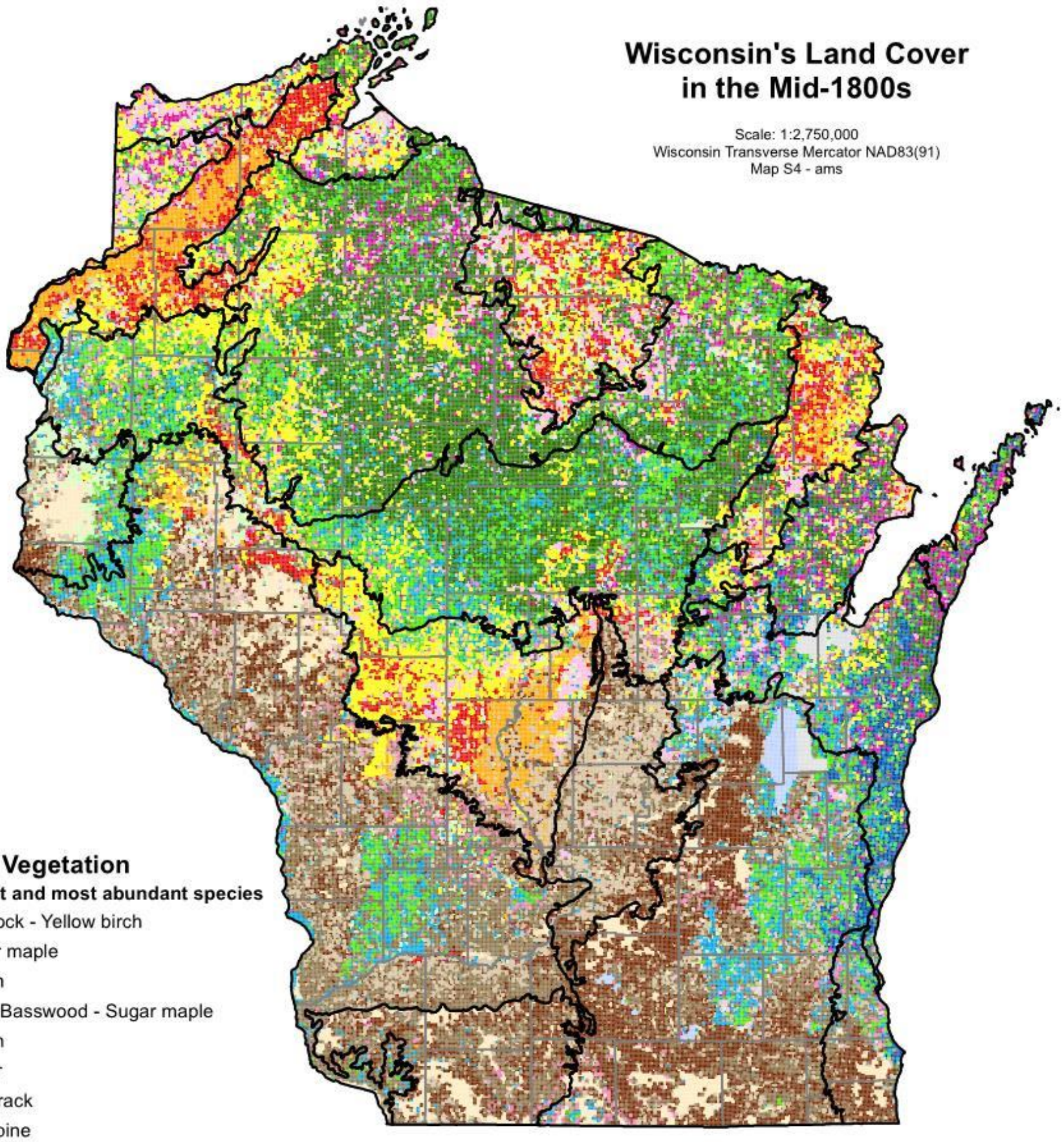
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	2	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	2	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
NORTHERN PIKE	Esox lucius	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
PUMPKINSEED	Lepomis gibbosus	4	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
PUMPKINSEED	Lepomis gibbosus	8	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
PUMPKINSEED	Lepomis gibbosus	1	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
PUMPKINSEED	Lepomis gibbosus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
PUMPKINSEED	Lepomis gibbosus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
PUMPKINSEED	Lepomis gibbosus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
PUMPKINSEED	Lepomis gibbosus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
PUMPKINSEED	Lepomis gibbosus	1	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
RAINBOW TROUT	Oncorhynchus mykiss	1	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
ROCK BASS	Ambloplites rupestris	7	1966-06-21	WHITE R FL	UNKNOW	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
SHORTHEAD REDHORSE	Moxostoma macrolepidotum	49	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
SHORTHEAD REDHORSE	Moxostoma macrolepidotum	16	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
SHORTHEAD REDHORSE	Moxostoma macrolepidotum	46	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
SHORTHEAD REDHORSE	Moxostoma macrolepidotum	77	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
WALLEYE	Sander vitreus	3	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
WARMOUTH	Lepomis gulosus	1	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
WHITE SUCKER	Catostomus commersonii	15	1980-05-13	WHITE R FL	SMALL-ME	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
WHITE SUCKER	Catostomus commersonii	76	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
WHITE SUCKER	Catostomus commersonii	5	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
WHITE SUCKER	Catostomus commersonii	31	2015-04-08	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
WHITE SUCKER	Catostomus commersonii	49	2015-04-10	WHITE RIVER FLOWAGE	FYKE NET	2894200	46.496856	-90.9132833	N46	W4	6	NE	SW
YELLOW BULLHEAD	Ameiurus natalis	2	1990-04-17	WHITE R FL	DC STRE	2894200	46.4975	-90.9094	N46	W4	6	NE	NW
YELLOW PERCH	Perca flavescens	1	1989-09-25	WHITE R FL	DC BOOM	2894200	46.4975	-90.9094	N46	W4	6	NE	NW

COMMON_NAME	SCIENTIFIC_NAME	FISH_COUNT	SAMPLE_DATE	ROW_WATERB	RIVER_MI	GEAR_TY	WBIC_CO	LATITUDE	LONGITUI	TOWNSHI	RANGE	SECTION	QUARTER	QUARTER
COMMON SHINER	Luxilus cornutus	3	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
GOLDEN SHINER	Notemigonus crysoleucas	1	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
HORNYHEAD CHUB	Nocomis biguttatus	2	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
LOGPERCH	Percina caprodes	2	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
LONGNOSE DACE	Rhinichthys cataractae	6	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
SHORTHEAD REDHORSE	Moxostoma macrolepidotum	10	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
SILVER REDHORSE	Moxostoma anisurum	1	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
TROUTPERCH	Percopsis omiscomaycus	24	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
WALLEYE	Sander vitreus	2	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE
WHITE SUCKER	Catostomus commersonii	2	1980-07-08	WHITE R	23.9	DC STREA	2892500	46.498	-90.9039	N46	W4	6	NE	NE

APPENDIX 4.5.1-1: Land Cover in the Mid-1800's

Wisconsin's Land Cover in the Mid-1800s

Scale: 1:2,750,000
Wisconsin Transverse Mercator NAD83(91)
Map S4 - ams



Native Vegetation

Dominant and most abundant species

- Hemlock - Yellow birch
- Sugar maple
- Aspen
- Elm - Basswood - Sugar maple
- Beech
- Cedar
- Tamarack
- Jack pine
- Red pine
- White pine
- Red oak
- Black oak - Jack oak
- Bur oak
- White oak
- Prairie
- Water
- No data
- Ecological Landscape
- County Boundaries

This data was compiled by the Forest Landscape Ecology Lab at the University of Wisconsin - Madison (http://landscape.forest.wisc.edu/). It is published here courtesy of David J. Mladenoff.

For more information about the General Land Office Public Land Survey, see Schulte L.A. and Mladenoff D.J. 2001. The original Public Land Survey records: their use and limitations in reconstructing presettlement vegetation. J. Forestry 99(10) 5-10.

0 12.5 25 50 75 100 Miles

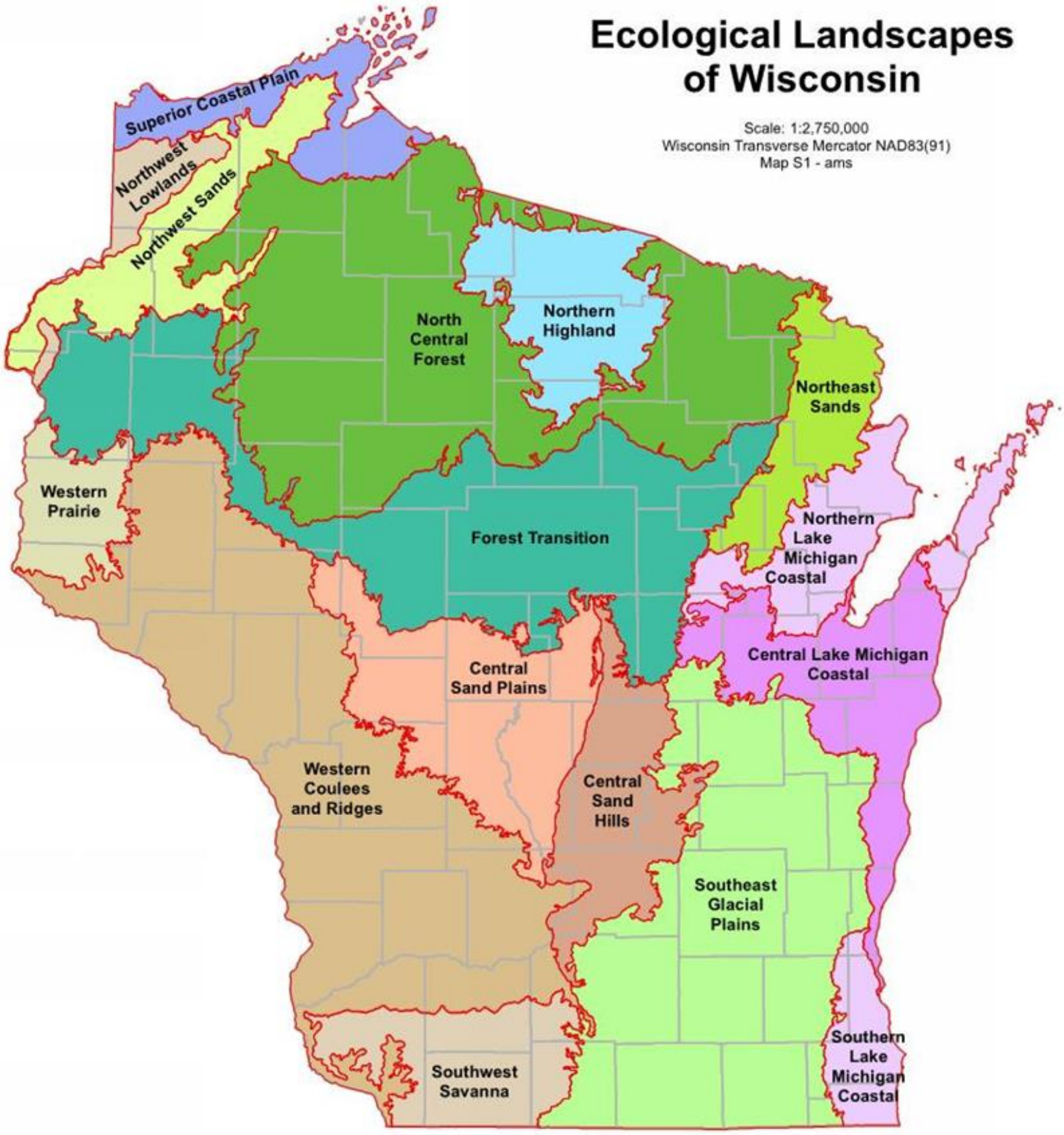
0 20 40 80 120 160 Kilometers

N W E S

APPENDIX 4.5-1: Ecological Landscapes of Wisconsin

Ecological Landscapes of Wisconsin

Scale: 1:2,750,000
Wisconsin Transverse Mercator NAD83(91)
Map S1 - ams

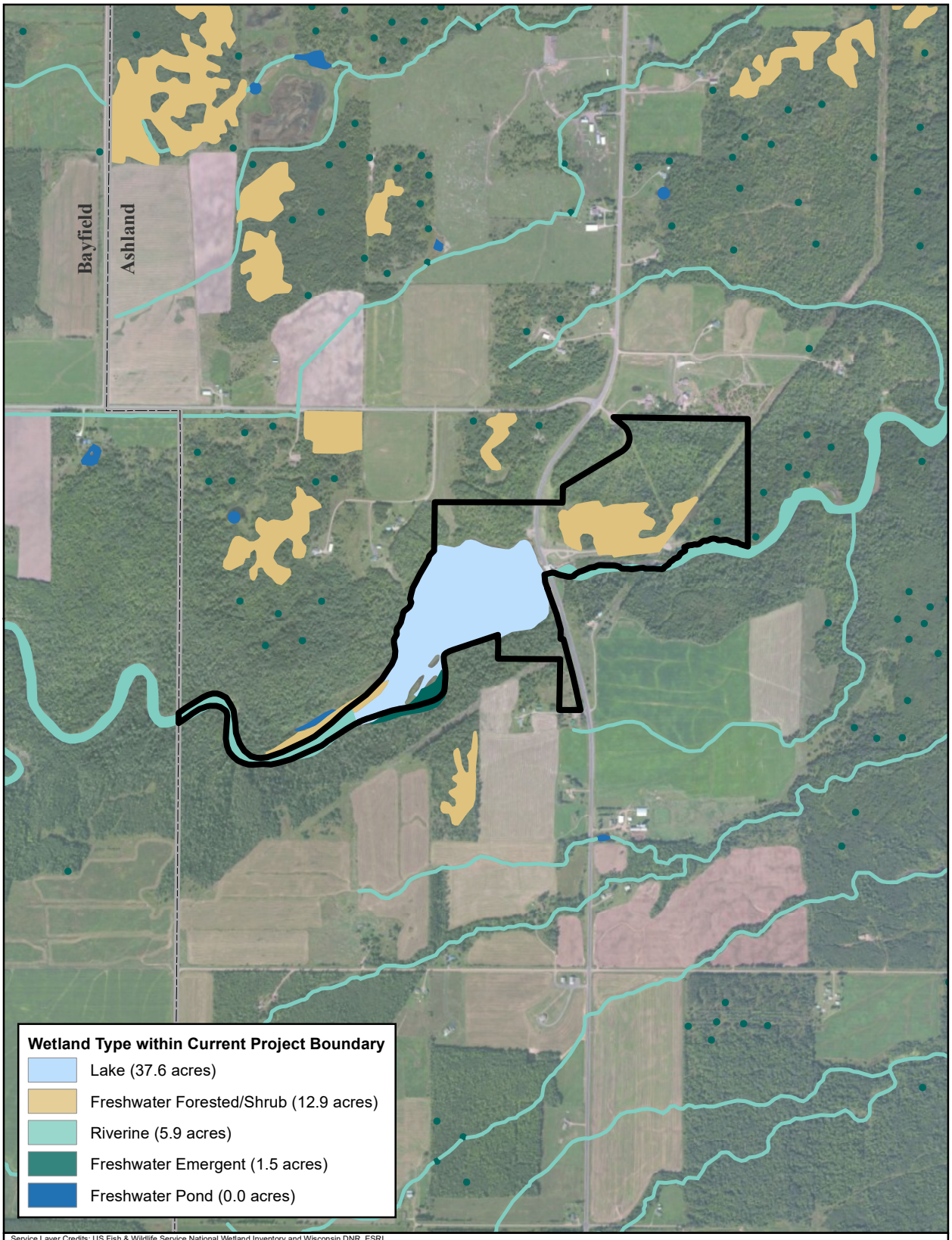


Wisconsin was divided into 16 ecoregions with similar ecology and management opportunities. Each of these ecoregions is called an Ecological Landscape. The Ecological Landscapes are based on the National Hierarchical Framework of Ecological Units (NHFEU; Cleland et al. 1997). There were too many NHFEU Subsections and too few NHFEU Sections to be useful for management purposes. Ecological Landscapes use the same boundaries as NHFEU Sections or Subsections. However, some NHFEU Subsections were combined to reduce the number of geographical units in the state to a manageable number. Therefore, Ecological Landscapes are at a size (scale) between NHFEU Sections and Subsections.

Ecological Landscapes
County Boundaries

0 12.5 25 50 75 100
Miles
0 20 40 80 120 160
Kilometers

APPENDIX 4.6.2-1 Wetlands in Vicinity of the Project



Service Layer Credits: US Fish & Wildlife Service National Wetland Inventory and Wisconsin DNR, ESRI

Xcel Energy®

Mead & Hunt

Current Project Boundary

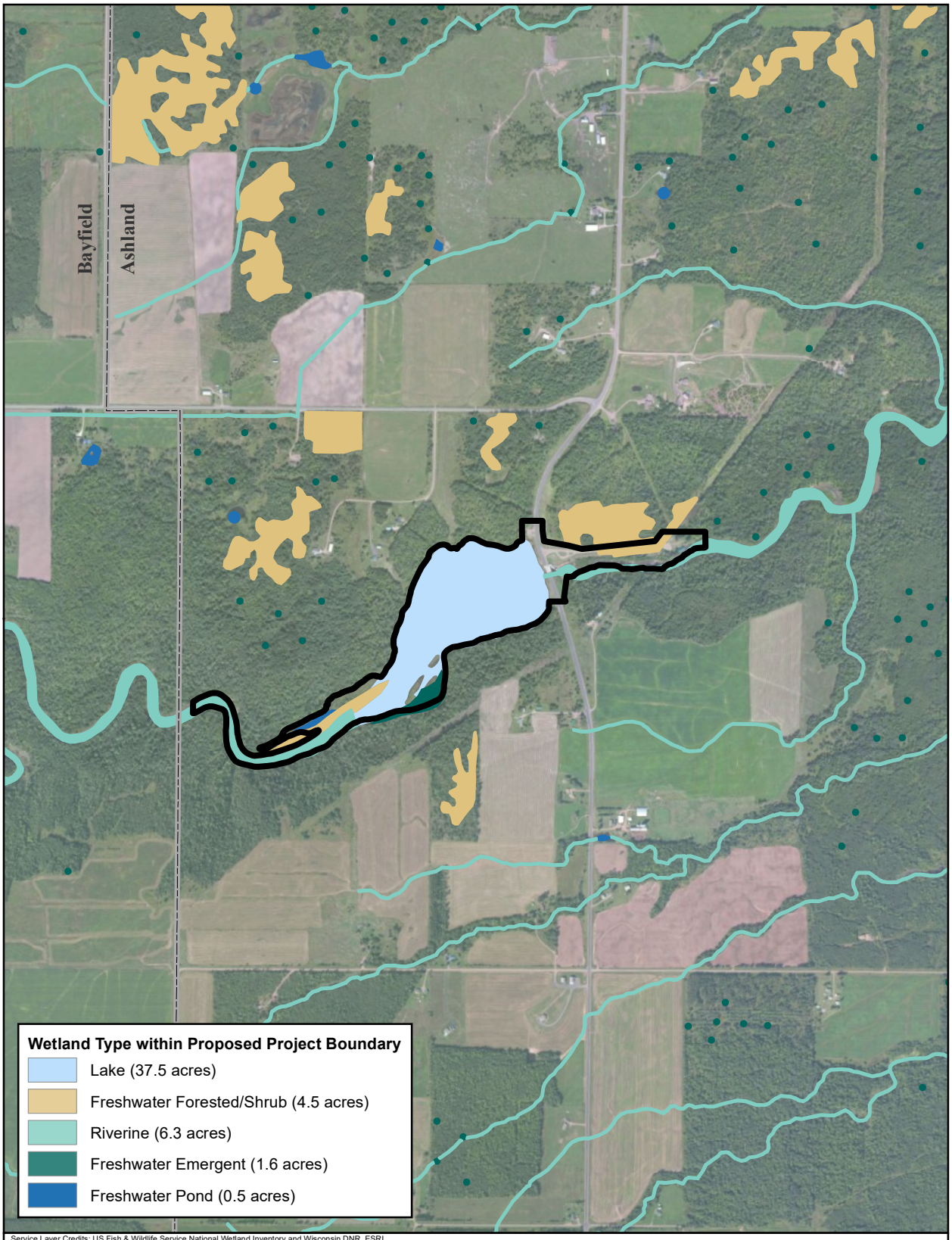
County Boundary

N

0 1,000 2,000 Feet

White River Project
Project Vicinity Wetlands

FERC No. 2444



Service Layer Credits: US Fish & Wildlife Service National Wetland Inventory and Wisconsin DNR, ESRI

Xcel Energy®

Mead & Hunt

Proposed Project Boundary

County Boundary

N

0 1,000 2,000 Feet

White River Project
Project Vicinity Wetlands

FERC No. 2444

APPENDIX 4.7.2-1 White River Project IPaC List

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Ashland and Bayfield counties, Wisconsin

Local office

Green Bay Ecological Services Field Office

(920) 866-1717
(920) 866-1710

2661 Scott Tower Drive
New Franken, WI 54229-9565

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Canada Lynx Lynx canadensis There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3652	Threatened
Gray Wolf Canis lupus There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4488	Endangered
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Endangered

Flowering Plants

NAME	STATUS
Fassett's Locoweed Oxytropis campestris var. chartacea No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/209	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Bittern Botaurus lentiginosus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6582	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cape May Warbler Setophaga tigrina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Jul 31
Dunlin Calidris alpina arcticola This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Evening Grosbeak Coccothraustes vespertinus — Breeds May 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden-winged Warbler Vermivora chrysoptera — Breeds May 1 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8745

Harris's Sparrow Zonotrichia querula — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Marbled Godwit Limosa fedoa — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Rusty Blackbird Euphagus carolinus — Breeds May 10 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Semipalmated Sandpiper Calidris pusilla — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

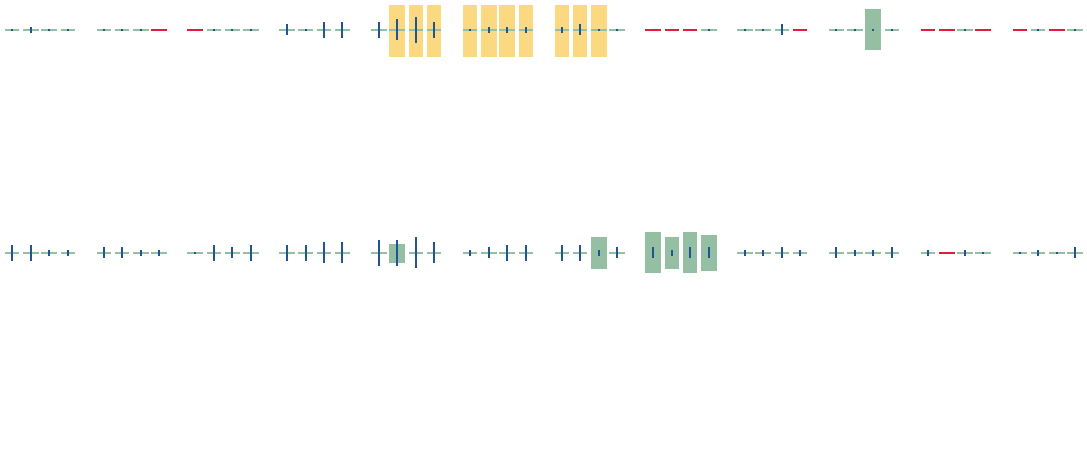
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in

knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
Palustrine

LAKE
Lacustrine

RIVERINE
Riverine

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.