



US Army Corps  
of Engineers®

# Stewardship

## news

### YOUR Thoughts

We are looking for contributors and ideas .

✳ If you have a topic, success story, lesson learned, or helpful suggestion—let us know.

Send to: [Tara.J.Whitsel@usace.army.mil](mailto:Tara.J.Whitsel@usace.army.mil)

*Stewardship News is an unofficial publication of the U.S. Army Corps of Engineers (USACE). This online publication is produced quarterly with the purpose of providing its readers information about the USACE Stewardship Program.*

*Editorial views and opinions expressed are not necessarily those of the Department of the Army.*

*Mention of specific vendors does not constitute endorsement by the Department of the Army or any element thereof.*

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## Your Stewardship HQ Update

**POC: Roseana Burick, Environmental Stewardship Business Line Manager, HQ USACE**

As the end of FY21 rapidly approaches and we prepare for the start of FY22 I would like to extend a sincere **THANK YOU** to everyone for the tremendous work completed over the past fiscal year. We continue to efficiently and effectively expend appropriations to ensure the full breadth of the Environmental Stewardship mission is successfully implemented. I recognize the many challenges that lay ahead in the upcoming year as we continue to update project master plans, manage the spread of invasive species, and coordinate our work with more people utilizing our project lands and waters. Our creativity, hard work ethic, and ability to partner with others will continue to advance our mission and the beneficial work we are doing “on the ground”.

*At the end of FY19, SRP involved work on 16 rivers and 5,083 river miles. SRP now involves work on 40 rivers and 10,953 river miles.*

I also wanted to remind everyone about funding opportunities associated with the Sustainable Rivers Program (SRP). The mission of SRP is to improve the health of rivers by changing infrastructure operations to restore and protect ecosystems, while maintaining or enhancing other project benefits. The SRP experienced rapid growth in FY20 and FY21 due to increased budgets. Currently, the SRP is accepting requests for proposals for projects and activities during FY22. All proposals are requested by October 22. Additional information can be found at <https://www.hec.usace.army.mil/sustainableivers/>. POC for additional information is John Hickey. [john.t.hickey@usace.army.mil](mailto:john.t.hickey@usace.army.mil)

**Goodbye FY21....Hello FY22!**

## Working for Pollinators at Cecil M. Harden Lake

**Article provided by Chris DeSmit, Natural Resources Specialist, Cecil M. Harden Lake**

Prairies have always been a symbol of the Midwest and a part of Indiana's natural history. In pre-settlement times, tall-grass prairies occurred in a vast area which extended from Iowa and Missouri to central Ohio. Indiana constituted approximately 15% of this area, with prairies that were concentrated in the northwest and west-central portions of the state. Today, fewer than 1% of these areas remain due to drainage, urbanization and agriculture. While a few large prairies in Indiana have been preserved, most of those remaining are small remnants found in areas left unplowed or undeveloped.

In response to the dwindling amount of prairie habitat in Indiana, as well as the recent USACE pollinator initiative, the staff at Cecil M. Harden Lake made it a priority to restore and expand upon prairie and pollinator friendly plantings over the past two years. In the spring of 2020, wet conditions and onsite staffing issues due to Covid-19 halted pollinator progress. However, staff were eager to begin working on the sites once again this year. Several sites were burned with prescribed fire, while others were planted.

*Photo: An Eastern Black Swallowtail rests on a Purple Coneflower at Cecil M. Harden Lake.*







## Congratulations!

Jennifer Mullins, USACE, is the winner of the 2nd annual DoD PARC Photo Contest in the Best Reptile (non-snake) category with her photo of an Eastern Collared Lizard at Table Rock Lake!

## Did You Know?

August 14<sup>th</sup> was World Lizard Day. Please help us recognize these awesome creatures that are important members of our ecosystems.

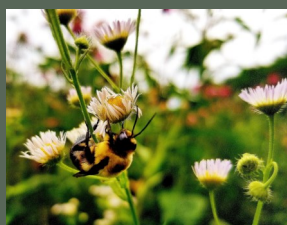
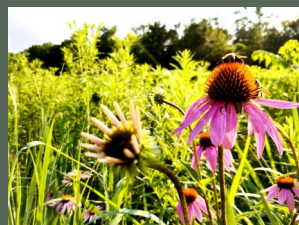
# Working for Pollinators Continued

2

A seed drill, donated by partners from the Indiana Chapter of Pheasants and Quail Forever, was used to plant over 6 acres. Within those 6 acres, close to 80 pounds of seed consisting of over 27 different species of native forbs and grasses including Purple Coneflower, Common Milkweed, American Senna, Partridge Pea, Indian Grass, and both Little and Big Bluestem were planted. Prior to seeding, the sites were cultivated with the use of both mechanical and chemical means in order to better prepare the soil and help combat the presence of the noxious weeds and invasives that once grew rampant there.



In total, more than 10 acres of warm season grasses, fescue, and noxious weeds are slowly being transformed into diverse plots of native forbs and grasses. When working with native plantings, both patience and persistence are needed. The rule of thumb for most native plants is "sleep, creep, leap." The first year the plants sleep, the second year they creep, and the third year they leap. Thus, it typically takes several years for efforts to be truly realized and appreciated. The 10+ acres are spread across seven different sites at Cecil M. Harden Lake with the majority of sites below the dam. Once established, these plots will offer a spectacular view from atop the dam of an array of color and life for those recreating at the project.



**Photos Upper Right Block:** (Top) A view from atop the Cecil M. Harden Lake Dam during the planting of one prairie plot. (Bottom) An early spring prescribed burn being conducted on a small plot. **Photos Bottom Block:** (Top) First year prairie planting after mowing to a height of 10" in order to help combat noxious weeds and invasive plants. (Middle Left) Bumble Bees rest on a Purple Coneflower. (Middle) Bumble Bee rests on a Daisy Fleabane flower. (Middle Right) An assortment of native warm season grasses, purple coneflower, and purple bergamot in an established prairie plot. (Bottom) A mature, well established prairie plot in full summer bloom.





# Learning More

**1 The RAIL Tool.** July brought the official live release of the Rapid Avian Information Locator (RAIL) Tool. <https://data.pointblue.org/apps/rail/#>.

This is a collaborative effort among multiple organizations with funding for tool development provided by the Bureau of Land Management and the U.S. Fish and Wildlife Service. Birdlife International, Cornell Lab of Ornithology and Bird Conservancy of the Rockies contributed data input with Point Club Conservation Science making the tool functional.

There will be updates coming soon on the tool in addition to an eBird data update being done within the next year that will further improve results.

The RAIL bird profiles are pulling graphics and information from six different data sources. Below are the list of sources, along with links to the source websites and information about the specific pieces of information being drawn into the tool from those data sources.

- *PIF Population Estimates Database*
- *Avian Conservation Assessments Database*
- *The Cornell Lab of Ornithology's All About Birds Database*
- *The Cornell Lab of Ornithology's McCauley Library*
- *Birdlife International*
- *Spreadsheet with supplemental information compiled by USFWS*

Click here to access the tool!


Rapid Avian Information Locator (RAIL)

Before using this tool, please read [About the RAIL Tool](#)

SELECT AREA GET RESULTS

Use all available species

Species Results FILTER RESULTS (Currently showing 268 of 268 results)

Bird Species	Population Estimates	Conservation Status	Detail
 Barn Owl <i>Tyto alba</i>	Global: 3,600,000 Continental U.S.: 130,000	State Threatened: OH State Endangered: CT, RI, IA, MI	

## Online Tick Training

Shared through the Armed Forces Pest Management Board, a self-paced introduction to ticks, tick-borne diseases, and tick control is available for anyone interested in learning more about ticks. This training will provide information on tick biology, identification, surveillance methods, tick management, common tick-borne diseases, safety and prevention, and how

all of these modules connect to overall public health. Training is provided through the University of Florida IFAS Extension.

<https://ifas-secvbd.catalog.instructure.com/courses/online-tick-training-course>



**2** DoD PARC has developed many exceptional educational products over the years including brochures, posters, PowerPoint presentations and fact sheets. However, their newest initiative takes outreach to an entirely new level!

DoD PARC is excited to announce the **DoD PARC Species Profile Video Series**. Over the next year, they will be developing many 2-3 minute videos on a variety of amphibian and reptile species on DoD lands. The intent of these videos is to inform and educate military natural resource managers on the ecology and life history of these amazing species, and make them easily available online, on cell phones, and on social media.

Check out the first few videos on YouTube following the links below!  
*Note: you may need to disconnect from your VPN to view the videos.*

- Episode 1—Cottonmouth: <https://youtu.be/H3ZkNeWljgg>
- Episode 2—Copperhead: [https://youtu.be/C0KMr6\\_7gMo](https://youtu.be/C0KMr6_7gMo)
- Episode 3—Spotted Turtle: <https://youtu.be/FM1vOnUpf-Q>
- Episode 4—Eastern Box Turtle: <https://youtu.be/YBtGD9KjTgo>
- Episode 5—Rough Greensnake: <https://youtu.be/2k60tU1iRV8>





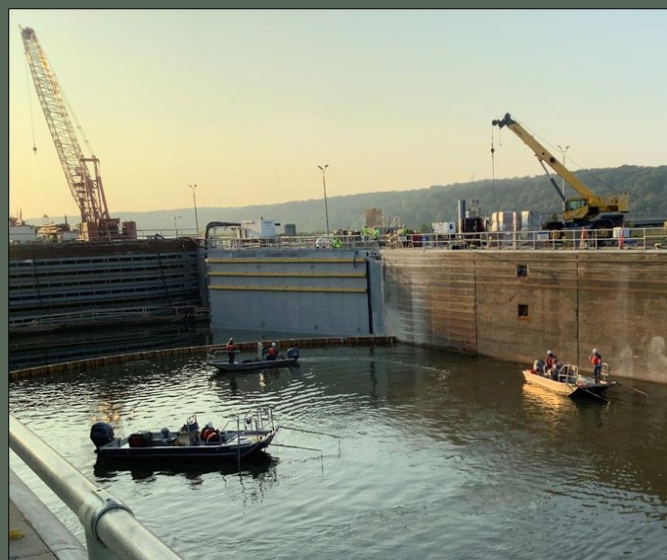
## Starved Rock Lock and Dam: Lock Chamber Dewatering Fish Relocation



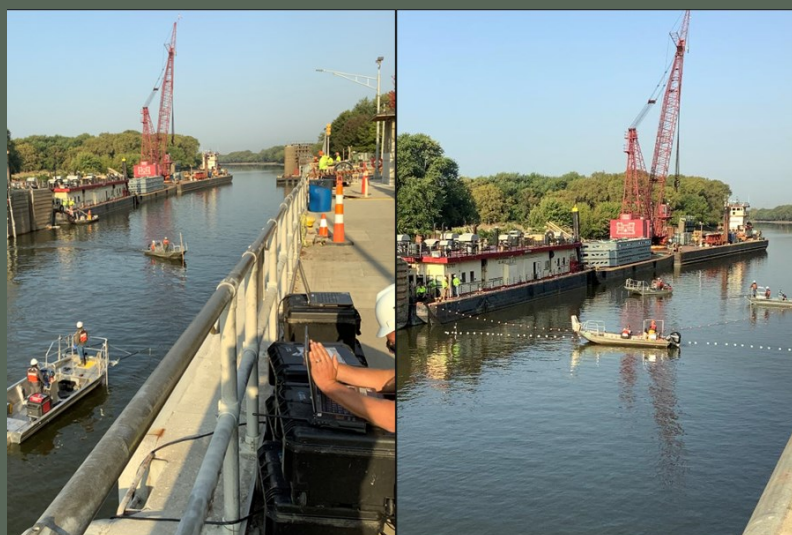
The Rock Island District dewatered Starved Rock Lock on July 8, 2020. This was done as part of the 2020 Illinois Waterway Consolidated Closures to conduct repair and maintenance work. Dewatering resulted in the stranding of thousands of fish, primarily invasive Silver Carp, necessitating a massive cleanup effort. After several months of construction, the District rewatered the lock to move equipment for miter gate replacements. A subsequent dewatering was planned so that construction could be completed in dry conditions. Prior to re-watering, Starved Rock Lock & Dam staff placed fencing material over all intake and outlet structures in the lock chamber to prevent fish from being trapped or hiding in these areas.

District biologists consulted with the Illinois Department of Natural Resources (DNR) and U.S. Geological Survey (USGS) to determine appropriate methods to reduce the number of fish stranded during the second dewatering event.

Biologists from both the USGS Columbia Environmental Research Center and USGS Upper Midwest Environmental Sciences Center agreed to assist the District on-site for the second dewatering event. Using a combination of technologies and methods known to deter invasive Silver Carp, they were able to reduce the stranding of these invasive fish.



On September 24, 2020, USGS installed four, fixed ARIS (Adaptive Resolution Imaging Sonar) (Sound Metrics, Bellevue, WA; two 3000 models set to 1.8 MHz frequency, and two 1800 models set to 1.1 MHz frequency) multi-beam imaging sonars inside the Starved Rock Lock chamber. The ARIS were mounted within recessed areas of the lock walls to monitor and compare fish activity before, during, and after the fish clearing effort. USGS also deployed four boats on-site for the effort. There were two dual-deterrent boats which were outfitted with electricity and underwater acoustic equipment to deter Silver Carp, thus driving them out of the lock chamber. Another boat was outfitted with side-scan sonar to detect fish in each portion of the lock chamber, and the final boat had a block net which was deployed at the downstream end of the lock. USGS biologists in the dual-deterrent boats began driving fish from the lock chamber at dawn using their equipment, revving boat engines, and making circles at the upstream end of the lock to startle Silver Carp Schools.



*Photo Top Circle: Rock Island District Fish Biologist, Bethany Hoster, holding a Northern Pike, one of the many sport fish successfully relocated alive from Starved Rock Lock back to the Illinois River.*

*Photos Left: USGS boats driving fish from lock chamber using dual deterrents.*

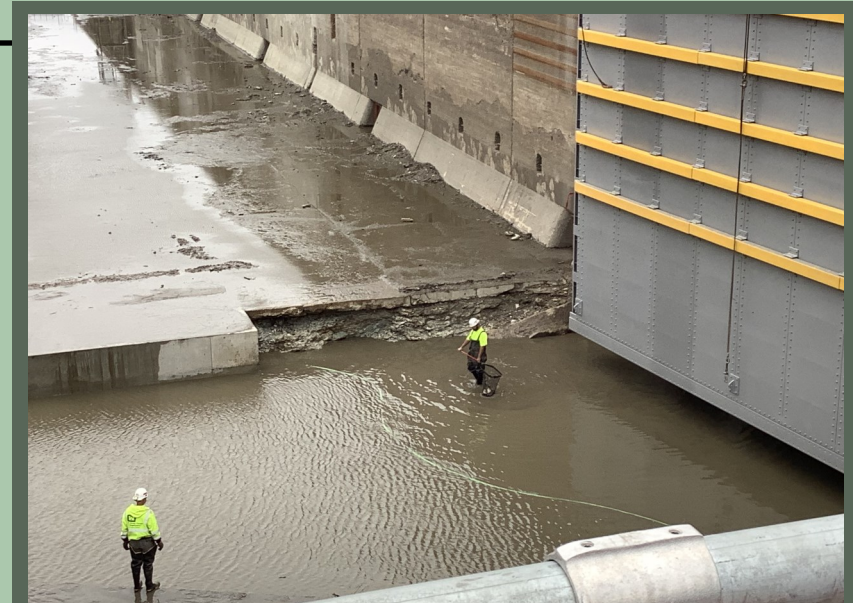
*Photos Right: USGS observing fish movement on ARIS sonars (left) and deploying a block net to limit fish movement back into the lock chamber (right).*



## Dewatering Continued

The boat equipped with side-scan sonar tracked Silver Carp school movements and gave directions to the dual-deterrent boats. USGS biologists stationed on the lock walls monitored the ARIS sonars for fish movement in a downstream direction. After a period of monitoring, USGS biologists estimated a few hundred fish remained in the lock, far fewer fish than during the July 2020 dewatering event. Since remaining fish would not leave the lock chamber, the net boat proceeded deploying the block net at the downstream end of the lock chamber. USGS left the block net in place until the District's dive team reinstalled bulkheads to close access to the lock.

The District began dewatering the lock chamber on the afternoon of September 24. By the morning of September 25, only one foot of water remained in the lock, with an additional 3-4 feet remaining in the miter gate recess. Pumping limitations in shallow water required an additional 24 hours before effective removal and relocation of remaining fish could commence. Recovery and relocation of stranded fish began on September 26. The District positioned two employees in the miter gate recess in the lock chamber with dip nets to catch stranded fish. The District also staged a concrete mixing bucket filled with water in the lock chamber to place fish. Once the bucket was sufficiently full of fish, a heavy lift crane raised the bucket onto the lock wall for Bethany Hoster, the District's Fish Biologist, to identify and enumerate fish. Following data



*Photo Above: U.S. Army Corps of Engineers employees netting fish to be lifted out of the lock chamber at Starved Rock Lock and Dam.*



*Photo Right Circle: Bucket lifted from the lock chamber onto the lock wall for Rock Island District Fish Biologist, Bethany Hoster, to identify and enumerate fish prior to release (Photo Above).*

collection, the crane lifted the bucket and emptied it into the Illinois River downstream of the lock. All fish were relocated into the Illinois River downstream of Starved Rock Lock and Dam. The relocation effort lasted approximately eight hours and led to the relocation of 702 fish. Relocated fish were primarily native species and included many sport fish species, such as Channel Catfish, Northern Pike, Black Crappie, White Crappie, Walleye, and Sauger. USGS's combined technologies and methods prevented the stranding of thousands of invasive Silver Carp. The significant coordination and partnership between the Rock Island District, USGS, and Illinois DNR allowed safe relocation of native fish while maintaining the construction schedule.

**Article provided by  
Bethany Hoster,  
Biologist, Rock  
Island District**





## St. Louis District's Rivers Project: Forest Management Geodatabase & Bat Monitoring



### St. Louis District's Rivers Project: Forest Management

To view the St. Louis District FMG data online, visit: <https://usace-mvs.maps.arcgis.com/apps/webappviewer/index.html?id=895ee893cfe1456dbdc9cc2645c96215>

Interested in learning more about the FMG? Contact a forester from MVP, MVR, and MVS: Andrew Meier, MVP; Ben Vandermyde, MVR; Lauren Mcneal, MVR; Brian Stoff, MVS

years, with second iteration inventories now occurring.

This robust set of data on past and current conditions of forest resources is housed in the Forest Management Geodatabase (FMG). The framework has a nested polygon design starting at the pool level (the portion of the River between Locks and Dams), to compartment, unit, site, and lastly stand. It reflects how foresters organize, analyze, and manage the forest across each project. The FMG also has tools built through Geographic Information Systems (GIS) to summarize data, conduct quality assurance, and more. This provides natural resource managers a data-driven system that can support management decisions and inform project development from a larger systematic scale down to a single forest stand and provides the most accurate data possible.

How does the Forest Management Geodatabase (FMG) work?

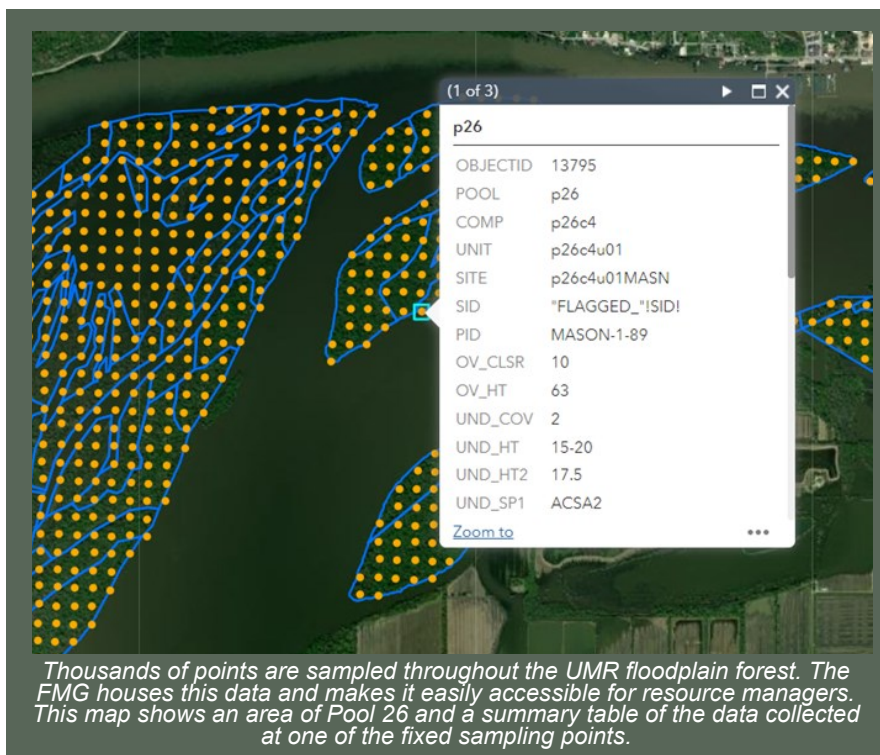
- Data is collected in the field using pre-determined points. This data is then loaded into the geodatabase.
- Quality Assurance tools built into ArcGIS run in a sequence to check the data for errors or inconsistencies.
- Summary tools can take data and build tables using a variety of parameters i.e. species diversity, health, plot and stand summary, etc.
- Data can be used to calculate stand prescription sheets, which can be used by USACE foresters and biologists, partner agencies, and stakeholders to assess forest conditions and develop management plans. Wildlife conservation can be integrated into these plans to target habitat management for species of concern.
- Forest prescriptions can be developed and implemented, including invasive species management, tree planting, timber stand improvement, etc.
- This process is repeated every ten years, building onto our knowledge of the UMR forest over time.

The FMG is not just used by USACE resource managers. Partner agencies such as the USFWS are utilizing the data housed in the FMG to improve habitat for wildlife and are working with USACE foresters to adapt protocols to fit their needs. Non-federal agencies have access to this data as well.

Forest communities in the Upper Mississippi River (UMR) system have changed drastically since the 1800s due to deforestation for agriculture and fueling steamboats, hydrological changes, and the spread of invasive species. This shift in forest diversity and composition impacts wildlife that rely on different tree species for food, nesting, shelter, and other habitat needs. The U.S. Army Corps of Engineers (USACE) manages over 160,000 acres of public land along the UMR across three Districts: St. Paul, Rock Island, and St. Louis. Much of this land includes bottomland forest habitat.

As there has been an increased focus on ecosystem restoration in the past several decades, there has been an accompanying need to understand the condition of forest resources to efficiently focus management efforts. This is especially true along the Upper Mississippi River and its large contiguous tracts of forest. In the 1980s, the three UMR USACE districts conducted a timber inventory to summarize forest metrics and used aerial images and field data to delineate forest stands. A second phase of timber inventory was initiated in 2004 with the development of a standard inventory protocol. This protocol involves a high-

density survey across floodplain forest managed by the UMR districts, with data such as tree species, tree health, canopy height, diameter at breast height (DBH), age, and woody and herbaceous understory species collected across thousands of points. These points are resampled using the standardized protocol every ten





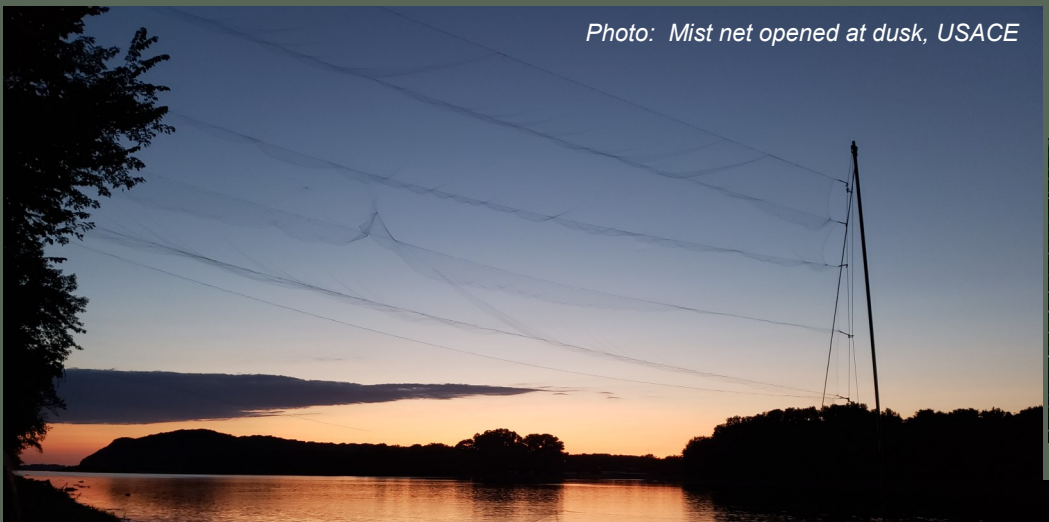
# Rivers Project Continued

The USACE Rivers Project Office partnered with the National Audubon Society to develop the Upper Mississippi River Bottomland Forest Avian Stewardship Plan in 2018. Data from avian surveys conducted throughout the USACE floodplain is being analyzed with data from the FMG to develop avian-focused forest management recommendations. Both these examples show the value of such a comprehensive set of data across the UMR.

As we continue to see factors such as invasive species impact forest communities and wildlife, collaborative data-driven management will be essential to understand and conserve our natural resources.

**Bat Monitoring:** Bat populations across the country have declined drastically in the past several decades due to habitat loss and fragmentation, human disturbance, and the rapid spread of White-nose Syndrome (WNS), a deadly disease that has killed millions of bats since its initial discovery in 2006. The USACE St. Louis District Rivers Project Office began monitoring bats in 2010 with the goal of determining the species, populations, and habitat-use of bats across floodplain forest in the Upper Mississippi River. These monitoring efforts are particularly targeting the federally endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septentrionalis*). Bat biologists sample in summer using mist nets, which are thin, nylon nets stretched across two poles, to capture bats as they become active after dusk. If an Indiana or northern long-eared bat is captured, radio transmitters are placed on their backs so they can be tracked to their roosting sites. Roost sites are where bats will rest during the day and are often large, dead trees. Bats are also checked for signs of WNS, though no detections have been recorded at the Rivers Project since

Photo: Mist net opened at dusk, USACE



the monitoring program began. This year, contractors sampled several islands in Pool 24 of the Upper Mississippi over the course of three weeks in June and July. They captured three big brown bats, six red bats, six gray bats, six evening bats, and three Indiana bats. Two Indiana bats, one male and one female, were tagged and followed to three different roost trees. One bat can use multiple day roost sites, as was the case of the tagged female Indiana bat.

The Rivers Project also conducts in-house acoustic sampling throughout the summer using audio detectors that record the ultrasonic calls of bats. The audio is run through specialized software that can identify different species by the frequency and length of the recorded call. This provides additional data on what bat species are utilizing USACE managed habitat. The data collected from these surveys is essential in informing natural resource managers about the habitat needs of bats in the floodplain. This information can then be integrated into management plans and objectives to improve bat habitat and prevent a negative impact to existing roosting and foraging habitat. For example, if areas with a lower tree density are favored by certain bats, forest management techniques can target thinning trees in other stands to provide better habitat for that species.

**Article provided by Insiyaa Ahmed, Rivers Project Office**

## Indiana and Northern<sup>7</sup> Long-eared Bats

Indiana and northern long-eared bats captured during bat monitoring are fitted with radio transmitters so they can be traced back to their roost sites. Emergence counts are conducted at dusk as the bats leave the roost to forage for insects at night. Information on what the bats are using as a roost site and how many bats are using it provides habitat and population data.



Photo: Indiana bat with tracker, USACE




Photo: Red bat in mist net, USACE

Photo below: Indiana bat, USACE. Indiana bats were listed as federally endangered in 1967 due to large population declines caused by human disturbance of hibernating populations overwintering in caves.





**1** Lake Sakakawea. Article from the Devils Lake Journal, "Zebra mussel infested pontoon highlights ANS danger to Lake Sakakawea". <https://www.devilslakejournal.com/story/news/2021/07/06/zebra-mussel-infested-pontoon-highlights-ans-danger-lake-sakakawea/7812019002/>

 [Click here to access article!](#)



Created in 1954 with the completion of the construction of the Garrison Dam, Lake Sakakawea is the nation's second largest man-made lake, the third by volume, and one of North America's premier fishing destinations. The lake hosts more than 35 recreation sites and offers more miles of shoreline than the California Pacific Coast. It provides flood control, irrigation, hydroelectric power, and supports municipal water systems for tens of thousands of North Dakotans. Recreation on Lake Sakakawea supports approximately 1,000 jobs and generates more than \$140 million in visitor spending. Amy Taborski, North Dakota Tourism

## Upcoming Webinars

**September 15, 1 p.m. CT: Flowering Rush Biology, Management, and Control.**  
[https://us02web.zoom.us/join/wn\\_fc8nKODtT7mKDY0ub\\_28Xg?utm\\_medium=email&utm\\_source=govdelivery](https://us02web.zoom.us/join/wn_fc8nKODtT7mKDY0ub_28Xg?utm_medium=email&utm_source=govdelivery)

**October 20, 1 p.m. CT: Forestry BMPs for Invasive Species.**  
[https://us02web.zoom.us/join/wn\\_UsM0vLBVQ32IVSKV\\_SvzNA?utm\\_medium=email&utm\\_source=govdelivery](https://us02web.zoom.us/join/wn_UsM0vLBVQ32IVSKV_SvzNA?utm_medium=email&utm_source=govdelivery)



## Spotted Lanternfly

The spotted lanternfly has made its way to Indiana, the farthest west it has been found. It was discovered in late July in Switzerland County, southeastern Indiana, in a woodlot within two miles of the Ohio River and the Markland Dam (USACE).

<https://www.indianaenvironmentalreporter.org/posts/invasive-species-spotted-lanternfly-found-in-indiana>

**2** **Raptors for Flood Control.** Article from All About Birds.  
<https://www.allaboutbirds.org/news/raptors-for-flood-control/>

 [Click here to access article!](#)

**3** LSU Ag Center adjunct professor Christopher Mudge (USACE ERDC) has produced several short videos on id and control for some common trouble species in the southeastern U.S., although several species have ranges beyond that of the southeast. Support for this effort was provided by Aquatic Plant Control Research Program, managed by USACE ERDC.

- Southern Naiad <https://youtu.be/Udb9eN6N51M>
- Cuban Bulrush <https://youtu.be/OzZUTltxzk>
- Crested Floating Heart <https://youtu.be/RvYIITQ3XPE>
- Hydrilla <https://youtu.be/1PVRMexiWVU>
- Duckweed <https://youtu.be/Du6ZZLzjEho>



**Aquatic Weeds**  
 with Christopher Mudge





## Some Interesting Reading & Viewing

**4 Past Webinar: HABs.** On July 29, 2021, EPA's Office of Science and Technology (within the Office of Water) held a webinar entitled, **EPA Tools for Managing CyanoHABs in Drinking and Recreational Waters**, to increase awareness of EPA's tools and resources for helping states and tribes on this subject. Representatives from California, New York, Ohio, and Oregon also presented their outreach and risk communication resources related to cyanoHABs and their toxins in recreational and drinking waters. In addition, webinar participants had the opportunity to share their challenges in managing and communicating the risks from cyanobacteria and their toxins with EPA.

A recording of the webinar as well as presentation materials are available here: <https://www.epa.gov/cyanohabs/webinar-us-epas-tools-managing-cyanohabs-drinking-and-recreational-waters-july-29-2021>

**5 Tracking CyanoHABs StoryMap.** EPA has published a new ArcGIS StoryMap that will allow the public to learn about and track reported cyanobacterial HABs (cyanoHABs) in freshwaters across the country. It consolidates freshwater advisory and closure information from state environmental and health agencies into user-friendly, interactive maps. In addition, the story map includes links to information on freshwater HABs causes and effects; several EPA tools on HABs preparedness and response; and state and local HAB resources such as the laboratories that perform analysis of water samples for cyanotoxins. [www.epa.gov/](http://www.epa.gov/)

**6 Longleaf Restoration Initiative—2020 Range-wide Accomplishment Report.** This report celebrates 10 years of accomplishments, translating to positive outcomes for local economies, national defense, rare species, recreation, forest resiliency, wildfire risk, clean air and water, carbon sequestration, and climate change mitigation. In 2020, partners were able to accomplish more than 138,000 acres of longleaf establishment, 1.4 million acres of prescribed fire, and 34,000 acres of land protection. The report can be accessed through the following link. <http://americaslongleaf.org/> and <https://www.facebook.com/>

## Past Webinar <sup>9</sup>

### National Conservation Training Center (USFWS)

#### Thinking About Adaptation: Exploring the Resist-Accept-Direct Framework

What will you learn?

<https://fws.rev.vbrick.com/#/videos/3d468dcb-47bf-4f43-8cc8-efece0da832a>

Climate change is a complex management problem because it involves persistent change across large landscapes and is difficult to address locally. Conditions fueled by or worsened by climate change may favor species new to an area over those that have been longtime inhabitants. The result: ecological transformation—a thorough system makeover that can occur when species move due to changes in their surrounding environment. Recognizing the need for coordinated action, representatives of several natural resource management agencies met in 2018 to develop a framework to address ecological transformation. The Resist-Accept-Direct framework allows managers to choose from three management responses: • Resist the direction of change, by working to maintain or restore function, structure or composition, based on historical or table current conditions. • Accept the direction of change, by allowing the change to occur without intervening. • Direct the change, by actively managing processes, function, structure or composition toward a new desired condition.

Cases: Exploring landscape management in the southwest, coastal forest transition in Maine, and cold-water fish management in the upper Midwest.

Photo: Cover, range-wide report

### America's Longleaf Restoration Initiative 2020 RANGE-WIDE ACCOMPLISHMENTS

