THE GLAN CHRONICLE

Moving Forward Mussel Conservation



By Jesse Weinzinger DNR Wisconsin Mussel Monitoring Program Coordinator

One year after the start of the COVID-19 public health emergency, volunteer opportunities to monitor mussels picked up speed and the Wisconsin Mussel Monitoring Program (WMMP) went back to providing limited in-person trainings and volunteer programs.

Volunteers helped the DNR document mussel populations, rescue mussels from stranding during dam drawdown and advance recovery efforts, while adhering to health safety practices. We are thankful for the partnerships that made it possible to continue these important conservation activities during the pandemic and that provide research for future recovery efforts.

This issue recaps program news and highlights from the 2021 field season. Read on to learn about the strength and resiliency of century-old spectaclecase mussels in the Saint Croix River and the introduction of a new recovery strategy for rainbow mussels in Southeast Wisconsin. You'll also learn how the DNR's Wisconsin Mussel Monitoring Program continues to provide a platform to build projects, program and tools for citizen-based monitoring of North America's most imperiled animals.



The Clam Chronicle is a bi-annual publication of the Wisconsin Mussel Monitoring Program, part of the Wisconsin Department of Natural Resources (DNR)'s Natural Heritage Conservation Program. Learn more about the Wisconsin Mussel Monitoring Program at: https://dnr.wi.gov/tiny/941.



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Cover Photo: Volunteers search for mussels in Cedar Creek. Photo Courtesy of Milwaukee Riverkeeper

Losing Mussel Mass



By Jesse Weinzinger DNR Wisconsin Mussel Monitoring Program Coordinator

In September 2021, the U.S. Fish and Wildlife Service proposed removing 23 wildlife species from the Endangered Species List because they have not been seen in the wild for many decades, meaning they may be extinct. Much of the media coverage focused on the removal of the iconic ivory-billed woodpecker, but importantly, eight of the 23 species presumed extinct are freshwater mussels.

Eight of the 23 species presumed extinct are freshwater mussels. While none of the eight were Wisconsin species, the extinction of these mussel species sounds the alarm for the need to focus on mussel conservation.

So, why are mussels vanishing in locations such as the Southeast, America's biodiversity hot spot for freshwater mussels? There are five major contributors to the loss of freshwater biodiversity including: over-exploitation, pollution, flow modification, exotic species invasion and habitat degradation (Downing et al., 2010). These five factors also drive the decline in freshwater mussel biodiversity which can create smaller and more isolated populations that are more vulnerable to extinction.

In Wisconsin, these five major factors have led to 24 of the state's 50 native species being listed as endangered, threatened or of special concern because their populations are declining. <u>Visit our</u> <u>website</u> to see a list of Wisconsin's native mussels and links to fact sheets on each.

The good news is that the DNR and its partners have projects in place to conserve our most imperiled mussel species. For example, Wisconsin is working with the Genoa National Fish Hatchery to propagate and release several state and federally listed mussels that may otherwise disappear from Wisconsin waters. Active projects target spectaclecase, winged mapleleaf, Higgins eye, sheepnose, snuffbox and salamander mussels.

In 2022, efforts will also focus on collecting brood stock for the

rainbow shell mussel, a species that has seen severe declines in Southeastern Wisconsin. Although propagating freshwater mussels is not the only restoration strategy, it provides a cost-effective solution to conservation that volunteers and the public can join in by helping release the hatchery-raised mussels into target streams.

Look for future emails from the Wisconsin Mussel Monitoring Program for volunteer opportunities related to release efforts.









All photos courtesy of Wisconsin DNR

Ancient Mussels Found Living In The St. Croix River



By Lisie Kitchel DNR Mussel & Snail Specialist

In the summer of 2021, DNR mussel biologists, along with National Park Service and University of Minnesota biologists surveyed the St. Croix River upstream of the St. Croix Falls dam as part of recovery efforts for a federally endangered mussel.

Team efforts focused on finding the spectaclecase mussel (*Cumberlandia monodonta*) as UW-Minnesota biologists reported having found mussels above the dam in 2003. The spectaclecase is one of Wisconsin's rarest mussels and is unique in that it is only found under large rocks or within rock piles, not out in the riverbed like other mussels.

The team was successful in finding a cluster of spectaclecase among a pile of large rocks that consisted of live species and dead shells.Finding the cluster alive was significant as their host fish needed for reproduction no longer exists in that reach of the St. Croix above the dam. The host fish species, mooneye and goldeye, had been prevented from getting upstream as a result of the St. Croix Falls dam built in 1907.

The found mussels are estimated to be over 100 years old based on when this species could have last reproduced and how long these mussels kept growing. Wisconsin's native mussels can live a long time, and these are considered old by living mussel standards – not quite ancient by geologic standards nor close to ripe old age of 507 reached by "Ming" the clam, but definitely contenders.

You can tell the age of mussels by counting the annuli (or rings) on their shell. However, it was difficult to tell the exact age of the found mussels by their annuli because

the shells were too eroded and their growth rings were too close. Although the team was unable to identify the age of the mussels externally, we were able to use a cross-sectioning of the shell to

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mark and count each annuli. The dead shell was saved and will be cross-sectioned this winter to verify the age of the mussels found in the rock pile. The living ancient spectaclecase were gently returned to the rocks from which they were found to survive for days or years to come.

The spectaclecase mussel is federally and state listed as endangered and has suffered declines throughout its range. Fortunately, there are living spectaclecase downstream of the dam, where a lot of mussel surveys have been done. They are still rare and still hard to find, but at least their fish host is present so they can reproduce, which unfortunately is not the case for the ancient spectaclecase living above the dam. The presence and advancing age of these mussels sounds the alarm that action needs to be taken to preserve their genetic stock while they are still alive and underscores the importance of current efforts to restore spectaclecase.

The St. Croix River surveys are part of a collaborative multi-state, multi-agency effort to help recover spectaclecase. The Wisconsin DNR, Minnesota DNR,

University of Minnesota, U.S. Geological Survey, U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service are all working to provide necessary data for spectaclecase recovery and implementing conservation, restoration and propagation priorities.

> Left: Individual Spectaclecase Photo Courtesy of Allison Holdhusen

> Right: Several Spectaclecase after targeted search. Photo Courtesy of Allison Holdhusen





A Mussel Species Makes Another Leap

By Lisie Kitchel DNR Mussel & Snail Specialist

In the summer of 2021, a biologist conducting water quality monitoring surveys in the St. Louis Estuary of Lake Superior sent a picture to the DNR of a tiny two-year-old mussel and asked what it might be. It turned out to be an Eastern pondmussel (*Ligumia nasuta*), a species first documented in Wisconsin's Medicine Lake in Onedi County in 2014. The biologist's discovery represents the first-ever report of this species from Lake Superior.

Prior to the Medicine Lake discovery, the closest Eastern pondmussel population to Wisconsin was in the lower portion of Michigan. In fact, the closest population to Wisconsin was in the lower portion of Michigan, not even in the Upper Peninsula. Since Medicine Lake is part of the Three Lakes Chain (actually 28 lakes), the DNR teamed up with volunteers to conduct a Mussel Blitz in 2018. This Blitz involved volunteers conducting short surveys at targeted locations to determine how many lakes the Eastern pondmussel might live in. The species was found in 10 lakes with more lakes still yet to be explored. Since then, the DNR has monitored for this species but has not identified it outside of Oneida County. The DNR will resume Bioblitz efforts including in the remaining lakes of the Thre Lakes chain and the Eagle Chain downstream.



However, the mystery remains as to how this species of mussel made it to Lake Superior from Oneida County as the Three Lakes Chain does not connect to Lake Superior. Did it come from one of the other Great Lakes? Historically, the Eastern pondmussel has been reported in Lake Ontario and Lake Erie, where the species is in serious decline. We definitely need to get out there and look for it. We welcome volunteers to help us solve this mystery by searching Lake Superior's waters.

Finding Mussels Upstream Of The Wisconsin River

By Jesse Weinzinger DNR Wisconsin Mussel Monitoring Program Coordinator

The DNR's Wisconsin Mussel Monitoring Program is working with partners and volunteers to help gain a better understanding of the diversity and status of native mussel species in one of the state's rivers most impacted by dams, the Wisconsin River.

Water flowing throughout Wisconsin's major rivers is intensively controlled by dams to generate hydroelectricity, regulate water levels in lakes and

"DAMS ALSO CREATE ARTIFICIAL BARRIERS THAT CAN FRAGMENT HABITAT AND ISOLATE MUSSEL POPULATIONS."

reservoirs and avoid or manage potential flooding. These dams modify habitat for native mussels and eliminate upstream and downstream movement of host

fish that mussels need to complete their life cycle. Dams also create artificial barriers that can fragment habitat and isolate mussel populations.

The Prairie du Sac Dam is the lowest downstream barrier on the Wisconsin River, preventing mussel and fish species living in the lower 92 miles of the Wisconsin River and the Mississippi River from accessing suitable habitat and colonizing above the dam.

Below the Prairie du Sac Dam, the diversity of mussels is relatively well-documented. DNR records document 36 species of native mussels occurring from a minimum of 700 historical survey locations. Far fewer surveys have been conducted above the dam.

DNR records also identify 25 species of native mussels from 60 survey sites up to the Kilbourn Dam in the Wisconsin Dells. Mussel occurrence and surveys decline even further in the next upstream stretch of the river, between the Kilbourn and Castle Rock dams. Only 11 species have been documented from six survey sites in that river stretch.







Wisconsin DNR

The Wisconsin Mussel Monitoring Program is working with partners to conduct additional surveys to better understand mussel populations between Prairie du Sac and Castle Rock dams. Wisconsin Mussel Monitoring Program volunteers conduct timed searches for native mussels in the project area's wadable tributaries of the Wisconsin River. Habitat suitability and population demographic data from this study will aid managers with information to inform future management plans.

Volunteers Help Relocate Ozaukee County Mussels & Bridges

By Lisie Kitchel DNR Mussel & Snail Specialist

Mussels and bridges can be known to go together. At times, the sand, gravel and cobble substrate under a bridge creates an excellent habitat for mussels, other times, the stream bottom is comprised of shifting sand and the riprap at the base of the piers provides the only stable substrate where mussels can be found. And, sometimes there is only soft mud under a bridge - not a suitable habitat for mussels.

To ensure bridge repair or reconstruction projects do not negatively impact mussels at a bridge crossing, the habitat is evaluated for suitability for mussels. To ensure bridge repairs or reconstruction projects do not negatively impact mussel habitat, DNR mussel biologists assist department transportation liaisons and Wisconsin Department of Transportation staff in bridge assessments. These assessments help determine whether suitable habitat and mussels are present. Assessments also help determine if impacts to the stream bottom can be avoided during bridge repair or reconstruction and when not avoidable, recommend conducting mussel relocations. In summer of 2021, the Milwaukee Riverkeepers held a mussel training workshop as part of the DNR's Wisconsin Mussel Monitoring Program at an Ozaukee County park. Twelve volunteers conducted a mussel survey and relocation in a tributary of the Milwaukee River.

A bridge over the tributary was to be rebuilt and instream impacts to the mussels was unavoidable. The volunteers jumped into the water and looked for and relocated

various species of native mussels from under and around the bridge.

It was a great practical experience for the volunteers and helped the DNR mussel biologists

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provide many more hands and eyes to collect and relocate the mussels in record time. Mussel monitoring training includes instream opportunities to look for mussels - and this one provided the group of new volunteers with a hands-on unique experience. Thanks to all who helped make quick work of this project!



Students & Volunteers Place Hatchery-Raised Mussels In Rivers

By Jesse Weinzinger DNR Wisconsin Mussel Monitoring Program Coordinator

In other good news for Wisconsin's native mussels, the Wisconsin Mussel Monitoring Program and its partners teamed up to deliver and "plant" more than 1,200 hatchery-raised mussels in several Wisconsin rivers where past water quality problems had taken a toll on mussel populations.

Genoa National Fish Hatchery raised thousands of fatmuckets (*Lampsilis siliquoidea*) as part of an experiment to research optimum water quality parameters and feeding rates for best survival. Many of the mussels went to Iowa, but a surplus of several thousand allowed the Wisconsin Mussel Monitoring Program to partner with the University of Wisconsin-Stevens Point (UWSP) and the Upper Sugar River Watershed Association (USRWA) and to augment local mussel populations.

UWSP students worked with the DNR conservation biologists to place over 700 mussels at Plover River and Mill Creek in Portage County to monitor their growth and survivorship. Results from this student-led project will help determine the feasibility of reintroduction.

In southern Wisconsin, the mussel program worked with USRWA to place an additional 500 mussels into the Sugar River to augment existing populations.



An additional batch of surplus mussels is estimated to be available in 2022, with plans to evaluate water quality and habitat suitability in the Lower Green Bay/Fox River Area of Concern. The Great Lakes rivers and harbors most severely affected by pollution and habitat loss are known as Areas of Concern (AOCs).

Releasing these mussels to this area and monitoring their survival and reproduction will guide future mussel reintroduction in conjunction with other efforts already underway to demonstrate sufficient improvement in the water quality and other habitat.





Hope At The End Of A Rainbow (Shell)



By Jesse Weinzinger DNR Wisconsin Mussel Monitoring Program Coordinator

Southeast Wisconsin is home to many notable features, from Milwaukee's sprawling skyline and vibrant culture to the glacial till plains and outwash landforms of the Kettle Moraine.

However, did you know the area is also home to over 20 species of native mussels including three on the state endangered species list: rainbow shell (*Villosa iris*) an endangered species, slippershell (*Alasmidonta viridis*) and ellipse (*Venustaconcha ellipsiformis*), both threatened species.

Recent surveys suggest mussels in this region are undergoing rapid changes. For example, observations of rainbow shell mussels have been infrequent, with evidence of juveniles (<4 years old) occurring only in one population since 2009. There is not a comprehensive understanding of the current distribution of rainbow shell nor is there detailed information on population



characteristics for this species at known locations.

To address this problem, the Wisconsin DNR is partnering with the Illinois Natural History Survey to examine past species distributions

and temporal trends and to identify the most significant remaining mussel assemblages in the Fox River watershed, a major watershed of Southeast Wisconsin.

Starting in summer 2021, the DNR chose sites throughout the watershed to compare species distribution and abundance from past surveys. Additionally, local volunteers searched tributary streams to document mussel presence in targeted areas.

In 2022, the DNR will call on volunteers to continue monitoring efforts to increase the understanding of mussel distribution. The DNR will also will target rare species for genetics research and propagation activities. Details will emerge by spring of 2022, so check your inbox for details.







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