Agenda
Upper Mississippi River Conservation Committee
Water Quality Technical Section Fall Meeting

U.S. Fish and Wildlife Service Office
1511 47th Avenue
Moline, IL 61265

November 16 and 17, 2009

Chair: Matthew Short, Illinois Environmental Protection Agency
Phone: 217-557-8746
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Monday November 16, (1:00 to 4:30 p.m); Tuesday November 17 (8:30am to 12:00pm)

- Welcome and introductions
- State/Agency updates: IA, IL, MN, MO, WI, CWA Assessment Status
- Monitoring updates: USGS/UMESC, LTRMP field stations, Metropolitan Council, ACOE, USFWS, USEPA, others
- Coordinator's report: Scott Yess, USFWS
- UMRBA Water Quality Task Force – Matt Short
    - Indicators Workshop Update
- Reach Planning Efforts Update

The fall meeting of the UMRCC Water Quality Technical Section (WQTS) was held November 16 and 17 at the Moline, IL U.S. Fish and Wildlife Service Office. The meeting was attended by:

Dave Bierl	U.S. COE, Rock Island, IL	Dave.bierl@usace.army.mil
Mike Coffey	U.S. Fish and Wildlife Service, Moline, IL	Michael_coffey@fws.gov
Peg Donnelly	U.S. EPA Region 5, Chicago, IL – UMRBA	Donnelly.peggy@epa.gov
Bill Franz	U.S. EPA Region 5, Chicago, IL	Franz.william@epa.gov
Tex Hawkins	U.S. Fish and Wildlife Service, Upper Miss. Refuge, Winona, MN	Tex_hawkins@fws.gov
Aleshia Kenny	U.S. Fish and Wildlife Service, Moline, IL	Aleshia_kenney@fws.gov
John Olson	Iowa DNR, Des Moines, IA	John.olson@dnr.iowa.gov
Matt Short	Illinois EPA, Springfield, IL	Matt.short@illinois.gov
John Sullivan	Wisconsin DNR, La Crosse, WI	John.sullivan@wisconsin.gov
Scott Yess	U.S. Fish and Wildlife Service, Onalaska, WI	Scott.yess@fws.gov

Meeting Summary:

State Updates: Updates on the status of state 303(d) listing concerning the Mississippi River were given by Matt Short (Illinois), John Olson (Iowa), John Sullivan (Wisconsin) and via email from Cindy Distefano (Missouri) and Louis Hotka (Minnesota). The primary listing issues are related to fish consumption (widespread) followed by more localized issues related to primary contact and public water supplies. Lake Pepin is the only section where a TMDL is in process due to turbidity and nutrients. Status of the State's biennial 303(d) list approval by U.S. EPA regions 5 and 7 varies with all 2006 lists now approved. 2008 list of impaired waters had not been approved for Illinois, Iowa, Missouri and Wisconsin. State WQ folks have participated in the Reach Planning efforts. (see attachments for more details).

Wisconsin is including some listings to be consistent with Minnesota. Both Wisconsin and Minnesota will include PFOS in the 2010 report cycle. Monitoring by Wisconsin this last year showed higher than typical light penetration resulting in a boom in plant growth. Zebra mussels were found colonizing the vegetation. Wisconsin DNR is working with UMESC in evaluating factors metaphyton (filamentous algae & duckweeds), vegetation and dissolved oxygen in ten selected backwater areas in Pool 8 following a randomized sampling design. Wisconsin is also working on several monitoring reports on submerged aquatic vegetation and fish related to the UMR.

Additional items included an update on Illinois rainfall as several of the other UMR states have had similar experiences with both 2009 and 2008 having higher than average rainfall with significant fall flooding. Also, the upcoming fish kill planned on the Chicago Sanitary and Ship Canal so that maintenance can occur on the electric barrier. The barrier is designed to prevent the movement of nuisance aquatic species into and out of Lake Michigan and the UMR.

UMRBA Update: Since the spring meeting a second Clean Water Act (CWA) – Ecosystem Restoration Workshop May 5-7, 2009 was held in Dubuque. Peg Donnelly (USEPA) is working with UMRBA via an IPA to look at Designated Uses on the UMR. A designated use is part of the water quality standard that identifies the activities or processes that a state wishes the waterbody to be clean enough to support (i.e., drinking water, aquatic life, etc.). Because of the navigation aspects of the UMR, the states wanted to review/update the application of designated uses on the river.

The state CWA agencies received additional monies under the Water Quality Management grants (604b) as part of the overall Federal stimulus monies in 2009. The five UMR states agreed to pool a portion of those monies through the UMRBA to review the use of biological indicators for CWA assessment purposes.

Coordinators Report: Scott Yess provided an update on general activities: newsletter, library, database, directory and publications. Activities by the other tech sections included the completion of a boating brochure thanks to Scott Johnson.

Other Federal Agencies:
Dave Bierl gave an update on HREP monitoring activities this past summer in Pool 11 (Sunfish, Mud and McCartney lakes), Pool 13 (Brown Lake), Pool 14 (Beaver Island), Pool 16 (Andalusia) and Pool 17 (Big Timber).

Miscellaneous: Brief discussion on the need for improving data sharing by the various groups monitoring on the river. Perhaps the web page could provide a list of contacts and web links for the various sources of water quality data.

Both John Olson (IA) and John Sullivan (WI) indicated that there has been some planning to conduct pool draw downs on 16 and 18 to improve SAV. Pool 16 was postponed due to heavy rains and for pool 18 there is some concern regarding potential impact to the butterfly mussel which is considered threatened by the state of Iowa.

Attachments: written updates from state agencies

Missouri Update (Cindy DiStefano**)**

MDC collected shovelnose sturgeon fillets from the Hannibal and Caruthersville area in 2008. Fillet and egg samples were collected from Crystal City (immediately below St. Louis) for shovelnose sturgeon, blue catfish and flathead catfish. Analytical results for these samples were received in October 2009. PCB and chlordane levels in fillet and egg tissues were similar to samples collected previously. The data indicated that contaminant levels tended to be higher in the Mississippi River nearest St. Louis. The data support the current Missouri fish consumption advisories for these fish species. Paddlefish sampling for 2009 was delayed until 2010. Missouri is in the process of developing nutrient criteria for rivers and streams. They are currently sorting through existing data and looking for data gaps.

Minnesota Pollution Control Agency update for the UMRCC Fall 2009 Meeting (Louis Hotka**)**

Lake Pepin (from Norman Senjem, Mississippi River Basin Planner, MPCA, 507-206-2655):

The MPCA is going to complete the site-specific standards for chlorophyll a (Lake Pepin – 32 ug/L) and Mississippi River turbidity (32 mg/L as expressed as TSS season average), and need EPA approval before moving forward with the public noticing of the draft TMDL. We are currently discussing whether we need to go through rule making, or use a simpler administrative process, for these standards.

Recent LTRMP data shows we are quite close to meeting our proposed SSS for eutrophication in lower flow years – 2006, 2007, and 2009. We are expecting challenges to the proposed standards, possibly from all sides.

An additional note: we are preparing to do another computer run showing the effect of point source P expanded to permitted flows at 1 mg/L, while TSS is reduced sufficiently to meet the 32 mg/L standard. It appears that factors such as air temperature, wind, and lake morphometry are preventing the lake from producing more algae at these lower flows. Also, most of the chlorophyll a consists of diatoms and green algae, with blue-greens composing 20-30 percent even in late summer. It's a tricky lake to assess.

Development of Great River Mississippi assessment based on biological measures (Dan Helwig, MPCA South Biological Unit Supervisor, 651/757-2422): Technical staff for Minnesota and Wisconsin (including John Sullivan, Terry Dukerschein, Walt Popp, and others) are exploring the potential for developing an appropriate set of Indices of Biological Indicators (IBI) for biologically assessing the river for the 2012 listing cycle. Draft steps and timeline have been drafted to get an idea of support from our organizations for moving forward. This may be expanded to all of the Upper Miss states, pending funding.

Minnesota's Intensive Watershed Monitoring: With a second year of bacteria monitoring in 2009, field collection work is complete for the Root River and Vermillion-Wells watersheds. Biological and bacteria collections were conducted in the lower St. Croix and Cedar-Shell Rock watersheds this summer, and in 2010, collection will begin on sites in the Twin Cities Metro-Mississippi watershed and the Mississippi-Winona area tributaries, including the Whitewater River.

Minnesota's Major Watershed Load Monitoring Program: The major watershed load monitoring effort provides data on water quality conditions and trends for Minnesota's major rivers and their main tributaries. The program's multi-agency approach combines stream flow data from the United States Geological Survey (USGS) and Minnesota Department of Natural Resources (DNR) with water quality data collected by the Minnesota Pollution Control Agency, Metropolitan Council Environmental Services, and local monitoring organizations. Major tributaries to the Mississippi border waters included in the program are the Root, Zumbro, Whitewater, and Cannon Rivers. The Mississippi River at Winona is monitored as well. Currently (2009) all sites have been monitored for one to three years. Water quality parameters analyzed include: total suspended solids, volatile suspended solids, total phosphorus, dissolved orthophosphorus, nitrate plus nitrite nitrogen, total kjeldahl nitrogen, and turbidity. Field measurements include: transparency, temperature, pH, specific conductance and dissolved oxygen. (Contact is Pat Baskfield, 507/344-5240).

Lower Vermillion River Turbidity TMDL Approved: The Vermillion River flows into the Mississippi downstream of the St. Croix confluence. For a quick or a detailed view of the work around this TMDL listing and plan, see: http://www.pca.state.mn.us/water/tmdl/project-vermillionriver.html

TO: UMRCC WQ Tech. Section
FROM: John Olson, Iowa DNR Watershed Monitoring & Assessment Section
Date: November 16 & 17, 2009
RE: state update for Iowa, Fall 2009 meeting

Iowa's 2008 Section 303(d) list: Iowa DNR continues to wait for word from EPA Region 7 on approval/disapproval of the state's 2008 Section 303(d) list; this list was submitted to EPA for approval in April 2009. As submitted to EPA, Iowa's 2008 list contained 439 impaired waterbodies with a total of 581 impairments. The increase over the 2006 list (160 more impaired waterbodies; 222 more impairments) is due largely to the new bacterial impairments that resulted from Iowa's implementation of the so-called "rebutable presumption" that all Iowa streams area capable of supporting the highest levels of contact recreation and aquatic life uses.

Impairments on the Iowa reach of the UMR remained basically the same as in the past with arsenic/drinking water impairments at Ft. Madison, Keokuk, and Davenport and the bacterial slime problem downriver from Clinton. Aquatic life impairments for aluminum continue upriver from Keokuk and near Burlington (based on IL-EPA data), and primary contact recreation impairments exist for segments identified by IL-EPA as impaired (covers the Iowa reach from the IA/MO line upriver to the Iowa River).

The issues of considering "exotic species" a pollutant and considering impairments due to "exotic species" as appropriate for TMDL development arose during review of Iowa's 2006 Section 303(d) list. Historically, IDNR has considered "exotic species" to be a non-pollutant stressor that did not require TMDL development. During discussion regarding Iowa's 2006 list, EPA Region 7 mentioned that EPA guidance would be available on this topic in early 2009; thus far, I have not seen such guidance nor have I had recent conversations with EPA Region 7 regarding whether "exotic species" should be considered as a Section 303(d) pollutant.

Iowa's 2010 Section 303(d) list & Integrated Report: Iowa DNR is working on its draft 2010 303(d) list and Integrated Report. IDNR's assessment database (ADBNet) is on-line at *http://programs.iowadnr.gov/adbnet/index.aspx*.

Fish Tissue Monitoring: As part of the U.S. EPA's Regional Ambient Fish Tissue (RAFT) monitoring program, fish samples were taken from three locations on the Iowa reach of the UMR in 2008: Linwood (dstr. Davenport), Dubuque, and Lansing. Composite samples of whole-fish common carp were analyzed from all three sites; results from this sampling are summarized below. Iowa's only current advisory for the UMR is a one-meal/week advisory for Pool 12 (from Bellevue upriver to Dubuque) due to high levels of mercury in predator fish (see *http://www.iowadnr.com/fish/news/consump.html*). RAFT monitoring will continue in 2009 at the following sites along Iowa's reach of the UMR: Lansing, Dubuque, Sabula, Davenport and Ft. Madison. Fillet samples of predator and/or bottom-feeding fish will be analyzed at all these sites.

Summary of Iowa fish contaminant monitoring on the UMR in 2008 conducted as part of the U.S. EPA Region 7 regional ambient fish tissue (RAFT) monitoring program.

Location of UMR RAFT Site	Pool	County	Fish	Bio-part	Sample Type	Chlordane (total) (mg/kg)	Mercury (total) (mg/kg)	Sum of Aroclors, 1248+1254+1260 (mg/kg)
Linwood	16	Scott	common carp	whole fish	Trend	0.047	0.201	0.273
Dubuque	11	Dubuque	common carp	whole fish	Trend	<0.03	0.104	0.159
Lansing	9	Allamakee	common carp	whole fish	Trend	<0.03	0.044	0.138

Upper Mississippi River Basin Association WQ Task Force: Iowa DNR continues to participate in the WQ Task Force and the WQ Executive Committee. The Task Force's recent projects include developing habitat-specific designated uses for the UMR and choosing/developing biological indicators for the UMR. Interstate consultation on Section 303(d) [impaired waters] listings remains an ongoing function of the WQ Task Force.

Nutrient Criteria Development: Iowa DNR continues to work toward development of nutrient criteria for lakes and rivers/streams. The U.S. EPA Region 7 nutrient RTAG (regional technical assistance group) proposed "benchmark" values (i.e., starting points for states in their efforts to develop nutrient criteria) for lakes in 2001 and for rivers/streams in 2006. In February 2008, an in-state technical advisory committee (Nutrient Science Advisors) proposed nutrient criteria to protect contact recreation in Iowa lakes. The life span of the NSA did not allow development of recommendations to protect aquatic life uses. Both the EPA-RTAG and the Iowa Nutrient Science Advisors recommendations are primarily science based; issues of attainability and background nutrient levels were not directly considered as part of the recommendation process.

Summary of nutrient benchmark proposed, thus far, for Iowa waters. Proposals have been made by the Region 7 Regional Technical Assistance Group and the Iowa Nutrient Science Advisors workgroup.

Waterbody Type:	Workgroup	Date of proposal	Total Phosphorus	Total nitrogen	Chlorophyll-a	Turbidity / Transparency
Lakes	EPA Region 7 RTAG	October 2001	35 ug/l	700 ug/l	8	Not considered or established
Lakes	Iowa Nutrient Science Advisors*	February 2008	35 ug/l*	900 ug/l*	25 ug/l*	1 meter Secchi Depth*
Rivers/streams	EPA Region 7 RTAG	December 2006	75 ug/l	900 ug/l	8 ug/l, sestonic; 40 mg/m2, benthic	Not considered or established

**NSA criteria recommendations apply only to primary contact recreation uses; Secchi depth and chlorophyll (response variables) and total phosphorus must be met at least 75% of the time during summer season (Memorial Day to Labor Day); if fail to meet criterion for phosphorus, nitrogen is considered.*

Based on the February 2008 report of the Nutrient Science Advisors, Iowa DNR staff have recently (fall 2009) proposed the following nutrient criteria to protect recreational uses in Iowa lakes with a mean depth greater than three meters:

- Secchi transparency should exceed 1 meter in at least 75% of the measurements conducted over at least three summer recreation seasons;

- No more than 25% of the samples collected over three summer recreation seasons should exceed 25 ug/l of chlorophyll-a.

Iowa DNR is planning to begin development of stream/river nutrient criteria. Best case scenario would have criteria recommendations in about three years.

Missouri River nutrient criteria: U.S. EPA Regions 7 (Kansas City) and 8 (Denver) has convened a Missouri River nutrient workgroup to identify nutrient benchmark values for the Missouri River. This workgroup—which included state representative from IA, MO, KS, NE, SD, ND, and MT—met in Denver, CO, in November 2008. A description of this project and some results from the 2008 Denver meeting can be found at the Central Plains Center for Bioassessment web site: http://www.cpcb.ku.edu/progwg/html/MORwg.htm. Nutrient benchmark values were established at the Denver meeting, but these benchmarks will not be distributed for review until a draft report is ready for review. USFWS has expressed concerns that the benchmark values may interfere, for example, with projects designed to improved habitat for pallid sturgeon in the lower Missouri River due to increases in sediment and nutrient concentrations related to wing-dam modification and chute creation.

Pool 18 drawdown: A drawdown has been proposed for Pool 18 with the goal of restoring submersed aquatic vegetation. The drawdown is proposed for two consecutive years. The major adverse impact is expected to be mortality of freshwater mussels, especially the state (Iowa) listed butterfly mussel (*Ellipsaria lineolata*). Preliminary mussel mortality estimates are relatively high (from 2-5 million mussels), and concerns have been expressed. Concerns also exist regarding the ability to re-established SAV in this pool given the relatively high turbidities and the existing seed-bank in the pool. Iowa DNR sent an October 15, 2009 letter to the Corps expressing support for the drawdown project.

Reach planning meetings: I attended three Corps-sponsored reach planning meetings this fall (lower impounded reach meeting at Milan, IL on September 15 and upper impounded reach meetings at Onalaska, WI on October 8 and November 4). My attendance is a response to a recommendation from the UMRBA workshops in 2008 on connections between the Clean Water Act and Ecosystem Restoration activities on the UMR. One recommendation from this workshop was to include CWA program staff in ecosystem objective-setting process for geomorphic reaches with the goal being to potentially incorporate state WQ standards into the objective setting process. Thus far, the connections between state WQS and reach planning/objective setting have been minimal, but exposure to the reach planning process and to the state and federal staff involved has been useful.

Illinois EPA Monitoring Update November 16, 2009

IL Ambient water quality monitoring network.

- Shut down in October 2007, restarted May 2008
- Stations reduced from 211 to 146
- 60 collected via contracts with ISWS and USGS (n=20)
- Maintained Mississippi River stations with reduced sampling frequency to 4x year
- Three year Contract costs $404K for 60 stations ($2200 per site/year)

Station	Site	Pesticides	Chlorophyll
I-84	RM 44 at Thebes, IL		
I-05	RM 111 near Chester, IL 1 mi ups US 150/51 bridge	X	X
J-36	RM 162.2 ups Meramec River confluence		
J-98	RM 200.8 Mel Price L&D 26, near Alton	X	X
K-21	RM 273.5 at L&D 24 Clarksville, MO		X
K-17	RM 325 at L&D 21, 0.75 MI SW Quincy, IL	X	
K-22	RM 364.6 at L&D 19 at Keokuk, IA	X	X
L-04	RM 437 L&D 17, 15 miles W of Aledo		
M-02	RM 482.9 at L&D 15 Arsenal Island	X	X
M-12	RM 522.5 at L&D 13, 1.5 miles NE of Fulton, IL		X
M-13	RM 583 at L&D 11, 2 miles NE of Dubuque, IA		X

IL 5-year Basin Monitoring

- For 2009: Green River and Upper Illinois River tributaries (north), Mississippi River Central and North Central tributaries (from Illinois to Rock River) (central), Mississippi River South tributaries (Kaskaskia River confl. south) and Cache River/Ohio River tributaries (southern)
- Continuous monitoring included in program (two, 7-day sets)
- Contracted with ISWS for additional CM to cover all intensive sites

IL Status of 2008 303(d) list

- Submitted to USEPA but not approved
  - Issues are changes in IEPAs use of non-standard cut-offs to assign impairments (cause) once a use is not supported. Can USEPA use the non-approval process to force states to use listing guidelines that are not water quality standards
  - October 15, 2009 response from Region V
- Mississippi River Assessments generally unchanged
  - ALU full
  - Primary contact some impaired segments
  - Drinking water
  - Fish consumption

IEPA 2008 Cycle Integrated Report Assessments on the Mississippi River (draft)

		Designated Use Level of Support				
Interstate Assessment Reach	**IEPA Segment Designation**	**Aquatic Life**	**Primary Contact**	**Secondary Contact**	**Drinking Water**	**Fish Consumption**
Apple-Plum	IL_M-02	Full	Full	Full	Non	Non
Copperas-Duck	IL_M-12	Full	Full	Full	NA	Non
Flint-Henderson	IL_K-22	Full	Non		Non	Non
Bear-Wyaconda	IL_K-17	Full	Full	Full	Non	Non
The Sny	IL_K-21	Full	Full	Full	NA	Non
Peruque-Piasa	IL_J-05	Full	Non		Non	Non
Cahokia-Joachim	IL_J-02	Full	Non		Non	Non
“	IL_J	Full	NA		Non	Non
“	IL_J-36	Full	Non		Non	Non
Upper Miss.-Cape Girardeau	IL_I-84	Full	Non		Non	Non

NA: indicates the use does not apply to that reach
Drinking water impairments: manganese on all segments, addition of sulfate on I-84
Fish consumption impairments: mercury and PCBs

http://www.epa.state.il.us/water/water-quality/index.html

10/29/2009 letter from USEPA to Missouri DNR: need to develop standards to protect primary contact recreation on the St. Louis to Meramec River confluence (28.6 miles) UAA = no.

IL WQ Standards

- Reminder: Illinois has a new dissolved oxygen standard adopted by IPCB
- Two levels of waters, seasonal factor, narrative statement
- Two levels for Mississippi River
- Level 1 (enhanced) cover ~230 miles (39%) of the UMR
    - State-line to L&D 14
    - L&D 21 to L&D 24
    - From below Chain-of-Rocks to Fountain Cr confl
    - Santa Fe Chute (dns of Thebes) to mouth
- Rationale for selecting Level 1 enhanced protection
    - Based on sensitive taxa (percent and # of taxa)
    - For Mississippi River 2.6% and 2 taxa
- March – July min. 5.0 mg/l; Aug – Feb min 4.0 mg/l

Upcoming work is on revising Boron, Flouride, and Manganese standards. Work on the Chicago Area Waterways UAA is ongoing.

IL Nutrient Criteria Development

- October 2007 meeting of CFAR researches
    - 2-year studies concluded no clear cut relationship between phosphorus and algal productivity in Illinois waters but were unable to recommend a number that was protective of Illinois waters
- Came up with two proposals
    - If DO shows an impact (significant swings) characteristic of too much algae, apply a 0.05 mg/l total P standard to the water
    - Look at stream types susceptible to algae blooms: clarity, habitat; apply 0.05 mg/l total P standard
- USEPA rejected because have to be for all waters of the state, had Tetra Tech look at data
- For now we are not working on N

Gulf Hypoxia

This years' July cruise was the 25th anniversary of the monitoring project. The initial forecast was that this year the hypoxic zone would be larger than normal: 7500-8500 mi2. Actual size was ~3000 mi2. Number of reasons were cited for the difference in predicted versus actual.

Update by the USEPA Science Advisory Board (December 2007) continues to call for 45% reduction in nutrients (nitrogen and phosphorus flux) to the Gulf of Mexico to reduce the hypoxic zone to 5000 km2.

UMRBA Water Quality Task Force

- CWA – Ecosystem Restoration Workshop May 5-7, 2009 in Dubuque
- States received increased Water Quality Management Grants (604b)
  - Committed portion to UMR efforts: ~300K
  - Result in RFP for an effort to examine and implement appropriate large river biological assessment approaches for the Upper Mississippi River
- Met with NRC panel on the Mississippi River on September 1 in Rock Island
  - Clean Water Act Implementation Across the Mississippi River Basin
  - Nutrient Control Actions for Improving Water Quality in the MRB and NGM
  - http://www8.nationalacademies.org/cp/projectview.aspx?key=49100
- Peggy Donnelly (USEPA) is working with UMRBA via an IPA on a Designated Uses project.
- PFC Paper
  - Determination of perfluorinated compounds in the UMR (Nakayamai, Shoji and Andy Lindstrom @ Research Triangle)
  - Study looked at a large scale collection, transportation and storage effort
  - Pilot study in 2007
    - Had some interferences, such as bacteria, algal growth in unpreserved bottles
  - 2008 samples from 88 sites (n=177) between March and August
  - At least one targeted compound was found above the LOQ in 94% of samples
  - Highest concentrations were for C4 (PFBA) in the Mississippi River near Cordova (Pool 14)
  - Missouri River had consistently the lowest concentrations
  - CAW had relatively high PFC levels
  - Note analysis of PFOS and PFOA were added (year 4) to fish tissue analysis as part of the national lakes study (http://www.epa.gov/waterscience/fishstudy) Results expected next year.

USACE, Rock Island, Summary of Water Quality Monitoring Activities – Fall, 2009 (Dave Bierl)

EMP HREP Monitoring

Performance evaluation monitoring was performed during the summer at the following HREPs:

Pool 11 - McCartney Lake, Sunfish Lake and Mud Lake)
Pool 13 - Brown's Lake
Pool 14 - Beaver Island
Pool 16 – Andalusia Refuge
Pool 17 - Big Timber

Baseline monitoring was performed at the Huron Island (Pool 18) project.

Additional baseline water quality monitoring will take place in Pool 12 this winter to compliment a fish telemetry study being performed by the Iowa DNR (Kirk Hansen). It is anticipated that transmitters will be placed on 50 fish captured from each of four backwater lakes: two control (Frentress and Green) and two potential HREP lakes (Stone and Fish Trap). Continuous water quality monitors will be placed in two of the lakes (most likely Stone and Green).

EMP HREP Construction

Construction of the Lake Odessa HREP project, which was impacted by flooding in 2008, will resume in 2010.

Transparency Tube Measurements at District Locks

Transparency tube measurements at District L/Ds will be less frequent now that the growing season is over. Regular sampling will resume in April. The data are available to the public and can be viewed on the rivergages.com website.

Presentation - *Pool 11 HREP Water Quality Review: Mud and Sunfish Lakes*

Two of the eight objectives of the Pool 11 Islands HREP are water quality related. The first is creation of off-channel, deep-water areas to provide year-round habitat for centrarchids and associated species. Dissolved oxygen, temperature and velocity are the water quality constituents that are being monitored to evaluate this objective. The second water quality objective is to reduce resuspension of sediments. This objective is being evaluated by measuring total suspended solids concentrations and turbidity values.

Monitoring has been ongoing since project completion utilizing a combination of grab samples and continuous monitors. Post-project dissolved oxygen concentrations observed during the winter have been above the 5 mg/L target level, with concentrations often exceeding saturation values. During the summer, dissolved oxygen concentrations occasionally fall below 5 mg/L. These instances are normally during the night, when photosynthesis is not occurring. The following day, dissolved oxygen concentrations typically rise above 5 mg/L as photosynthesis resumes.

The winter water temperature target value of 1°C was attained with mixed success. The deeper dredge cuts with low velocity were more likely to stratify and thus maintain winter water temperatures above 1°C. The 0.45 m “humps” constructed every 100 m along the main dredge cut in Mud Lake appeared to be ineffective in containing the warmer water. Here, little difference was observed in temperature values 25 cm off the bottom versus those at 125 cm off the bottom.

Additional rock placed in the upper and lateral inlets at Mud Lake during 2006 was effective in reducing water velocities for overwintering fish. Water velocities in Sunfish Lake were generally lower than those observed in Mud Lake. This is most likely due to the location of the inlets of the two lakes, with the Sunfish Lake inlet being farther removed from the influence of the main channel.

Pre- and post-project total suspended solids and turbidity values were compared to assess the effectiveness of the deflection embankments in reducing resuspension of sediments. In general, post-project total suspended solids and turbidity values were significantly lower than those observed prior to project construction, indicating the deflection embankments at both Mud and Sunfish Lakes are effective in reducing resuspension of sediments.