Priority Mussel Conservation Activities for the Next 10 Years (2009-2019)

A significant amount of effort has taken place since 2003 to begin implementing the Upper Mississippi River Conservation Committee Mussel Conservation Plan. However, given the facts of limited budgets and staffing, it is crucial that future activities be focused on the most critical conservation issues and information needs over the next 10 years. These questions are presented here as a draft for further refinement and prioritization by the Mussel Coordination Team and Upper Mississippi River Conservation Committee Mussel Ad Hoc Committee:

1. What is the current distribution and status of mussels across the UMR?

a. How does species composition and mussel distribution change over the length of the system?
b. Why are some species present in some pools and tributaries and not others?
c. What is the relative health of the UMR mussel community (% juveniles, age/length structure)?
d. What are the criteria used to define important mussel areas—where are they and what are their extents?
e. What is the minimum information needed to conduct mussel surveys?
f. What is limiting the distribution of species once common but now rare or absent?

2. What are the trends in mussel populations in the UMR over time across a group of species?

a. Are populations stable, increasing or decreasing?
b. What are the trends in recruitment over time?
c. What are the trends in total mortality over time?

3. What population-level variables (i.e., mortality, recruitment, reproduction, movement) are most likely constraining mussel populations in the UMR?

a. What are the effects of zebra mussels on unionids?
b. How much does predation (i.e., carp, drum) affect unionid populations?
c. What are the effects of climate change on unionids?
d. What is the minimum population size needed for rare species (population viability analysis)?
e. How does hydrology/geomorphology influence population vital rates?
f. How do host fish populations influence unionid populations?
g. How are barriers to fish movement limiting distribution?

4. What are the restoration targets for mussels at both the species and community level?

a. What is the historical species composition/richness in each pool/reach?
b. Would a “mussel IBI” be useful to assess mussel health and the success of

restoration projects?

c. Is there a “critical density” that defines an ecologically functioning mussel “bed” where ecosystem services become measurable and the bed persistent?

5. What are the effects of ecosystem restoration activities on mussels?

a. What is the long-term significance of mussel mortality during drawdowns or island construction on the UMR?
b. Which ecosystem activities are most beneficial to mussels?
c. How do altered flow regimes affect mussel populations?
d. What is the balance between short-term impacts and long-term benefits in river restoration activities?

6. What management activities can we undertake to enhance mussel populations?

a. Can we re-establish a viable, self-sustaining mussel assemblage through propagation and reintroduction including T&E species?
b. How can we use results from hydrophysical models to design and construct mussel habitat projects in the field?
c. Would installation of fish passage facilities enhance populations or reintroduce mussel species?
d. What are the host fish for rare species?

7. In educating people, what roles do mussels play in the UMR ecosystem?

a. How important are mussels in stabilizing river sediment?
b. How important are mussels in processing nutrients?
c. How important are mussels in providing habitat to other biota?
d. How important are mussels as a food source to other animals during their first year or two of life?

8. Can the UMR support a commercial mussel industry?

a. How would managers determine a sustainable harvest rate for each species of interest?
b. Would a sustainable harvest provide additional interest and funding for mussel resource management?