La Crosse Fish and Wildlife Conservation Office

Making Waves

Volume 12, Issue 7 October 2014

Boone Dam Now a Rapids

By Louise Mauldin

The Boone Waterworks Dam, located on the Des Moines River northwest of Boone, Iowa, was converted to a rock rapids this spring to eliminate a public safety hazard and improve fish passage, both up- and down-stream of the dam.

A Des Moines River dam (left) was recently converted to a rock arch rapids (right) to improve safety and reconnect river habitat.

The Des Moines River is a state designated river trail and is widely popular for canoeing, tubing, boating, and fishing below the dam. The 212-foot wide, 3-foot high dam was constructed in 1933 to supply water to Boone.

Recirculating currents from the dam claimed five lives over the years, most recently in 2012 when an angler fell in the water along the west side of the dam. This dam was particularly dangerous because the dam itself, and the waterline it created, could not easily be seen while navigating downriver until one was almost on top of the structure. The tragic drowning of

Megan Pavelick while tubing the river in 2006 sparked a family lawsuit and subsequent settlement with the City of Boone to make the dam safer for the public.

By 2010, the Iowa Department of Natural Resources, City of Boone, Prairie Rivers of Iowa Resource Conservation & Development, Boone/Greene County Natural Resources Conservation Board, and La Crosse FWCO were diligently working to design dam modifications, raise funds, and obtain necessary permits.

Richards Construction from Sac City, Iowa, was contracted to construct the rapids. A 3-row rock-arch weir structure was constructed downstream of the dam with the first weir placed at the base of the dam face. An 80-foot wide by 0.5-foot deep notch was cut into the concrete structure and boulders placed in the trough at a lower elevation than the rest of the weir row to create a mid-channel trough for low river flows.

Conversion of dams into rock rapids has been very successful in Minnesota and this is the fourth dam transformation of its type in Iowa. This work has reconnected 34 miles of the Des Moines River and its tributaries located upstream of the Boone Dam, as well as improved fish passage for walleye, smallmouth bass, channel catfish, suckers, darters, and other species including the federally endangered Topeka shiner. The rock rapids helps maintain the upstream pool elevation for water supply and improves safety in the area for recreational users of the river, eliminating one of Iowa's deadliest drowning hazards.

What's Inside?

Panning for Buried Treasures

By Mark Steingraeber

Before Tuesday, October14, I could only imagine what it must have been like to have been a gold prospector, panning for flecks of a precious commodity buried amid the coarse sand and gravel of a cold, clear stream.

However, I had a much better idea after responding to a request that day (and the remainder of the week) to help recover juvenile mussels from submerged rearing cages in a pond at the Genoa (WI) National Fish Hatchery.

Not wanting to horde this enriching experience, I was fortunate to recruit several FWCO staff and volunteers on short notice to join in this rewarding recovery effort.

The slurry of sediment at the base of the cages which the mussels called home all summer was stirred and sluiced through fine-mesh sieves by our team of novice prospectors until tiny, iridescent, golden shells came into view.

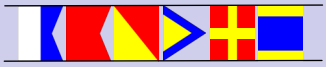
Valves measured <¼-inch in length

More than 18,000 juveniles (6,009 endangered Higgins' eye mussels alone) were gently teased and gathered by finger in 4 days of panning efforts. All of these will now be fed and kept indoors in relatively warm waters. This will promote year-round growth until they are large enough to be released and assume their treasured status in our public waters.

On a crisp autumn morning, volunteers Rick Worden (left) and Fred Zenz (right) retrieve the base of a mussel propagation cage from a pond at the Genoa NFH.

Welcome Aboard!

by Mark Steingraeber



William Lamoreux (*aka*, Bill) joined the La Crosse FWCO staff in late October as a biological science technician. Although new to the U.S. Fish and Wildlife Service, he is no stranger when it comes to serving his country.

Bill Lamoreux joins the La Crosse FWCO

Bill was an aircraft handler aboard the U.S.S. George Washington when it sailed into New York Harbor days after the 9/11 attacks in 2001. He later continued to serve in that role overseas (supervising 15 crewmen) during Operation Southern Watch (Iraq) and Operation Enduring Freedom (Afghanistan).

After military service, Bill returned home to North Mankato (MN) where he was a self-employed marine aqua-culturist and a student at Minnesota State University - Mankato. He also interned at the Water Resource Center on campus here before earning his Bachelor of Science degree (Zoology) in 2010.

After graduation, Bill worked briefly for the U.S. Forest Service in California before moving in 2012 to Michigan where he worked for the U.S. Geological Survey.

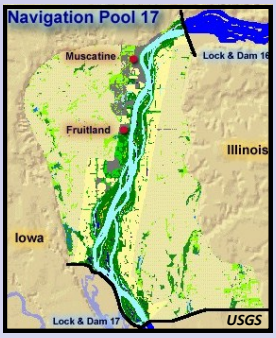
Bill will play a key role in La Crosse FWCO surveillance efforts to monitor the upstream advance of Asian carp in the Upper Mississippi River and Chicago area waterways. His welding and aquaculture skills are also welcome additions to our team. Mean time, Bill is happy to be closer to home and looks forward to many new angling opportunities on *Old Man River*.

WELCOME ABOARD!

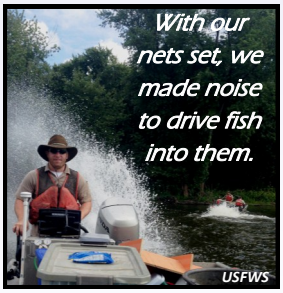
Fishing for Two

by Kyle Mosel

A crew from the La Crosse FWCO traveled south to Pool 17 of the Upper Mississippi River for several days early in October to resume tagging invasive Asian carp with acoustic tags.



This was a multi-purpose trip since we would also supply Asian carp to a U.S. Geological Survey (USGS) research team from Columbia (MO) for a so-called "Judas" fish study. Their plan was to initially tag, transport, and release the fish downstream in Pool 19. These tagged fish may later congregate with large numbers of other Asian carp. Thus, locating a tagged fish may indicate (*i.e.*, betray) the location of a large school of Asian carp that may be targeted for removal efforts. In two days of effort, a total of 21 silver carp were captured, tagged, and released in Pool 19 as *Judas* fish; then we started to see what we could catch for ourselves.



Silver carp began to jump immediately and we knew we would be able to catch enough fish to tag ourselves. Fish were held in a holding pen while we pulled them out, one by one, to surgically implant the tags. We completed over 30 surgeries in all which increased our number of fish tagged and released in Pool 17 to fifty. Next year we plan to tag more Asian carp in pools located upstream of here.

Special thanks for Karl Andersen and Joe Deters (USGS) for helping us complete our work for the week; an extra crew makes a world of difference!

Guns Take Aim at Asian Carp

By Mark Steingraeber

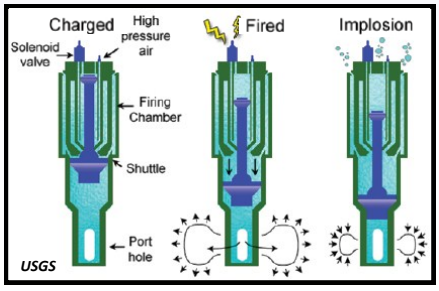
Whether competing athletically to win a game, or ecologically to control an invasive species, many successful teams subscribe to the maxim which states "The best defense is a good offense". Likewise, whether in sports or natural resource management, a multi-faceted plan of focused, pro-active efforts is apt to yield consistently positive results.

The Service's Midwest Regional Fisheries program and its partners have used a similar strategy, termed *Integrated Pest Management*, to help control invasive sea lamprey in the Great Lakes for decades and are now working to bring this philosophy to bear in efforts to limit the spread of Asian carp in the Upper Mississippi River basin.

Thus on October 9-10, Dave Wedan (Regional Safety office), Jeremiah Smith (Columbia FWCO), and I attended a 2-day test demonstration/evaluation of the potential use of high-pressure water guns to deter movements of Asian carp which was convened at the U.S. Geological Survey (USGS) Upper Midwest Environmental Science Center in La Crosse (WI).

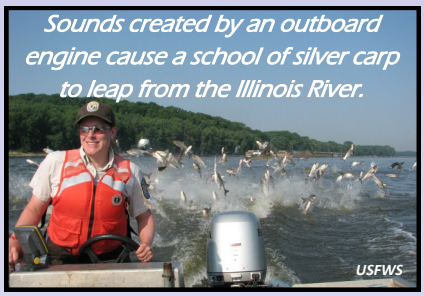
A seismic water gun

Water guns are seismic devices that create underwater sound and are used in the marine oil exploration industry to assess the geological structure of the ocean floor. These guns generate high pressure sound energy waves that may also deter fish movements. USGS researchers are assessing Asian carp responses to water gun firing to determine if high pressure sound waves can be used as a safe and effective barrier to help repel Asian carp and supplement existing electrical fish barriers in locations like the Chicago Sanitary and Ship Canal.



A water gun produces sound waves within a cylinder with a piston; when fired, the ensuing cavity rapidly collapses (implodes), creating a large pulse of pressure.

Fish detect sound waves through pressure receptors in the inner ear and along the lateral line and are behaviorally sensitive to certain frequencies.



Sounds created by an outboard engine cause a school of silver carp to leap from the Illinois River.

Guns used for the tests we observed can operate at pressures of 500-2500 psi and were more powerful than others previously tested with Asian carp.

A large industrial compressor (above) supplies air pressure to the cylinder while a solenoid valve is operated remotely by manual or automated switches (below) that fire the gun.

A seismic water gun, deployed 2 feet below the water surface from this pontoon float, was repeatedly fired in a test pond containing silver carp.

All test fish were tagged with acoustic transmitters that allowed researchers to record precise locations and movements of each fish within the pond before, during, and after the water gun was fired. Analyses of these data are continuing.

Acoustic tagged carp

Each gun shot caused a notable release of pressurized air at the water surface as well as a subsurface pressure wave that was sensed by observers standing at the edge of the pond. Not long after the firing sequence began, several test fish floated to the surface; the first such occurrence ever noted by the water gun research team. More than a dozen of these silver carp fish were quickly recovered; all were alive but visibly stunned by the series of powerful blasts.

Six of these fish and a pair of similar sized, untested (*i.e.*, control) silver carp were subsequently euthanized at the research center and transported in minutes to the Service's Fish Health Center in Onalaska where they were received and processed under strict biosecurity protocols. Autopsy results revealed that a portion of the swim bladder, a buoyancy organ, had ruptured in all test fish.

An in-tact swim bladder

While this injury was not immediately lethal, any fish sustaining such an injury in the wild would be susceptible to delayed mortality, as well as predation. While this may appear to be a welcome outcome for Asian carp, the physical impacts of repeated powerful water gun blasts on non-target species of fish and other aquatic life (*e.g.*, mussels), as well as on critical pieces of infrastructure found in most waterways (*e.g.*, bridge pilings, lock walls, dams), must be thoroughly vetted before seismic technology like this can be confidently deployed in public waters as an Asian carp deterrent.