



**UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ENDANGERED SPECIES PROGRAM**

TELEPHONIC INTERVIEW TIME (9:18)

HIGGINS EYE PEARLYMUSSEL (HOST – SARAH LEON WITH PHIL DELPHEY)

This transcript was produced from audio provided by FWS Endangered Species Program

P R O C E E D I N G S

(Music plays.)

MS. LEON: This is Sarah Leon for the U.S. Fish and Wildlife Service, and I'm on the phone today with Phil Delphey, fish and wildlife biologist at our Twin Cities field office in Minnesota. Hi, Phil. How are you today?

MR. DELPHEY: I'm good, Sarah. How are you?

MS. LEON: I'm doing great Phil, thanks. Do you have some time to tell us a little about the Higgins eye pearl mussel?

MR. DELPHEY: Yes, I do. It's a freshwater mussel. It mostly occurs in the upper Mississippi River, more or less from northern Missouri or southern Iowa, up to about where Minneapolis, Minnesota is. It's never been one of the most abundant mussels in the Mississippi River, and it was probably on its way to recovery, actually, in the late '80s, early 1990s, before zebra mussel, and invasive species, was introduced by accident into the Mississippi River. So like I said, it's a freshwater mussel. It has always been rare, but now is much more so because of the introduction of zebra mussels.

MS. LEON: So how has this invasive zebra mussel impacted this species?

MR. DELPHEY: Zebra mussels can reproduce in just huge numbers. They made their way in oceangoing ships across the Atlantic and were released into the Great Lakes, and then they made their way from Lake Michigan down the

Illinois River, and just kind of like barnacles, they attach to any kind of firm substrate like rocks or boats or barges. The zebra mussels apparently were able to move upstream in the Mississippi River attached to barges, and then they fell off the barges and actually started colonizing the river.

This all really started happening in the early to mid 1990s. Like I said, zebra mussels reproduce in just huge numbers. They just put billions and billions of early life stages into the river, and these early life stages just kind of drift with the current. When they get to a certain size, they settle out and they really infested some of our mussel beds in the Mississippi River in huge, huge numbers. They attach themselves to the mussels themselves, and make it impossible for the mussels to feed properly or reproduce.

So with Higgins eye, there is some place where Higgins eye used to be relatively abundant on the Mississippi River, where now we can hardly find any Higgins eye. Then there are some areas where we have some pretty good data in terms of the numbers of Higgins eye, and in some of those areas, the Higgins eye populations have declined by nearly 90 percent. So Higgins eye are still hanging on, but they've probably declined by maybe 90 percent.

MS. LEON: Wow. So what conservation actions are currently underway to help this species?

MR. DELPHEY: We're still trying to figure out what we might do about zebra mussels, but we haven't really figured anything that we can do on a big scale that wouldn't also adversely affect other native species. There is some research going on, on some materials that we might be able to use, but the research so far hasn't yielded anything that we can use to really deal with the zebra mussels on a broad scale.

They're really firmly established in the Mississippi River, so we've taken the tact to try to artificially propagate Higgins eye, and then reintroduce them into areas within their historical range, where the Higgins eyes went extinct, probably largely because of really bad water pollution that occurred before the passage of the Clean Water Act, like lack of any kind of sewage treatment on some of the tributaries of the Mississippi River, and also parts of the Mississippi River like where it flows through the Minneapolis and St. Paul area.

Higgins eye used to be there, but because of the terrible water quality, Higgins eye and other mussel species were killed off. But some of these areas, zebra mussels haven't gotten to yet, so we're going into areas where Higgins eye have been infested by zebra mussels and in the spring, usually April, we'll go into the river, look for Higgins eye that are brooding.

When the Higgins eye have the larval baby Higgins eye inside the females, we take those Higgins eye to Genoa National Fish Hatchery in southwestern

Wisconsin, right on the Mississippi River, and when we get them there, we take the larval Higgins eye – each Higgins eye probably has on the order of thousands of small larval Higgins eye, and we mix those in with usually smallmouth or largemouth bass, and those larval Higgins eye, at that point, we call them glochidia. They are basically tiny, tiny mussels that are more or less microscopic.

We put them into buckets with a small number of these smallmouth or largemouth bass, and they attach themselves to the fish and essentially become parasitic at that stage. We keep the fish at the hatchery for a few weeks, and then we take them out into locations usually in the Mississippi River. We put those fish that have the parasitic stage of the mussel attached to their gills into these specially designed cages, and then put those cages on the bottom of the river.

After a couple of weeks, the larval Higgins eye will detach themselves from the fish, and usually if we're careful not to get too many of those larval Higgins eye on the fish, the fish are essentially unharmed. So after a certain point when we know that the Higgins eye have detached themselves from the fish, we go back in and we pull up the cages, and let the fish go or just go to the bottom of the river and pull the top off the cage and let the fish go. Then we go back in subsequent years and monitor those cages, and see if we've been successful in producing a significant number of juvenile Higgins eye.

Once they get to a certain size, where they're maybe less vulnerable to predators, we can take those out. At that stage, we usually refer to them as sub-adult mussels, and we release them into those areas in the historical range, where the zebra mussels are either absent or only present at low densities, and the habitat has otherwise recovered. This has been going on for about 10 years. We've released over 41,000 sub-adult Higgins eye into about 10 different areas within their historical range, so we've been really good so far, I think, at producing those mussels, and now we've just got to go back and monitor those areas.

MS. LEON: Through this monitoring, have we found whether or not these mussels are actually surviving once they've been released?

MR. DELPHEY: The early indications are generally good. The divers are able to find Higgins eye in those areas, so it's clear that a significant number of those released sub-adults are surviving. We're even finding that some of them are reproducing. We're finding gravid female Higgins eye.

What we do to tell whether or not the Higgins eye we find are "ours" or just naturally reproduced from the river, we put basically a black dot of Super Glue® on each sub-adult so then when we go into those areas and find mussels with that black dot we know that they're mussels that we released there. We have

found some of those that are reproducing. There have been a couple of cases, I think at least one case, where we've gone in and we didn't find them, but obviously, that doesn't mean they're not there.

It just means they may not be doing quite as well at that area, so we'll continue to do that for several years to see whether or not the Higgins eye are able to establish new populations strong enough in those areas to make a real tangible contribution to the species' recovery.

MS. LEON: I know you've mentioned Genoa National Fish Hatchery as a principal partner in this recovery effort. Is there anyone else involved?

MR. DELPHEY: Whenever a federal agency does something that may affect an endangered species, they have to consult with the U.S. Fish and Wildlife Service. We were consulting with the U.S. Army Corps of Engineers regarding their operation and maintenance of the 9-foot-deep navigation channel on the Mississippi River, and we found during that consultation that the Corps' operation and maintenance of the river basically facilitated the barge traffic that led to the introduction of zebra mussels to the river.

So basically, we found that the Corps had to do something to kind of make up for that or to try to offset the adverse impacts that their programs were having on the river. So the Corps has really been the primary agency funding the propagation and reintroduction effort for Higgins eye, and they'll continue to work on that until we're sure that it's been successful. The state Departments of Natural Resources of Minnesota, Wisconsin, Iowa, and Illinois have also been very important in this whole effort. Each one of those states has at least one of those reintroduction areas that we talked about earlier.

Also, the National Park Service, the St. Croix National Scenic Riverway, Prairie Island Indian Community, which is right on the Mississippi River near Red Wing, Minnesota, and I'd say, too, the EPA. Not so much from this propagation effort, but EPA is working on issues that are important to water quality and amounts of sediment in the Mississippi River and things like that.

MS. LEON: Well, thank you so much, Phil, for taking the time to tell us about the Higgins eye pearl mussel. It was a real pleasure having you on.

MR. DELPHEY: You're welcome.

MS. LEON: For the U.S. Fish and Wildlife Service, this is Sarah Leon. Thanks for listening.