

## Appendix B: Prioritized Recommended Actions and Gap Analysis

Tracking	Responsible Group	Area	H, M, L	Date (or Gap)	Recommendation
<b>1.0 Strategy Maintenance and Implementation – Core Monitoring Team</b>					
1.1	Monitoring Section and Tech Team Coordinators	Core Program	High	December – Annual Progress report	<ul style="list-style-type: none"> <li>Review and update Water Resources Monitoring Strategy (2015) annually to incorporate new science and tools, program needs, water resources priorities, and USEPA requirements. Prepare annual report on the implementation success of the Monitoring Strategy by January 1st of each year.</li> </ul>
1.2	Monitoring Section	Program Performance Measure	High	2015-2016	<ul style="list-style-type: none"> <li>Assemble <b>strategy implementation workgroup</b> to identify and oversee implementation of priorities and products with goals, specific staff/teams, timelines, and accountability measures on an ongoing basis and to update these priorities and accomplishments through online tools</li> </ul>
1.3	Strategy Work Group	Performance Measure	High	2015-2016	<ul style="list-style-type: none"> <li>Build upon existing lines of communication with other agencies and partners through regular liaison positions, meetings, &amp; workshops for success. Share strategy and build collaborative relationships.</li> </ul>
1.4	Strategy Work Group	Tracking & Communication	High	2015-2016	<ul style="list-style-type: none"> <li><b>Document progress on strategy priorities</b>, identify tracking and communication tools, update the DNR's internal and public facing websites with the updated monitoring strategy, and create a calendar/schedule for coordination work in the coming biennium.</li> </ul>
1.5	Monitoring Section and Tech Team Coordinators	Tracking & Communication	High	Check in w/biologists in Winter 2015 and May 2016	<p>Complete FY15 reports and closeouts for and document the status of work for <b>statewide probabilistic and fixed site monitoring</b> as described in the monitoring strategy and as required in annual work plan for Field Season 2015-16 including:</p> <ul style="list-style-type: none"> <li>Natural Community Random and Long Term Trend (LTT) Streams,</li> <li>Long Term Trend Rivers and River Macroinvertebrates and Lake Satellite,</li> <li>Long Term Trend Lakes, and</li> <li>Reference Aquatic Plant Lakes.</li> </ul>
1.6	Monitoring Section and Tech Team Coordinators Database Coordinators (Shupryt, Helmuth, Hein)	Tracking & Communication	High	Check in w/biologists in Winter 2015 and May 2016	<ul style="list-style-type: none"> <li>Complete FY15 reports and closeouts for <b>Prescribed Monitoring</b> (Targeted Watershed, Follow-up, and Directed Lakes) projects that are approved and funded for FY16.</li> <li>Projects are maintained in SWIMS and data is entered and reviewed for completeness (stations, labslips, field data, methods/ procedures, equipment, data quality, and final reports). <b>Final reports are linked in SWIMS</b> and new findings are incorporated into the WATERS system through watershed planning and/or narrative updates.</li> </ul>
1.7	Monitoring Section and Tech Team Coordinators Database Coordinators (Shupryt, Helmuth, Hein)	Tracking & Communication	High	Check in w/biologists in Winter 2015 and May 2016	<ul style="list-style-type: none"> <li>Complete FY15 reports and closeouts for <b>Local Needs and CWA Section 319 Project Eligible monitoring</b> as approved and funded. Data is entered in SWIMS and reviewed for completeness (stations, data quality, and applicable final reports). Each year, final reports for projects are linked in SWIMS and new findings are incorporated into the WATERS system in a timely manner.</li> </ul>
1.8	Monitoring Section and Tech Team Coordinators Database Coordinators	Tracking & Communication	High	2016	<ul style="list-style-type: none"> <li>Complete FY15 reports and closeouts for <b>response and evaluation activities</b> including response to fish kills, storm events, spills, harmful algal blooms, etc., or responding to requests for evaluation of water quality data to support permit issuance and compliance (APM, Chapter 30, WPDES, high capacity wells, FERC, etc.).</li> </ul>
1.9	Monitoring Section	TWA Development	Medium	GAP	<ul style="list-style-type: none"> <li>A formal schedule for incorporating key resource areas as into the work planning process and follow through by technical teams and WR PMT Managers. <ul style="list-style-type: none"> <li>Streams, Rivers (2013-14)</li> <li>Aquatic Invasive Species (2014-15)</li> <li>Lakes (2015-16)</li> <li>Wetlands (2016-17)</li> <li>Springs (2016-17)</li> </ul> </li> </ul>
1.10	Monitoring Section	Reporting	High	2016-17	<ul style="list-style-type: none"> <li>Wisconsin should annually publish the results of monitoring in online reports that are easily accessible to the public.</li> </ul>

## Wisconsin's Water Monitoring Strategy 2015 to 2020

Tracking	Responsible Group	Area	H, M, L	Date (or Gap)	Recommendation
<b>2.0 Rivers / Streams Technical Team Products – Mike Shupryt</b>					
2.1	Rivers / Streams Technical Team	River Study Designs	High	2015-2016	Continue to update <b>study designs</b> : <ul style="list-style-type: none"> <li>Long Term Trend Rivers v2.2, WQ Monitoring 2015</li> <li>River Macroinvertebrate Monitoring (v2.0), WQ Monitoring 2015</li> <li>Follow Up Monitoring (V 1.1) , WQ Monitoring 2015 [see below]</li> <li>National Rivers and Streams Assessment 2016</li> </ul>
		Stream Study Designs	High	2015-2016	<ul style="list-style-type: none"> <li>Wadeable Trend Reference Sites (LTT Streams) V 1.1 Study Design, WQ Monitoring 2015</li> <li>Natural Community Stratified Random Monitoring Study Design (V1.1), WQ Monitoring 2015</li> <li>Targeted Watershed Site Selection Tool 2015</li> <li><a href="#">Water Action Volunteers Stream Monitoring</a> (Review Existing)</li> <li>Targeted Watershed Approach 2016</li> </ul>
2.2	Rivers / Streams Technical Team	Assessment metrics and standard operating procedures	High	2015-2016	<ul style="list-style-type: none"> <li>Refine monitoring protocols for <b>follow up monitoring</b> when following up on “Poor” biologic scores including protocols to detect less frequent or less widespread stressors.</li> </ul>
			High	2016	<ul style="list-style-type: none"> <li>Refine or develop monitoring and assessment measures (metrics) and collection protocols (SOPs) for physical habitat and sedimentation in streams and rivers.</li> <li>Update additional SOPs including:</li> </ul>
			Medium	2016	<ul style="list-style-type: none"> <li>Increase capability (documentation, training, protocols) to collect high frequency and <b>event-based flow monitoring</b>.</li> </ul>
2.3	Rivers / Streams Technical Team	Study design, capacity, and site selection	Medium	2016	<ul style="list-style-type: none"> <li>Review <b>wadeable trend Reference site</b> network and determine if adding addition or rotating sites are necessary. Add high frequency chemical data collection to reference site network.</li> </ul>
2.4	Shupryt, Miller, Diebel, and Tech Team	Reporting	Medium	2015-2016 Winter	<ul style="list-style-type: none"> <li>Develop <b>calendar</b> and <b>long-term plan for Baseline and TWA monitoring</b> programs.</li> </ul>
2.5	Watershed Planning/ Streams Tech Team	TWA/WQ Planning	High	2015-2016 Winter	<ul style="list-style-type: none"> <li>Create/ <b>update guidance for blending planning and river/stream and lake monitoring</b> processes and outputs/final reports.</li> </ul>
2.6	Rivers / Streams Technical Team and Monitoring Section	Study Design	High	TWSST Tool 2015	<ul style="list-style-type: none"> <li><b>Target land use to determine stream monitoring locations.</b> We should target land uses and practices to determine where we have the greatest monitoring needs.</li> </ul>
2.7	Rivers / Streams Technical Team	study design, capacity, and site selection	Medium	GAP	<ul style="list-style-type: none"> <li>Develop a <b>“toolbox” of stressors to monitor</b> for when following up on a “Poor” biologic sample. May be different stressors regionally.</li> </ul>
2.8	Rivers / Streams Technical Team and Assessment Team	study design, capacity, and site selection	Medium	GAP	<ul style="list-style-type: none"> <li>Develop a <b>protocol to determine what length of stream</b> is represented by a single station (may be parameter specific) using scientific justification.</li> </ul>
2.9	Rivers / Streams Technical Team	study design	Medium	GAP	<ul style="list-style-type: none"> <li>Collect more <b>event based samples</b> at targeted sites</li> </ul>
2.10	Stream Baseflow Monitoring	study design, capacity, and site selection	Medium	GAP	<ul style="list-style-type: none"> <li><b>Monitor stream baseflow</b> in existing projects and studies to gain an understanding of stream flow conditions and to manage change in response to existing and proposed catchment alterations.</li> </ul>
<b>3.0 Lakes Technical Team Products – Katie Hein</b>					
3.1	Lakes Technical Team	Data Management	Medium	GAP (\$\$\$)	<ul style="list-style-type: none"> <li>Update SWIMS capacity to capture <b>aquatic plant data and calculate biocriteria metrics</b> [Request Funding for FY17 Contracts]</li> </ul>
3.2	Lakes Technical Team	Levels and Flows	Medium	2016	<ul style="list-style-type: none"> <li>Lake level monitoring by volunteers (partnered with professional surveyors) initiated on approximately 20 lakes in 2015. <b>Complete monitoring and summarize data.</b></li> </ul>
3.3	Lakes Technical Team	Parameter creation	Medium	2016	<ul style="list-style-type: none"> <li>Work on developing and refining <b>lake assessment parameters</b> (e.g., aquatic plant biocriteria, diatom biocriteria, shoreland habitat health, etc.) for both the integrated reporting process as well as the designated use/biocriteria refine monitoring protocols when following up on “Poor” biologic scores including protocols to detect less frequent or less widespread stressors.</li> </ul>
3.4	Lakes Technical Team	Reporting	Medium	2016	<ul style="list-style-type: none"> <li>Continue to work on providing improved and accessible data for lakes both through online system and consistent reports.</li> </ul>

## Wisconsin's Water Monitoring Strategy 2015 to 2020

Tracking	Responsible Group	Area	H, M, L	Date (or Gap)	Recommendation
3.5	Lakes Implementation Team - Groundwater	Lakes, GW Teams	High	2016	<ul style="list-style-type: none"> <li>Develop a <b>groundwater quantity and quality monitoring program</b> including water level and flow to assess groundwater / baseflow quantity information needs. Additional parameters related to groundwater quality could also be developed.</li> </ul>
3.6	Monitoring and Evaluation Sections	Monitoring	high	GAP	<ul style="list-style-type: none"> <li>Develop a monitoring program and develop standards for Harmful Algal Blooms.</li> </ul>
3.7	Monitoring and Evaluation Sections	Monitoring	high	GAP	<ul style="list-style-type: none"> <li>Develop a monitoring program for human pathogens on inland beaches.</li> </ul>
3.8	Monitoring and Evaluation Sections	Monitoring	low	GAP	<ul style="list-style-type: none"> <li>Develop a monitoring program at near shore stations in addition to traditional testing at the deepest point of the lake.</li> </ul>
3.9	Monitoring and Evaluation Sections	Monitoring	Medium	GAP	<ul style="list-style-type: none"> <li>Develop second biocriteria indicator for lakes and new monitoring design to collected necessary data</li> </ul>
3.10	Monitoring Section	Data management	high	GAP	<ul style="list-style-type: none"> <li>Funding and staff to integrate new monitoring programs into existing databases</li> </ul>
<b>4.0 Wetlands Technical Team Products - Tom Bernthal</b>					
4.1	Monitoring Section and Management	Communication	High	Begin in 2015 – plan by 2016	<ul style="list-style-type: none"> <li><u>Team Formation</u> The team mission, membership and structure encompass both ambient monitoring as well as site specific evaluation of impacts on wetlands. Staff needed to seek approval for the team creation, write up an issue brief and receive supervisor approvals for participation on the team.</li> </ul>
4.2	Monitoring and Groundwater Programs	Resource integration	High	2015-2017	<ul style="list-style-type: none"> <li><u>Groundwater and Wetland Issues in the Central Sands:</u> Progress to support wetland impact evaluation and groundwater drawdowns from high capacity well permits have been initiated through a collaborative project between the wetlands staff and the Water Use Section of the Groundwater and Drinking Water Bureau. The proposal includes plans to add a wetland component to an ongoing hydrologic study of wetlands by installing wells/piezometers and gathering baseline vegetation data.</li> </ul>
4.3	Monitoring and Wastewater program	Resource integration	High	2015-2017	<ul style="list-style-type: none"> <li><u>Wastewater Wetland Impacts</u> This work involves analyzing potential impacts from wastewater discharges on wetlands, which has long been a concern for wetland biologists and ecologists. A small group was formed to create training and guidance on stormwater impacts to wetlands.</li> </ul>
4.4	Wetlands Technical Team	standard operating procedures	High	2015-2017	<ul style="list-style-type: none"> <li>Continue to update wetland monitoring and assessment procedures and study designs and outcomes to be published and shared.</li> <li>Share existing procedures and SOPs and put in consistent format for storage and accessibility on DNR's SWIMS application, EGAD guidance system and DNR's website.</li> <li>Identify specific documents that are "done" and which are planned for the coming year.</li> </ul>
4.5	Wetlands Technical Team	restoration assessment	Medium	2015-2017	<ul style="list-style-type: none"> <li>Assess whether the restoration/ mitigation projects meet restoration or ecosystem goals.</li> <li>Identify how these goals intersect with Clean Water Act Reporting Assessments.</li> </ul>
4.6	Wetlands Technical Team	Reporting	Medium	2015-2017	<p>Increase frequency and accessibility of wetland assessment or condition data through migration into IT infrastructure.</p> <ul style="list-style-type: none"> <li>Location of wetlands assessments in WATERS.</li> <li>Location of wetland monitoring in SWIMS.</li> <li>Wetland restorations loaded and used in SWDV, WCV</li> <li>Potentially restorable wetland areas in SWDV, WCV</li> <li>Identify additional surveys WRAPs, FQIs and others and where and how they should be stored and used in programs.</li> </ul>
4.7	Wetlands Technical Team	Assessments	Low	2016	<ul style="list-style-type: none"> <li>A plan for using the Wisconsin Wetland Rapid Assessment Methodology of Function and Condition (WRAM) in the water quality program needs to be developed.</li> </ul>
4.8	Wetlands Technical Team	Assessment and reporting	Low	2016	<ul style="list-style-type: none"> <li>Develop Routine FQA Monitoring and Incorporate into Clean Water Act reporting.</li> </ul>
4.9	Wetlands Technical Team	Study design and assessments	Medium	2017	<ul style="list-style-type: none"> <li>As FQA benchmarks are linked to Tiered Aquatic Life Uses the Department will be in a position to incorporate FQA surveys into the water resources monitoring program, with staffing and a funding structure. At this point in time we envision applying FQA to provide a measure of wetland condition at a watershed scale through the use of probabilistic survey design.</li> </ul>

## Wisconsin's Water Monitoring Strategy 2015 to 2020

Tracking	Responsible Group	Area	H, M, L	Date (or Gap)	Recommendation
4.10	Wetlands Technical Team	Study design and assessments	Very High Priority	2015-2018	<ul style="list-style-type: none"> <li>The wetland datasets and monitoring results need to be moved to a shared location and better integrated with the SWIMS system and SDE feature class environment so that staff may use the fruits of the wetlands evaluation and assessment tools more readily. Further, wetland site level functional assessments need to be integrated into the water resource monitoring system, with staffing and training needs assessed.</li> </ul>
4.11	Wetlands Technical Team	Study design and assessments	Low	2017	<ul style="list-style-type: none"> <li>"Rapid FQA" – After 2017 we will have a large data set in the neighborhood of 700 sites. Through data analysis and an expert group process we may be able to select a subset of species that can be tested for use in a "Rapid FQA" as MN has done. FQA metrics would be calculated using the subset of species to see if they yield similar results compared to the full species list. A list of 200-300 species would allow practitioners to focus on learning these rather than the full WI wetland flora.</li> </ul>
4.12	Wetlands Technical Team	Study design and assessments	Low	2016	<ul style="list-style-type: none"> <li>The program evaluation of the usefulness of Floristic Quality Assessment in all sectors of the Department where it is in use should be conducted after 2-3 years of implementation, and subsequently every 5 years.</li> </ul>
4.13	Wetlands Technical Team	Training and Outreach	Low	2017	<ul style="list-style-type: none"> <li>Train staff in the use of the WRAM v. 2</li> </ul>
4.14	Wetlands Technical Team	Training and Outreach	Medium	2016	<ul style="list-style-type: none"> <li>Opportunistically gather WRAM v. 2 assessments from water regulatory staff. Continue to provide training to water regulatory staff. Incorporate the assessment data into SWIMS.</li> </ul>
4.15	Wetlands Technical Team	Study design and assessments	Low	GAP	<ul style="list-style-type: none"> <li>Complete the conversion of the Wisconsin Wetland Inventory to National Wetland Inventory system. Design a stratified random sampling scheme based on hydro geomorphic (NWI+) class for targeted watersheds.</li> </ul>
4.16	Wetlands Technical Team	Study design and assessments	Medium	GAP	<ul style="list-style-type: none"> <li>Integrate the watershed scale and the site scale functional assessments. Use WAWFA for coarse level planning uses and as a screen for selecting Assessment Areas for on the ground WRAM v.2 functional assessments. WRAM v 2 Assessments can serve as ground truth for watershed scale assessments. Apply this approach to pilot targeted watershed in 2017-2019. Evaluate results of pilot project and refine methods.</li> </ul>
4.17	Wetlands Technical Team	Study design and assessments	Medium	GAP	<ul style="list-style-type: none"> <li><u>Collecting WRAM Results to characterize wetland condition and function:</u> The area of analyzing WRAM (wetland rapid assessment methodology results from site assessments where wetland permits have been issued is a new area of study for the wetland group. This initiative involves ensuring that WRAMs are completed for all individual and general permits by train water quality biologists and stormwater staff to use WRAM and by exploring efficient ways to capture WRAM surveys for storage and access in an accessible database.</li> </ul>
4.18	Wetlands Technical Team	Study design and assessments	Medium	GAP	<ul style="list-style-type: none"> <li><u>Floristic Quality Assessment Development</u> The continuation of this critical wetland assessment and function tool continues. The team is working on developing Floristic Quality Assessment Benchmarks during 2016 research and is developing an outline for implementing FQA bioassessment as a routine part of watershed condition monitoring.</li> </ul>
4.19	Wetlands Technical Team	Study design and assessments	Medium	GAP	<ul style="list-style-type: none"> <li>The following items from the Monitoring Strategy are identified as areas to implement in years 3-5 of the Monitoring Strategy: <u>SOP Development:</u> Continue to update wetland monitoring and assessment procedures and study designs and outcomes to be published and shared.</li> </ul>
4.20	Wetlands Technical Team	Study design and assessments	Medium	GAP	<ul style="list-style-type: none"> <li><u>Restoration assessment:</u> Assess whether the restoration/ mitigation projects meet restoration or ecosystem goals.</li> </ul>
4.21	Wetlands Technical Team	Study design and assessments	Medium	GAP	<ul style="list-style-type: none"> <li><u>Reporting:</u> Increase frequency and accessibility of wetland assessment or condition data.</li> </ul>
<b>5.0 Safety Training Program</b>					
5.1	WR PMT Training Coordinator and Technical Teams	Safety and Training Coordinator	Medium	2016-2017	<ul style="list-style-type: none"> <li>Design and implement a <b>safety and training program for water quality biologists</b> that may include modules related to bioassessment, aquatic plant identification, water quality monitoring, statistical analyses, and related.</li> </ul>
5.2	Monitoring Section	Quality Assurance	Medium	GAP	<ul style="list-style-type: none"> <li>Top quality training for biologists and accessible documentation of training records for each employee;</li> </ul>
<b>6.0 Information Technology and Data Integrity</b>					
6.1	Information Technology Workgroup	System maintenance	High	2015-2016	<ul style="list-style-type: none"> <li>Maintain oracle/GIS databases including SWIMS, WATERS, SWDV, intranet SWDV, Water Condition Viewer, dynamic webpages, and custom tools such as the Targeted Watershed Site Selection Tool.</li> </ul>
6.2	Information Technology Workgroup	System maintenance	High	2016	<ul style="list-style-type: none"> <li>Update the Water Quality Bureau Information Technology plan from 2008 with emphasis on new technologies, program</li> </ul>

## Wisconsin's Water Monitoring Strategy 2015 to 2020

Tracking	Responsible Group	Area	H, M, L	Date (or Gap)	Recommendation
					changes, and training and help guides for IT products that support monitoring.
6.3	SWIMS Integrity Group	It Systems	High	GAP	<ul style="list-style-type: none"> <li>Help ensure stable systems with adequate backup, adequate memory, 'bug/error' monitoring and journaling of actions to identify problem actors, users.</li> </ul>
6.4	SWIMS Integrity Group	It Systems	High	GAP	<ul style="list-style-type: none"> <li>Long-term vision team to modernize and enhance system accessibility including mobile options, tablet forms, infield data entry, topical search and display and more.</li> </ul>
6.5	SWIMS Integrity Group	IT Systems	Low	2016/17	<ul style="list-style-type: none"> <li>Continue working with <b>partnership monitoring programs</b> linking with federal partners through the Environmental Data Exchange Network and hosted by the Water Division to increase data comparability, increase the potential for collaboration with other entities collecting ambient water quality information, and make data available to the public.</li> </ul>
6.6	Monitoring/Assessment Staff	Assessment Evaluation	High	2015/16	<ul style="list-style-type: none"> <li>Wisconsin should provide a summary report regarding what percentage of waters in <b>WATERS are navigable and assessed in its Integrated Report on online.</b></li> </ul>
6.7	Information Technology Workgroup	IT System Managers	High	Winter/Spring 2016	<ul style="list-style-type: none"> <li>Update help guides, videos, and skype outreach with focus on special groups: Great Lakes, Volunteers, Mississippi River Teams, etc.</li> </ul>
<b>7.0 Clean Water Act Standards, Assessment, and Monitoring – WQ Bureau</b>					
7.1	Biocriteria Designated Use Assessment Team	Designated Use Biocriteria	High	GAP	<ul style="list-style-type: none"> <li>Create user interface data entry pages, parameter code programming, statistical packages for assessments for <b>algal biomass and diatom taxa assessment</b> in our databases at some point.</li> </ul>
7.2	Triennial Standards Review	CWA assessment procedures	Medium	GAP	<ul style="list-style-type: none"> <li>Implementing consistent CWA assessment procedures for the <b>Upper Mississippi River</b> that may follow protocols developed by the UMRBA WQ Task Force or which may influence UMRBA recommendations.</li> </ul>
7.3	Biocriteria Designated Use Assessment Team	WES Assessment Designated Use Biocriteria	High	2015-2016	<ul style="list-style-type: none"> <li>Design the template for tiered aquatic life uses and numeric biological criteria for wadeable streams and test their application in the two pilot watersheds that were assessed in 2010 and 2011.</li> </ul>
7.4	Biocriteria Designated Use Assessment Team	WES Assessment Designated Use Biocriteria	High	2015-2017	<ul style="list-style-type: none"> <li>Apply the Natural Communities model to determine the appropriate class and as validated by the ambient biological, chemical, and physical data; Supports WPDES</li> <li>Determine the appropriate TALU tier that applies to each stream and stream segment;</li> <li>Complete an aquatic life use assessment using the appropriate TALU tier biocriteria for each assemblage as the primary basis for attainment or non-attainment;</li> <li>Use the accompanying chemical/physical and other stressor data to determine the proximate causes and sources of impairment and threat;</li> <li>Use the results of the attainment and stressor analyses to determine how to assign appropriate management recommendations and/or actions to include WPDES permitting, TMDLs, nonpoint source management, or any other management program; and,</li> <li>Utilize this experience to determine what tools are needed and if any existing tools need additional development.</li> </ul>
7.5	Monitoring, Fisheries and Assessment Staff	Database Infrastructure, Management	High	2015-16	<ul style="list-style-type: none"> <li>Integration of new findings and model results, including modeled natural communities based on flow and temperature projections, into database infrastructure to identify specific biological potential of a stream or river or lake. (John Lyons, Methodology for Streams Natural Communities, 2013).</li> </ul>
7.6	WES Staff	Standards and Assessments	High	2015-16	<ul style="list-style-type: none"> <li>Procedures to validate or change modeled natural community/temperature classes for flowing waters. (John Lyons, Methodology for Streams Natural Communities, 2014).</li> </ul>
7.7	Monitoring Section	Technical Tool Development		GAP	<ul style="list-style-type: none"> <li>Develop relationships between the habitat assessment tool and the biocriteria indices as this will be needed in the determination of the appropriate TALU tier within the Natural Community class in which it applies. Habitat is a critical factor in the attainability of aquatic life uses for warm water streams and rivers. Supports WPDES</li> </ul>
7.8	Bioassessment Review	Technical Tool Development	Medium	GAP	<ul style="list-style-type: none"> <li>When a biological impairment exists habitat is the key variable in the determination of use attainability absent the confirming evidence of biological attainment. As part of this approach strong consideration needs to be given to using a quantitative or qualitative habitat evaluation index (QHEI) given its practical-to-apply characteristics and its demonstrated use for this purpose elsewhere.</li> </ul>

## Wisconsin's Water Monitoring Strategy 2015 to 2020

Tracking	Responsible Group	Area	H, M, L	Date (or Gap)	Recommendation
7.9	Bioassessment Review	Technical Tool Development	Medium	GAP	<ul style="list-style-type: none"> <li>Develop relationships between key chemical/physical and other common stressors and the biological indices and their attributes. This specifically refers to the use of biological assessment data to develop relationships between measures of biological response and anthropogenic stressors. This includes the exploration of developing biological response signatures in addition to correlative analysis with chemical/physical parameters and indicators.</li> </ul>
7.10	Bioassessment Review	Technical Tool Development	Medium	GAP	<ul style="list-style-type: none"> <li>A capability for developing these relationships extends the use of biological assessments from assessing condition to informing identification of causes and sources of a biological impairment at multiple scales.</li> </ul>
7.11	Bioassessment Review	Technical Tool Development		GAP	<ul style="list-style-type: none"> <li>The association of biological response with stressors and their sources affecting aquatic systems requires a comprehensive database that should include:                             <ul style="list-style-type: none"> <li>o Biological, chemical, physical, and Whole Effluent Toxicity (WET) data and information;</li> <li>o Detailed watershed and land use information;</li> <li>o Locations of discharges and discharge monitoring;</li> <li>o Geographic Information System (GIS) capability to assemble watershed and discharge information and relate them to the correct sampling sites.</li> </ul> </li> </ul>
7.12	Bioassessment Review	Technical Tool Development		GAP	<ul style="list-style-type: none"> <li>Creation of paired biological and other relevant environmental data support developing quantitative stress-response relationships is needed along with a relational database that enables data export and analysis via query.</li> </ul>
<b>8.0 Mississippi River Monitoring Activities – Asplund &amp; Designee</b>					
8.1	Mississippi	Program Development	Medium	GAP	<ul style="list-style-type: none"> <li>Insufficient field support to carry out system-wide CWA assessments following new biological assessment procedures/methods.</li> </ul>
8.2	Mississippi	Triennial Standards Review	Low	GAP	<ul style="list-style-type: none"> <li>WQ assessment procedures need to be developed for off-channel aquatic areas including impounded, backwaters and wetlands.</li> </ul>
8.3	Mississippi	Monitoring assessments	Medium	GAP	<ul style="list-style-type: none"> <li>Need an improved process for capturing LTRM data and using it state CWA assessments, including the derivation of Fish and SAV IBIs.</li> </ul>
8.4	Mississippi	Triennial Standards Review	Medium	GAP	<ul style="list-style-type: none"> <li>UMR States need to develop consistent assessment procedures for the Mississippi River rather than having five state assessment procedures for the river.</li> </ul>
8.5	Mississippi	<i>Funding issues on hold</i>	Low	GAP	<ul style="list-style-type: none"> <li>The Mississippi River Unit needs to obtain funding to support implementation of the UMRBA WQ Task Force WQ Monitoring Strategy for the UMR.</li> </ul>
8.6	Mississippi	assessments	Medium	GAP	<ul style="list-style-type: none"> <li>Future monitoring assessments should not focus solely on 305b/303d evaluations but be supportive of more WQ program needs.</li> </ul>
8.7	Mississippi	Triennial Standards Review	Medium	GAP	<ul style="list-style-type: none"> <li>Future WQ standards, sediment criteria and FCAs for the UMR should be consistent between states where appropriate.</li> </ul>
<b>9.0 Cross Program Recommendations – WQ, WT, FH and DG Programs</b>					
9.1	Runoff / Monitoring	BMP Team	High	2015-2016	<ul style="list-style-type: none"> <li>Implement <b>runoff management monitoring studies</b> for BMP Evaluation (Monitoring to evaluate the success of best management practices); Nine Key Element Plan Development (Monitoring to collect data for Nine Key Element Plans)</li> </ul>
9.2	TMDLS / Monitoring	WARP and TMDL Teams	High	GAP	<ul style="list-style-type: none"> <li>Implement runoff management monitoring for <b>TMDL Development – Runoff Dominated</b> (Monitoring to develop TMDLs for runoff dominated catchments with waters impaired primarily due to diffuse pollutant sources).</li> </ul>
9.3	Monitoring Program/ USEPA Program	Reporting	Medium	GAP	<ul style="list-style-type: none"> <li>Wisconsin to amend the Environmental Performance Partnership Agreement (EnPPA) between the State and EPA to reflect the changes that this strategy recommends.</li> </ul>
9.4	Monitoring Section	TWA/Watershed Planning	High	2016	<ul style="list-style-type: none"> <li>Confirm a TWA/WQ Planning formal schedule, complete with study design, protocols, funding, and implementation schedule to incorporate key resource areas into the work planning process using technical teams and WR PMT Managers.</li> </ul>
9.5	Monitoring Section	TWA/Watershed Planning	High	2015-2016	<ul style="list-style-type: none"> <li>Support <b>Intra-bureau communication plan</b> to ensure program guidance is developed to implement all or a portion of the TWA processes. Guidance would include planning, implementation, analysis of results and sharing those results through water quality planning and other means.</li> </ul>

## Wisconsin's Water Monitoring Strategy 2015 to 2020

Tracking	Responsible Group	Area	H, M, L	Date (or Gap)	Recommendation
9.6	WQM planning program staff	AWQM Planning		GAP	<ul style="list-style-type: none"> <li>Wisconsin DNR also has a goal to coordinate a statewide framework of high quality, consistent, and scientifically defensible methods and strategies to improve the monitoring, assessment, reporting, implementation and most importantly, the condition, of Wisconsin's water. This framework is part of the state's continuous planning process (CPP) Plan, which should be updated every five to ten years.</li> </ul>
9.7	WPDES Program	Study Design		GAP	<ul style="list-style-type: none"> <li>Develop a rotational monitoring program within TWA to support WPDES needs.</li> </ul>
9.8	WPDES Program	Quality assurance		GAP	<ul style="list-style-type: none"> <li>Train staff on utilization of WET testing and other methods to support enforcement actions using case studies</li> </ul>
9.9	WPDES Program	Quality Assurance		GAP	<ul style="list-style-type: none"> <li>Limit calculators need access to wetland data and expertise.</li> </ul>
<b>10.0 Management Budget and Program Communication - Asplund, WR PMT</b>					
10.1	Management Team	Partnership funding	Medium	GAP	<ul style="list-style-type: none"> <li>Support existing contracts with USGS, UW Extension volunteer monitoring programs, and LTE support to increase the capacity for lake and wetland water level and stream flow monitoring, and identify and upload historical data.</li> </ul>
10.2	Management Team	Monitoring Volunteers	Medium	GAP	<ul style="list-style-type: none"> <li>Citizen-based Water Monitoring Data Quality Funding Increase Coordinator (1 FTE): ~\$90,000 annually. This position would provide stable funding and support for volunteer water monitoring to ensure that the data being collected are useful for Department decision-making. This work is currently supported by LTE employees through the EPA Monitoring Initiative funding.</li> </ul>
10.3	Management Team	TMDLS Funding	Medium	GAP	<ul style="list-style-type: none"> <li>A stable funding source is needed for TMDL monitoring and model development, particularly for large scale projects.</li> </ul>
10.4	Management Team	Intrabureau IT support Base Program Support	Medium	GAP	<ul style="list-style-type: none"> <li>Water Information Systems enhancements Funding Increase \$100,000 annually. Funds programming support to implement needed integration and upgrades to core water information systems used for federal and state reporting, permit decisions, and condition information (SWIMS, WATERS, SWDV). This funding supplements existing funding (WWI) which has not kept up with increased demands.</li> </ul>
10.5	Management Team	TWA Development	Medium	GAP	<ul style="list-style-type: none"> <li>Baseline water quality monitoring for lakes, wetlands, and streams funding increase \$400,000 annually. Additional funding for the targeted watershed approach, address emerging monitoring needs, and enable more waterbodies and watersheds to be sampled on an annual basis. These funds would be used to augment existing funds for lab analysis, contracts, equipment and supplies, travel, and LTE support.</li> </ul>
10.6	Management Team	Monitoring capacity	Medium	GAP	<ul style="list-style-type: none"> <li>Water Resources Monitoring Technicians Funding Increase (4 FTE): ~\$225,000 Annually. This would create 4 new technician level positions to conduct baseline and targeted monitoring of lakes, wetlands, streams, and rivers throughout the state.</li> </ul>
10.7	Management Team	Partnership Outreach	Medium	GAP	<ul style="list-style-type: none"> <li>Work closely with stakeholders to develop and implement the most effective data collection, evaluation, and reporting tools so that we can communicate a consistent message regarding Wisconsin's water quality.</li> </ul>
10.8	Monitoring Section	Partnership Outreach	Medium	GAP	<ul style="list-style-type: none"> <li>Wisconsin also emphasizes improving intra-agency, inter-agency, and stakeholder coordination of programs and data sharing.</li> </ul>
10.9	WQ Management	It Systems	Medium	GAP	<ul style="list-style-type: none"> <li>Water Division should provide base program support for IT system maintenance funding and upgrades for monitoring and assessment program protocols results (WisCALM) and monitoring strategy (2015-2020) compliance.</li> </ul>
10.10	Monitoring Section	Partnership Outreach	Medium	GAP	<ul style="list-style-type: none"> <li>Build stronger partnerships with agencies, watershed groups, volunteer monitors, and others to facilitate the sharing of information, the collection of comparable data, and the use of monitoring tools.</li> </ul>
10.11	Monitoring Section	Partnership Outreach	Medium	GAP	<ul style="list-style-type: none"> <li>Develop and evaluate measures to determine the effectiveness of our program activities and make modifications to improve that effectiveness.</li> </ul>
<b>11.0 Quality Assurance/Data Integrity – Helmuth &amp; Core Team</b>					
11.1	Quality Assurance Workgroup	Data Integrity	Medium	2016-17	<ul style="list-style-type: none"> <li>Carry out SWIMS Data Integrity Plan developed in 2013 (incorporate the plan elements into the Bureau's strategic IT plan)</li> </ul>
11.2	Quality Assurance Workgroup	Data Accessibility	Medium	2015-2017	<ul style="list-style-type: none"> <li>Ensure that data is easily accessible as well as product reports and summary information for use in final product [reports, maps, analyses, published studies] (*)</li> </ul>
11.3	Quality Assurance Workgroup	Quality Assurance Reporting and Document Generation	Medium	2016-2017	<ul style="list-style-type: none"> <li>Update quality assurance management plan and quality assurance program plan, both established in accordance with USEPA policy, to ensure the validity of monitoring and laboratory activities and fulfillment of state reporting requirements with credible and comparable data. The updated quality assurance management plan should be updated to include new</li> </ul>

## Wisconsin's Water Monitoring Strategy 2015 to 2020

Tracking	Responsible Group	Area	H, M, L	Date (or Gap)	Recommendation
					study designs, project manager perspectives, database capabilities, and requirements from federal, state and local entities.
11.4	Quality Assurance Workgroup	Technical Team documentation	Medium	GAP	<ul style="list-style-type: none"> <li>Develop specific quality assurance guidelines for each study design. Recommendations will work through technical teams and will be incorporated into database "controls" to reinforce data entry rules and ability to more readily fill out information.</li> </ul>
11.5	Quality Assurance Workgroup	QA Process with QA Program Coordinator	Medium	2016-2017	<ul style="list-style-type: none"> <li>Consult with quality assurance project plan officer consultation when creating quality assurance project plans for large studies. [how often does this happen, when does it happen, where are they stored, EGAD?]</li> </ul>
11.6	Quality Assurance Workgroup	QA Process with QA Program Coordinator	Medium	GAP	<ul style="list-style-type: none"> <li>Quality assurance project plans (for large studies) or quality assurance checklist (to be developed) are submitted with project proposals as a prerequisite for funding</li> </ul>
11.7	Quality Assurance Workgroup	Quality Assurance	Medium	2016 (DUP?)	<ul style="list-style-type: none"> <li>Ensure all studies have completed quality assurance aspects documented (see QA Checklist and/or SWIMS REPORT)</li> </ul>
11.8	Quality Assurance Workgroup	Quality Assurance	Medium	2016 (DUP SEE 11.13)	<ul style="list-style-type: none"> <li>Complete an ongoing inventory and strategic gap analysis of monitoring protocols, methods and procedures.</li> </ul>
11.9	Quality Assurance Workgroup	Springs - Data (See also IT group)	Medium	2017-2018	<ul style="list-style-type: none"> <li>The Wisconsin Geological and Natural History Survey (WGNHS) manage a database of springs. Data from this study will be added to the WGNHS database as well as the WDNR's Register of Waterbodies and the Water Assessment, Tracking and Electronic Reporting System (WATERS). Geolocating springs in the WATERS database is a component of the state's surface water assessment work.</li> </ul>
11.10	Quality Assurance Workgroup	Study Design& SOP Documentation	Medium	2015-2016 (IN PROGRESS)	<ul style="list-style-type: none"> <li>Create Targeted Watershed Approach (TWA) procedures and methods and store them in the SWIMS system.</li> </ul>
11.11	Quality Assurance Workgroup	Quality Assurance in Strategy and Updates	Medium	2015-2016 (IN PROGRESS)	<ul style="list-style-type: none"> <li>Wisconsin's strategy update includes a thorough section on quality assurance measures to be incorporated in the monitoring program and throughout the project planning, as well as a template for detailed QAPP documents for large monitoring projects and an auto generated "QAPP" for all projects in the SWIMs database.</li> </ul>
11.12	Quality Assurance Workgroup	Quality Assurance Subteam (to be developed)	Medium	GAP	<ul style="list-style-type: none"> <li>Wisconsin will include in its five-year implementation strategy <b>creation of a quality assurance program initiative</b> that will address the three legs of this quality assurance goal.</li> </ul>
11.13	Quality Assurance Workgroup	Quality Assurance Documentation (Technical Teams and IT Teams)	Medium	2015-2016 (IN PROGRESS)	<ul style="list-style-type: none"> <li><b>Completed high-quality, easily accessible, documented methods and protocols for all core media studies.</b></li> </ul> <p>[A major element of Monitoring Strategy implementation work will involve completion of an ongoing inventory and strategic gap analysis of monitoring protocols, methods and procedures. Not only will the presence of a documented procedure be evaluated but the training and implementation of that documented procedure will be evaluated to ascertain whether sufficient training and support is provided for new and veteran staff to carry out their work successfully.]</p>
11.14	Quality Assurance Workgroup	Training and Outreach	Medium	GAP [design, plan, conduct, write up]	<ul style="list-style-type: none"> <li>Top quality training for biologists and accessible documentation of training records for each employee.</li> </ul>
11.15	Quality Assurance Workgroup	In field Quality Assurance via Technical Teams	Medium	GAP	<ul style="list-style-type: none"> <li>Evaluation of how methods have been carried out in the field through follow up procedures including surveys, discussions, focus groups or technical team reminders and check ins.</li> </ul>