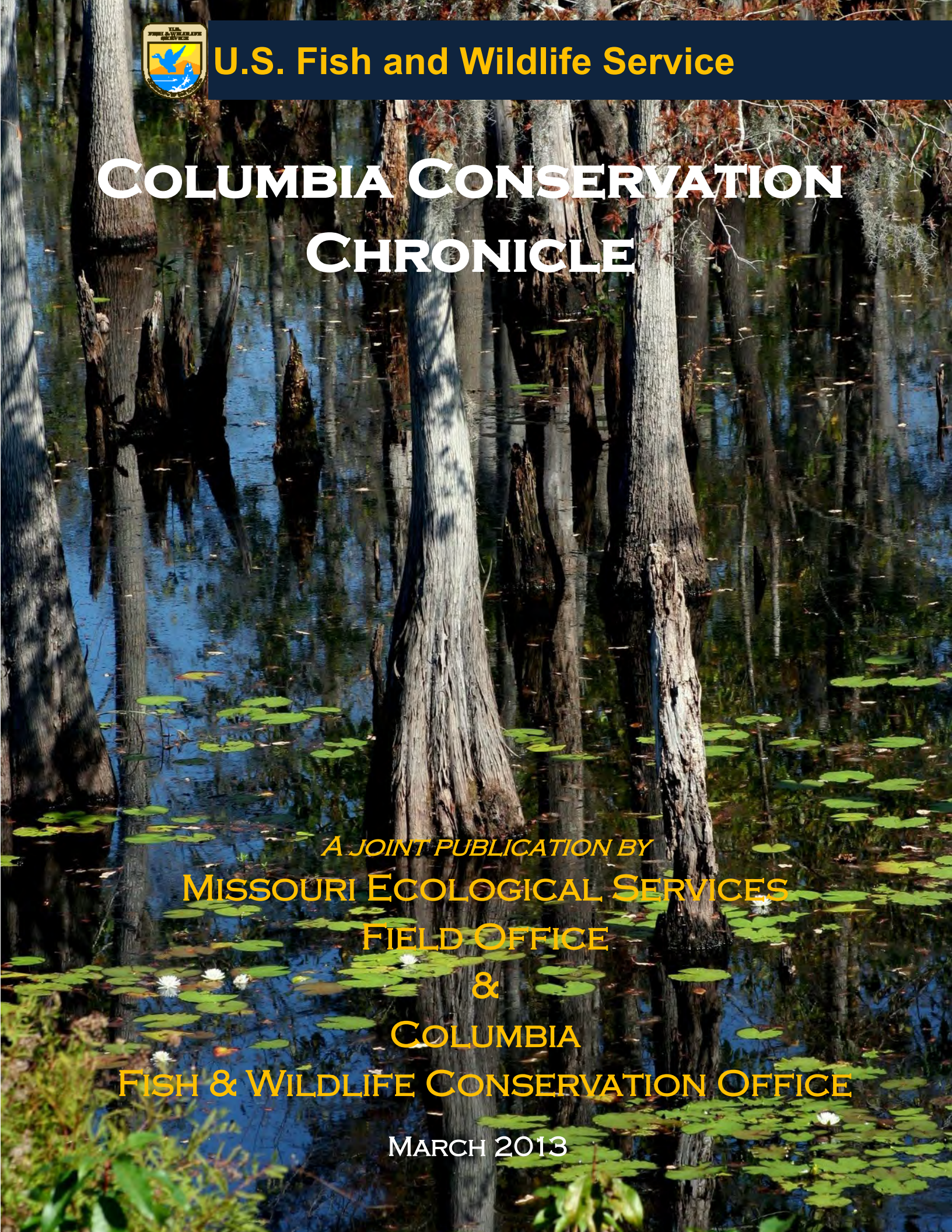

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Inside This Issue

On the Cover: Reflections in a cypress swamp. Photo credit: Rick Hansen, USFWS.

Above: An Indian paintbrush (Castilleja coccinea) blooms among the prairie grasses. Photo credit: Rick Hansen, USFWS.

The Past, Present, and Future of Freshwater Mussels on the Osage River

In 1913, one year after the sinking of the Titanic, a man named William Utterback climbed in a small, wooden boat and rowed down the entire length of the Osage River from eastern Kansas to central Missouri, a distance of over 300 miles. While the scenery must have been amazing, the sole purpose of his adventure was to document, for the first time, the distribution of freshwater mussel species in the Osage River. Utterback found 39 mussel species on his quest down the Osage. One of these species would later be named after him in his honor, the paper pondshell (Genus: *Utterbackia*). This was field biology in its purest form: exploration, discovery, and the identification and description of species. Today, such a study might seem like a fool's errand to some people. However, it was a noble pursuit because mussels play important roles in stream ecosystems. They are also good indicators of stream health due to their sensitivity to environmental changes. Utterback's data is important historical information that is still used today by people who study river ecology and freshwater mussels.

It would be 67 years before the next person would step foot into the Osage River for the sake of freshwater mussels. Although this time only the lower 80 miles of the river could be surveyed. It was 1980, and the Osage River was now a much different place. Most of its length through Missouri had been impounded by large dams. Most of the flowing river was now flat water busy with pleasure boats. Somewhere at the bottom of the lakes lie the ghostly remains of the many mussel shoals that once filtered the water clean. The shimmering riffles, rolling rapids, and reflections of towering bluffs off glassy pools had vanished into the dark depths of the lakes. Much of the riverine aquatic community was gone from the impounded reaches.

Fortunately there is some of the Osage River left to cherish. The last 80 miles of the river still provide flowing water, which is a critical need for native riverine mussels, and the sun still illuminates its natural features. However, it appeared that some of the mussel diversity witnessed by Utterback had been lost. Not all of the species he found were relocated in the 1980 survey. Additionally, several species were found to be very rare, including two that are now federally endangered. More intensive surveys were conducted in 2000 and 2001, and the results were similar. On the other hand, it is difficult to assess rare species and even more challenging to document the absence of a species. Finding small shellfish on the bottom of the river is a daunting task. After all, it is the largest river inside of Missouri.

The most recent biologists to tackle the Osage River in search of mussels are members of the

Bryan Simmons prepares to descend into swift water along a steep channel riddled with boulders to search for the federally endangered spectaclecase mussel. Photo credit: Andy Roberts, USFWS.

(Continued from page 3)

Region 3 Dive Team of the U.S. Fish and Wildlife Service. In the summer of 2012, we completed a four-year project to establish long-term mussel sampling sites on the lower Osage River. During that time we traveled the river several times over searching for mussel beds, mapping sites, conducting preliminary sampling, and delineating monitoring sites. In all, we found 17 significant mussel beds. Now that the preliminary work is done, mussels will be sampled in these areas annually for the next several decades. The purpose of this monitoring project is to track trends in mussel populations, which reflect the overall health of the river. We will also gain insight on the status of rare and endangered species.

The hickorynut (left) and elephantear (right) were among several species only represented by a single individual during survey work conducted between 2009 and 2012 on the Osage River.

In the process of conducting our preliminary work on the Osage River, we explored many types of habitat and found several rare mussel species. In a diverse mussel bed near the mouth of the river we turned up a hickorynut mussel, which has not been collected live since the time of William Utterback. A dead shell of a Lilliput mussel was found in a sluggish, muddy side channel. Likewise, no evidence of that species has been seen since the first survey. We had to negotiate scattered boulders in deep, swift water to locate populations of the endangered spectaclecase mussel. Another endangered species, the pink mucket, occurred in slow moving, shallow pools. We also observed several other species that are very rare in Missouri and the Osage River, including the elephantear, ebonyshell, and Gulf mapleleaf. While these findings may not represent viable populations, it gives hope that these species are still hanging on in the lower Osage River.

We probably already have traveled more river miles on the Osage River than our forefather, William Utterback, but we are much better equipped today to find mussels. I wonder what he would think of our jet boats laden with biologists, SCUBA gear, and various mussel sampling paraphernalia. Would he be impressed or would it remind him of the Titanic?

Acknowledgements: We had help from our partners to accomplish this project including partial funding from Ameren Missouri and hard-working biologists from the Missouri Department of Conservation and Missouri State University. The Region 3 Dive Team in Missouri includes members from both Ecological Services and Fisheries including: Jeff Finley, Bryans Simmons, Joshua Hundley, and Andy Roberts.

Andy Roberts
Ecological Services

A subsample of freshwater mussels collected from a diverse mussel bed on the Lower Osage River.

Casting a Wide (Gill) Net

Each year of gill netting on the Missouri River presents challenges. In past years, flooding, ice flows, or very warm temperatures have hindered progress. This season, the extremely low water levels threw us a curveball. The low water left many boat ramps unusable or hazardous to use, which led to longer travel times to sample sites. Also, accessing many of the habitats we normally sample proved trying at times. Despite these obstacles, by March we had completed standard gill netting for the Pallid Sturgeon Population Assessment Project. We deployed 250 gill nets, equaling more than 9 miles of net, and captured 19 pallid sturgeon. Most of the pallid sturgeon we collected were adult size, with 15 of the pallid sturgeon measuring greater than 30 inches. We also captured 6 lake sturgeon, with the largest weighing over 20 pounds. Other species of interest included shovelnose sturgeon (more than 3,000 individuals) and blue sucker (more than 100 individuals).

Colby Wrasse releasing a pallid sturgeon back to the Missouri River. Photo credit: Jeffrey Muchard, USFWS.

The gill net effort is part of the larger Pallid Sturgeon Population Assessment Project which uses a suite of gears to sample pallid sturgeon and the fish community of the Missouri River. This is the eleventh year we have deployed gill nets for this long term monitoring project. Our 2013 pallid sturgeon total for gill nets represents the second highest annual total we have recorded. Although we commonly collect hatchery reared (stocked) pallid sturgeon, truly wild pallid sturgeon remain exceedingly rare in our samples.

Colby Wrasse
Fisheries

Jeffrey Muchard and Adam McDaniel with a healthy Missouri River lake sturgeon. Photo credit: Colby Wrasse, USFWS.

Injured Hawk Rescued in Saint Louis

Recently, the Columbia Missouri Field Office (CMFO) received a call about a red-tailed hawk which appeared unable to fly and was potentially injured. While a raptor rehabilitation facility in Columbia was willing to receive and treat the hawk; none of their staff were able to drive to Saint Louis to retrieve the animal. The hawk had been in this condition for at least three days, and the caller was concerned about any further delay in medical attention.

Red-tailed hawk prior to capture. Photo credit: Trisha Crabill, USFWS.

Because the hawk had already been without food or water for several days, CMFO offered to assist by driving to Saint Louis to retrieve the bird. Working with the Service's Special Agent Matthew Rogers, biologist Trisha Crabill was able to capture the hawk and transport it to the World Bird Sanctuary, a nearby rehabilitation facility in Saint Louis.

Upon examining the hawk, veterinarians quickly discovered the source of injury -a wound through the chest and into the esophagus. According to veterinarians, the injury could have been the result of a number of things, including colliding with a stick or other object while hunting prey. Unfortunately, wounds penetrating the esophagus often are unable to heal and despite the veterinarians' best attempts, the hawk didn't survive. Although the outcome was disappointing, we appreciate the concern of the people who reported the hawk and the veterinarians who worked to rehabilitate it.

So what should you do if you find an injured bird?

Please call your local veterinarian, humane society, or county or municipal wildlife agency to find the nearest qualified wildlife rehabilitator that can take and treat the bird. Or you may also access the National Wildlife Rehabilitators Association (NWRA) site at the link below to help put you in touch with a qualified rehabilitator. While you are locating a suitable rehabilitator, keep the bird in a dark box in a warm, quiet spot. Do not disturb it or offer it food. Let it rest.

http://www.nwrawildlife.org/content/finding-rehabilitator

Trisha Crabill
Ecological Services

Above left: Veterinarians inspect the hawk for signs of injury. Above right: USFWS biologist Trisha Crabill holds the beak closed while veterinarians clean the wound. Photo credit: USFWS.

Grant Elementary

In March, Heather Calkins and Anna Clark visited the U.S. Grant Elementary School Eco-club in their eco-classroom. An hour was not nearly enough time to quench the thirst for ecological knowledge that these students had. This bright and inquisitive group of children from urban Columbia, did not have an end to the questions about our presentation on adaptations and invasive species. The live fish we brought were a huge hit. We received mixed reactions of delight and distance as we pulled silver carp and shovelnose sturgeon from the murky water, revealing their funky, armored appearance. The children had opportunity to touch and hold the fish, while we had more discussion about adaptations and invasive species in our ecosystems. None of the children had ever heard of an Asian carp or shovelnose sturgeon and it was a huge thrill for them to actually see and hold them. This was as exciting for us as it was for the students. It was very rewarding to reach out to a class that was primarily from the local urban community and that does not get a lot of opportunity to interact with aspects of nature not readily available to them. As the Service looks to future generations to lead conservation, educational events are an effective way to increase visibility and promote recognition of our work.

Anna Clark and Heather Calkins
Fisheries

Heather Calkins helps the Eco-Club at Grant School understand invasive species. Photo credit: Anna Clark, USFWS.

Conservation Briefs

Paul McKenzie provided a bird identification workshop on winter raptors and sparrows to Columbia Ecological Services and Fisheries staff and 16 members of the Columbia Audubon Society on Feb. 20th. Paul then teamed up with Brad Jacobs of the Missouri Department of Conservation to provide the same workshop to 25 members of the Audubon Society of Missouri and refuge staff at an outreach event at Swan Lake National Wildlife Refuge on March 15-16, 2013. The latter workshop included a combination of field trips and classroom presentations. Participants during the workshop observed over 70 species of birds.

Paul McKenzie lectures participants at the Bird Identification Workshop held at Swan Lake National Wildlife Refuge. Photo credit: USFWS.

Paul McKenzie, Trisha Crabill and Shauna Marquardt collaborated with employees of the U.S. Forest Service Region 9 and the Mark Twain National Forest in providing an educational/training webinar on various aspects of Sections 4 and 7 of the Endangered Species Act on February 20th. This training was repeated on March 20th and will also be given on April 17th. Participants in the webinar include Forest Service employees from multiple states throughout the eastern United States.

Paul McKenzie collaborated with the Service's Manhattan, Kansas Ecological Services Field Office and the Missouri Department of Conservation in coordinating two public meetings involving the Service's Jan. 23, 2013 proposed rule, published in the Federal Register, to establish a non-essential experimental population of the endangered Topeka shiner in six counties in northern Missouri. The first public meeting was held Feb. 19 in Eagleville, Harrison, Co. Missouri and the second was held Mar. 7 in Green City, Sullivan County, Missouri. There was no opposition to the proposed introductions.

New publication- Paul McKenzie teamed up with Dr. Marian Smith, Professor Emeritus at Southern Illinois University, Edwardsville, Illinois in the recent publication of a manuscript of a new hybrid plant to science that was the culmination of a 10-year+ research project on the Wichita Mountains. Wildlife Refuge and Fort Sill Military Reservation involving Hall's and Rocky Mountain bulrushes. The manuscript was published in Phytoneuron, an on line, peer-reviewed international botanical journal. The citation for the publication is: Smith, M. and P.M. McKenzie. 2013. *Schoenoplectiella ×magrathii*, a new interspecific hybrid between *S. hallii* and *S. saximontana* from Oklahoma, USA. *Phytoneuron* 2013-19:1-10.

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