Appendix H: Water Resources in Wisconsin – Overview of Resources

Resource Descriptions

Rivers and Streams

The state contains an estimated 88,000 stream miles from approximately 54,000 discrete rivers and streams; however, fewer stream miles (42,468) are delineated and documented in the Department's WATERS database. However, the database contains a majority of the larger streams and rivers in the state.

Fish and aquatic life (FAL) use is the primary assessed use in streams/rivers – 19,625 stream miles (46% of stream miles in the WATERS database) have been assessed for FAL use support. Of the stream miles assessed, approximately 70% are supporting FAL uses. The FAL use assessments are primarily based on Indices of Biotic Integrity calculated from macroinvertebrate sample and fish survey data. A very small amount of stream miles have been assessed for fish consumption and recreational uses, as these assessments are often conducted in response to a known problem or specific program need, such as a county health department monitoring program for swimming uses.

Lakes

Recreation and fish and aquatic life (FAL) uses are the primary designated uses assessed for lakes (Table 2 and Figure 4). WDNR assessed FAL use of 793,899 lake acres using a combination of in-lake water quality samples and water clarity data gathered from satellite imagery. Wisconsin's Citizen Lake Monitoring Network data, combined with satellite imagery analysis developed by the WDNR's Bureau of Science Services, contributed greatly to the 2014 assessments. Over 1,200 volunteers who sample 800 lake stations each year; this data is extrapolated based on modeling techniques with satellite data to provide assessments for over 6,000 lakes in the state. Based on these assessments, approximately 69% of assessed lake acres are supporting the FAL use. The recreation use of over 50,000 acres of additional lakes was assessed in this reporting cycle.

The number of assessed waters in Wisconsin reflects the use of automated analysis and investments in information technology tools. For example, the Department uses a customized "assessment package" that generates trophic state index values (TSI values) for lakes in the state. TSI values are usually ascertained by comparing the results of sample data against a set of condition thresholds derived from Carlson's Trophic Status Index. However, as in other states such as Michigan and Minnesota, Wisconsin routinely processes TSI values extrapolated from satellite imagery correlated with Secchi depth readings gathered by Citizen Lake Monitoring Network volunteers. These data are used to calculate general assessments for lake fish and aquatic life use. This method provided the state with significantly more lake assessments in 2014, bringing the number of lakes assessed for fishable, swimmable waters to over 80%. This is a significant accomplishment, particularly given the magnitude of waters in the state and the technical work involved in the analysis.

Impoundments

Impoundments are bodies of water created by structures (dams) which hold water either permanently or in a controlled fashion. Many of Wisconsin's large impoundments provide electricity service, controlled through the FERC process. Similar to natural lakes, WDNR primarily assesses the recreation and fish and aquatic life (FAL) uses for impoundments. Due to landscape and morphological features of impoundments (sediment transport, collection of nutrients and algal debris, a majority of impoundments assessed do not support fishing and swimming and are listed as impaired (75,139 acres, 63%) and a large majority of impoundments assessed (83,064 acres or 95%) do not support recreation use (Table 3). Due, in part, to the accumulation of sediment behind riverine structures and proclivity of pollutants (organic contaminants and metals) to attach to sediment, a large proportion of impoundments (80,906 acres or 89%) do not support fish consumption (i.e., these waters have specific advise that recommend strict limits on the number and type of fish consumed).

Beaches

Wisconsin's beaches provide wildlife habitat, recreation areas and tourist destinations. Beaches are especially vulnerable to agricultural, urban and industrial land uses, and some of our beaches are showing the effects of improper land management practices. Still, of the approximately 55 miles of Great Lake and inland beaches assessed, 39 miles (71%) supported recreation use. Conversely, 16 miles (29%) of beaches did not support recreation use, primarily due to elevated levels of E. coli – a bacterial indicator of potential risks to human health.

Great Lakes Shoreline

Wisconsin has roughly 1,000 miles of Great Lakes Shoreline, with only a fraction of those shoreline miles considered assessed for Fish and Aquatic Life uses (see Table 5 and Figure 9). Many of these waters' fish and aquatic life uses are impaired due to sediment contamination from historic discharges or "legacy" pollutants. As staff and fiscal resources allow, WDNR will conduct a more comprehensive assessment of the Great Lakes shorelines in the future.

Multi-State Resources and Programs

Mississippi River

Wisconsin's Mississippi River reach runs 230 miles from the confluence of the St. Croix to the Illinois Border and includes a diverse array of aquatic and terrestrial habitat within this corridor. Eighty percent of this reach (182 miles) is part of the Upper Mississippi River National Wildlife and Fish Refuge, which runs from the Chippewa River mouth to Rock Island, Illinois. The U.S. Corps of Engineers dredges (roughly 1 million yd^3 annually) to maintain a 9-ft navigation channel and operates 10 locks and dams to facilitate commercial and recreational navigation traffic through Wisconsin's reach.

In 1986, Congress recognized the Upper Mississippi River System (UMRS) as a nationally significant ecosystem and navigation system (Public Law 99-662). Wisconsin shares its water resource management responsibilities on the Mississippi River with adjoining states (Iowa and Minnesota) and federal agencies and participates in numerous interagency work groups, committees and associations. The Department carries out water quality, fisheries and wildlife management program functions on the Mississippi River through the operation of the Mississippi River Team at La Crosse, Wisconsin (WDNR 1992).

Wisconsin conducts water quality monitoring on the Mississippi River with state-funded programs and federal funding as part of the U.S. Corps of Engineers Environmental Management Program (EMP) Long Term Resource Monitoring Program (LTRMP). Monitoring conducted with federal support is primarily conducted by the Department's field station at Onalaska, Wisconsin.

Mississippi River water quality monitoring is established through the development of work plans as directed by the Water Division. Monitoring efforts conducted by the LTRMP follow operational plans, cooperative agreements and scopes of work prepared by USGS with input from federal-state partners (EMP Coordinating Committee and LTRMP Analysis Team) (USFWS, 1992).

State-sponsored monitoring activities on the Mississippi River have primarily focused on fixed station, intensive, synoptic and screening-level sampling designs. The federal LTRMP utilizes a probabilistic sampling design (stratified random sampling) as part of its monitoring in Pool 8 (also Pool 4 by MDNR).

Great Lakes

The Great Lakes, including their bays and harbors, represent a water resource of major significance to Wisconsin's aquatic life, recreational uses, drinking water supply and economy. Monitoring of these vast water resources relates directly or indirectly to nearly every component of this monitoring strategy. As such, it is not possible to put all of the Great Lakes monitoring components in one section of this Strategy. However Section 5.8 provides an overview of the categories and goals of the core monitoring work directly related to the primary water quality program needs.

Baseline Monitoring for the Great Lakes includes three primary activities:

- Lake Michigan Major Tributary Phosphorus Loading.
- Great Lakes Fishery Assessment.
- Pathogen Indicator Monitoring on Great Lakes Beaches.

Great Lakes monitoring also involves other projects including:

- Contaminated Sediment is an Evaluation Monitoring and is widespread in the Great Lakes.
- Cladophora/Nutrient monitoring of near shore waters of Lake Michigan is also conducted as a targeted program.

- Lakes Superior and Michigan have 15 public water intakes that are monitored according to the Safe Drinking Water Act, using the same protocols as Public Drinking Water Well Monitoring.

Great Lakes monitoring generally represent activities conducted in conjunction with a variety of federal, state and local partners. A number monitoring and restoration projects are funded to address Area of Concern-specific issues in the five AOCs.

Great Lakes Restoration Initiative (GLRI)

The Great Lakes Restoration Initiative was launched in 2010 to accelerate efforts to protect and restore the largest system of fresh surface water in the world — the Great Lakes. During FY15 -19, federal agencies will continue to use Great Lakes Restoration Initiative resources to strategically target the biggest threats to the Great Lakes ecosystem and to accelerate progress toward long term goals for this important ecosystem.

GLRI Action Plan II summarizes the actions that federal agencies plan to implement during FY15-19.

These actions will build on restoration and protection work carried out under the first GLRI Action Plan, with a major focus on:

- Cleaning up Great Lakes Areas of Concern
- Preventing and controlling invasive species
- Reducing nutrient runoff that contributes to harmful/nuisance algal blooms
- Restoring habitat to protect native species

Implementation of Wisconsin's Great Lakes Strategy

Wisconsin's Great Lakes Strategy provides the necessary details to help support and implement the recommended action items of the Great Lakes Regional Collaboration Strategy. The Office of the Great Lakes facilitate role in project development for the restoration and protection of the Great Lakes in Wisconsin. As restoration monies become available, it will be important to promote and utilize existing mechanisms for accomplishing projects. Existing partnerships such as the Lake Superior Binational Forum will play a key role in striving to achieve the goals articulated in the Strategy. Specific examples of project proposals for implementing Wisconsin´s Great Lakes Strategy can be found in the 2009 updated strategy document below. Please note: this document is not intended to be a comprehensive list of implementation projects and is subject to change.

- 2013–2014 DNR Action Plan for Lake Superior [PDF]
- Wisconsin's Great Lakes Strategy 2009 update [PDF]
- 2006 Wisconsin's Great Lakes Restoration and Protection Strategy [PDF]
- DNR Testimony about Restoration Plan by Todd Ambs [PDF]
- Great Lakes Restoration Initiative
- Great Lakes Regional Collaboration Strategy [exit DNR]
- Wisconsin's Great Lakes Strategy Brochure [PDF]