Chapter 2: Assessment Methodology & Summary Data

Every surface water in the state is assessed for "use support status" by DNR regional staff using available monitoring and evaluation data from DNR files. The use support status for surface waters (lakes, rivers) includes fully, partially, threatened, not meeting, or not assessed for a given designated use. Data is evaluated and assessments are written up in water quality management plan rivers and lakes tables, which in the past have been published every 5 years. New management systems are being implemented to allow continual update of tables by regional staff as they occur. Once assessments have been made, data is entered into the "305b Surface Water Quality Database", a Microsoft Access Database developed by the USEPA for use by states. Wisconsin is evaluating this system for possible conversion to an inhouse oracle-based system that would be accessible to DNR and the public through the internet.

Assessments typically involve watershed specialists consulting with lake managers, fisheries managers and water quality biologists on the quality or condition of the stream or lake. This information is often found in DNR files in the form of reports and more recently in data systems developed for maintaining records of baseline data results and from STORET. DNR also relies on the use of best professional judgement in the assessment of streams and lakes that have older available data.

Data used in assessments include:

- Baseline data (includes Fish Community, Macroinvertebrate, Habitat/Physical data)
- Intensive Surveys (ie., like TMDL studies)
- Ambient Fixed Station Data
- Fish advisory data
- Surface water use classification reports
- River basin water quality management plans
- County soil erosion and animal waste management plans
- Water chemistry data (STORET database)
- Sediment data
- Effluent data
- County surface water resources publications
- Wisconsin trout streams publications
- Wastewater discharge and polluted runoff impact assessment data
- Fishery resource master plans
- Inventory of non-metallic mining sites
- Wisconsin Adm. Code, NR102 antidegradation stream classifications
- Wasteload allocation reports
- Environmental impact statements, Environmental assessments
- Endangered resources data

Water Quality Assessment Criteria – Rivers/Streams

Aquatic Life Use Support

A waterbody's designated or beneficial uses are based on the type of aquatic community the water should be able to support. DNR evaluates whether the stream's existing use is equivalent to its potential biological use to determine if it is meeting is aquatic life use support (ALUS).

Existing Use: This indicates the biological use that the stream or stream segment currently supports. This is not a designation or classification; it is based on the current condition of the surface water and the biological community living in that surface water. Information in this column is not designed for, and should not be used for, regulatory purposes. In cases where the existing use is unknown, "UNK" was entered. The biological use categories are defined in NR102(04)(3) under fish and aquatic life uses, which are the same categories used to describe the

stream's codified use. The following abbreviations for existing stream uses are used in the table. See also *Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Surface Waters (6/98 Draft). This draft guidance is used for determining existing and potential use for Cold (generally), WWSF, WWFF, LFF, and LAL. Until this draft is formally adopted, the categories listed below will be used, as opposed to the proposed revisions incorporating CWT-1-3, CWF, and GLM waters.*

COLD Cold Water Community; includes surface waters that are capable of supporting a community cold water fish and other aquatic life or serving as a spawning area for cold water fish species. The cold water community may be indicated by a trout class based on the document, *Wisconsin Trout Streams* (DNR Publ. 6-3600[80]). The approximate length or portion of stream meeting each of the use classes is indicated.

CLASS I high-quality stream where populations are sustained by natural reproduction;

CLASS II stream has some natural reproduction, but may need stocking to maintain a desirable fishery;

Class III stream has no natural reproduction and requires annual stocking of legal-size fish to provide sport fishing.

WWSF Warm Water Sport Fish Communities; includes waters capable of supporting a community of warm water sport fish or serving as a spawning area for warm water sport fish.

WWFF Warm Water Forage Fish Communities; includes surface waters capable of supporting an abundant, diverse community of forage fish and other aquatic life.

LFF Limited Forage Fishery (intermediate surface waters); includes surface waters of limited capacity due to low flow, naturally poor water quality or poor habitat. These surface waters are capable of supporting only a limited community of tolerant forage fish and aquatic life.

LAL Limited Aquatic Life (marginal surface waters); includes surface waters severely limited because of low flow and naturally poor water quality or poor habitat. These surface waters are capable of supporting only a limited community of aquatic life.

Potential (Attainable) Use: This column indicates the biological use that the investigator believes the stream or stream segment could achieve through proper management of "controllable" pollution sources. Beaver dams, hydroelectric dams, low gradient streams, and naturally occurring low flows are generally not problems that can be controlled.

The potential (or attainable) use may be the same as the existing use or it may be higher. Abbreviations for "potential use" are the same as those used in the "existing use" column. Information sources used to determine stream potential are indicated by footnotes in each table. Unless otherwise noted, the source for trout streams was *Wisconsin Trout Streams* (DNR Publ. 6-3600[80]), Wis. Adm. Code NR102.10 and NR102.11, and the professional judgment of WDNR personnel.

Supporting Potential Use: This column indicates whether a stream is threatened or is fully, partially, or not meeting its potential biological use. An entry in this column shows the relationship between the stream's current and potential biological use. To determine if a waterbody or segment supports a potential use, one or more of the following is used: chemical, physical (habitat, morphology, etc.), or biological information, direct observation and/or best professional judgment. When biological data contrary to chemical or physical data exists, the biological data overrides the other data.

Fully Supporting "FULLY"

A stream or stream segment's existing biological use is the same as its potential biological use (E = P). This includes stream or stream segments that are *not affected* and stream or stream segments that have *culturally irreversible* impacts. An example of culturally irreversible impacts are those effects in a river system with an "optimally operating" dam—a dam that operates with minimal to no effect on the fish and aquatic life community assemblage, productivity, and diversity. Note that fairly to poorly operating dams are not considered "culturally irreversible" and their effect on biological resources is factored into the use support designation (see partially supporting).

Fully Supporting/Threatened "FULLY-THR"

A stream or stream segment's existing biological use is the same as its potential biological use (E = P), but there is a *clear and imminent* "threat" to the existing use remaining at its current level of biological productivity and ecological health. This threat could be due to actions likely to occur on or to the stream and/or in the watershed, such as:

- Rapid commercial, residential, and/or industrial development in the watershed,
- The advent of large-scale industrial operations in the watershed,
- Planned or active channel modifications that have been, or will be permitted, or cannot be regulated under existing state or federal rules (i.e., drainage districts).

Partially Supporting "PART"

A stream or stream segment's existing biological use is the same as its potential biological use, except that implementation of management practices could enhance the overall ecological health of the biological community. Management practices in this category include modification of hydro-regimes to reduce the impact of dam operations on the biological community.

Thus, E = P, but the potential use assessment is below the stream or stream segment's maximum biological potential and this "less than optimal" condition is reversible.

Not Supporting "NOT"

When a stream or stream segment's existing biological use is less than its potential biological use by a factor of 1 or more of the following codified use classifications:

Cold (includes Cold I, II, IIN, and III in one group);

WWSF

WWFF

LFF

LAL

Thus, E < P, with problems considered reversible by implementation of management actions.

Miles Assessed — Monitored, Evaluated, or Unassessed: To substantiate the Use Support designation of "fully," "partially," "not," or "threatened," the terms monitored, evaluated, or unassessed are defined as the following:

Monitored: A stream has been "monitored" for the purposes of Wisconsin water quality management plans and/or Wisconsin's Water Quality Assessment Report to Congress (305[b]) if:

Site-specific data has been collected on that stream or stream segment in the past five years; For the purposes of this document, data is defined as structured information gathered to assess the quality or integrity of a resource. Data from outside the WDNR can be used to help determine the quality or integrity of waters in the State of Wisconsin.

The data are adequate to develop a best professional judgment about the existing and potential biological use of that stream or stream segment;

The data should be adequate to judge the difference between the "existing" versus "potential" biological use for that stream or stream segment.

This information is used to determine if the Existing Biological Use matches or supports the Potential Biological Use "fully," "partially," or "not:"—and if that use is "threatened."

Evaluated: A stream has been "evaluated" if information other than site-specific data is adequate to determine a Potential Biological Use and to determine if the stream is currently meeting that level of biological use.

Sources of "evaluated" information include:

- Site-specific data that is more than five years old,
- Information on file provided by the public or others,
- Best professional judgment of a WDNR biologist or a WDNR fish manager.

Unassessed: A stream has been not been assessed.

Fish Consumption Use Support

In the past, the following decision criteria were applied: rivers that **Fully** meet fish consumption use support have been tested but *no special advisory* has been issued. All fish are edible under the *General Advisory* rules. **Threatened** rivers are ones that have localized contaminant problems but the extent of the contamination is not yet known. **Partially** meeting rivers for fish consumption are those that have type of restricted consumption, which includes any advisory beyond the General Advisory. In Wisconsin's tiered consumption advisory system, this includes any type of restriction *short of a do not eat* (i.e., limited consumption for women, children, etc.). Rivers that are **Not Supporting** their fish consumption designated use are those that have *any type of a Do Not Eat advisory* under a special advisory. However, In 2002, Wisconsin is listing all 57,698 stream miles as not meeting fish consumption uses due to the presence of the general mercury advisory in place for all Wisconsin waters.

Other Uses:

Other designated uses of interest to USEPA — Shellfishing, Drinking Water Supply, Swimming, Primary and Secondary Contact, Agriculture, and Aesthetics — are either not evaluated by Wisconsin DNR at this time due to a lack of data or a lack of a standardized assessment protocol.

Water Quality Assessment Criteria - Lakes

Lakes are assessed for Aquatic Life Use Support, Fish Consumption, and Secondary Contact Recreation. During 2001 DNR enhanced the criteria it uses to make aquatic life use and fish consumption use designations. Enhancements include adding aquatic nuisance species, use of nutrient sensitivity categories, and inclusion of language noting the tiered consumption advisories and special vs. general advisories for Hg. Statewide, lakes tables have been updated during 2000-2001 through the integrated planning process.

Aquatic Life Use Support

In Wisconsin, support of Aquatic Life Use indicates the health of lakes measured by fish population dynamics, absence or presence of disease, or through indicators such as nuisance or exotic macrophytes, TSI scores coupled with the presence of activities known to cause excess phosphorus loading, often the limiting nutrient for lake productivity.

Lakes that are **Fully** meeting do not winterkill or they are considered Class IA lakes with no identified source or causes of problems identified in the lakes tables. **Threatened** lakes also do not winterkill, but have stunted panfish or carp, *or* they are Class IA lakes and have specifically identified source or causes of problems in the lakes tables that involve export of excess phosphorus into the lake such as NUT, TURB, or SED

Lakes that are **Partially** meeting do not have winterkill, but do have high levels of contamination in fish tissue or turbidity/sedimentation problems, *or* Encroachment by exotic species, *or* Seasonally high levels of phytoplankton/anoxia, *or f*ish threatened by infectious disease. Finally, lakes that are **Not** meeting aquatic life use support do have winterkill problems or they are listed as a Class IIB lake.

Fish Consumption Use Support

In the past, Wisconsin applied the following criteria for fish consumption uses: lakes that **Fully** meet fish consumption use support have been tested but *no special advisory* has been issued. All fish are edible under the *General Advisory* rules. **Threatened** lakes are ones that have not yet been tested for a special advisory. **Partially** meeting lakes for fish consumption are those that have type of restricted consumption, which includes any advisory beyond the General Advisory. In Wisconsin's tiered consumption advisory system, this includes any type of restriction *short of a do*

not eat (i.e., limited consumption for women, children, etc.). Lakes that are **Not Supporting** their fish consumption designated use are those that have *any type of a Do Not Eat advisory* under a special advisory. However, In 2002, Wisconsin is listing all 900,000+ lake acres as not meeting fish consumption uses due to the presence of the general mercury advisory in place for all Wisconsin waters.

Secondary Contact Recreational Use Support

Secondary contact recreation pertains to the safety of waters for direct exposure to individuals through recreational activities (as opposed to Primary Contact, which is full contact swimming). Lakes **Fully** supporting are those that are oligotrophic, mesotrophic or dystrophic; *or* Class IA lakes with no accompanying source/cause categories indicating excess phosphorus is actively mobilized by human activities in the watershed. **Threatened** lakes include oligotrophic or mesotrophic lakes with seasonal nuisance densities of plants or algae, *or* Class IA lakes coupled with source/cause categories that include any type of problem that contributes excess phosphorus to the lake, such as NUT, TURB, or SED.

Lakes that are **partially supporting** include those that are eutrophic, *or* turbid, *or* have nuisance densities of plant or algae, *or* lakes that are considered Class IB. Lakes **not support** secondary contact recreation are those that are hypereutrophic, *or* considered Class IIB lakes.

Impaired Waters Screening Criteria

Waters identified as “impaired” under Section 303(d) of the Clean Water Act include those that have either quantitative water quality standards violations or aquatic life and/or fish consumption use designation problems combined with that water not meeting its codified water quality classification. Once a waterbody is on the impaired waters list, it is categorized according to the factors causing impairment. Within each category is a description of the strategy the Department may use in development and implementation of TMDLs.

Impaired Waters Categories

Point source dominated - Waters (usually waterbody segments) in which the impairment is present as a result of a current discharge from an existing point source. The WPDES program is implemented to assure the attainment of standards at the time of permit issuance. Existing law and rules including the water quality standards and WPDES permit rules preclude the issuance of a permit if it will not attain water quality standards. Waters in this category are likely between permit cycles, or may have obtained a variance to the water quality standards under current law. TMDLs in this category may also be implemented through the development of waste load allocations under the provisions of NR 212.

Nonpoint source dominated - Waters in which the impairment is present primarily as a result of nonpoint source runoff or from the destruction of habitat caused by nonpoint sources. Many of these waters are headwater segments, or subwatershed areas. Others are large bodies of water at the downstream end of large drainage basins. TMDLs for waters affected by nonpoint sources will, therefore, vary according to the system impacting the impaired waterbody. The implementation strategy for NPS includes the following: the priority watershed program for watershed size or small scale projects selected prior to 1998 through cost-sharing incentives based on voluntary participation by landowners and other participants; enforcement of nonpoint source controls is implemented through the designation of “critical sites”; the new NPS program established under Act 27, Laws of 1997, which will include options for site and waterbody designation based on application and need; application of standards of performance; other statutory requirements. All urban stormwater sources are included as nonpoint sources for purposes of this list.

Point source and nonpoint source combined - Waters in which nonattainment of standards is substantially affected by both point source contributions and nonpoint source runoff, and in which both types of sources, each may be contributing to the failure to achieve water quality standards. Listing a water which is impacted by a point source does not imply that the source is not meeting all the requirements in its discharge permit, but only indicates that additional analy-

ses are needed to determine relative contributions by the sources and what additional requirement, if any, might be needed. Development of TMDLs will be based upon the waterbody specific evaluation and could include specific segments, watersheds or subwatersheds or sites. Segment-based modeling and assessments, watershed level analyses, or other analyses specific to the individual waters, will be used as necessary. Implementation will be through the permit program and the nonpoint programs described above, potentially using innovative approaches such as pollutant trading or other cost-effective strategies.

Contaminated sediment waters - Waters(usually segments of waterbodies) in which the impairment is present primarily as a result of toxic or other substances in the sediments which may be affecting either the ecology or uses of the site or moving off-site and affecting other uses of the water at locations beyond the boundary of the contaminated sediment. Contaminated sediments frequently are associated with the bioaccumulation of contaminants in fish and wildlife, thereby resulting in consumption advisories or harm to wildlife populations. The list of contaminated sediment waters originates from a list which was developed cooperatively by the Department's Remediation and Redevelopment and Watershed Management programs. The list reflects sites at which the Department and other parties have active investigations and, in some instances remediation underway. Several additional sites have been included based upon an inventory and scoring system for contaminants in sediments compiled by the Department in 1995. The implementation strategy for waters listed under this category will be addressed in a variety of ways depending on the nature of the impairment and the program activities which are deemed best for the location. Cleanups at sites will be implemented through the application of the NR 700 series within the Remediation and Redevelopment program and may include cooperative as well as enforcement techniques; some projects are implemented under the federal Superfund program. The TMDL analysis will vary with the complexity of the site and nature of the contamination and may include determination of sediment quality objectives, sediment transport modeling, remedial investigations, risk assessments, feasibility studies, etc.

Atmospheric deposition dominated - Waters in which the impairment is present primarily as a result of atmospheric deposition of toxic substances(such as mercury) into the waterbody and sediments resulting in concentrations in fish tissue above levels safe to consume. Most of these waters are lakes and main stems of major rivers. Waters impaired by atmospheric deposition were identified using the state's fish consumption advisory list. Because the transport of air toxic substances is transboundary in nature and not entirely known, it is impossible to assign state-only responsibility. Therefore, the state does not plan to undertake individual TMDL analyses for these waterbodies at this time. Waters listed under this category must be addressed through actions taken by U.S. EPA in cooperation with the states under the provisions of the Clean Air Act. The Department will continue to monitor waters potentially impacted by atmospheric deposition and, when deemed necessary by current practice, issue fish consumption advisories to provide public health protection.

Habitat/physical impaired - Waters in which the impairment is present primarily as a result of destruction of habitat for aquatic organisms due to flow obstructions or physical barriers to the movement of water where aquatic organism populations are impacted by alterations in the natural flow of water at a particular site. These waters are usually stream segments or may be impoundments. (Note: Habitat impairment caused by point or nonpoint sources are not included in this category.) In the 1998 listing process relatively few waters which may be impaired by habitat/physical causes have been listed. The Department is aware of concerns which exist regarding the impact of dams(including beaver dams and other impoundments), channelization, and other physical changes have on water resources. However, the data base for making consistent decisions regarding such impairments has not been fully developed to select sites for inclusion on this list. The Department plans to address this issue prior to the development of the year 2000 list. Waters listed under this category will be addressed in a variety of ways depending on the nature of the impairment and the program activities which are deemed best for the location; operations of dams which affect organism populations may be addressed through licensing of dams or other orders the Department may issue.

Other factors - Waters in this category primarily include large waters, involving basins, or multibasin areas, which may be impaired as a result of several different categories of impairment

or there are uncertainties regarding the cause of impairment. For example, Great Lakes Areas of Concern have been identified and Remedial Action Plans prepared which identify many impairing factors including point and nonpoint sources, contaminated sediments, etc. causing violations of water quality criteria and designated uses, fish consumption advisories, and others. Implementation of TMDLs for these waters may be addressed in a variety of ways depending on the nature of the impairment and the program activities which are deemed best for the location; combinations of implementation strategies identified in specific categories above will or may be used.

Removing Waters From The List

The manner in which waters are removed from the impaired waters list once they have been placed on the list is contained in EPA guidance (August 1997). The process requires that information be presented to demonstrate there is no longer an impairment or there is evidence to show that the basis for the original listing was in error. The Department intends to use these bases for its ongoing evaluation of the waters on the list.

Waters of Special Interest

Several interstate waters are included on the list or described below. In some instances, the waters listed by Wisconsin are also listed by the other state(s) bordering that waterbody. It will be important for EPA to evaluate any discrepancies in these listings, and assist the border states in resolving any differences. If and when TMDLs are conducted for those waters, coordination and collaboration among the states will be necessary.

Lake Michigan

The waters of Lake Michigan contain contaminants at levels which bioaccumulate to levels in fish and other biota to levels of human health, wildlife or aquatic life concerns. There is, therefore, a consumption advisory for Lake Michigan fish. Because of the migration of fish into and out of Lake Michigan tributaries, the consumption advisory extends into the tributaries of the Lake. The Lake and tributaries therefore are impaired and do not meet water quality standards for those specific substances.

Lake Superior

Some fish in the waters of Lake Superior contain levels of contaminants sufficiently high to warrant a consumption advisory and therefore would warrant inclusion on the 303(d) list. However, Lake Superior is, by agreement between the adjacent states of Minnesota and Michigan, the Province of Ontario and the federal governments, a special water for which many efforts are underway to assure protection of water quality. It is the Department=s position that those efforts are sufficient to improve and protect the Lake and any other TMDL activities will not be implemented. As with outstanding and exceptional water designations, Lake Superior is not included.

Mississippi River

The Mississippi River is an interstate water for which the state has issued fish consumption advisories for the entire river along the western border. It is, therefore, included on the 303(d) list for this impairing factor. Adjacent states may not include this water on their list submitted to EPA.

Sources Of Information

Water Quality Management Plans/Integrated Plans

Water Quality Management Plans are a primary source of information for the waters placed on the list because they provide the Water Program's primary source of integrated information on the state of the waters. They are developed with input from multiple programs during the basin planning update process and are grounded in codified classifications and a formal hearing process. Within those plans are tables and descriptions indicate whether a water's existing aquatic life biological use is less than its codified use or the use specified or referenced in the

Water Quality Standards

Those waters which have Priority Watershed Program data more recent that the most recent basin plan data has been reviewed for accuracy and updates of the basin plan information. For this list, impairment is defined as a waterbody that has an existing biological use that is not

meeting its codified classification and for which the potential biological use is equal to or greater than the codified use.

Fish Consumption Advisory

This document is published periodically by the DNR and Division of Health and contains a list of waters where data indicates fish exceed levels protective of human health. This list contains only those waters where the Department has actual data to support the listing for the noted species and sizes of species.

Contaminated Sediment Inventory and Project Lists

In 1995 the Department developed an inventory list of waters for which there was data on levels of contaminants in sediments. Using that data, the Department developed a list of waters containing sediments which were most contaminated. The 303(d) list contains these waters. In addition, the Department's Remediation and Redevelopment and Watershed Management programs have developed a list of additional projects which have been identified as potentially containing toxic substances. These are oftentimes associated with land-based sites where contaminants are known to be present.

Other information

In a limited number of instances, Department staff have identified waters for which there is data to indicate impairment. These waters are included on the list. A few waters are also included based upon data and information submitted to the Department by outside parties following submittal of the 303(d) list in 1996.

For more information about the impaired waters program and TMDL development see the "Impaired Waters Program" section in Part II.

Borah Creek, Grant County is a high quality water in SW Wisconsin. Portions are classified as trout water and exceptional resource water.