Wisconsin 2014 Guidance for

Watershed and Targeted Water Planning

To support the Wisconsin Consolidated Assessment and Listing Methodology (WisCALM) Requirements

Clean Water Act Section 305(b), 314, and 303(d) Integrated Reporting

Wisconsin Department of Natural Resources

Last Revised 01/07/2014

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Cover Photo Lower Kaubashine Lake, Hazelhurst, Wisconsin.

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Wisconsin 2014 Guidance for Watershed and Targeted Water Planning

Springs near Lower Kaubashine Lake, Hazelhurst Wisconsin

Wisconsin Department of Natural Resources
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Photo by Lisa Helmuth, Lake Mendota/Cherokee Marsh, 2013

Executive Summary

A watershed management plan identifies broad goals and objectives, describes environmental problems, outlines specific alternatives for water restoration and protection, and documents where, how and by whom these action alternatives will be evaluated, selected and implemented.

Step 1: Identify Watershed & Gather Data
Once your watershed of interest is identified, central office staff will assist in gathering information including: land use, population /demographic data, water quality condition results, existing or historical water quality goals/designated uses, landscape/watershed concerns, completed, ongoing, or proposed projects.

Step 2: Data Analysis: Water/shed Goals, Priorities and Recommendations
Once data gathered and analyzed, managers and biologists will define watershed goals, priorities and recommendations, including objectives for watershed management or restoration. These high level strategic tools should also clearly spell out specific recommendations or actions that needed for monitoring, grant funding, management, and restoration and other specific efforts. Biologists and central office will ensure that waters/shed data, narrative information, and recommendations are updated in the WATERS database (which updates online watershed plans).

Step 3: Strategic Action Lists to Nine Element Plans for Impaired Watersheds
Once watershed plans are developed, a strategic action list that identifies priorities for actions to maintain and restore water should be developed. This action list is an outgrowth of the goals/priorities/recommendations for the watershed and is the starting place for watershed implementation work.

Identify the Watershed to update.

Gather and analyze data and information to select watershed goals, priorities, and recommendations.

Create strategic action lists to form the basis for watershed restoration work as opportunities arise.

For impaired 'watersheds', these tools provide a starting point for nine element planning which is required for Section 319 funding and which may supplant the creation of a TMDL.

Implement the watershed plan/action list, and the nine key element work as indicated.

Follow up actions include grant funding, partnership projects, impaired waters or orw/erw water restoration efforts, updates to water quality use designations or natural community delineations, etc.

In the case of a watershed that has a large number of impaired waters or potentially impaired waters, this initial watershed planning work forms the basis for a much more detailed, extensive planning process ("Nine Element Planning") which is required for Section 319 Funding. Nine Element Planning is distinct from watershed plans but the two are related for those areas where a much deeper level of public input and partnership involvement is indicated.

Step 4: Implement Action Lists and/or Nine Element Plans and Evaluate Progress.
Implement the watershed plan/action list, and if indicated create the nine key element work planning work as indicated. Follow up actions include grant funding, monitoring projects, partnership projects, standards designation updates, impaired waters listing/delisting, orw/erw water restoration efforts, updates to water quality use designations or natural community delineations, etc.

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Chapter 1: Watershed Planning Overview

What is Watershed Planning?

A watershed approach is a framework designed to manage water resources within a specific drainage area, or watershed. Wisconsin's planning framework based on the watershed approach includes the following steps:

- determining the condition of the waters based on sound science from monitoring data
- identifying waters that do not meet water quality standards, prioritizing problems
- identifying management goals, priorities, and recommended actions

The watershed plan is a strategy that provides the assessment and management information for a geographically defined watershed, which includes the analyses, recommended actions, stakeholders and possible resources related to developing and implementation the plan.

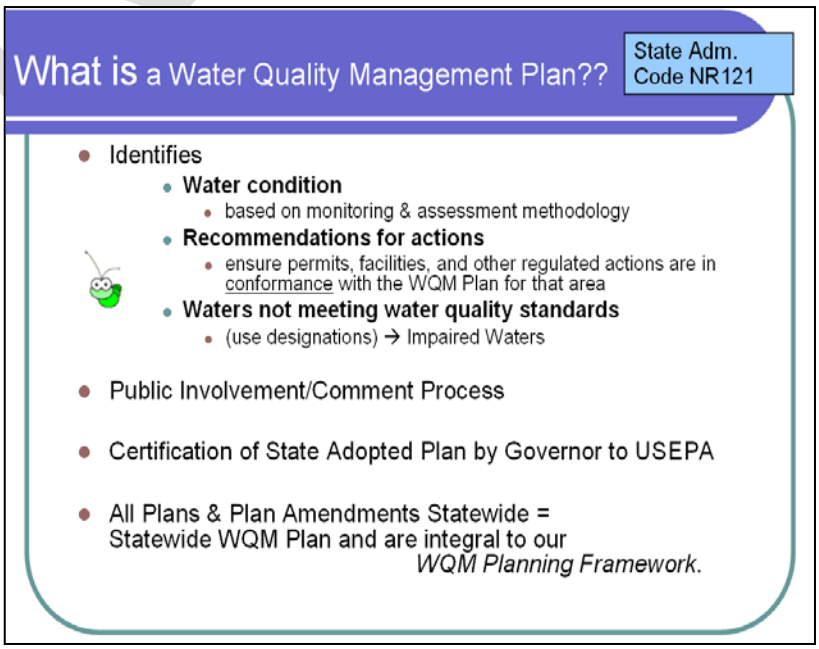
Background:

Watershed planning requirements exist at both the federal level (Clean Water Act Section 208) and state level (NR121). WDNR has conducted Water Quality Management Planning since the 1970s when plans were first instituted to identify wastewater treatment plants for federal grants and low-cost loans.

In the 1980s, Areawide Water Quality Management Plans (Basin or Watershed Plans) were updated every five years, and evolved from a focus on point source dischargers to include non-point source evaluation, helping identify high priorities for nonpoint source watershed plans. In the 1990's watershed plans were modified to address all resource issues holistically. These integrated plans were called the "State of the Basin" reports. While the State of the Basin reports addressed ecosystem-based issues, efforts such as this were difficult to replicate due to resource constraints, production costs, and multi-program coordination requirements.

Today, federal and state required watershed planning is moving to electronic "Watershed Planning" to provide flexibility in format, reduced costs (no paper), and use of the agency's relational databases and website to provide real-time information.

The Water Assessment Tracking and Electronic Reporting System (WATERS) is the Water Program's tool to track use designations, water quality standards, and current status of waterways in the State of Wisconsin. The system helps connect water monitoring data, assessments, use classifications, and planning/strategies. WATERS is used to report out to EPA and also connects projects and regulatory actions.



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Planning will be documented in WATERS to provide the most current water resource information and clear resource management priorities for staff and the public. Electronic sharing of water status, watershed goals, and water recommendations is a direct outcome of the planning process.

In Wisconsin's Water Quality Planning Framework, watershed planning is linked to county land and water plans, grant selection/ranking work, federal and state identification of impaired waters, and development and implementation of TMDLs and watershed effectiveness reporting ("SP-12" Watersheds) under CWA S. 106.

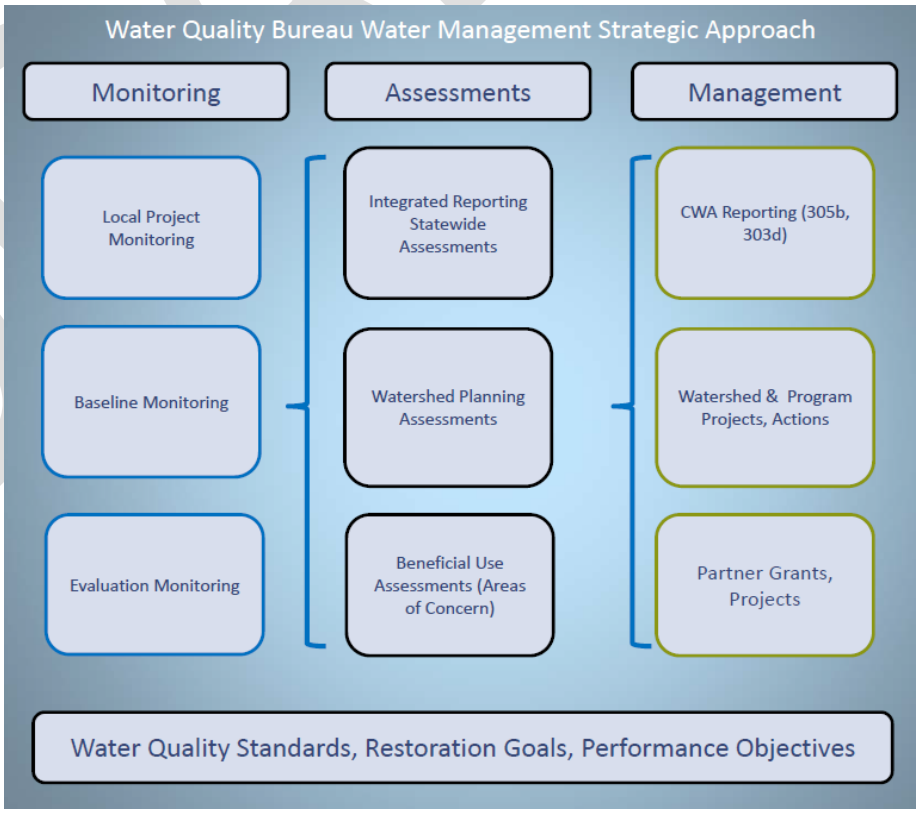
How does this fit into the Bureau's work plan?

2013-14 biennial workplanning guidance specifies that watershed plans will be updated for at least one watershed per basin per year. Watershed plans provide formal updates to the state's Areawide Water Quality Management Plan. A public comment period and online public informational meeting will be provided, and plan updates will be transmitted from the DNR Secretary's Office to the US EPA for certification as formal updates.

Links between Monitoring, Planning and Integrated Reporting

Wisconsin's Water Quality Bureau *Mission* is to provide clean, safe water and the highest quality protection and treatment of water for the citizens of Wisconsin by adhering to state and federal requirements for water quality and environmental protection.

Resource investment is focused on securing a robust monitoring program, science-based, routinized assessment procedures, and resource connectivity between these key processes with management actions. These actions include but are not limited to impaired waters listings and delistings, watershed plan recommendations for resource management, funding allocations for partnership programs including runoff management, lakes and rivers grants, and conformance evaluations for wastewater facility upgrades, changes and infrastructure approvals. This diverse array of activities reflects the wide scope of impact water the Water Division's Water Quality Standards, restoration goals, and program performance objectives have on both grand scale and incremental success in restoring, managing and protecting Wisconsin's water.



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Identifying Roles and Responsibilities

A critical element of successful "planning" is identifying who from DNR (and non-DNR agencies if you wish) will participate on the planning team. During 2013-14, it is recommended that you start with an internal watershed team, unless existing stakeholder connections are already in place. The timeframe associated with this work activity and the turnaround for assessments and recommendations is relatively short, so establishing "who" will do "what" early in the process will help ensure success.

If you are able to reach out to interested parties during the inventory/assessment or recommendation development, phone calls, meeting invitations or emails to active groups in your watershed may be effective ways to reach stakeholders and partners. Groups that may be interested in reviewing or participating include Trout Unlimited, Wisconsin Wetlands Association, Sportsman Clubs, County LCD – especially individuals who have upcoming County Land and Water Plans – Local Zoning Departments, Regional Planning Commissions, nature centers, etc.). Involving partners in the beginning or mid-way through the process may take more time, but in the end may result in a more thorough analysis and set of management recommendations.

Water Supervisors are ultimately responsible for ensuring that watershed planning is conducted, but central office planning staff will provide direct support for biologists, supervisors and others throughout the fiscal year.

Each watershed can have a "team" of individuals who may have special knowledge of resources and issues ongoing in the area. Through the support of the central office, the process might involve one or more meetings of a Watershed Team for each of the targeted areas to ensure that there is a common understanding of what information is available, what is missing, and what the major recommendations for resource management work are for the area.

Roles and Responsibilities

Central Office Planning Staff

- Central office planning team will **generate assessment packages** and lists of actions, projects and other relevant data for watershed plan updates and provide that information to regional biologists and managers. Minimum data quality control processes will be in place before sending information to biologists for review. Special care to work with biologists on fisheries IBIs will be taken due to the complexities involved.
- **Assessments**: Central office will help communicate general assessment data and recommendations to water quality biologists during the watershed data collection phase, including organization and communication of assessment work between. Once the general assessments are reviewed, data entry support will be provided Ruth Person and/or Lisa Helmuth or other LTE support.
- **Facilitation**: Ruth and Lisa will provide a communication and facilitation role to ensure that the timeline, processes and review procedures are adhered to according to guidance.
- **Planning Public Review**: The planning process will involve a final "Public Input Process" at the end of the year – around May/June the watershed "plan" will be posted on the DNR's website and an opportunity for a public meeting regarding the plan will be provided to local citizens and stakeholders. Central office will provide the lead role in this area of work.

Selecting a Watershed

In selecting a watershed(s), be aware that the Bureau is closely aligning monitoring with watershed planning. For FY14 and beyond consider working on those areas of the state that provide the most efficient return for your investment, such as a planning for a **watershed recently monitored**, one that has listed impaired waters, or one that has an active DNR and/or stakeholder project. To select

watersheds that provide the greatest efficiency such as watersheds that were monitored and have biological and /or physical and chemical data ready for condition evaluation, we can look to the list of watersheds that were approved through the competitive monitoring process. A listing of recent competitive projects is available on the next page.

In summary, consider the following three alternative approaches– choose one of the following and document which type of approach that is followed.

1. **Targeted Condition Watershed**: Regional managers can use one or more of the following types of categories to identify high priorities for data updates and resource allocation:

a. Investigation, Management, Restoration Watersheds:
- SP12 Watersheds (or candidates)
- TMDL Development or Implementation Watersheds
- Watersheds with high priority Performance Standards implementation areas
- River, Lake, TRM grant - based watersheds (areas with ongoing studies, resources allocated to identify or resolve problems).
- Monitored Watersheds

b. Watersheds that need protecting:
- High quality waters in need of evaluation/protection
- Watersheds with a high percentage of fully supporting waters where O/ERW documentation/updates are appropriate.

c. Threatened watersheds:
- Key watersheds where point/nps source and/or land use change "threaten" the maintenance or restoration of water condition.

2. **Rotating Watershed Targeting**: Resources are reviewed, updated/or confirmed for rivers/lakes/wetlands, etc. Additional reviews of water quality classifications/use designations are conducted and updated and permit updates/issuance and ambient monitoring is coordinated with new information from this process. These types of watersheds would follow a monitoring strategy with a rotating watershed monitoring strategy. This may be an element available for future watershed planning cycles.

3. **Partnership-Focused Watershed Targeting**
Regional managers coordinate watershed/ county based planning updates and goal setting based on the County Land and Water Plan development schedule. Managers plan for watershed or county-based resource updates and goal setting one or two years before the scheduled CLWP updates to maximize confidence in resource information and to help drive implementation of performance standards more closely with the CLWP process. In this scenario, resource managers might promote the development of watershed plans through grant projects funded by River, Lake and TRM grants so that DNR staff are updating assessment information with partners but the actual planning work may be conducted or led by the partner group as part of the grant.

Recent Local Monitoring Projects

Project Name	Project ID	Project Subtype	Start Date	End Date
Lower Oconto Watershed Monitoring 2012 - NER_01_CMP13	NER_01_CMP13	Evaluation Monitoring	07/01/2012	12/31/2012
South Branch Manitowoc River Assessment - NER_03_CMP13	NER_03_CMP13	Impaired Water Assessment	05/01/2012	12/31/2012
Lower Oconto River Watershed 303(d) waters evaluation and Lakes - NER_11_CMP13B	NER_11_CMP13B	Impaired Water Assessment	01/01/2013	12/31/2013
Willow Creek Phosphorus, Fish, Qualitative Habitat and Macroinvertebrate Sampling for Watershed Planning - NER_12_CMP13B	NER_12_CMP13B	Watershed Plan Monitoring	01/15/2013	12/31/2013

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Middle Peshtigo and Thunder River Watershed Assessment - NER_15_CMP13B	NER_15_CMP13B	Watershed Plan Monitoring	01/01/2013	12/30/2013
Rhinelander Flowage Watershed Assessment - NOR_05_CMP13	NOR_05_CMP13	Evaluation Monitoring	07/01/2012	12/31/2012
Tyler Forks River-Watershed Assessment - NOR_07_CMP13	NOR_07_CMP13	Watershed Plan Monitoring	07/01/2012	12/31/2012
St. Louis River TMDL data support and watershed 303d evaluation - NOR_12_CMP13B	NOR_12_CMP13B	Impaired Water Assessment	01/01/2013	12/31/2013
Elk River Watershed Assessment - NOR_14_CMP13B	NOR_14_CMP13B	Watershed Plan Monitoring	05/01/2013	12/31/2013
Tyler Forks Watershed Assessment - Continued - NOR_20_CMP13B	NOR_20_CMP13B	Watershed Plan Monitoring	01/01/2013	12/31/2013
Middle and Lower Grant River Watershed Assessment - SCR_02_CMP13	SCR_02_CMP13	Watershed Plan Monitoring	07/01/2012	12/31/2012
Legler School and Pioneer Valley Watersheds Assessment - SCR_03_CMP13	SCR_03_CMP13	Evaluation Monitoring	07/01/2012	12/31/2012
Jackson Creek Watershed Evaluation - SCR_06_CMP13B	SCR_06_CMP13B	Watershed Plan Monitoring	03/15/2013	12/31/2013
Black Earth Creek - SCR_12_CMP13	SCR_12_CMP13	Evaluation Monitoring	07/01/2012	12/31/2012
Indian Creek Watershed Study SCR_17_CMP13B	SCR_17_CMP13B	Watershed Plan Monitoring	01/01/2013	03/30/2014
Pleasant and Kittleson Valley SP-12 Project - SCR_18_CMP13B	SCR_18_CMP13B	SP 12 (Measure W)	01/01/2013	12/31/2013
Upper Rock River (UR-12) watershed evaluation - SCR_19_CMP13B	SCR_19_CMP13B	Evaluation Monitoring	05/01/2013	12/31/2013
Lower/Middle Sugar River Watershed Evaluation - SCR_20_CMP13B	SCR_20_CMP13B	Watershed Plan Monitoring	01/15/2013	12/31/2013
Ulao Creek Watershed Monitoring Project - SER_07_CMP13B	SER_07_CMP13B	Evaluation Monitoring	05/01/2013	12/31/2013
WCR Watershed Assessment 2013 - WCR_01_CMP13B	WCR_01_CMP13B	Watershed Plan Monitoring	04/01/2013	12/31/2013
Big Eau Pleine TMDL Monitoring 2012-2013 - WCR_03_CMP13	WCR_03_CMP13	Refine Load Estimates	07/01/2012	12/31/2012
WCR Watershed Assessment 2012 - WCR_09_CMP13	WCR_09_CMP13	Watershed Plan Monitoring	07/01/2012	12/31/2012
Eau Claire County Reservoir Tier II Monitoring 303d Listing and Watershed Management Implementation - WCR_14_CMP13B	WCR_14_CMP13B	TMDL Monitoring	07/01/2013	12/31/2014
Big Eau Pleine TMDL 2013 Citizen-Based Stream Monitoring -WCR_17_CMP13B	WCR_17_CMP13B	Citizen Based Stream Monitoring	03/01/2013	09/30/2013
Wisconsin River 2013 HUC 12 Data Gap Analysis - WCR_18_CMP13B	WCR_18_CMP13B	TMDL Development	05/01/2013	10/31/2013
La Crosse Marsh Wetland Macroinvertebrate Assessment 2013 - WCR_22_CMP13B	WCR_22_CMP13B	Wetlands	01/01/2013	12/31/2013

As you can see from the project listings above, any number of types of projects would lend to assessment and write-ups for updated watershed plans.

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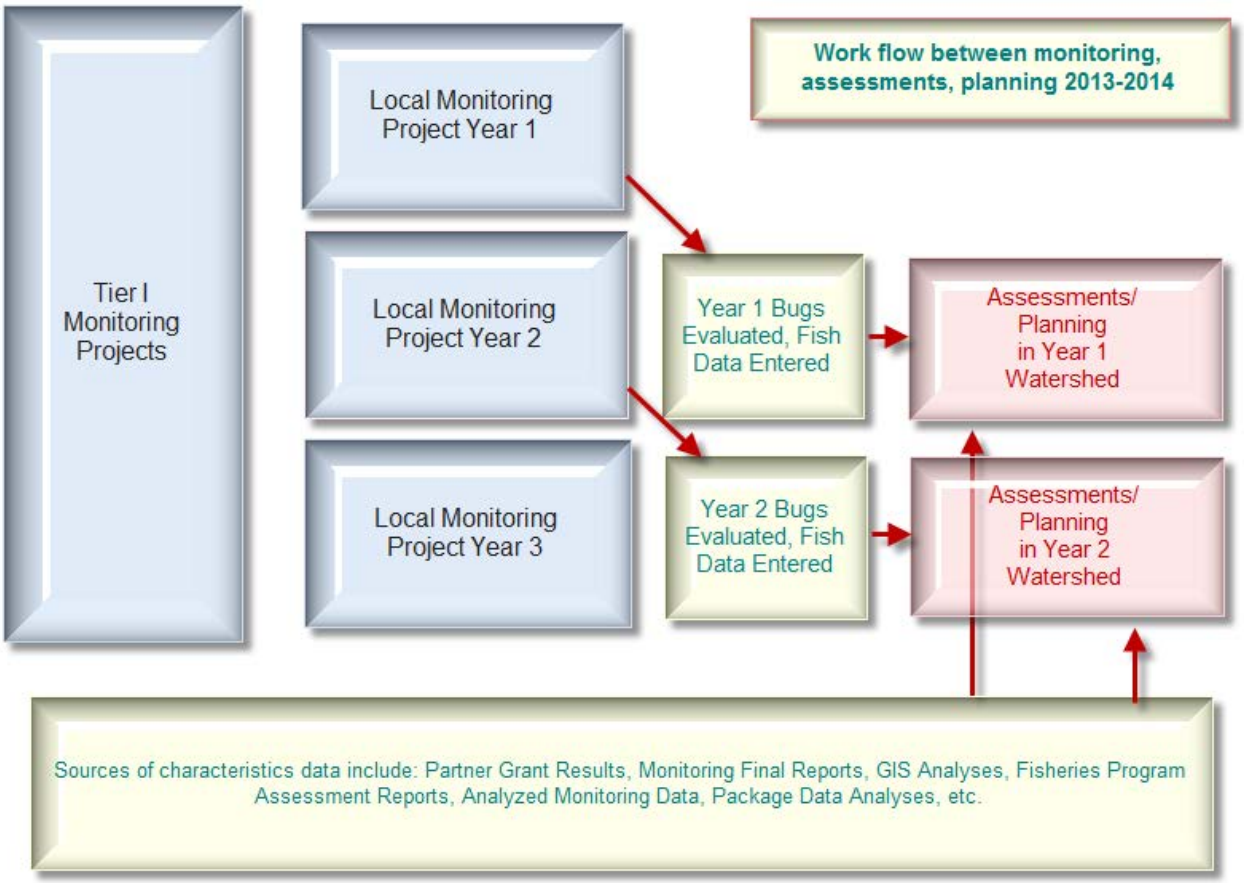
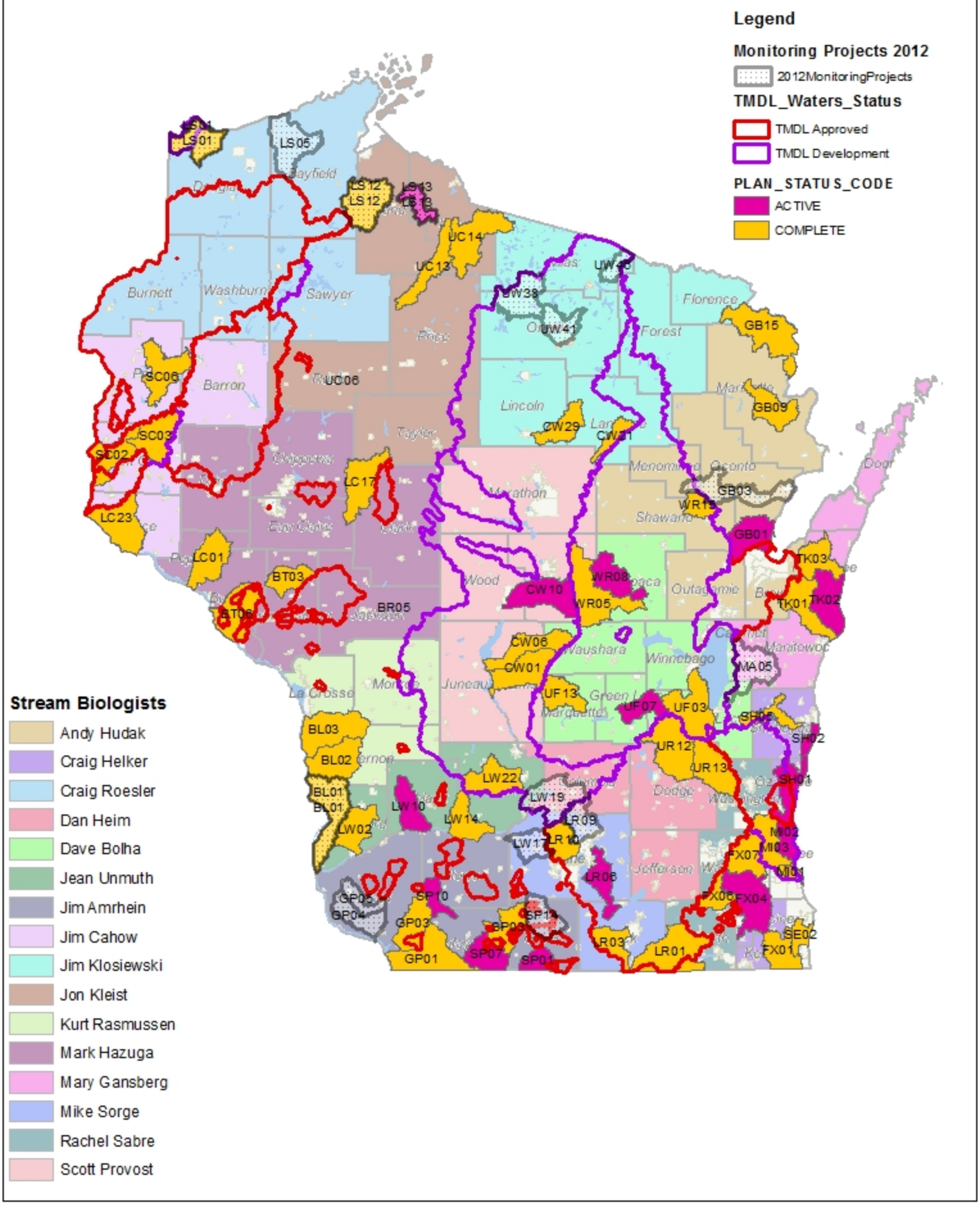
In future years, it is a goal to design a multi-year schedule for monitoring/ planning/ and management sequence that will accommodate the multiple types of condition investigations (Tier I, Local Projects in II and Evaluation, Tier III), including the timing of data collection and analysis, with planning – incorporating into the process a one to two year lag time, so that the information will available for a plan the subsequent year.

A diagram of this timing is below.



Watershed Planning Analysis Map 2013-14



Chapter 2: Establish Timeline for Planning

Watershed planning is a federal Clean Water Act requirement that helps our agency generate statewide assessments and impaired water information on a consistent, timely basis. The timeline below reflects a cycle of monitoring/inventory, assessment/analysis, recommendations/planning, and distribution of information to the public online and in documents.

STEP 1: Inventory and Assessment - July 1st through December 1st: Each year, from July 1st through December 1st, regional management and staff will be responsible for reviewing draft assessments and draft plans derived from inventory and analysis of water resource features in selected watershed(s).

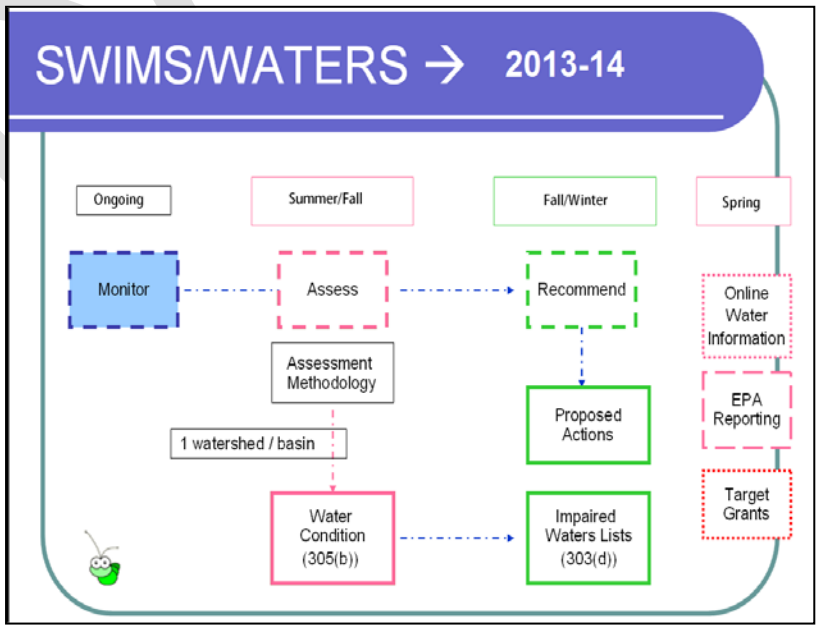
Central office will provide the following for condition assessments analyses:

- Land use percent (Wisconsin Land Inventory from 2006),
- Pollutant/stressor data,
- Actions/projects proposed, in place, or completed,
- Natural communities,
- Wetland restoration potential analyses ,
- Lists of NR104, Trout Class Data, and Impaired Waters status,
- Monitoring data exports from SWIMS (chemistry, bug data) and Fish DB (Fish, Habitat) and
- Use of modeling tools for watershed condition as resources allow.

STEP 2: Analysis, Goals, and Recommendations - October 1st through January 1st: Data compiled during the inventory phase will be analyzed so that staff and management can prepare recommendations to restore, maintain and protect resources. For waters with impaired waters or pending TMDL development, more data and information will be available to create resource management recommendations. For other waters, recommendations may be much more generalized and focused on the need for additional data gathering. Creation of water/shed condition goals based on resource assessment work (described below) are the precursors to recommendation development.

STEP 3: Compilation/Report Write-up and WATERS Data Entry - January 1st through March 1st:

Central office will work with regional biologists and managers to ensure that watershed/ waterbody narratives and assessment data is updated in the WATERS system during the winter months.



STEP 4: Public Input/ Plan Finalization – March 1st through June 30th:

The public input process for planning involves posting updated watershed plans, providing an opportunity for public comment and public informational meeting, incorporation or comments, and transmittal of plan updates to the USEPA through the Governor's Office.

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Chapter 3: STEP 1 - Inventory and Assessment of Resources

A watershed plan identifies the **status of resources in the area,** goals for those resources (and/or the watershed as a whole), and recommendations for actions needed to resolve problems or protect resources. At its most basic level a Watershed Plan under the state's Water Quality Management Planning Program will:

- l**ist the primary water resources** – including rivers, streams, lakes, springs, wetlands, and groundwater aquifers (if possible),
- use **watershed models** to characterize the landscape in which the waters are located,[1]
- **describe their status** in terms biological or hydrologic condition,[2]
- **identify known or potential environmental problems**, and
- **recommend specific data collection and or resource management wor**k alternatives needed for maintenance, restoration and/or protection.

If a watershed has a preponderance of condition issues, the watershed plan may be a precursor to a ***watershed action list or strategy*** that ultimately details specific "where, how and by whom" for each proposed action alternative, including how the activities may be selected, implemented, funded, and evaluated. For impaired waters, a watershed action strategy may include a schedule proposing a Total Maximum Daily Load (TMDL) analyses be conducted in the watershed.

Water Resources Inventory and Assessment

Through monitoring studies, waters are sampled to obtain water quality results. Monitored waters are then assessed by comparing monitoring data to guidelines designed to evaluate water condition against water quality standards. A two-step process will be used to assess the water. First, a general assessment is conducted to identify status condition (the federal Clean Water Act Section "305(b) assessment"). If the water's condition is indicated as poor, then a secondary or specific assessment will be conducted to identify pollutants, impairments, and to help determine what type of management actions may be necessary. Both monitoring results and assessment data are stored in state and federal databases and most data are available online to agencies and the public.

Based on the results of condition assessments, water quality biologists and managers determine which actions might be needed to ensure that water quality standards are met, including antidegradation, or maintenance, of existing water quality condition (particularly for high quality or "excellent condition" waters), as well as restoration of water condition for those considered "impaired".

Waters that do not meet water quality standards are placed on Wisconsin's list of impaired waters ("the 303(d) List") under the Federal Clean Water Act, Section 303(d). Every two years, states are required to submit list updates to the United States Environmental Protection Agency (U.S. EPA) for approval. The WDNR previously submitted impaired waters lists in 1996 and updates in 1998, 2002, 2004, 2006, and 2008[3]. U.S. EPA did not require, and the Department did not submit, a list in 2000.

[1] A table of WDNR modeling procedures and related uses is provided as an appendix of this document.
[2] The WisCALM guidance document is the defining reference for assessing waters; however a general assessment table is provided below the "how to steps" for watershed planning, page 18.
[3] The 2012 List is pending approval by U.S. EPA.

Key Steps for Watershed Planning

The following are key steps for the watershed planning:

Step 1: Assemble an inventory of rivers, streams, and lakes – including size and location. This work involves running a data download from WATERS for rivers, streams and lakes.[4]

Step 2: Conduct an analysis on streams to validate the natural community data model results for waters in the watershed (optional for 2014). This is a prerequisite for using the FIBI.

Step 3: Review monitoring data (fish, chemistry, macroinvertebrates etc.) using the general assessment protocols on page 19 to determine the "current use" condition for fish and aquatic life. Other areas that may have data for analysis are recreation and fish consumption.

Note: central office will download data for the natural community validation and assessments and will update errors or problems identified by biologists. Corrections on electronic "consolidated summary spreadsheets" or printed copies may be used to communicate these updates.

Step 4: Identify "attainable use support" [fully supporting, supporting, or not supporting designated/ attainable uses] for fish and aquatic life, recreation and fish consumption.

Overview of Detailed Process - Fish and Aquatic Life

a. Optional (for 2014) **natural community review** to validate the use of the specific fish IBI tool.[5] Natural community data verification includes a download of fish species counts and tolerance values for stations on streams along with natural community model results to evaluate if a recommended change is indicated.
b. Download **fish and macroinvertebrate data for rivers/streams** and **TSI data for lakes**.
c. Provide **fish community data and bug species data by station**/data for given water to help determine "attainable use" based on presence of stenothermal obligate fish or macro invertebrates.

→ Identify stations/waters that have both macroinvertebrate and fish data and prioritize these for evaluation.

→ Apply proposed FAL wadeable streams, non-wadeable rivers, and lakes assessment methodology thresholds for excellent, good, fair and poor 'condition' to waters. Document in spreadsheet and update in WATERS. Each watershed consolidated assessment values will contain data for each watershed.

→ Central office provides worksheets to regions for review and will incorporate approved assessments into the system.

→ Compare data values to WisCALM Integrated condition guidance[6] for FAL, make recommendation on any updates or changes needed.

[4] Wetland data downloads, analysis and recommendations, including restoration potential, will be conducted by the Wetlands Program; data availability will be based on whether or not the potential wetland restoration model has been run for your watershed(s).
[5] Draft protocols for natural community evaluation are in pilot testing, Fall 2013 and are available for use in concert with testing by Amrhein and Hazuga.
[6] See below for general assessment guidance for streams.

Overview of Detailed Process - Fish Consumption (Central Office)

→ Downloading Fish Consumption status documented in WATERS for each waterbody. Work with Candy Schrank to review data and ensure that advice listings are correct.

→ Identify stations/waters recently monitored to remove or add specific advisory.

Overview of Detailed Process - Recreation (Central Office)

→ Downloading recreational use support data for rivers/streams and lakes from WATERS. Work with SWIMS and USGS to identify updated monitoring results for specific areas (SWIMS E. Coli assessment package). Compare data values to WisCALM guidance, make recommendation on any updates or changes needed.

→ Identify stations/waters that have a recreational use update or change and provide to WQ Biologists for review. Update change in WATERS.

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WisCALM Integrated Condition Guidance for Streams:

General Assessment Parameter Results and General Condition Table. Each parameter is assessed separately. General assessments do not make impairment decisions or designate a use as 'Not Supporting'. For Total Phosphorus and Chlorophyll-a an assessment package was created for Impairment Assessments, but results besides those that result in 'Not Supporting' or 'Fully Supporting' are used in the General Assessments. There are currently no General Assessment decisions for Chlorides or Temperature. No assessment is done for a parameter if the minimum data requirements are not met. Waterbodies that are 'Suspected Poor' are flagged for follow-up.

			Attainable Use					
Parameter (Code)	Minimum Data Requirement	Not Supporting	Not Assessed		Supporting			Fully Supporting
Total Phosphorus (665)	*Uses Impairment Assessment requirements.* Minimum of 6 samples. Lakes: 3 monthly values from each of two years from the time period June 1 – Sept. 15. Rivers: 6 monthly samples from May through October.	See Table 1.2	May Exceed	May Meet	---			See Table 1.2
Chlorophyll-a (99781)	3 monthly values from one year from the period July 15 – Sept 15.		May Exceed	May Meet	---			
MIBI (80027)	1 value			---	Poor	Fair	Good	Excellent
FIBI[1] (Various)	1 value			---	Poor	Fair	Good	Excellent
Chlorides (940)	2 values within a 3-year period			---	---	---	---	---
TSI (90273)	1 value				Poor	Fair	Good	Excellent
Temperature (10)				---	---	---	---	---
		---	Unknown		Suspected Poor	Fair	Good	Excellent
			Current Use					

[1]Natural Community Validation will be conducted prior to running the FIBI.

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Table 1.2: Impairment Assessment Parameter Results and General Condition Table. Minimum data requirements are for a stand-alone assessment. When chlorophyll-a, MIBI, and FIBI are used as a confirmation to the Total Phosphorus assessment then the General Assessment minimum data requirements apply. TSI is not used for Impairment Assessments. No assessment is done for a parameter if the minimum data requirements are not met.

			Attainable Use (Impairment Decision)					
Parameter (Code)	Minimum Data Requirement	Exceedance Frequency	Not Supporting (Impaired)	Not Assessed (Watchwater)	Not Assessed (Decision Unclear)	Fully Supporting (Supporting)		
Total Phosphorus (665)	Minimum of 6 samples. *Lakes*: 3 monthly values from each of two years from the time period June 1 – Sept. 15. *Rivers*: 6 monthly samples from May through October.	Lower 90th confidence interval of the sample mean/median[2] exceeds threshold.	Clearly Exceeds	May Exceed	May Meet	---	---	Clearly Meets
Chlorophyll-a (99781)	Period of July 15 – Sept 15. TP Confirmation: 3 monthly values from one year from the. Stand-alone: 3 monthly values from each of two years.	Lower 90th confidence interval of the sample mean/median[2] exceeds threshold.	Clearly Exceeds	May Exceed	May Meet	---	---	Clearly Meets
MIBI (80027)	1 value from each of two years (averaged).	Averaged score is a Poor.	Poor	---	---	Fair	Good	Excellent
FIBI[1] (Various)	1 value from each of two years (averaged).	Averaged score is a Poor.	Poor	---	---	Fair	Good	Excellent
Chlorides (940)	2 values within a 3-year period.		Exceeds thresholds for Impairment	---	---	---	---	---
TSI (90273)	---		---	---	---	---	---	---
Temperature (10)		Vary (see thresholds)	Exceeds thresholds for Impairment					
			Poor	Suspected Poor	Unknown	Fair	Good	Excellent
			Current Use					

[1]Natural Community Validation will be conducted prior to running the FIBI.
[2]Mean value is used in Lake assessments and Median value is used in River/Streams assessments.

Table 2: Total Phosphorus and Biology Assessment Impairment Decisions. Total Phosphorus (TP) and Biology are assessed separately and then combined. Based on the available amount of data different 303(d) Category assignments are made. Biology can be used as a confirmation of a TP assessment or as a stand-alone assessment. A stand-alone assessment requires more data (see table 1.2). If 'Confirmation' or 'Stand-alone' is not indicated then the assessment decision is the same for both. TP Overwhelming Exceedance means that the lower 90th percentile value exceeded the impairment threshold 2X for rivers and 1.5X for lakes.

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Combination of TP and Biology Assessment Results	303(d) Category and Assessment Decision
TP Overwhelming Exceedance, Biology Exceeds	(5A) Impaired for TP, Biological Impairment
TP Overwhelming Exceedance, Biology Meets	(5A) Impaired for TP only
TP Overwhelming Exceedance, No Biology	(5A) Impaired for TP only
TP Clearly Exceeds, Biology Exceeds	(5A) Impaired for TP, Biological Impairment
TP Clearly Exceeds, Biology Meets	(5P) Impaired for TP only
TP Clearly Exceeds, No Biology	(5P) Impaired for TP only
TP Decision Unclear, Biology Exceeds (Stand-alone)	(5A) Impaired for Biology
TP Decision Unclear, Biology Exceeds (Confirmation)	(3) No Assessment, Insufficient Data
TP Decision Unclear, Biology Meets (Stand-alone)	(3) No Assessment, Insufficient Data
TP Decision Unclear, Biology Meets (Confirmation)	(3) No Assessment, Insufficient Data
TP Decision Unclear, No Biology	(3) No Assessment, Insufficient Data
TP Clearly Meets, Biology Exceeds (Stand-alone)	(5A) Impaired for Biology
TP Clearly Meets, Biology Exceeds (Confirmation)	(3) No Assessment, Insufficient Data
TP Clearly Meets, Biology Meets	(2) Meets at least one Designated Use
TP Clearly Meets, No Biology	(2) Meets at least one Designated Use
TP Insuf. Data, Biology Exceeds (Stand-alone)	(5A) Impaired for Biology
TP Insuf. Data, Biology Exceeds (Confirmation)	(3) No Assessment, Insufficient Data
TP Insuf. Data, Biology Meets (Stand-alone)	(2) Meets at least one Designated Use
TP Insuf. Data, Biology Meets (Confirmation)	(3) No Assessment, Insufficient Data
TP Insuf. Data, No Biology	(3) No Assessment, Insufficient Data

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FAQ General Assessments:

--Are general assessments based solely on biology?

Largely, yes.

What do we do when they conflict? What do we do if it conflicts with another parameter (i.e. TP)? Do we need more information on how to generally assess with more than one parameter, or do we just default to biology first?

Biological data will drive the general assessment except for TSI analyses for lakes or e.coli analyses for beaches. Additional parameters are "additional" pieces of the puzzle and may help identify the sources of the condition.

--What about if there are more data (on TP, for example)?

If there is sufficient TP data to run the package analysis, that can be used for assessment but the biological data must also be considered.

--Is there a way to label/indicate the Suspected Poor/Unknown categories as something other than "Not Assessed"? Seems misleading.

We currently do not have a different selection for these types of situations but it is something we can look at.

--Do we use chloride or temperature at all in a general assessment?

We have not previously incorporated these into an analysis for general assessment due to historical disagreement on how to interpret the data for different stream types.

--Can we use TP even if not enough samples to meet minimum data requirements (these show up in package reports, but not those generated in WATERS)? Could it be a flagged "Suspected Poor", for example?

If there are data that indicate a real problem, these should be high priorities for data collection and "watch waters".

--Do we ever mark waters as "not supporting"

Yes, when the water is impaired.

--When do we mark waters as "fully supporting"? Does this only matter in terms of a 303(d) Categories 2 vs. 3?

Yes, when the water has "excellent biology".

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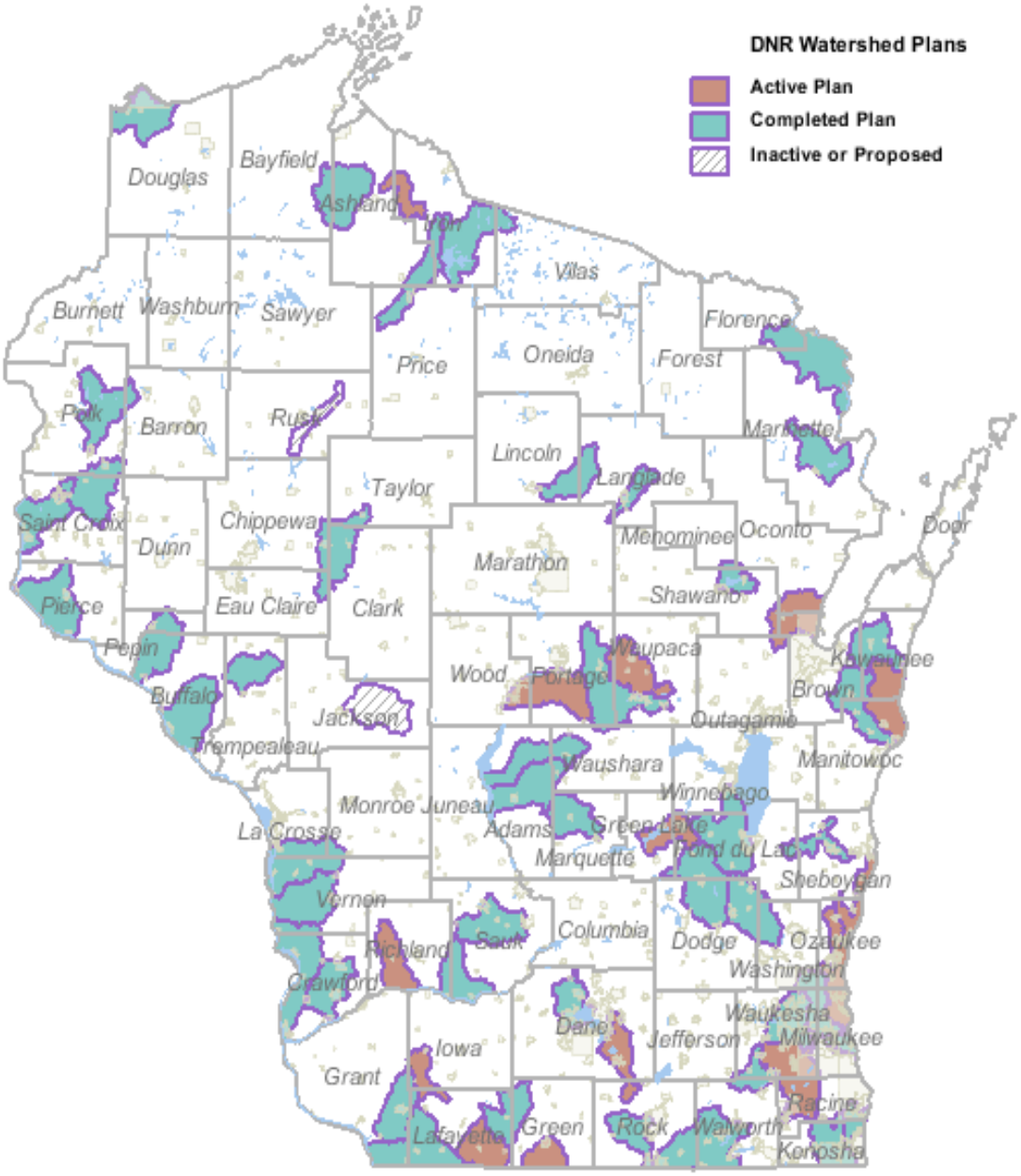
Status of Watersheds in 2013-14

The following watersheds are either completed or active. Active watersheds are from 2012; completion involves wrapping up work from watersheds selected for 2012. The first priority for biologists this fall is to help complete the 2012 watersheds; the second priority is to identify additional watersheds for the 2013-14 time period and to convey those priorities to central office.



DRAFT List of Watersheds for Updates			
Watershed	**Water Manager**	**Water Biologist**	**Reason Recommended**
Multiple watersheds/waters based on 303d Report write-ups – as per Cheri (information on its way).	Cheri Hagen	Craig Roesler 715-635-4076	Will focus on 303d watersheds for report completion. Central Office will update…
Upper Tomahawk River (UW38)	Tom Aartila	Jim Klosiewski 715-365-8992	Monitoring studies have been conducted for UW38 OR UW41 OR UW46
Tyler Forks (LS13)	Tom Aartila	John Kleist 715-762-1344	LS13 based on FY12 planning work.
Fourmile and Five Mile Creek (CW10)	Paul LaLiberte	Scott Provost 715-421-7881	CW10 is started, need to finish
Black Creek Watershed – CW25	Paul Laliberte	Mark Hazuga 715-839-1603	**Additional Watersheds Ready:** Yellow River Watershed – CW05 Cawley and Rock Creek Watershed – BR10
Bear Creek Watershed – Update – LC01	Paul LaLiberte	Kurt Rasmussen 608-785-9910	No specific recommendations please pick a watershed where you have monitoring data to analyze condition or where there is an approved TMDL and where you can make recommendations for future work.
Little Suamico (Finish) FY12 (Central Office will help finish) Lower Oconto (GB03) FY14	Rob McLennan	Andy Hudak 920-662-5117	
Big Green Lake (UF07)	Rob McLennan	Ted Johnson	FY12 Watershed
Milwaukee River South (MI02) Black River (SH02) (finish- Central Office Help)	Rob McLennan	Craig Helker 262-884-2357	Both SH02 and FX04 have been started in FY12.
East Twin (TK02) South Branch Manitowoc (MA05)	Rob McLennan	Mary Gansberg 920-662-5489	TK02 is started and MA05 are monitored
South Branch Little Wolf River (WR08)	Rob McLennan	Dave Bolha 920-424-7892	UF07 and WR08 are started
Otter and Morrey Creeks Watershed (LW11) Rush Creek HUC 12 code 070700051204 Finish: Mill Indian Creek WT (LW10)	Greg Searle	Jean Unmuth 608-935-1926	Jean will focus on Rush Creek subwatershed within LW11
Middle Fox River Rachel Sabre FX04 (finish- Central Office Help)	Greg Searle	Rachel Sabre 262-574-2133	Finish
Yahara River and Lake Kegonsa LR06	Greg Searle	Mike Sorge 715-839-3794	Finish
Lower Pecatonica (SP07) Honey Richland Creek (SP01) or (SP10) or start (GP04) or (GP05)	Greg Searle	Jim Amrhein 608-275-3280	Lower Pecatonica SP07 or SP01 or SP10 are started and GP04 or GP05 are monitored.
Beaver Dam River (UR03)	Greg Searle	Dan Heim 920-387-7865	UR03 based on monitoring work

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Chapter 4: STEP 2 - Goals, Priorities, & Recommendations

Watershed/Water Goals

Analyzing watershed and water condition will help identify watershed goals or goals for specific waters. For each watershed, a set of priorities and goals should be developed. Goals must be clear and attainable, and if possible focused on individual waters or groups of waters within the area.

Goals can be as simple as achieving a higher attainable use (such as an "excellent condition" versus a "good" or "fair" condition), or something as complex as restoration of all documented problems on an impaired water by a certain date. Goals might also focus on project creation/development with less ambitious outcomes and can be articulated by interim performance measures. Below is an example of a water/shed goals entered into WATERS.

Watershed Goal Examples (plus "status" [planned, in progress, complete])

- Complete a watershed land use inventory/analysis which identifies land use, potential pollutant sources and impairments.

- Create a local action plan with partners and stakeholders to address key restoration and maintenance activities associated with impaired waters in the watershed.

- Work with the city of ____ to incorporate resource protection elements into local smart growth planning work, including recommendations for WWTP upgrades, facility capacity issues, and collection system maintenance.

Watershed/Water Priorities

Watershed Priorities must also be identified along with their relative level of importance (high, medium, low). Example priorities include:

- Reduce streambank erosion in the XXXX watershed. [high priority]
- Analyze hydrological modifications in the xxx subwatershed [medium priority]
- Gather input for stream restoration projects in the xxxx river watershed [low priority]

Watershed/Water Recommendations

Watershed Recommendations are critical for ensuring that the goals and priorities you have identified are translated into meaningful work items. Example recommendations include:

Watershed/Waterbody Recommendation Examples:

Restore Stream X from its current condition of "fair" to a fully supporting, "good" to "excellent" condition by promoting a river planning and protection grant to help landowners create permanent riparian buffers and reduce phosphorus and sediment loads by September 2015.

Encourage the city of X to undertake collection system maintenance activities through applying for low cost loans provided by the state.

Getting started on identifying goals, priorities and recommendations

Create a "vision" or goals for the watershed, as well as specific recommendations based on "priority issues" that must be dealt with before you can attain these goals. Once this nested set of management activities is outlined, action lists or strategies can be developed for longer term

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restoration activities. The main thing is to not get too concerned with semantics, but instead create lists of actions that are high priorities and which promote the work that you believe needs to get done.

- **Problem Statement**: What is the issue or problem?
- **Resource Goals**: What is the general goal or vision of a better situation?
- **Resource Priorities**: What are the priority issues to be resolved?
- **Recommendations**: General recommendations on what should be done.
- **Strategies**: Specific approach and work about how the recommendation is going to get done. [who, what, when, why, how and who will fund]

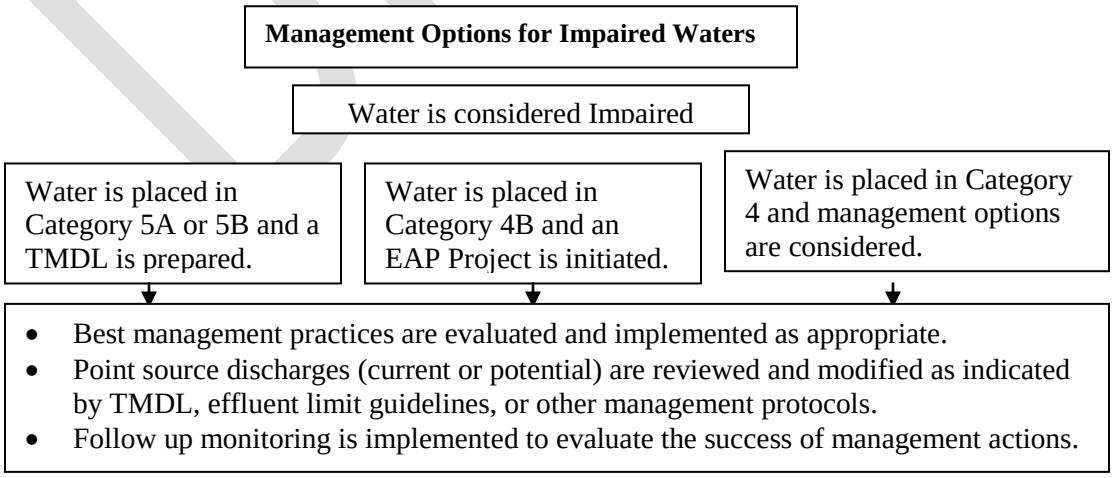
Management Options for Assessment Units that do not attain uses

There are a variety of management options for waters that do not attain uses—including but not limited to preparing a TMDL analysis and related TMDL implementation plan, placing the water on the (Wisconsin) list of Environmental Accountability Projects (EAPs), or considering the water for a specific variance classification under NR104. Variance classifications are those in which the water condition is designated as a limited forage fishery (LFF) or limited aquatic life (LAL) aquatic community.

A new alternative that is emerging is the development of a Nine Key Element Plan, a thorough and public-involvement planning process that will take the place of a "TMDL" requirement as long as all the required elements of the planning process are met and approved by DNR and USEPA. More will be available for this option in the future, but the initial watershed planning process will feed into the Nine Key Element Planning process rather than be supplanted by the process.

When a water is listed as impaired, specific DNR actions will be assured, including follow up monitoring, pollutant analyses and potential modeling, preparation of a Total Maximum Daily Load (TMDL), and eventually a TMDL Implementation Plan, which may or may not include provisions for general or specific effluent limits in WPDES permits.

However, regardless of the 'listing' or regulatory decision made for waters not meeting water quality standard(s), resource management actions such as promoting grants for best management practice planning, design and implementation, water action plan development, or interagency resource protection work are plausible activities to recommend for the water and its immediate drainage area. Watershed Supervisors and Biologists should determine the best mix of recommended and/or regulatory actions to document for current and future actions to help ensure that the water is restored, maintained or protected.



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Environmental Accountability Projects (EAPs)

Alternatives to a TMDL can be prepared for waters on the 303(d) list. These alternatives include "Environmental Accountability Projects" or EAPs, as well as the Nine Key Element Planning Process (to be discussed in depth in the future). In the federal framework, a formal EAP project, as well as a Nine Key Element Plan, has specific reporting requirements and actions that must occur on a defined scheduled.

Wisconsin has not formally advanced waters for EAP listing (Category 4B) but instead keeps all impaired waters in the Category 5 listing group and identifies those projects which may qualify for "DNR" EAP status. These listings include waters with planned implementation actions on the impaired water that will result in that water meeting water quality standards. EAPs are commonly used when the source of impairment and the appropriate management action are readily identifiable, and the situation is not complex enough to require a TMDL analysis to identify multiple sources and management actions. If the management action results in restoration of the impaired water, the state will update its impaired water list documenting the water restoration and related monitoring data.

Examples of EAP actions are nonpoint source projects or activities, remedial actions under Superfund, or dam removals. Acceptable EAPs must meet a minimum of nine required elements prescribed for water quality-based plans in federal program guidance for Section 319 of the Clean Water Act. Wisconsin currently has several projects that may have an EAP prepared to address specific pollutants and impairments instead of a TMDL. In 2008, no waterbodies are proposed to be de-listed based on having implemented an EAP. It is likely that waterbodies will be de-listed in the future as a result of having an EAP project implemented.

Management Options for Assessment Units that do attain uses

Waters that are not considered impaired may still be in need of management actions. For example, waters identified as "excellent" during the general assessment process may be considered for further evaluation for outstanding resource water or exceptional resource water listing.

Management goals for waters considered "good" include maintaining existing condition (anti-degradation) and those considered "fair" will be placed on a list of waters for further monitoring and evaluation and may receive higher priority for grant funding through programs that offer cost-share incentives for restoration projects.

If the water is degraded in part due to runoff related problems, the water may be ranked 'high' for nonpoint source ranking and the watershed as a whole may be evaluated or reassessed for this watershed nonpoint source rank score. Table 9 outlines some of these management options for the different stream types analyzed through the assessment process.

Chapter 5: STEP 3- Compilation/Report Write-up and WATERS Data Entry

1. Scope out priority actions and enter them into WATERS as recommendations.
2. Seek funding for creation of Nine Key Element Plan projects.
3. Locate specific waters and assign "action" to the water.
4. Assign "party" (DNR, partner) to do the work.
5. Work to incorporate actions into bureau work planning, budget, and legislative processes.
6. Match staff and fiscal resources to proposed projects.
7. Incorporate project goals into goals and performance measures for programs.
8. Promote actions in program and legislative arenas to ensure initiation and completion.
9. Develop MOUs and partnership agreements to see that actions are implemented.

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Introduction

Watershed planning staff will update the following areas in WATERS. The sections that follow show screens from the system where data will be entered.

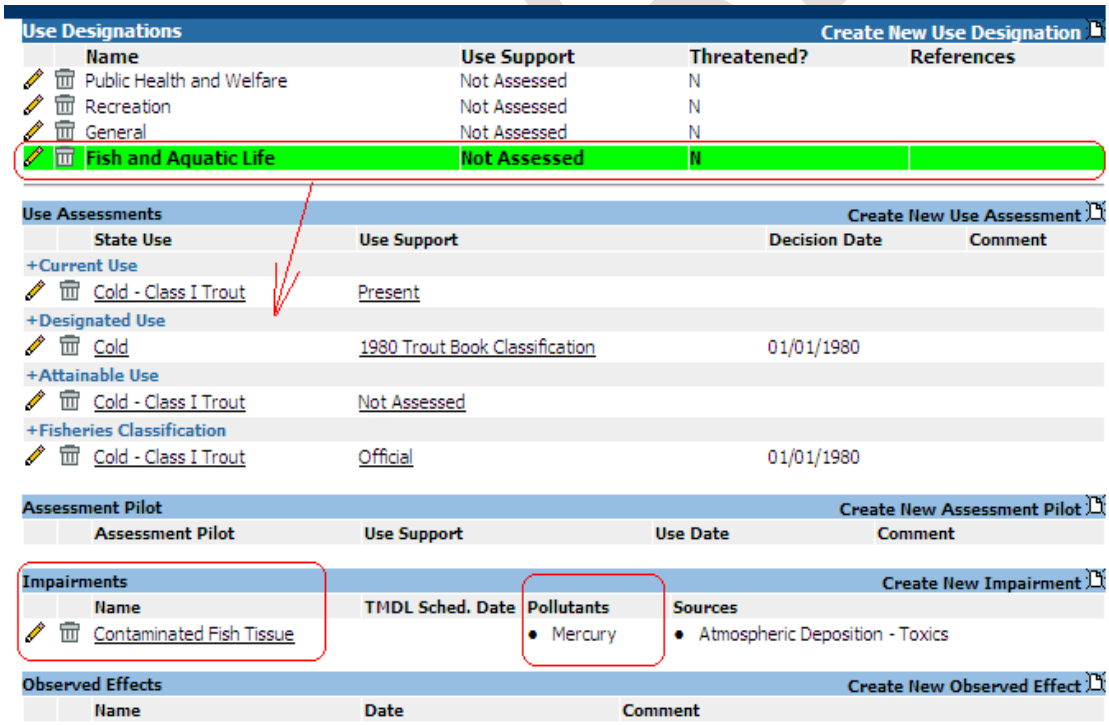
- → Update assessment information for key waters that have been assessed;
- → Identify potential impaired waters based on data and thresholds outlined in WisCALM guidance and located in the appendix of this report.
- → Identify resource goals, priorities, and recommendations for waters (proposed actions) based on resource condition and known or potential opportunities.
- → Update water/shed narratives to summarize overall condition/description of resources.

Assessment Data: Use Attainment Status

WATERs User Guide
http://intranet.dnr.state.wi.us/int/water/wm/WADRS/documents/WADRS_USER_GUIDE_1_07.pdf

WATERS contains a place to hold multiple designated uses for water – Fish and aquatic life, recreation, and fish consumption. Records have been filled in for these areas but the information may need review. Because decision rules for documenting these fields are complex, we have provided specific 'how to' guidelines below. As you will see, we have developed procedures for accommodating waters that have not had a formal rule update for the designated use, but where there has been an updated use designation report filed. If after reviewing these rules you have questions, please feel free to contact lisa.helmuth@wisconsin.gov.

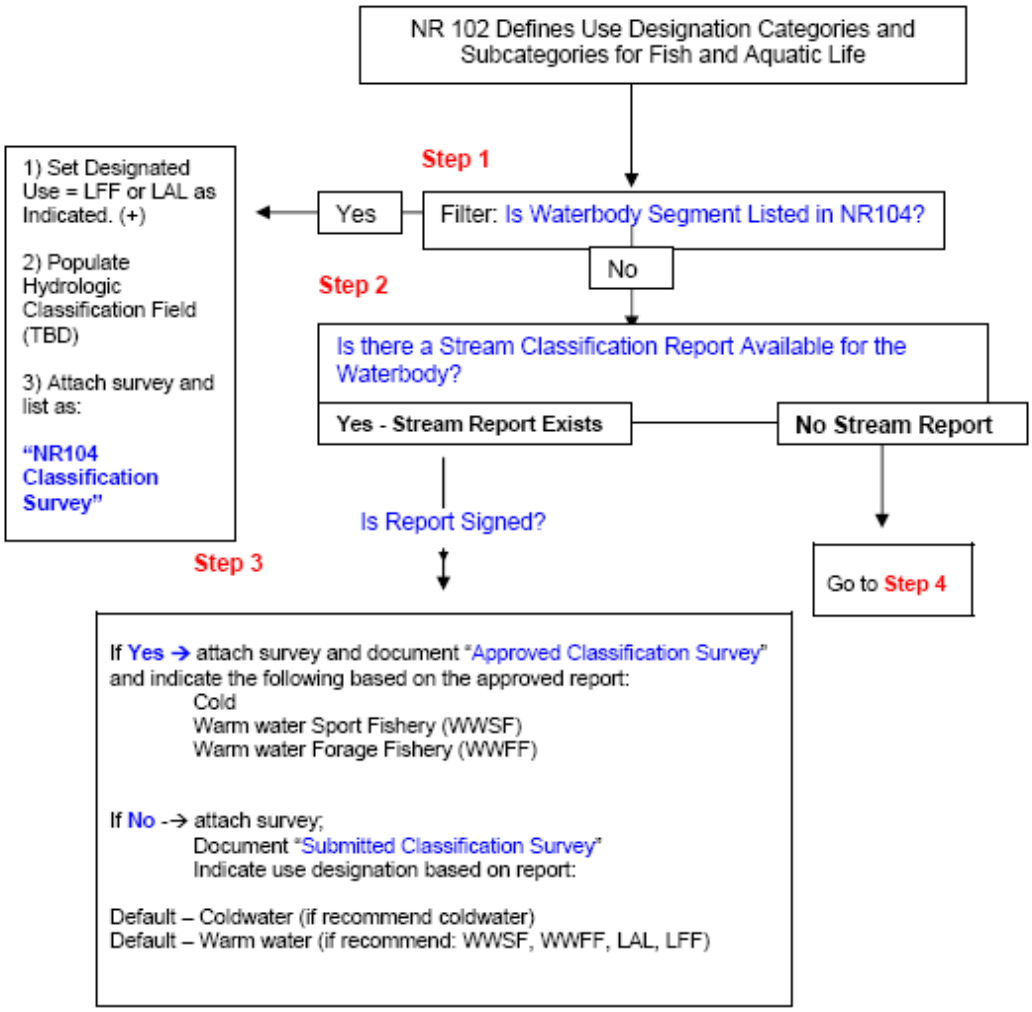
Below is a picture of the use designation area for water in WATERS.



DRAFT PROCESS FOR ASSIGNING FISH AND AQUATIC LIFE SUBCATEGORY FOR DEFAULT WATERBODIES UNDER "FISH AND AQUATIC LIFE USE"

Prepared May 12, 2008
Bob Masnado, Nicki Richmond, Lisa Helmuth

To be applied to all future process flows for Designated Use Program, in the WATERS database and to all other areas of the water evaluation section use designation work.



Step 4 **Use if No Stream Classification Report** exits and the waterbody is NOT listed in NR104.

NO

Is Water Listed in the **1980 Trout Book?**

YES

WATERS in the 1980 Trout Book

If **yes** for Trout Class I, Class II or Class III -

Set **Designated use to "cold"** and note = "1980 Trout Water"

Fisheries classification = cold – trout class I, cold – trout class II or class III and "official" with date indicated.

Use below if:
→ **No Stream Classification Report** exits,
→ Waterbody is **NOT** listed in **NR104,** and
→ Water is **NOT listed in 1980 Trout Book**

Is WATER in Trout Water in 2002 or later Trout Book/List?"

YES:

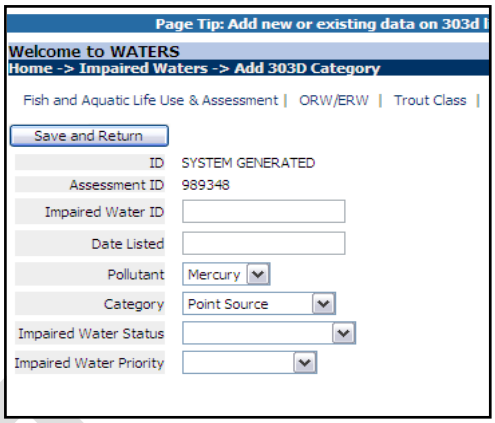
If Class I or II, set Designated use = *Default – Coldwater*

If Class III, set Designated use = *Default – Unknown*

Notes:
(+) Marginal Water is Limited Aquatic Life (LAL) ("II"); Interim Water is Limited Forage Fishery (LFF) ("I")
Each Region's Promulgated Date differs (list here)
Hydrologic Classifications (list here… continuous, noncontinuous, wetland etc.) are part of the classification
Each NR 104 Waterbody Must have a paper file which should also be attached in Waters as the "official classification survey"

Documenting Water Status

WATERS holds both general (305b) data as well as specific listing (303d) data for a water. The two areas are linked. First, the general assessment decision should be accompanied by documentation of the type and quality of data behind the decision, the results of the analyses, and a pollutant/ impairment combination.



Second, in the "monitoring and listing" area, the pollutants and impairments identified in the general area become a 'set of choices" for the 303d listing area.

Example Listing Work:

Thus, if Water A lists the following pollutants/impairments under the general assessment:

→ eutrophication - total phosphorus
→ habitat degradation – sediment

Then, under the 303(d) impaired waters area, you will have two choices: total phosphorus and sediment. When you pick the pollutant that drives the listing, the impairment automatically shows up under the 303d area.

The picture at right shows water that only has mercury listed under its general assessment. Therefore, under the 303d area, mercury is the only choice of pollutant for an impaired waters listing. This data integrity is important for keeping general and specific assessment information in sync.

Detailed information on how to document regarding a proposed or current impaired waters listing is located in this document:

Review/Update Watershed Narratives

Watershed and stream and lake narratives were originally developed in the 1960s and 1970s and published in County Surface Water Inventories. These written summaries of water description are one of the most valued elements by DNR partners and stakeholders. In a survey of basin plan users, the waterbody and watershed narratives were the most highly used and popular element of the plans.

For the most part, previous plan information (water/watershed narratives, NPS rankings, recommendations) has been migrated to WATERS. There may be instances where information from the 1999-2002 State of the Basin Reports is not in the system – if that is the case, please contact Central Office to obtain assistance in getting that information into system. If this more recent information is in the system (or if you need to start from scratch for a narrative), please follow the guidelines below to update water narratives and watershed narratives.

Content:

Watershed narratives should include the following key points based on planner's or biologists' knowledge of water condition and best professional judgment. Much of the information may be available from the agency's GIS mapping tools.

- General condition of watershed (land use, presence and general stream and condition), presence of wetlands and use of / issues with groundwater.
- Changes in land use, including development pressures, changes in land management (CREP/CRP enrollment, specific areas in special need of protection or restoration (ie., note special areas such as large or dominating presence of state wildlife areas, fish hatchery lands, federal forests, etc.)

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- Presence of special designations or listings if this information is relevant to the water description written.

Procedure:

Please do not delete the previous narrative or write over existing information, but instead create a new entry with the current year's date adjacent to your write-up. You can copy and paste and update the previous narrative if you wish. If you find information that is incorrect (ie. at the time it was written, then you can make an update and put your name at the bottom as having modified the information). It is much cleaner, however, to just copy and paste the narrative, update the pieces that are needed, and put your name at the bottom.

Identify in the "display Yes/No" flag whether your narrative can be posted to the website for public viewing. You may write up some notes to yourself in the narrative area and wish to keep those for internal use only – in this case, put "display "no" and the data will not e displayed. If you put "yes", the paragraph may be used on our dynamic website pages for rivers/streams, lakes, and watersheds.

Review/Update Waterbody Narratives

Waterbody narratives might include the following key points:

- Physical description of the water (where it originates, which water it is tributary to),
- The fish and aquatic life use for the water (designated), current, attainable and meeting attainable use. Whether or not there are significant pollution or land use issues associated with the water.
- Specific areas that have been stocked or otherwise intensively managed or that is in special need of protection or restoration (ie., note special areas such as large or dominating presence of state wildlife areas, fish hatchery lands, federal forests, etc.). Fish propagation sites are located in the SWIMS system – detailed help on finding this information will be provided.
- Presence of special designations or listings if this information is relevant to the water description written.

Note that whatever narrative you write will be associated with the entire WBIC, rather than just the segment that you are writing up. Thus your narrative should be written with that overall water-body perspective in mind.

Example Water Narrative:

> Springville Branch, located in west central Vernon County, flows for approximately eight miles in a westerly direction before reaching the North Fork of the Bad Axe River. It has a moderate gradient of 40 feet per mile and drains steep forests, lowland pasture, agricultural land and a portion of the City of Viroqua. The natural origin of Springville Branch is in the small village of Springville where springs well up in the stream bed creating a quicksand like stream bottom. However, since the City of Viroqua discharges stormwater and treated wastewater to a natural channel that eventually reaches the Springville Branch at Springville, the length of the perennial flowing stream has increased. The downstream end of Springville Branch flows through Duck Egg, a Vernon County park, where a wet flood control structure is owned and maintained by Vernon County. Springville Branch contains cool, clear water which turns turbid during periods of rain and associated run-off.
>
> Fish kills have sporadically occurred during high flow events throughout the years. The ultimate source of these fish kills has not been positively identified. Springville Branch is a Class II trout stream from its mouth upstream to Springville (approximately 7.6 miles), and a limited aquatic life stream upstream of Springville to Viroqua. Limited aquatic life streams cannot provide the life cycle requirements for fish species, and have limited ability to support

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other fully aquatic life forms. The latest fish and habitat surveys, completed in 1998 and 1999 documented a stream bottom composed mainly of gravel and rubble with lesser amounts of silt and sand. The presence of beaver dams caused silt accumulation and altered flow of the stream. The stream banks contained little to no erosion (NOTE: if a habitat value is the source of this type of measurement (versus best professional judgment) that data should be noted).

A wide variety of aquatic vegetation and aquatic insects, as well as pickerel frogs and wood turtles were documented during these surveys. Fish collected include brook and brown trout, smallmouth bass, green sunfish and a variety of forage fish species. Maintenance or improvement of Springville Branch includes control of beaver dams, reduction of non-point source runoff, and proper operation of the Viroqua Wastewater Treatment Plant. WDNR stocked Springville Branch from 1960 to 1998 with brown trout and occasionally with rainbow trout and smallmouth bass. Four road crossings and Duck Egg County Park provide access to the stream.

Attaching Documents:

WATERS/SWIMS hold documents, pictures, urls, reports, proposals, etc. in several areas. Please use these *guidelines* for storing your photos, reports, data assessment documentation, use designation reports, etc.

Detailed guidance regarding which documents should go "where" is located in this document.

http://intranet.dnr.state.wi.us/int/water/wm/wadrs/documents/DOCUMENTS_PICTURES_WADRS.pdf

You can upload data in various formats in the WADRS/SWIMS shared documents area: images including the formats: JPG, PNG, TIFF, BMP; Office files including excel worksheets and word documents (including charts and graphs), and Adobe PDF files. You can also reference URLs on internal and external websites. Be careful to include links that are long-term and stable.

There are currently **four areas in WADRS** to hold these types of materials. For reliability/statewide consistency, please use these guidelines to decide where to store your information. Following these will allow us to generate high quality reports and summary lists of specific types of information, including dynamic WebPages… Using these procedures will also provide a foundation for formal electronic "files" or archives for water quality classifications, ORW/ERW designations and Impaired Waters documentation.

Waterbody Detail: "Waterbody Documents"

- General pictures, reports
- Links to automated reports in SWIMS
- Lake bathymetric maps (Central office will complete this)
- Land use, regional or other larger scale plans that directly affect the water
- Use Designation reports

State Use Assessment -- Designated Use:

- Use **Designation Reports** and related Monitoring Study Write Ups,
- Links to monitoring studies in SWIMS
- Links to automated reports in SWIMS
- Pictures of the assessment unit / water or monitoring stations
- Link to Use Designation reports

Monitoring & Listing: Impaired Waters Documentation, including:

- Impaired Water/303d data documentation sheets
- recommended listing or delisting reports
- links to SWIMS 303d monitoring studies
- links to SWIMS TMDL monitoring studies or partner (USEPA, other) websites
- TMDL reports (final reports through public comment and submitted to USEPA)

Watershed Documents

- Documents, pictures, project proposals, urls, and other information at the Watershed level or of watershed-wide significance.

Note that whatever narrative you write will be associated with the entire WBIC, rather than just the segment that you are writing up. Thus your narrative should be written with that overall water-body perspective in mind.

Chapter 6: STEP 4: Public Input/Plan Finalization

Once Watershed Plans are prepared and all water/shed data is entered into the WATERS system, the content developed will automatically show up on the state's online webpages – watershed details and waterbody details, as well as impaired waters search and review tools. [7]

The process for finalizing watersheds plans include:

1. Posting draft plans online for public comment.
2. Receive and compile public comment.
3. Respond to public comment by modifying plan content and/or addressing online in a FAQ.
4. Update WATERS database in response to corrections and updates.
5. Finalize plans and post online with dynamic webpages and connected to interactive watershed planning map.
6. Write transmittal letter from WDNR Secretary to USEPA Office of Waters Region V requesting certification of the Plan Update as an approved update to Wisconsin's Water Quality Management Plan.
7. Receive final letter back from USEPA and upload to the SWIMS Project for the specific watershed that was updated and where the plan was approved.

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[7] Appendix E provides a step by step display of watershed plans "online".

Appendix A: Water Quality Standards: Three Elements

Wisconsin's assessment process begins with water quality standards. The Department is authorized to establish water quality standards that are consistent with the Federal Clean Water Act (Public Law 92-500) through Chapter 281 of the Wisconsin Statutes. These water quality standards are explained in detail in Chapters NR 102, NR 103, NR 104, NR 105, and NR 207 of the Wisconsin Administrative Code.

The water quality standards described in the Wisconsin Administrative Code rely on three elements to collectively meet the goal of protecting and enhancing the state's surface waters:

- *Use designations*, which define the goals for a waterbody by designating its uses,
- *Water quality criteria*, which are set to protect the waterbody's designated uses, and
- *Antidegradation provisions* to protect water quality from declining.

Waters not meeting one or more of these water quality elements are to be included on the impaired waters list.

Designated Uses

Designated uses are goals or intended uses for surface waterbodies in Wisconsin which are classified into the categories of: recreation, public health and welfare, wildlife, and fish and aquatic life. The following designated uses are described in Chapter NR102 (Wisc. Adm. Code).

- *Recreational Use:* All surface waters are considered appropriate for recreational use unless a sanitary survey has been completed to show that humans are unlikely to participate in activities requiring full body immersion.
- *Public Health and Welfare:* All surface waters are considered appropriate to protect for incidental contact by humans. Some are even protected further since they serve as a drinking water supply to nearby communities.
- *Wildlife:* All surface waters are considered appropriate for the protection of wildlife that relies directly on the water to exist or rely on it to provide food for existence.
- *Fish and Aquatic Life:* All surface waters are considered appropriate for the protection of fish and other aquatic life. Surface waters vary naturally with respect to factors like temperature, flow, habitat, and water chemistry. This variation allows different types of fish and aquatic life communities to be supported. This category has subcategories as described below.

Currently, Wisconsin recognizes the following Fish and Aquatic Life Use Designation sub-categories:

- *Coldwater Community:* Streams capable of supporting a cold water sport fishery, or serving as a spawning area for salmonids and other cold water fish species. Representative aquatic life communities, associated with these waters, generally require cold temperatures and concentrations of dissolved oxygen that remain above 6 mg/L. Since these waters are capable of supporting natural reproduction, a minimum dissolved oxygen concentration of 7 mg/L is required during times of active spawning and support of early life stages of newly-hatched fish.

- *Warmwater Sport Fish Community:* Streams capable of supporting a warm water-dependent sport fishery. Representative aquatic life communities associated with these waters generally

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require cool or warm temperatures and concentrations of dissolved oxygen that do not drop below 5 mg/L.

- *Warmwater Forage Fish Community:* Streams capable of supporting a warm water-dependent forage fishery. Representative aquatic life communities associated with these waters generally require cool or warm temperatures and concentrations of dissolved oxygen that do not drop below 5 mg/L.

- *Limited Forage Fish Community:* Streams capable of supporting small populations of forage fish or tolerant macro-invertebrates that are tolerant of organic pollution. Typically limited due to naturally poor water quality or habitat deficiencies. Representative aquatic life communities associated with these waters generally require warm temperatures and concentrations of dissolved oxygen that remain above 3 mg/L.

- *Limited Aquatic Life Community:* Streams capable of supporting macro-invertebrates or occasionally fish that are tolerant of organic pollution. Typically small streams with very low-flow and very limited habitat. Certain marshy ditches, concrete line-drainage channels, and other intermittent streams. Representative aquatic life communities associated with these waters are tolerant of many extreme conditions, but typically require concentrations of dissolved oxygen that remain about 1 mg/L.

Water Quality Criteria – Numeric and Narrative

Water quality criteria are specified numeric or narrative requirements relating to each of the use designations recognized by Wisconsin. Each designated use has its own set of requirements that must be met to protect the intended use. Some of these requirements relate to the amount of a pollutant that can exist without causing harm. Other requirements relate to allowable concentrations of chemical compounds or levels of bacteria. Yet others are set so that physical measurements like temperature or pH are not allowed to reach levels that cause problems. These requirements are expressed as water quality criterion. Wisconsin's water quality criteria are found in Chapters NR 102, NR 104, and NR 105 of the Wisconsin Administrative Code. Criterion may be expressed as either numeric (quantitative) or narrative (qualitative).

Wisconsin DNR's Water Division Monitoring Strategy is available for review on the Department's website at http://dnr.wi.gov/topic/surfacewater/standards.html

Numeric criteria: Numeric criteria are quantitative and are expressed as a particular concentration of a substance or an acceptable range for a substance. For example, the pH value shall be from 6-9 standard units. Numeric surface water quality criteria have been established for conventional parameters (e.g., dissolved oxygen, pH, temperature), toxics (e.g., metals, organics, unionized ammonia), and pathogens (e.g., *E. coli*, fecal coliform). These numeric criteria are established for each designated use.

Narrative criteria: All waterbodies must meet a set of narrative criteria which qualitatively describe the conditions that should be achieved. A narrative water quality criterion is a statement that prohibits unacceptable conditions in or upon the water, such as floating solids, scum, or nuisance algae blooms that interfere with public rights. These standards protect surface waters and aquatic biota from eutrophication, algae blooms, and turbidity, among other things. The association between a narrative criterion and a water body's designated use is less well defined than it is for numeric criteria; however, most narrative standards protect aesthetic or aquatic life designated uses. Wisconsin's narrative criteria are found in Ch. NR 102.04(1).

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Antidegradation

Wisconsin's antidegradation policy is intended to maintain and protect existing uses and high quality waters. This part of a water quality standard is intended to prevent water quality from slipping backwards and becoming poorer without cause, especially when reasonable control measures are available. The antidegradation policy in Wisconsin is stated in NR 102.05(1) of the Wisconsin Administrative Code:

> "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."

One component of Wisconsin's antidegradation policy is the designation of Outstanding Resource Waters and Exceptional Resource Waters. These are surface waters which provide outstanding recreational opportunities, support valuable fisheries and wildlife habitat, have good water quality, and are not significantly impacted by human activities. Outstanding Resource Waters typically do not have any dischargers, while Exceptional Resource Water designation offers a limited exception for increased discharge if human health would otherwise be compromised.

This guidance addresses the assessment of all waters of the state—and listing those that do not meet water quality standards. Inherent in this process is the application of antidegradation provisions. Antidegradation is an important aspect of pollution control because preventing deterioration of surface waters is less costly to society than attempting to restore waters once they have become degraded.

Appendix B: Monitoring and Data Management

Types of Monitoring

The Department's Water Monitoring Strategy (*Strategy*) directs monitoring efforts in a manner that efficiently addresses the wide variety of management information needs, while providing adequate depth of knowledge to support management decisions. The *Strategy* employs a three-tiered approach to information gathering. This careful investment in monitoring effort ensures that the status of Wisconsin's water resources can be determined in a comprehensive manner without depleting the capacity to conduct in-depth analysis and problem-solving where needed. There are three tiers of the monitoring strategy.

> *Wisconsin DNR's Water Division Monitoring Strategy* is available for review on the Department's website at http://dnr.wi.gov/topic/surfacewater/monitoring.html

Tier 1 – Statewide Baseline Monitoring: *Trend establishment and problem identification*

Under Tier 1 of the S*trategy*, staff and partners collect baseline physical, chemical and biological information necessary to satisfy Water Division information needs at a broad spatial scale. This level of monitoring determines water quality status and trends in each water type based on ecologically-based indicators, and identifies potential problem areas. The results of Tier 1 (or baseline) monitoring are often used to assess statewide, broad-scale health of Wisconsin's waters. For resources that are too numerous to individually evaluate such as streams, a dispersed sampling effort allows information from sampled waters to be used, through inference, to provide technically rigorous and credible information on all of the state's waters. Where environmental problems are discovered through Tier I monitoring or other credible sources of information, these problem areas are identified and prioritized for further study under Tier 2.

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Tier 2 – Targeted Evaluation Monitoring: *Site-specific monitoring of targeted areas*

Waterbodies identified under Tier 1 as not meeting minimum levels for core indicators are prioritized and monitored more intensively under Tier 2. Under this tier, confirmation of the problem is made, along with documentation of the cause(s). Thus, it is a more comprehensive evaluation of individual waterbodies, often requiring cross-program collaboration. Tier 2 monitoring is often used to verify whether waterbodies should be placed on the Impaired Waters List ("303d List") and to develop comprehensive water quality management plans such as Total Maximum Daily Loads (TMDLs) for specific waterbodies. It also provides the pre-data for determining how well a waterbody responds to management, as evaluated under Tier 3. Monitoring in response to episodic events such as fish kills, where the cause and extent of the problem must be determined, also falls under Tier 2, as do short-term, one-time research projects.

Tier 3 – Management Effectiveness and Compliance Monitoring: *Determining effectiveness of management measures and permit conditions*

Tier 3 monitoring provides follow-up analysis of management plans that have been implemented for problem waterbodies, and evaluates permit compliance and the effectiveness of permit conditions. Monitoring under this tier evaluates how well core indicators have responded to management actions. Effectiveness of water-specific management actions is determined using core indicators from the more intensive sampling designs under Tier 2 that are specific to the problem being addressed. The chosen indicators are compared before and after management actions are implemented.

Regulatory monitoring of permitted entities is also included in Tier 3. Effluent monitoring helps WDNR determine whether permitted entities are meeting their permit conditions and state regulations, and to assess the health of waters receiving effluent. Monitoring of public drinking water wells is also carried out under Tier 3 to ensure that surface and groundwater meet federal public health standards for contaminants in drinking water.

Sample Collection – General Assessments

Monitoring for the purpose of general assessment and broad-scale, statewide characterization of Wisconsin's waters is conducted under the baseline or "Tier 1" level of the *Wisconsin DNR Water Division Monitoring Strategy*. Baseline monitoring protocols are documented in the *Strategy*.

The core metrics for various waterbody types collected the baseline program include:

Lakes

- Trophic Status Index (TSI)*
- Aquatic Macrophyte Community Index (AMCI) *
- Contaminants in fish tissue—mercury and PCBs*
- Pathogen indicators *
- Game fish population dynamics

Rivers

- Macroinvertebrate samples*
- Fish assemblage characteristics*
- Water chemistry*
- Contaminants in fish tissue—mercury and PCBs *
- Pathogen indicators*
- Gamefish, Endangered, & Threatened species surveys
- Habitat assessment

Streams

Macroinvertebrate samples*
Fish community characteristics*
Water chemistry*
Game fish population dynamics
Habitat assessment

** Metrics used in the general assessment steps described in Section 5.2 of this document*

Sample Collection – Specific Assessments

Additions, deletions or other modifications of the majority of waters on the 303(d) list are the result of specific targeted studies (Figure 1). For the past several years, DNR staff has been directed to validate listings or prepare for new listings or delistings through conducting targeted monitoring studies. This requirement has resulted in a variety of waters with specific projects or delisting analyses and the improvement of state minimum data requirements and formal documentation of listing decisions over time.

In 2010, the derivation of updates or changes to the 303(d) list will originate from a targeted watershed planning update which involves general assessments of all waters, as well as follow-up data and specific assessments for those waters that warrant a more detailed evaluation (waters indicated as "poor" during the general assessment). Due to minimum data requirements and documentation standards, the majority of 2010 list updates will likely originate from planned, detailed specific assessments that have been studied by WDNR water quality biologists over time.

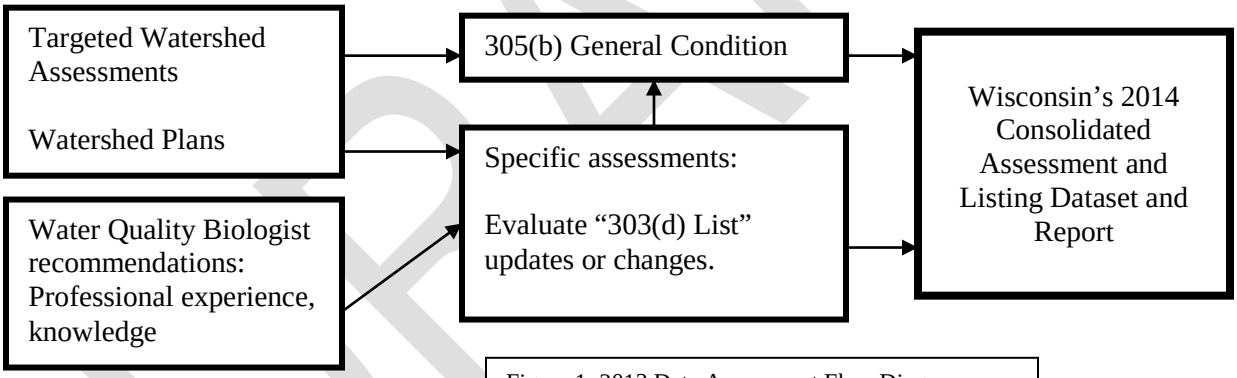


Figure 1: 2013 Data Assessment Flow Diagram

Use of Data from Other Sources

Non-Department Data Sources

In addition to Department-generated data, the Department biennially seeks information from partners and the public to use in its assessment of waterbodies. Partners include federal agencies such at the U.S. Geological Survey, the U.S. EPA and the U.S. Fish and Wildlife Service, other state agencies and Universities, regional planning commissions and major municipal sewerage districts. The Department issued a news release on spring 2013, notifying the public of their opportunity to submit applicable data. If a third party has applicable data, Department staff review the data, the procedures used to collect the data and the procedures used to analyze the data.

Data collected by specially trained citizen volunteers are also used to supplement DNR's monitoring efforts. Data are collected following stringent quality assurance/control procedures, and samples that need laboratory analysis are analyzed by an approved laboratory. Citizen-generated data are currently used for general, Tier 1 water assessments, including broad-scale statewide assessments. If these data

indicate a potential water quality problem at a specific site, additional data are collected by Department staff to verify the extent of the problem and determine if a waterbody should be placed on the impaired waters list.

Information Not Used to Add Waters or to De-list Waters
Information that is not considered representative of current conditions or that does not follow the Department's Quality Management Plan cannot be used in preparation of the 303(d) list. When this type of information is received by the Department, it is evaluated but is not considered sufficient for modifying the impaired waters list. The Department classifies these types of data as "evaluated" information. Information that the WDNR considers "evaluated" includes:

- Information provided by groups, other agencies or individuals where collection methods are not documented and thus the quality of the data cannot be assured,
- Projected stream or lake conditions based on changes in land use with no corresponding in-water data (i.e., desktop analyses).
- Visual observations that are not part of a structured evaluation; and
- Anecdotal reports.

Though not used directly to update the impaired waters list, "evaluated" data may potentially be used to flag areas where further monitoring may be needed for future listing cycles.

Quality Assurance and Laboratory Analysis

For all Tier 1 (baseline) monitoring supporting general and statewide assessments, quality assurance measures are described within each applicable chapter of the *Wisconsin DNR Water Division Monitoring Strategy*. For laboratory or sample analysis, the Department uses only certified laboratories, primarily the State Lab of Hygiene and the University of Wisconsin Stevens Point Aquatic Entomology Laboratory. For targeted, or special, monitoring studies which are frequently used to discern impairment prior to listing a water, quality assurance protocols, such as field blanks, duplicates or spikes, are incorporated as funds allow.

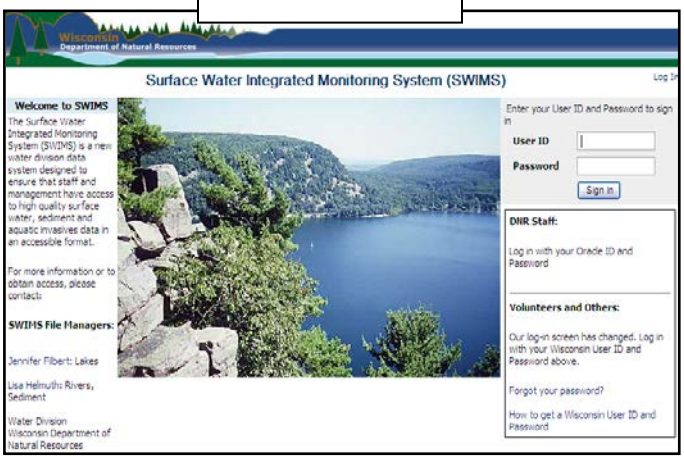
Data Management

Well organized and readily accessible data is fundamental to a smooth functioning, scientifically grounded Water Quality Standards Program. The WDNR has invested many resources into building and maintaining monitoring and assessment databases.

Monitoring Data - SWIMS

The Surface Water Integrated Monitoring System (SWIMS) (Figure 2) is a WDNR information system that holds chemistry (water, sediment), physical (flow), and biological (macroinvertebrate, aquatic invasive) data.

SWIMS Screen



SWIMS is the state's repository for water and sediment monitoring data collected for Clean Water Act work and is the source of data sharing through the federal Water Quality Exchange Network, which is an online federal repository for all states' water monitoring data. WDNR Fisheries and Water Quality Biologists use the system to document monitoring stations

for both Watershed and Fisheries Program datasets, providing a gateway to fisheries management datasets housed at the U.S. Geological Survey. SWIMS also supports Citizen Based Stream Monitoring (CBSM) Level 2 Program volunteers as well as the Citizen Lake Monitoring Network (CLMN) datasets, which are used directly for lake general assessment work.

Assessment Data – WATERS

The Water Assessment, Tracking and Electronic Reporting System (WATERS), created in 2002 and put in full production in 2004, holds the following water program items:

- Water Division Objectives, Goals, Performance Measures, and Success Stories,
- Clean Water Act Use Designations and Classifications (NR102, NR104),
- Outstanding and Exceptional Resource Waters Designations (NR102),
- Clean Water Act assessment data, including decisions regarding a waterbody meeting its attainable use or whether or not the waterbody is considered "impaired"
- impaired waters tracking information, including the methodology used for listing, the status of the TMDL creation, and restoration implementation work;
- Fisheries Trout Classifications (Administrative Code, NR 1.02(7)), and
- Watershed planning recommendations, decisions, and related documents.

The WATERS system is closely integrated with the Surface Water Integrated Monitoring System (SWIMS).

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Appendix C: General Aspects of Data Assessment

Data Quality, Documentation

The creation of enterprise data systems for monitoring and assessment data has helped to provide a systematic location and process for documenting decision making behind general and specific assessments. The Surface Water Integrated Monitoring System (SWIMS) holds key information about monitoring data behind an assessment decision (Figure 3). Associated with each fieldwork event is the project, or reason behind the monitoring, as well as a place to hold equipment used, field procedures or collection methods, and associated documents or final reports.

In addition, within the Waterbody Assessment Tracking and Electronic Reporting System (WATERS), summary values and specific information behind the assessment decision are linked directly to the monitored waters. For example, the sample result above, through a database connection, is directly linked to the studied rivers and streams in the WATERS system. The picture below shows that when a monitoring station is documented in the Northern Region Baseline Streams Water Quality Study, the system links to assessment units in WATERS that are monitored. Through this association, individuals reviewing data and information in WATERS to update assessment decisions can more readily find monitoring data and the purpose behind and methods used for that data collection effort.

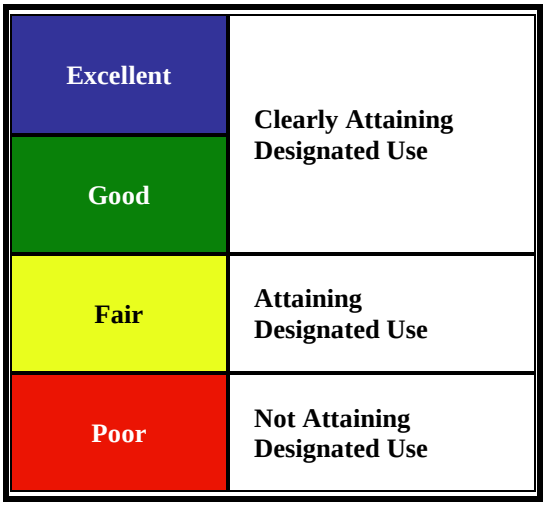

Figure 6. Water Condition Continuum

By clicking on the assessment wizard icon in the monitoring system, the investigator is taken directly to the assessment unit in WATERS (Figure 5). The picture below shows the White River where the sample above was taken. The yellow triangles are monitoring stations; the bright triangles show monitoring data collected within the last 5 years. A more muted yellow indicates data collected from 5 to 10 years ago.

Condition Documentation Policies

In 2006 the WDNR began requiring the creation of data documentation sheets for all waters listed as impaired or proposed for inclusion on 303(d) List. With over 500 waters in the state currently on the list of impaired waters, this challenging documentation requirement is still underway. However, it is the goal of the WDNR to have these data documentation sheets available and accessible as soon as possible, given resource constraints.

Water Status: Four Condition Levels

Data collected under WDNR's tiered monitoring system are used to identify where a specific water falls on a continuum of water condition, which is the core *assessment* to determine if a water is attaining its applicable designated uses.

WDNR uses four levels of water condition to represent a water's placement in the overall quality continuum (Figure 6). Waters described as *excellent* and *good* clearly attain each assessed designated use; waters described as *fair* are meeting their designated uses, but may be in a state that warrants additional management to keep water quality from declining. Waters that are described as *poor* may be considered *impaired*, and may warrant placement on Wisconsin's 303(d) List of Impaired Waters

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in accordance with Section 303(d) of the federal Clean Water Act. See the current WisCALM Document for more information about listing impaired waters.

This section outlines minimum data requirements, indicators and associated thresholds to measure attainment status of Wisconsin lakes, rivers, and streams. For purposes of this guidance, the term "*indicator*" is used to describe the various measures of water quality, including those that represent physical, chemical, biological, habitat, toxicity, and body tissue data. The term "*threshold*" is used to address the numeric value or narrative description that distinguishes attainment of the water quality standards versus values that indicate impairment.

Data Requirements

A minimum data requirement has been established for each indicator including: a) period of record, b) sampling period (e.g., season, month, time of day) where appropriate, c) sample type, and d) sample size. Two key goals of establishing these requirements are to allow WDNR staff to: 1) collect representative data as efficiently as possible with limited staff and fiscal resources; and 2) use those data in a manner that minimizes the chance of incorrectly characterizing that attainment status of any particular water while recognizing that extremely large datasets are neither available nor necessary for many water bodies in the state.

Period of Record: Data from **the most recent 10-year period** are to be used when making use assessments. Such a window ensures that the data are representative of a wide range of factors that affect water quality (i.e., weather and flow) while still being contemporary enough to document "current" water quality conditions. Further, this 10-year window also increases the chance that the preferred minimum data conditions are satisfied allowing for a more robust and defensible assessment decision. Department staff are not obligated to use all data that fall within the 10-year time frame if those data are determined to be unrepresentative of the stressors and normal characteristics of a water. Within the 10-year window, decisions using data from within the last 5 years are considered to be based on "monitored" data and decisions made from data between the 5 to 10 year windows, as per U.S. EPA guidance, are considered "evaluated".

Sampling Period: The sampling period required for assessment decisions depends upon the subject parameter and water feature involved. For example, collecting macroinvertebrate samples in spring, though possible, heightens the likelihood that individuals will be missed; sampling in fall is a preferred sampling period for this indicator. Each assessment below (fish and aquatic life – lakes, streams; recreation, etc.) identifies the preferred sampling period.

Sample Type: The indicator being evaluated will dictate what type of samples should be used for an assessment decision. In some cases, samples may be collected as instantaneous measurements vs. continuous measurements. In other cases, the choice may be between a grab sample and a composite sample. In either case, the selection of the values should result in using the most representative data available.

Sample Size: Sample size is a much studied topic among water quality managers seeking to achieve balance between collecting enough data to make sound decisions while not collecting so much that scant resources are expended without adding significant value to the resulting decision. In U.S. EPA's CALM Guidance (2002), it is suggested that a sample size of 30 or more values (for water chemistry parameters) has good power of detecting exceedance values of water quality standards. U.S. EPA acknowledges that state agencies may use small data sets to make assessment decisions, but encourages a commitment to collection of enough data to support data quality objectives. In fact, a review of other state assessment methods reveals that many states require sampling sizes of as few as 10 values and even 5 in some instances.

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WDNR will make assessment decisions based on smaller, representative datasets. Minimum data set requirements are generally higher for indicators that exhibit high degrees of variability (e.g., temperature). When making assessment recommendations, staff should use all representative data available to ensure that the minimum data requirements are met.

Key Indicators

General Assessments

The choice of indicators to assess the impairment conditions was based on *WDNR's Water Division Monitoring Strategy* – a program that relies on a *tiered* approach to monitoring to maximize statewide coverage of sampling effort while doing so as efficiently as reasonably possible.

Summary of Required Data – General Assessment

Use Designation/ Water Type	Parameters	Sampling Period/ Notes	Sample Type/Size
Fish & Aquatic Life			
Rivers	F-IBI, M-IBI	M-IBI – Fall Preferred F-IBI – Summer	Min. 1 IBI per stream segment; preferably both F- & M-IBIs
Streams	M-IBI, F-IBI		
Lakes	TSI Values (based on Secchi disk or chlorophyll a data)	Satellite-inferred or in-lake data. Summer index period: July 15th – September 15th	2 samples /season / parameter at least three times in 5 year period. If satellite, then 1 inferred value from each of 3 different years.
Recreation			
Great Lakes and inland beaches	*E. coli* monthly aggregate geometric mean	May 1st to Sept 30th	*E. coli* geometric mean criterion of 126 CFU/100 mL, applied when five or more samples for any calendar month within the beach season are available.
Fish Consumption			
All Waters	Fish Tissue	Fish Advice Monitoring	Refer to fish consumption advice: http://dnr.wi.gov/fish/consumption/

Additional Assessment Details

Additional data to support general assessments include but are not limited to the specific concerns for water reflected in the following types of data. The assessment can include any or all of the parameters. Indicators are sub-divided into the following categories:

- Conventional physical-chemical indicators
- Toxicity-based indicators
- Biological indicators
- Lake eutrophication indicators

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Summary of Additional Supporting Data

Use Designation/ Water Type	Parameters	Sampling Period/ Notes	Sample Type/Size
Fish Aquatic Life			
Rivers Streams	Replicate biological data collection and investigate suspected pollutants based on professional judgment of reason behind degradation.	M-IBI – Fall Preferred F-IBI – Summer Chemistry / DO, Temp – sondes and grab samples Fish and macro-invertebrate community assemblage.	Min 1 IBI per stream segment; preferably both F- & M-IBIs
Lakes	In-Lake TSI Values	In-situ chlorophyll-a data summer index period July 15th – September 15th and/or satellite data can be used for general assessments.	In-situ chlorophyll-a data summer index period July 15th – September 15th and/or satellite data can be used for general assessments.
Recreation			
Great Lakes and inland beaches	*E. coli* monthly aggregate geometric mean	May 1st to Sept 30th	*E. coli* geometric mean criterion of 126 CFU/100 mL, applied when five or more samples for any calendar month within the beach season are available.
Fish Consumption (Public Health & Welfare)			
All Waters	Fish Tissue: mercury, dioxin, PCBs,	Fish Advice Monitoring	Refer to fish consumption advice: http://dnr.wi.gov/fish/consumption/

Assessment Thresholds

Assessment thresholds—the thresholds at which it is determined that a water should be placed within a condition group (excellent, good, fair, or poor) – when applied to placing waters on the Impaired Waters List for any given indicator—are based on numeric water quality criteria included in Chapters NR 102-105 (Wis. Adm. Code), WDNR technical documents, and federal guidance. In some cases, qualitative thresholds based upon narrative standards may be used to make assessment decisions. In those cases, a thoroughly documented analysis of the contextual information should be used in conjunction with professional judgment to collectively support a decision. The current WisCALM Document is the controlling document for identifying water condition. However special mention of overall/general assessments is necessary in this planning guide to relate water condition to the required reporting fields of supporting, not supporting, not assessed and fully supporting

Exceedances Frequency

The numbers of times a water quality standard may be exceeded over a period of time and still provide the desired level of protection is referred to as the *exceedances frequency. A* complete and representative data set for each parameter is required to make an assessment decision. When those data are evaluated, exceedance frequency should be used to make a final assessment decision.

The exceedance frequency varies for each indicator and under ideal circumstances would be representative of the relationship between *a number of exceedance and the time it takes for a lake, river, or stream community to recover from an exceedance event*. However, there are very few models available that can accurately predict the recovery rate of any particular aquatic community**.** U.S. EPA recommends characterizing water as impaired whenever there is a 10% exceedance

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frequency of the available data for a chosen indicator. This guidance document relies in part on U.S. EPA guidance, but also encourages professional judgment in making an assessment decision.

Independent Applicability

When minimum data requirements have been met and available data are representative of current water quality, water should be considered "impaired" ***if the attainment threshold for any single indicator has been exceeded***. This decision philosophy is referred to as *independent applicability* and is consistent with the Clean Water Act requirements to protect biological, chemical, and physical integrity of surface waters. U.S. EPA states that this policy of independent application is based on the premise that any valid, representative data set indicating any actual or projected water quality impairment should notbe ignored when determining attainment status.

Independent Application Decision Matrix for Multiple Assessment Indicators

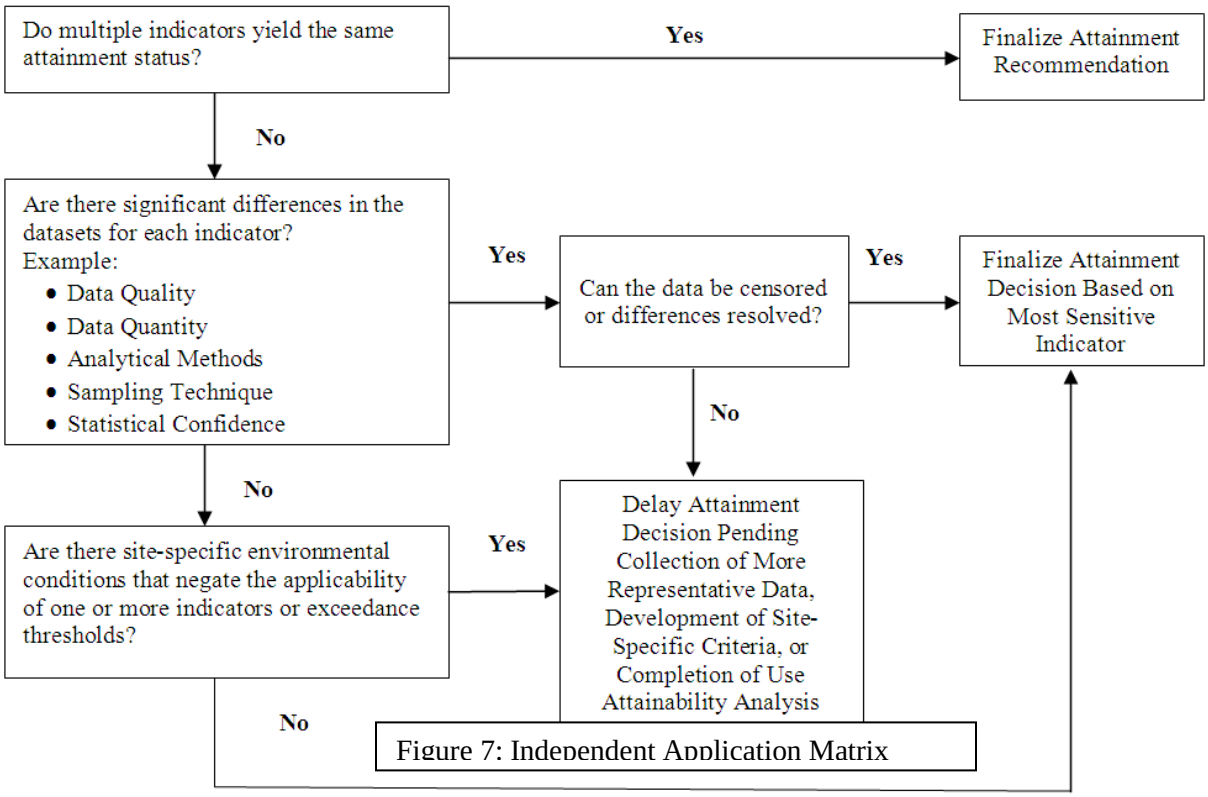

Figure 7: Independent Application Matrix

U.S. EPA also recognizes that there are exceptions to this philosophy and encourages further investigation into the reasons why data may not agree with each other before making an attainment decision. When there are conflicting results from multiple datasets, WDNR staff should review all available data and determine if there are significant issues with any of the data sets that preclude a decision from being reached when one indicator suggests non-attainment. In limited cases, *a hierarchy of the indicators may be appropriate*. For example, biological indicators (e.g., fish or macroinvertebrate IBI) for assessment of fish & aquatic life use may have precedence over chemical indicators in the impairment decision process. However, this hierarchical approach should be used with caution, knowing that exceedance of chemical indicators may correspond to a more recent event that was not reflected in the biological community data due to differences in collection periods or

delays in community response. In such a case, a decision to rely on a hierarchical approach would be inappropriate.

A decision matrix is described in Figure 7 to describe the process for not making attainment decisions using independent application. Cases where this process is used will be rare and should be well documented.

Professional Judgment

Staff most familiar with a waterbody should be directly involved in the assessment decision. Their knowledge and experience with the factors that influence water quality should be considered when reviewing and interpreting available data. Professional staff should consider a myriad of issues to determine the most relevant and appropriate data to use for attainment decisions, including: data quality, frequency and magnitude of exceedances, weather and flow conditions during sample collection, anthropogenic or natural influences on water quality in the watershed, etc. If professional judgment results in the removal or censoring of any available data, clear documentation of the reasons for doing so must be included in the final attainment decision.

Some questions to be considered include:

- Were samples collected and analyzed in accordance with established QA/QC protocols?
- Is the data representative of current water quality conditions?
- Are the data from a wide range of weather and flow conditions, or are they limited for critical hydrological regimes (low and high flows)?
- Have land uses or point sources changed substantially since the data were collected?
- Are data representative of the entire period of record or are they clustered and non-representative?
- Are the minimum data requirements met? If not, do the limited data provide overwhelming evidence of impairment?
- What are the duration, frequency, magnitude and timing of threshold exceedances?
- Is there any contextual information (e.g., naturally occurring conditions) that would explain the exceedance?

Weight of Evidence

Except where alternative procedures are specified in administrative rules, Department staff review all available data relating to numeric and narrative criteria to determine if those criteria are not being met. Staff takes into account the following:

- The applicability of data to critical periods. For example, data collected during the summer months are most appropriate for lakes with severe algae conditions.
- The frequency and duration of a criteria violation. In some cases, there is a natural variability that occurs that may cause criteria not to be met for a short period of time. In other cases, an "event" such as a large amount of runoff during a rainfall or snowmelt may cause a periodic excursion from a criterion.
- The likelihood of stress on aquatic communities, including fish, insects, mussels, snail, plants or other biota.

Dissolved oxygen again provides a good way of describing how the factors of frequency, duration and magnitude may result in a decision about whether or not to include a water on the impaired waters list. In waters where measured dissolved oxygen is very low (magnitude) and data are available to indicate this occurs often (frequency), the Department would be inclined to recommend a water as "impaired." In some cases, the time during which the dissolved oxygen actually falls below

the criterion may be measured in minutes (duration) while in others, it could occur for hours at a time. This is not uncommon for those streams that exhibit what is known as a diel fluctuation. This occurs in streams where higher densities of plants and algae create very high concentrations of dissolved oxygen during the day when photosynthesis is active, but the concentrations drop to very low levels at night into dawn when respiration is consuming oxygen instead of producing it. Diel fluctuations may occur regularly during a summer—especially in waters where there may be excessive nutrients. Such diel fluctuations coupled with exceedances of high magnitude may cause stress on the aquatic community and result in the Department recommending the water as "impaired." In contrast, the Department may not recommend a water for listing when data indicate dissolved oxygen concentrations below the criterion occur very infrequently and only last for a short period of time; this is not uncommon when a stream receives stormwater runoff during a rainfall or snowmelt event. In these cases, the stress to aquatic life may be minimal.

In all cases, Department staff will look for corroborating information, such as the various biological indices that can be used to measure stress within a fish and aquatic life community. Data indicating the type and number of species of fish, macroinvertebrates (such as insects or snails), plants, or algae are evaluated. The state has available a number of datasets, including fish assessment data, habitat assessment data, and macroinvertebrate data. These datasets provide a quantitative approach to be used when determining whether a water should be listed.

In addition, researchers have access to water chemistry data that include dissolved oxygen, phosphorus, pH, temperature, toxic substances, and others. If the suite of available data does not strongly suggest impairment, then the water will not be listed, but will be recommended for additional monitoring as resources allow. The Department will provide a rationale for those cases where data are available that show that a water quality criterion has been exceeded, but the water has not been recommending for the impaired waters list. In most cases, the indicator has not reached the magnitude, duration or frequency to warrant placing a water on the list. In the future, as assessment methodology report will provide a more definitive approach for placing waters on the list.

Data Quality

Information used for purposes of general or specific assessments must be consistent with the WDNR Quality Management Plan or have been obtained using comparable quality assurance procedures. Proposed changes to the 303(d) List must be based on the specific assessment methods identified and used by Department staff. Specific assessments must be based on monitored data that are site-specific and considered representative of current conditions.

In general, monitored information contained in the Department's databases will be used, unless more recent information is available. These data will be used unless experts determine that the data are no longer representative of current conditions. Department staff will determine if changes in the watershed have occurred, such as significant changes in land use, decreases of nonpoint source controls, or increases in the amount of pollutants discharged from point sources. If significant changes have not occurred, available database results will be used.

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Appendix D: Modeling Tools for Watershed Planning

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The following table is an excerpt from the "Adaptive Management Technical Handbook". The complete guidance document is available at http://dnr.wi.gov/topic/SurfaceWater/AdaptiveManagement.html.

Estimating load reductions from nonpoint sources

The phosphorus reductions calculated above set the minimum reductions needed from adaptive management partners such as agricultural producers and MS4s for each permit term. The adaptive management plan must include modeling to ensure that the needed reductions will be achieved from the management measures selected in Step 5 of the adaptive management plan. Agricultural information is sometimes considered proprietary (not available to the public). Given this, and the constantly changing dynamic of land use practices within a watershed, it can be very difficult to gather sufficient data to model the land use for your entire action area.

To account for these restrictions, WDNR does **not** expect field-by-field modeling for the entire action area. Rather, WDNR recommends that models be run using approximate land use conditions to estimate the reductions received from various management practices. To further focus the modeling effort, modeling activities should focus on quantifying management measures within the critical area. As the adaptive management plan is implemented and more reliable land use data becomes available, models should be re-run to ensure that the needed reductions are being accomplished in the watershed.

Models can also be used to demonstrate interim compliance with adaptive management in cases where residual phosphorus loading in the receiving water prohibit measured reductions from monitoring data. In these cases, models should be selected that relate land use practices to water quality concentrations.

What models are available for use?

Facilities using nonpoint source phosphorus reductions in conjunction with the adaptive management option will be required to evaluate where phosphorus will be reduced and what type of reduction is achieved using certain best management practices (BMPs). Following the identification of critical phosphorus areas within the watershed (Step 4 of the Adaptive Management Plan), the subsequent step is to evaluate what the implementation of management practices within the targeted zones means for phosphorus load reductions. There are many models available to help determine this. The following models have been applied throughout Wisconsin to help estimate the phosphorus reduction through improved landscape practices:

- Agricultural Policy/Environmental eXtender (APEX)
- Program for Predicting Polluting Particle Passage thru Pits, Puddles, & Ponds (P-8)
- SNAP-Plus (Wisconsin Phosphorus Index)
- Spreadsheet Tool for Estimating Pollutant Load (STEPL)
- Soil and Water Assessment Tool (SWAT)
- Source Loading and Management Model for Windows (WinSLAMM)

Table 1 summarizes each of the above models, reviewing their functional scale, if model calibration is required, and the types of BMPs assessed with respect to evaluating phosphorus reductions. It should be noted that the one land type not able to be explicitly assessed using the models listed is barnyards. Barnyard models such as the USDA Barnyard Evaluation Tool (BERT) and BARNY, a Wisconsin adapted version of the ARS feedlot runoff model, are qualitative ranking tools and are less effective at quantifying load reduction. If barnyard practices are utilized as an adaptive management practice, the adaptive management applicant may want to consider offsetting more than the minimum requirement in permit terms 1 and 2 to account for the potential inaccuracy associated with barnyard models.

The landscape models discussed in this portion of the guidance vary in their complexity and have known strengths and weaknesses. The selection of a model includes factors such as the question being answered, the complexity of the landscape and the level of detail required from the model output. Simple landscape models such as STEPL require generalized data such as estimated landcover composition. A simplistic model approach typically relies on landuse-based export coefficients, yielding an event-based or average annual phosphorus load. Robust, process-based models such as APEX or SWAT require detailed data inputs; however, the benefit of such a model is that the output can be tied to in-stream water quality at a sub-annual time step. All models, regardless of their ease of use, require proper model conceptualization. In addition, all the models discussed in this step model some type of BMP. It is recommended that the simulation of BMPs include design and efficiency based on technical standards from agencies such as WDNR, NRCS, and DATCP.

While the models listed have traditionally been used to simulate phosphorus reductions from the landscape with typical BMPs, permittees are not limited to those models cited. If permittees have questions about another model's applicability, they can contact the WDNR water quality modeling group (dnrwaterqualitymodeling@wisconsin.gov) for input.

Table 1. Summary of Tools for Estimating Phosphorus Load Reductions.

Model	Functional Scale	Calibration Recommended?	Types of BMPs	
APEX	Field to Watershed	Yes	• buffer strips • channel protection • cover crops • crop change • infiltration trench	• stream restoration • terraces • tillage • wetland creation
P-8	Urban Watersheds	Yes	• buffer strips • detention ponds • flow splitters	• infiltration basins • pipes • swale
SNAP-Plus	Field to Farm	No	• contour cropping • cover crop • crop change	• fertilizer • filter strips
STEPL	Field to Watershed	No	• alum treatment • bioretention • contour cropping • diversion • dry retention • fencing • filter strips • gully stabilization	• infiltration basin • swale • strip cropping • streambank stabilization • separation basin • terraces • waste storage facility
SWAT	Watershed	Yes	• contour cropping • cover crop • crop change • fertilizer	• filter strip • infiltration basin • land use conversion • tillage
WinSLAMM	Urban Watersheds	No	• catch basin cleaning • filter • impervious disconnection • swale	• pond • street sweeping

APEX (Available at http://epicapex.brc.tamus.edu/ or http://apex.tamu.edu/) Maintained by the Texas A&M AgriLife Research & Extension Center	
Background	The Agricultural Policy/Environmental eXtender (APEX) model provides a continuous-time daily simulation to predict the impact of management practices on soil and water quality at the edge-of-field and watershed. The model can be linked with the Soil and Water Assessment Tool (SWAT) to evaluate small-scale impacts within a larger watershed.
Interface	Windows (WinAPEX)or ESRI ArcMap Add-in (ArcAPEX)
Scale	Field / Watershed
Time Step	Daily
Input	• Topography (DEM) • Soils (STATSGO / SSURGO) • Time series metrological data (User defined or from model database) • Land use • Land management (tillage, crop, fertilizer, herd size)
Output	• Daily stream flow • Daily sediment load and concentration • Daily phosphorus load and concentration
BMPs	• Structural practices: infiltration trench, terraces, wetland creation, stream restoration • Nonstructural practices: no till, cover crops, buffer strips, channel protection Complete list: http://apex.tamu.edu/media/57882/conservation-practice-modeling-guide.pdf

P-8 (Available for download at http://wwwalker.net/p8/) Maintained by Dr. William Walker	
Background	The Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds – Urban Catchment Model predicts the generation and transport of stormwater pollutants in urban watersheds.
Scale	Watershed (Urban)
Time Step	Hourly
Input	• Time series metrological data • Land area and use (and associated curve number) • Pervious and impervious surface percentages • Existing BMPs (and parameters for pond, basin, buffer, pipe, splitter) • Depressional storage
Output	• Water and mass balances • Mean inflow and outflow concentrations • BMP removal efficiencies • Sediment accumulation rates
BMPs	• Structural practices: swales, detention ponds, flow splitters, infiltration basins, and pipes. • Nonstructural practices: buffer strips

SNAP-Plus (Available at http://www.snapplus.net/) Maintained by the University of Wisconsin - Madison Department of Soil Science	
Background	SNAP-Plus is the interface for the Wisconsin Phosphorus Index and is designed to produce a nutrient management plan. In accordance with Wisconsin's nutrient management standard code 590 the tool also simulates annual sediment and phosphorus losses from cropland.
Interface	Windows
Scale	Field / Farm
Time Step	Annual
Input	• Field Acreage • Crop per year • Tillage per year • Field characteristics (*size, slope, slope length, below field slope to water, distance to water*) • Soil test information (*pH, percent organic matter, phosphorus, potassium, and buffer pH*) • Fertilizer or manure amount, method, season, and composition (N, P, K, percent dry matter)
Output	• Phosphorus export • Soil loss
BMPs	• Nonstructural practices: contour or strip cropping, filter strips, cover crops, changes in management (crop rotation, fertilizer or manure, tillage)

STEPL (Available for download at http://it.tetratech-ffx.com/stepl/default.htm) Maintained by the US EPA	
Background	The Spreadsheet Tool for Estimating Pollutant Load (STEPL) is a regression-based model with simple algorithms that calculates sediment and nutrient loads from different land uses and the load reductions that would result from the implementation of various best management practices (BMPs).
Interface	Microsoft Excel Workbook
Scale	Field to Watershed
Time Step	Annual
Input	• Drainage area and Land use • Hydrologic soil group • Metrological data (pre-loaded precipitation stations) • Animal units and manure application • Septic systems and point sources • Universal soil loss equation parameters per land use Model input generator (http://it.tetratech-ffx.com/stepl/steplweb.html)
Output	• Annual phosphorus and sediment load • BMP Efficiencies
BMPs	• Structural practices: terraces, bioretention, dry retention, streambank stabilization and fencing, infiltration basins, swales, diversion, separation basin, waste storage facility • Nonstructural practices: contour or strip cropping, buffer strips, alum treatment • Custom BMPs with known pollutant load reduction efficiency rates

SWAT (Available for download at http://swatmodel.tamu.edu/) Maintained by the Texas A&M AgriLife Research & Extension Center	
Background	The Soil and Water Assessment Tool (SWAT) model is a continuous-time, physically-based model that can predict the impact of land management practices on water, sediment, and nutrients within complex, mixed land use watersheds. The model is relatively complex; calibration to measured flow and water quality is recommended.
Interface	Fortran executable, EPA BASINS, or ESRI ArcMap Add-in (ArcSWAT)
Scale	Watershed
Time Step	Daily
Input	• Time series metrological data • Soils • Land use • Topography • Land Management • Hydrology • Point Sources
Output	• Discharge at various scales • Sediment and nutrient concentrations and loads at various scales • Crop yields • Water and mass balances
BMPs	• Nonstructural practices: contour and strip cropping, changes in management (crop rotation, cover crop, fertilizer, tillage), changes in landuse (cropped to grassland), buffer strips • Structural practices: infiltration or detention basins, wetlands

WinSLAMM (Available for download at http://www.winslamm.com) Maintained by the PV & Associates	
Background	Source Loading and Management Model for Windows (WinSLAMM) is a proprietary model used as an urban watershed decision support system. Computations are based on extensive field data collected in Wisconsin.
Scale	Watershed (Urban)
Time Step	Hourly
Input	• Drainage area • Soils • Time series metrological data • Pervious and impervious surface percentages • Land use (types of urban such as parking lots, roofs) • Existing BMPs
Output	• Phosphorus concentration and yield at outfall • BMP removal efficiencies
BMPs	• Structural practices: ponds, swales, and filters • Nonstructural practices: street sweeping, catch basin cleaning, and impervious area disconnection

Appendix E: Watershed Plan Outline

Abstract (overview of watershed)

- Watershed Size, Location, and overall summary figures for streams, lakes, wetlands, great lakes shoreline miles, and mention any trout, orw/erw or impaired waters if that is a main issue.

WATERSHED DETAILS

- Population Dynamics (DOA growth patterns)
- Land Use (2001 NLCI dataset analysis)
- Hydrology (include Impervious Surface Analysis, if available) (Purdue Model)
- Ecological Landscapes (Website)

Maps, pictures etc. (Sidebar)

WATERSHED CONDITION

Overall Description

- General Condition (NPS Watershed Rank, known pt. nonpt. issues, TMDLs established, if any, impairments, etc.)
- Groundwater (any problems, quality/quantity, high-cap well permits, issues with d.w. permits, diversions, etc.*) [Groundwater program?]*
- River and Stream Health (overall condition, summary values, types of waters (natural communities?), and problem(s).
- Lake Health (overall condition, summary values, types of waters (natural communities?), and problem(s).
- Wetland Health (breakdown of wetland types left, wetlands lost, reed canary grass infestations, potentially restorable wetlands).

Specific Issues

- Point and Non-point Pollution (NPS rankings for watershed, special rankings for specific waters in watershed). Describe:
    - Sewer Service Areas/Facility plans (presence, status)
    - CAFO permits, Notice of Violations, special issues relating to NPS problems.
    - Runoff Events (Fish Kills if any) [SWIMS]

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        - Stormwater Permits (large, small/Urban, Ag)
        - Phosphorous Analysis: Any waters scoring "high" in total phosphorus package (to be run this winter), any follow up monitoring or analysis planned or needed to gather more data or list waters if needed (competitive project monitoring).

- Impaired Waters
    - Listings, reasons, when/why, follow up monitoring and status of any projects designed to further investigate or remediate problems.
- Fish Consumption Advisories
    - Presence of advisory, when/when/why.
- Aquatic Invasive Species
    - Presence of AIS in watershed: what, when, why

Waters and Aquatic Communities of Note

- Trout Waters
- ORW/ERW
- Waters/Aquatic Communities with Species of Special Concern, Threatened Species or Endangered Species

WATERSHED ACTIONS

- Watershed Partners, Grants/Projects
    - Summarize Basin/Watershed Partners and contributions (supervisors)
    - TMDLs established if any
    - Grants and other projects ongoing or completed
- Monitoring Studies
    - Volunteer Monitoring work if any (Lakes, Streams, etc.)
    - Internal monitoring projects and studies in watershed
    - Partnership agency, NGO or for-profit organization monitoring work.

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WATERSHED NEEDS

- Priority Issues & Water Quality Goals
- Recommendations
  - Overall Watershed Recommendations
  - Specific recommendations (as appropriate)
    - Water quality monitoring projects
    - Fish and Habitat monitoring or management recommendations
    - Lakes grants, Rivers Grants, Runoff Grants, AIS Grants
    - Water Quality Standards related
    - TMDL creation or Implementation (or recommendations for detailed 9 element watershed plan, if appropriate)
    - Wetlands Restoration, if appropriate
    - Groundwater management/monitoring/wellhead protection recommendations
    - Wastewater and Drinking Water System related recommendations
    - Partnership projects or interstate, intergovernmental issues as appropriate

CONTRIBUTORS

Appendices

- Maps
- References/website links
- Waters - general condition list (see below)

Water	Overall condition	Fish IBI	Bug IBI	Habitat IBI	Chemistry
Bob Masnado Creek	Good	Excellent	Good	Good	None
Matt Rehwald Creek	Poor	Poor	Poor	None	None

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Appendix F: Online Watershed Plans and Data

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Abstract (overview of watershed)
• Watershed Size, Location, and overall summary figures for streams, lakes, wetlands, great lakes shoreline miles, and mention any trout, orw/erw or impaired waters if that is a main issue.

WATERSHED DETAILS
• Population Dynamics (DOA growth patterns)

• Land Use (2001 NLCI dataset analysis)

• Hydrology (include Impervious Surface Analysis, if available)

(Purdue Model)

• Ecological Landscapes (Website)

WATERSHED CONDITION
Overall Description
• General Condition (NPS Watershed Rank, known pt. nonpt. issues, TMDLs established, if any, impairments, etc.)

• Groundwater (any problems, quality/quantity, high-cap well permits, issues with d.w. permits, diversions, etc.*) [Groundwater program?]*

• River and Stream Health (overall condition, summary values, types of waters (natural communities?), and problem(s).

• Lake Health (overall condition, summary values, types of waters (natural communities?), and problem(s).

• Wetland Health (breakdown of wetland types left, wetlands lost, reed canary grass infestations, potentially restorable wetlands).

Specific Issues
• Point and Non-point Pollution (NPS rankings for watershed, special rankings for specific waters in watershed). Describe: ▪ Sewer Service Areas/Facility plans (presence, status)

▪ CAFO permits, Notice of Violations, special issues relating to NPS problems.

▪ Runoff Events (Fish Kills if any) [SWIMS]

- Stormwater Permits (large, small/Urban, Ag)

- Phosphorous Analysis: Any waters scoring “high” in total phosphorus package (to be run this winter), any follow up monitoring or analysis planned or needed to gather more data or list waters if needed (competitive project monitoring).

• Impaired Waters o Listings, reasons, when/why, follow up monitoring and status of any projects designed to further investigate or remediate problems.

• Fish Consumption Advisories o Presence of advisory, when/when/why.

• Aquatic Invasive Species o Presence of AIS in watershed: what, when, why

Waters and Aquatic Communities of Note
• Trout Waters

• ORW/ERW

• Waters/Aquatic Communities with Species of Special Concern, Threatened Species or Endangered Species

WATERSHED ACTIONS
• Watershed Partners, Grants/Projects o Summarize Basin/Watershed Partners and contributions (supervisors)

o TMDLs established if any

o Grants and other projects ongoing or completed

• Monitoring Studies o Volunteer Monitoring work if any (Lakes, Streams, etc.)

o Internal monitoring projects and studies in watershed

o Partnership agency, NGO or for-profit organization monitoring work.

WATERSHED NEEDS

• Priority Issues & Water Quality Goals

• Recommendations o Overall Watershed Recommendations

o Specific recommendations (as appropriate) ▪ Water quality monitoring projects

▪ Fish and Habitat monitoring or management recommendations

▪ Lakes grants, Rivers Grants, Runoff Grants, AIS Grants

▪ Water Quality Standards related

▪ TMDL creation or Implementation (or recommendations for detailed 9 element watershed plan, if appropriate)

▪ Wetlands Restoration, if appropriate

▪ Groundwater management/monitoring/wellhead protection recommendations

▪ Wastewater and Drinking Water System related recommendations

▪ Partnership projects or interstate, intergovernmental issues as appropriate

CONTRIBUTORS

Appendices

• Maps

• References/website links

• Waters - general condition list (see below)

Water Overall condition Fish IBI Bug IBI Habitat IBI Chemistry

Bob Masnado Creek Good Excellent Good Good None

Matt Rehwald Creek Poor Poor Poor None None