A-Team
April 27, 2016, La Crosse, WI

Attendees:
Jennie Sauer
Nate DeJager
Karen Hagerty
Jon Hendrickson
Dave Potter
Shawn Giblin
Alison Anderson
Jeff Houser
Andy Casper
Jim Rogala
Sara Strassman
Jeff Janvrin
Scottie Gritters
Kristin Bouska
John Chick
Steve Winter
Marv Hubbell (phone)
Kirk Hansen
Dave Bierman
Janet Sternberg (phone)
Dave & Molly (MO) (phone)
Mike McClellan (phone)
Nick Schlesser (phone)
Rich King (phone)
Chuck Theiling
Jim Fischer
Brian Gray
Sharonne Baylor

Time & Place—August 1st, UMESC with an online option

UMRR Update--$21M+ for FY16, $20M for FY17 with the potential for additional funds through the Corps' work plan, long term prospect for program is strong, feedback has been good, RTC is in process, so soliciting brief success stories for use within that document (Kirsten sending out requests for that), continuing to work on resiliency proposal (Jeff & Kristin) there is a management plan for that with future for agenda
Branding process has been completed. A logo has been selected and will be distributed.
30th anniversary this summer. August 8th in La Crosse (Monday), UMRBA is Aug 9, UMRR-CC is Aug 9,

following the UMRBA meeting. Soliciting someone from each agency, would like to bring in some interactive stuff, hoping to put together an Accomplishments book.
Will utilize River We Have Wrought to lay out the history and build the program from there. Visioning for the "4th River". Looking for La Crosse STEM, connections to schools, support for kids & parents into parks (per Jewell), Kids & Mentors Outdoors. Shawn will connect with the mentors group he knows.

Approval of January meeting minutes: Karen's comments were incorporated. Janet—MO DEC should be MDC. Chick moves to approve. Winter seconds. Approved unanimously.

Fish Indicators Report—Alison Anderson (INHS)
Single species in past were problematic based on Indicators ad-hoc (IAH). Two recommendations from IAH are being carried forward: backwater assemblages and migratory species. We need a reference condition to compare against, no other systems were appropriate.
Proposed Indicators (see slide)
Migratory-determined by LTRM Life History classification
Backwater Assemblage-created for each study pool/reach, strata were used to classify where the species were found, probability of being found within each strata, no alterations were made for species that were affiliated with backwater
YOY was added per Kat McCain to represent recruitment potential, utilized Barko length cut offs

Concerns:

-Request to remove YOY from other indicators—Karen adds that adult single species were the target in the last S&T
Backwater species were only run CPUE within the backwater strata

-Did you look at seasonal differences in CPUE? Can we refine it with life histories since some species might be lost from the final list if seasonal bias exists?

-If we utilize this information to select specific backwaters to site an HREP, will we end up with specific enough recommendations? Also, will we see a response in backwater strata species following HREP installation?

- We may be missing backwater dependent species in areas where the backwater is already poor. We may be missing the improvements.

- Backwaters uses just backwater strata, so it is more refined than the other S&T that are pool scale.

-This is different from other S&T in that you are inferring the status of a strata, versus a single species and their health. May not be comparable between past reports and if new analysis in 10yrs develops a new set of 'backwater fish', how will results be interpreted?

-A-Team (IAH) had previously suggested that the backwater species should be a single set of species, not changing over time.

-There is uncertainty about whether a species represents a BW within your analysis, so it may be reflected within the status developed from these results

Suggestions:
*Check backwater dependent guilds in LTRM to add to the list developed with the species analysis. Incorporate life history traits without being too subjective.

*You would re-run the analysis in 10yrs, which would pick up any improvements at that point. This is more of a single status point that gets renewed each round.

*Consider running a system-wide species list for BW to make the list more inclusive, maybe cluster pools 4, 8, 13—Alison does not feel this analysis is appropriate.

*A-Team will need to endorse the final approach.

*Develop the S&T with 3-4 different approaches and the A-Team can evaluate how the data looks compared to what we know about the system. For example, are 4$^{th}$ trophic level predators well-represented?

*Do we have any consistent "desired state" goals that could be utilized for comparative purposes?

Overlap between migratory & BW species:
Reducing migratory species list might be the best approach. The analysts feel the BW are more defendable due to having undergone statistical analysis, not just life history. Reducing the list to system-wide migrants is the improvement (i.e. removes shorter distance seasonal movements as migrations). *There was some agreement among folks in the room regarding removing the within pool movements.*

If the migratory species are impacted by the dams, how well canwe measure any improvements in those species, we aren't going to be doing anything to benefit the dams. *There was some discussion of being able to evaluate the commercial fishing impacts, dams remaining as is*.

Reference Condition: (not utilizing a traditional approach)
Baseline definition—over the 5 year period, there is a moving average that will represent a static condition, so when significant changes occur, you utilize the standard deviations. *Folks in the room seemed comfortable with this.*

**CONNECTIVITY PANEL:**
**Jim Rogala**: Connectivity described (Lubinski et al)
BW connectivity types: frequency of connection, USGS developed inundation tool to evaluate timing, f, duration, etc.
GW exchange important in some isolated BW
Contiguous BW lakes—connection at low-moderate discharge (non-flood) and connection during flood

pulse
single vs multiple connection lakes
Water level fluctuation effects connectivity of BW lakes single connection, reflected in WQ variables
Size of connection
Alignment of connection
Bathymetry can control exchange-related values
Morphometry of BW (sills have been used to retain warm water)
Connectivity planforms are varied
Bathymetry, cross section of the connection point and presence of sills interact to impact connectivity

How they are mapped: (predicting connectivity)
Percent of perimeter that is channel
Number of connection to channels
How did surrogates perform: 51 BW sampled, just using 2 surrogates (number of connections to channels and percent of perimeter that is channel), they found all but 4 were correctly identified for suitable WQ conditions
Velocity can be another model (SRS direct measures—after accounting for discharge, no changes in velocity in BW)
Nutrient associations with connections: N positive correlated with connectivity, metaphyton also associated with connections
N:P ratio within tissue is lower in low connection lakes
No trend in among-lake variation in velocity, occurrence of BDL values was increasing (perhaps due to growth of veg beds)

Estimating water exchange using (velocity for cost)*distance (sediment transport) predicted sediment levels well in North-Sturgeon project areas

The sediment models for North-Sturgeon reflect well the monitoring data.

P26 or LG or P3 could serve as end points for what can happen in connectivity driving WQ & veg

On IL River, stage frequency for inundation is reducing effectiveness of the HREPs
We have to incorporate wind fetch and bioturbation in BW lake conditions and expectations.

**Jon Hendrickson**: multiple connection BW focus
Hydraulic connectivity (HC) has been a priority for St. Paul District b/c HC is extremely high, projects are focused around reducing connection, dredge cut locations affected by HC, models needing refining for HC

Follow Corps protocols for evaluating velocity.
Develop rating curves for site discharge vs. total river discharge (along each inlet into a multi-channel bw)

Summarize total inflow for each BW with multiple connections, and can be evaluated as a portion of MC flow and how that volume changes over time. Typical trend for St. Paul to see increased connectivity and growing size of inlets.

Basic continuity equations utilized to measure flow in channels, MC, dams.
Engineer evaluates ratio of agreement between LD3 flow and measured flow (between 0.95 and 1.05)

Significant increase in Lansing Big Lake, a bit less in Winneshiek, a bit less in Onalaska, but still measured increases matching with managers' concerns over increased connectivity and growth

Closure structures were common HREPs in 90s, P8 Phase II as example
Connectivity hit targets at low flows and 2 year, less sharp at 10-yr flow

Lansing Big Lake—8 closure structures during 1994 HREP; learned about structures that have not worked as well to meet flow reduction goals, were still able to hold off a negative trend

Dakota navigation project in P7 reduced outflows into Lake Onalaska to benefit barge traffic. Recent data (2015 flow measures to evaluate upper 7 outdraft problem) showed decrease in MC flow to Lake Onalaska. Seems to be anomaly in St. Paul District.

Deltas into BW are slowing filling them and in some cases, encroaching far enough to reach the deepest parts of the BW.
Non-linear reduction in stream power at flow splits results in consistent dredge cut locations.

At flows above 2yr event, sediment concentration goes way down, hysteresis takes concentration down in high flows with high connectivity of floodplain.

Recent measurements suggest flow into BW has been stable or decreasing.
This leads to questions: What was driver of secondary channel erosion and increased HC in 1980s-90s?
What has caused apparent leveling off from 90s-present?
Is HC on a decreasing trajectory?

1980 appears through some data to be a pivot point in hydrologic effects, 3" rainfall events in IL, improvements in tile drainage, increased roughness across floodplain XSE, loss of SAV in Lake Onalaska

Wing dams may not have done much scouring work in the rapidly falling limb of 2014 events, leading to the huge amount of bedload hanging in the MC

**Sharonne Baylor:**
Discussing O&M on hydraulic connectivity. Very common structures are utilized, so straightforward O&M for USFWS, who is charged with most of the O&M for HREPs.
Primary O&M tasks are veg control around structures, gate opening, lube. Sedimentation at inlets.
USFWS has no floating dredge for O&M, so have to work with Corps to mobilize equipment & materials at some sites.

USFWS cuts willows, clears debris, etc to maintain dikes, spillways, gates, weirs, etc.
Trempealeau NWR many gates and pumps, requires more maintenance attention.

Island maintenance—monitoring erosion
Dikes & levees—burns and vegetation cutting
Gate structures—lubrication, clear debris, address interference by public

Chuck: temporary closures could be desirable based on seasonal connectivity control needs (Dual-season benefits could come from winter closures and increased flows in summer)

**Jeff Janvrin:**

Rate of change has increased dramatically, Hydraulic connectivity increases much faster now than any historic rate, geomorphology effects sediment transport, deposition, flow distribution, terrestrial & aquatic habitat, impoundment has connected the historically disconnected off-channel areas, went through potential distribution of bluegill overwintering habitat from historic data, significant increase in aquatic veg following island building in P8, saw increased depth in areas where emergent veg was growing, isolated wetlands may be built into projects, wetlands open to river (mudflats) had relatively low reptile use compared to isolated wetlands

**Kirk Hansen:**

Hydraulic connectivity-northern—WQ variables for fish over winter (DO, T, flow)
Telemetered crappie found that fish were following lowest flow while keeping above 3mg/L DO and low temps, O2 consumption is very low for small fish at 1.7C, but can cause death of larger fish, but flow and temps can be really critical for small fish, esp YOY. 1985 study found many YOY (424,000) were dead within a week with temps & flow. Natural levees benefit backwaters—higher elevation, less frequent flooding, better sediment filtration, lower sedimentation were found near to the highest quality BW habitats, overtopping islands during winter is bad for fisheries!

Question: Regarding island elevation, do your examples use main channel sand or adjacent borrow that adds depth to BW? *We support using BW material, as it provides a benefit to BW fisheries, resets clock on long-term sedimentation in BW. Using MC sand to raise elevations misses the opportunity to gain a benefit in BW fishery.*

**John Chick:**

Southern Perspective relative to Pools (1-19)

- Much greater sediment loading
- Higher TSS
- HREPs focused on waterfowl/moist soil units have been successful
- HREPs attempting to improve fish habitat while maintaining connectivity have not been as successful.

- Backwater lakes are extremely shallow.
- Extremely high TSS (60+ mg/L), chlorophyll a also very high (60+ ug/L)
- Multiple stressors working on backwater lakes (sediment loading, hydrologic alterations, nutrient loading, invasive species).
- Lessons learned: connectivity is a significant challenge in lower UMRS, agency staff that have been able to manipulate systems to be a vegetative response have turned over and new staff will have to learn these nuances in the future.
- Backwater lakes appear to be used heavily by Asian carp.
- The starting point for high quality projects appears to be successful isolation combined with water level management.

**Molly Sobotka:**

- Steep-sided channel only allow water movement out of channels at very high river stage.
- As a result, number of days water is on the floodplain is very low.
- Elevated primary productivity is observed, but is restricted to areas that are protected from velocity.
- High correlation between days flooded and crappie recruitment index.
- Fish recruitment related to floodplain connectivity has become reduced post Asian carp.
- We know that management is needed to restore connectivity- if areas are disconnected, animals can't use them.
- This can be a fine line; too much connectivity to the main channel can remove things we value about off channel areas. A variety of habitats is the solution.
- Restoring the floodplain will benefit the entire ecosystem. Specific actions that could help: reforesting areas inside the levee, restructuring the banks for more gradual slopes, and levee setbacks.