



Mussel Conservation in the Upper Mississippi River Basin

Brett Ostby, Daguna Consulting's Co-owner and Senior Biologist started his career in the Upper Mississippi River Basin. He worked with Dr. James Eckblad at Luther College to survey streams of northeastern Iowa for native mussels from 1999 to 2000 and interned with the Minnesota Department of Natural Resources' Statewide Mussel Survey in 2000. In 2002, he started graduate research at Virginia Tech and eventually co-founded Daguna in Virginia. Daguna Consulting's Minnesota office is ready to assist public and private clients in the Midwest with projects that protect our aquatic natural resources.

Black River Mussel Survey and Relocation

In summer 2015, Daguna Consulting surveyed streams of the Black River delta in Wisconsin that would be disturbed by Dairyland Power line upgrades. We detected a population of the state-listed pistolgrip (*Tritogonia verrucosa*) and coordinated with the Wisconsin DNR to relocate that population beyond direct impacts.



Ford Bridge Mussel Relocation

In summer 2017, we relocated mussels from under the Ford Bridge in St. Paul, Minnesota prior to repairs and bank stabilization at the site. We found a remarkable assemblage comprising 17 species and nearly 400 individuals in only a tenth of an acre of Mississippi River habitat.



Pettibone Condo Dock Mussel Survey and Relocation on the Mississippi River

Prior to a dock removal and reconstruction in a Mississippi River harbor near La Crosse, we conducted a spatially explicit survey for listed species, including the federally endangered *Lampsilis higginsii*. Since no listed species were detected, we proceeded with a relocation of ~300 mussels representing 10 common species. Although the invasive Zebra mussel was detected at this site, its numbers were depressed. Before moving any native mussels, we removed Zebra mussels from the shells of natives and euthanized them. We strictly followed decontamination protocols before using our equipment again.



St. Croix River Mussel Surveys and Relocation (ongoing through 2018)



Because the St. Croix River is inhabited by many globally rare species, any project that might alter habitat or disturb native species falls under intense federal and state scrutiny. As we have a federal recovery permit for mussels, we recently conducted a series of dives to determine the presence or absence of endangered species in a marina undergoing reconstruction. Our survey results are being used to develop a relocation plan in coordination with the Minnesota DNR and the Army Corps of Engineers.

Chippewa River Bank Restoration



Before starting a bank restoration project in western Minnesota, the Chippewa Soil and Water Conservation District was required to relocate mussels that would be directly impacted by construction to suitable habitat elsewhere. Daguna Consulting biologists moved over 2,000 mussels from three sites over a four-day effort in spring 2018. This reach of the Chippewa River supports one of the better remaining mussel assemblages in the Minnesota River Basin, so mitigating population loss due to habitat improvements was imperative. This project required coordination with the Army Corps of Engineers to lower flow in a channel that was normally 3 to 5 feet deeper in spring due to snow melt and rainfall.