



## “Liver of the river”: Aquatic biologists, scientific divers finish relocating endangered mussels in preparation for new bridge construction project

*“Look closely at nature. Every species is a masterpiece, exquisitely adapted to the particular environment in which it has survived.”*

*- Edward O. Wilson,  
biologist and multiple  
Pulitzer Prize winner  
by Julie Berg-Raymond*

The next few years are going to see a lot of activity on the Mississippi River at Lansing - while, in a state-of-the-art, multi-agency project involving some of the top specialists in several fields, a new bridge is built across the river there for the first time in almost 100 years.

The past few months have already seen some activity near the shore at Lansing. From August 15 until November 18, teams of scientific divers and aquatic biologists worked on both the Wisconsin and Iowa sides of the river to collect, identify and relocate approximately 29,500 mussels - nearly 400 of which were the endangered Higgins Eye Pearly Mussel (*Lampsilis higginsii*).

The relocation project is a result of findings from two environmental surveys conducted in 2018 and 2020 by EcoAnalysts, Inc. (headquartered in Moscow,

ID, with offices in Missouri, Connecticut, Washington State and Florida) to determine what mussels were present along the Black Hawk Bridge corridor. EcoAnalysts was subcontracted by the Canada-based company, Stantec - prime contractor working under the Iowa Department of Transportation (DOT) on the project. The surveys determined the area was inhabited by the endangered Higgins Eye Pearly Mussel; and the U.S. Fish and Wildlife Service issued a biological opinion that the mussels would have to be moved to another location, out of harm's way.

One of the most imperiled groups of aquatic species, "(m)ussels are sedentary, which means that if you don't move them to accommodate a project, they'll likely get crushed," according to the website for Stantec ([www.stantec.com](http://www.stantec.com)). This needs to be avoided, the website continues, because "(m)ussels sit in substrate under the water, drawing water through themselves, absorbing nutrients, and removing bacteria. They filter the water, improving water quality for humans, fish, and other wildlife."

### **ON THE JOB**

Along with divers from Stantec's own team, freshwater mussel specialists from EcoAnalysts' Missouri office were also onsite during the collection and relocation process, working as divers and aquatic biologists.

Ron Kegerries was technical lead aquatic biologist on the relocation project - one of the federally and state-permitted biologists on the project overseeing the mussel relocation study design and coordination. While in the field, he says, he and other biologists "led the field crew to conduct daily relocation tasks, identify all mussels collected, count, measure, age, record data, and mark individuals before relocating them within the recipient site outside of the project impact area."

Kelly Love, an aquatic biologist, had been working for EcoAnalysts, Inc. for about a month, when she arrived onsite for the project August 20 of this year - five days into the relocation effort. "My favorite part about the job is traveling to different places and exploring the area," Love says. "Every town, no matter how small, has some hidden gems. I loved how beautiful the Lansing area is."

Ben Dunn, dive supervisor with EcoAnalysts' Missouri office, was a lead diver on the project. He is a certified DMT (dive medical technician); and, prior to joining EcoAnalysts, he served in the United States Army - where he received

scuba training in Schofield Barracks, HI. He completed his commercial diver training at Divers Institute of Technology located in Seattle, WA.

“I get to be at a new place along and under some new waterbody all the time,” he says. “I’m one of those people who sometimes thinks, ‘This is what I actually get to do as a job.’ I’ve been very thankful to fall into a career like that. Diving isn’t for everybody, but it is very fulfilling for the people it IS for.”

### **TYPICAL WORKDAY**

“An average workday started at 7:30 a.m.,” Love says. “We headed to the bridge and prepared the equipment for the day while the divers suited up. Divers took turns in the water throughout the day and dove from about 9 a.m. to 3:30 p.m.”

On a particularly cold day in early November, Dunn recalls, “We got out on the water a little later than usual due to checking all our gear and thawing some things out. We can conduct the mussel relocation as long as the water temp is above 40-degrees Fahrenheit,” he says. “We attempted to keep our divers warm with hot water that we ran through portable tankless camping showers that ran down through a hose you’d put into your wetsuit. Ideally the diver was supposed to be warmer than most of the people up on deck.”

Weather always impacted their work, Love says. “On cold days I would wear four layers of clothes and stand next to a heat lamp,” she says. “Divers would warm their hands at the lamp. The safety of our divers always comes first. If the weather was too cold, we would have shorter days.”

On a day that it snowed, Love wasn’t onsite but recalls thinking everyone probably had the day off - “because the mussels can’t survive long in the cold out of water. Plus, that’s very cold for the divers,” she says. “The biggest issue we were having was cold hands in the water.”

Divers worked from along the shoreline to approximately 80 meters riverward from the shoreline. The deepest they dove was approximately 26 feet; the average depth was approximately 12 feet. Dunn and all the divers are highly skilled in surface-supplied diving - the most efficient and safe method of collecting in waters with low visibility and strong currents.

“Most of the time, this is all by feel,” Dunn says. In the murky waters of the Mississippi, “you usually can’t see your hand in front of your face,” he adds.

Like in an above-ground archaeological dig, the divers are methodical in searching the riverbed. “We used grids laid out with lines and stakes,” he says. “Some groups use small gauge chain. We also set up some grids using PVC pipe.”

Throughout the day, Love and the other aquatic biologists spent their time identifying the mussels and giving them markings “so we’d know in the future that it was a relocated mussel,” Love says. “The endangered species got special treatment and received a unique number. I kept track of the number of mussels collected and how many endangered species we found.”

They kept all the mussels in bags and at the end of the day they placed them in the relocation areas. “Divers were given the endangered mussels, and they placed them in a relocation area dedicated to endangered species,” Love says.

## **RESULTS**

“Based on the relocation efforts, construction impacts to the mussel bed and local mussel community should be minimal and allow for successful natural recolonization of the mussel bed within the area of the Black Hawk Bridge,” Kegerries says.

In total, divers relocated a little over 29,500 freshwater mussels - of which nearly 400 were the endangered Higgins’ Eye. “The number of mussels might sound small in comparison to the total,” Love says. “But they are called an endangered species because there are less of them, and they are a struggling and sensitive species.”

This relocation project brought some good news, though. “Last time the area was surveyed it was estimated there were about 200 Higgins’ Eyes in the area,” Love says. “It is a good sign we are seeing the population increasing. It is a sign the population is doing better.”

Along with weather conditions and barge traffic, the unexpected population increase was one of the reasons the team completed the relocation project

later than anticipated, on November 18. “The density and the diversity of the mussel bed on the Iowa bank was remarkable,” Kegerries says.

That matters, Kegerries says, because “freshwater mussels are a great indicator of good water quality. If you have mussels present, that means that water quality may be healthy, and the aquatic habitat is stable. If you start losing these species, it means something is degrading.”

One way of thinking about this, Love says, is that “mussels are the ‘liver of the river.’ They act as a filter and keep our water clean and healthy.”

Love says that every day she was out on the river working, she saw “people on their boats fishing, or just enjoying a beautiful day. Outdoor recreation is a major part of the Mississippi River. We need to protect mussels to keep our rivers healthy, since they act as a filter - because without mussels the water wouldn’t be as healthy, and we wouldn’t see as many fish.”

“I think as humans and residents of a particular area we are all given a responsibility to be stewards of the resources that God has provided for us to use,” Kegerries says. “This is one example of how even under environmental impacts, we can be good stewards of our resources by mitigating for as many impacts as possible to better ensure the longevity and sustainability of our ecological resources for generations to come.”



*Mussel movement ... “The density and the diversity of the mussel bed on the Iowa bank was remarkable,” says Ron Kegerries, Technical Lead Aquatic Biologist on the relocation project. The unexpected density was one of the variables causing the team to finish the project later than anticipated. Other variables that caused delays were weather conditions and barge traffic. Submitted photo.*



*Well-suited for this line of work ... Dive Supervisor Ben Dunn helps a fellow diver put on his 26-pound helmet. Divers could work as long as the water temperature was above 40-degrees F. The team attempted to keep the divers warm with hot water that is run through portable, tankless, camping showers that run down through hoses the divers can put into their wetsuits. The divers completed their relocation efforts on November 18. Submitted photo.*



*Along the shore ... Divers worked from along the shoreline to approximately 80 meters riverward from the shoreline. The deepest they dove was approximately 26 feet; the average depth was approximately 12 feet. In 2018 and then again in 2020, surveys were conducted of the area to see where mussels were present. On this relocation project, the team was pleased to collect many more mussels and nearly twice the number of Higgins' Eye than they expected - which is a sign the population is doing better. Submitted photo.*



*Efforts on the water ... After the divers collected mussels from each section of the relocation area, aquatic biologists on the boat identified each mussel and gave it a special marking, so it could be identified during monitoring efforts to track the success of the relocation and recolonization. The endangered mussels were given special treatment and received a unique number. Divers relocated a little over 29,500 freshwater mussels of which nearly 400 were the endangered *Lampsilis higginsii*, commonly known as Higgins' Eye. "The number of mussels might sound small in comparison to the total," Aquatic Biologist Kelly Love says. "But they are called endangered species because there are less of them, and they are a struggling and sensitive species." Submitted photo.*



*Diving right in for some mussel work ... Left to right: Benjamin Dunn, of Kansas City, MO, dive supervisor; Kelly Love, of Cleveland, OH, aquatic biologist; and Ronald Kegerries, of Missouri, director of aquatic sciences. All three work out of the Missouri Office with EcoAnalysts, Inc., a provider of ecological field sampling, laboratory, and consulting services in terrestrial, freshwater, estuarine and marine environments. Photo by Julie Berg-Raymond.*