



US Army Corps
of Engineers®

Stewardship

news

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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

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.

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Your Stewardship HQ Update

POC: Roseana Burick, Environmental Stewardship Business Line Manager, 202-263-9067

As the end of the fiscal year rapidly approaches, I would like to take this opportunity to thank each and every one of you for all of the work accomplished over the past year—it sure went by quickly! This issue of Stewardship News provides several great examples that showcase the diversity and complexities of our environmental stewardship program. Thank you to each that took the time to submit an article and I can't wait to see what is shared in the future. Until then, be safe and enjoy the change in seasons as fall arrives.



See page 9 for information on proposal requests for the Sustainable Rivers Program

Photo Above: An aerial view of Jennings Randolph Lake, Baltimore District.

Garrison Project Acquires Mussel –Muscle to Assist with ANS Prevention Efforts

Article provided by Joan Koob and Scott Sterling, Garrison Project

The Garrison Project acquired *Mussel-Muscle* to assist with aquatic nuisance species (ANS) prevention efforts as part of an ongoing focus to ramp up prevention and education efforts. Scott Sterling and Joan Koob, USACE biologists at North Dakota's Garrison Dam, secured mussel sniffing K-9s to assist in boat inspections at the state's oldest and largest walleye fishing tournament, the Governor's Walleye Cup. Scott and Joan fetched the help of two K-9 Wardens out of Washington State. These K-9s have been trained and certified in quagga and zebra mussel detection. The highly invasive and easily transported mussels are rapidly spreading across the west, and Garrison Project staff are implementing initiatives to prevent their spread in the upper Missouri River. Utilizing the mussel sniffing K9s at the Annual Governor's Walleye Cup was the first use of mussel sniffing K9s for the State of North Dakota. Puddles and Finn, the K-9 sniffing professionals, were received with great excitement and anticipation by the Governor's Walleye Cup board of directors and the participating anglers. The two dogs greatly cut down on inspection and registration times. The dogs inspected all 260 boats in 120 minutes, approximately 46 seconds per boat (including our human lag time!). It was an eye-opening experience seeing how well the K-9s complement human inspectors not only by increasing the efficiency and effectiveness of prevention efforts, but also by helping to raise public awareness.

Article continued on page 2

Photo: A mussel trained dog performs a vessel inspection at the Garrison Project during the annual walleye tournament.



Garrison Project continued

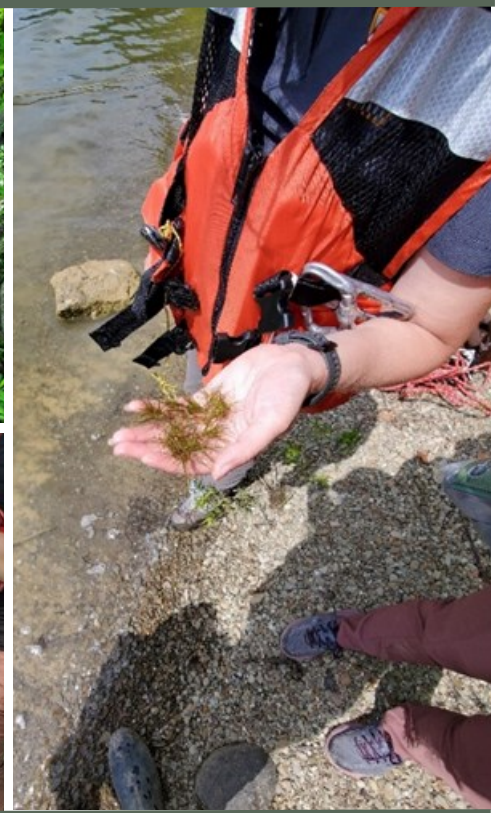
simultaneously. It was a successful weekend with no mussels detected! In addition to the K-9 demonstration, Garrison Project staff have begun to execute other education and prevention strategies such as Awareness Wednesday social media campaign, recruiting the USFWS Dive Inspection Team, and hiring Recreation Area ANS Inspectors in partnership with the State. The Garrison Project staff plans to continue expanding upon their current prevention efforts and hopes to implement K-9s more in the future.



Photos: Garrison Project staff with K-9 demonstrations and aquatic nuisance species control efforts.

Subaquatic Vegetation Survey at Shenango Lake

Staff at Shenango Lake partnered with Pennsylvania Department of Conservation of Natural Resources (DCNR) and Mercer County Conservation District to investigate a report on the possible presence of hydrilla in the lake. Together, a survey was designed to inventory likely areas of subaquatic vegetation, document species present, and report the findings as appropriate. Upon completion of the survey, hydrilla was determined to not be present while Coontail, Spad-derdock, and Brittle Naiad were confirmed.



New Nationwide Genetic Study of the Aquatic Invasive Plant, *Hydrilla verticillata* Aims to Detect Cryptic Populations of a Recently Introduced Biotype

POC: Dean Williams (Department of Biology, Texas Christian University), Michael Greer (ERDC – Technical Director's Office), Nathan Harms, (ERDC- Aquatic Ecology and Invasive Species Branch)

Hydrilla (Hydrilla verticillata L.f Royle), is an aquatic invasive plant that significantly impacts freshwater resources in the U.S. by its aggressive, canopy-forming growth that degrades aquatic ecosystems, limits recreation, fouls boat motors, and clogs irrigation and hydro electric plants. *Hydrilla* was introduced into the southern and the northeastern United States from India and South Korea in the 1950 and early 1980s

respectively. These introductions correspond to genetically and ecologically distinct dioecious and monoecious biotypes. In 2018, a new type of hydrilla was found in the Connecticut River in the state of Connecticut. This type was determined to be genetically distinct from the previous two introductions (Photo 1).

Dioecious and monoecious hydrilla biotypes are closely related but differ in their phenology, biocontrol compatibility, and susceptibility to herbicides. Currently, the monoecious biotype has a more northern distribution in the U.S. while the dioecious biotype has a more southern distribution, although there are some waterbodies where the two biotypes are found together (Figure 1). The new introduction in Connecticut belongs to a separate phylogenetic clade (clade C) than the dioecious or monoecious biotypes and matches a common biotype found in China between 38-46° latitude, suggesting it may pose a problem mainly in more northern waterbodies.

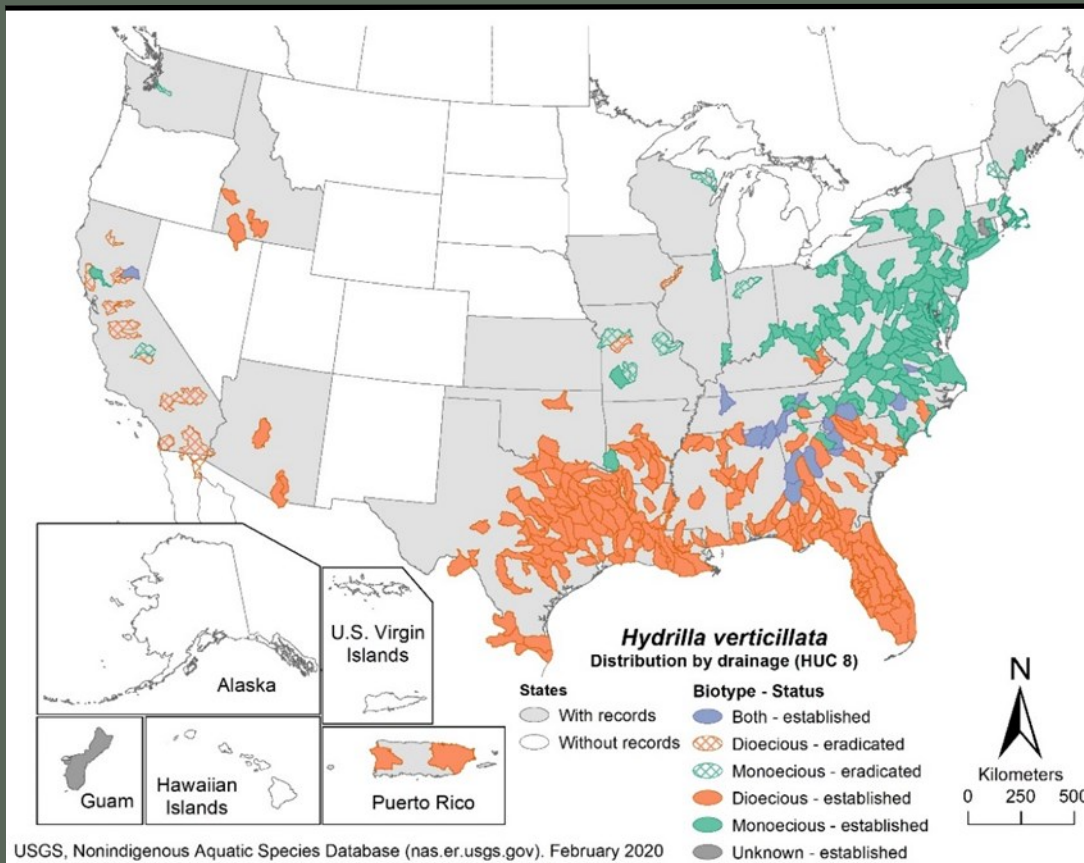


Photo 1 (Top Circle). The three recognized haplotypes of *Hydrilla verticillata* that are currently found in the US: dioecious (left), monoecious (center), and the new CT River population (right).

Figure 1. Distribution of hydrilla biotypes in the U.S. The new introduction is not displayed on this map.

<https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=6>, Revision Date: 2/3/2020, Peer Review Date: 10/27/2015.

New Nationwide Genetic Study Continued...

The three hydrilla biotypes in the U.S. will probably require different control measures, and so knowing the geographic distribution of these introductions will help with their effective management. Additionally, although hydrilla reproduces asexually in the U.S., when multiple types co-occur, there is a possibility of hybridization. Hybridization between biotypes could increase invasiveness or decrease the efficacy of control actions.

If the new introduction is still localized in/near the CT River, it may be possible to eradicate it and if it has spread, then other management options will need to be considered such as long-term control efforts. While most of the known management differences in these variables for hydrilla correspond to differences between biotypes it may also be useful to know the distribution of genetic variation within biotypes. The standing level of genetic diversity can be related to the probability a population becomes adapted to local conditions or develops resistance to control measures such as fluridone resistance in dioecious hydrilla. Waterbodies with a similar genetic makeup may be expected to respond in a similar fashion to control efforts while those that are different may not. Similarly, waterbodies with relatively high genetic diversity may have more variable responses to control measures than lower diversity waterbodies. If levels of genetic diversity are known, managers can take this information into consideration when monitoring the efficacy of control measures.

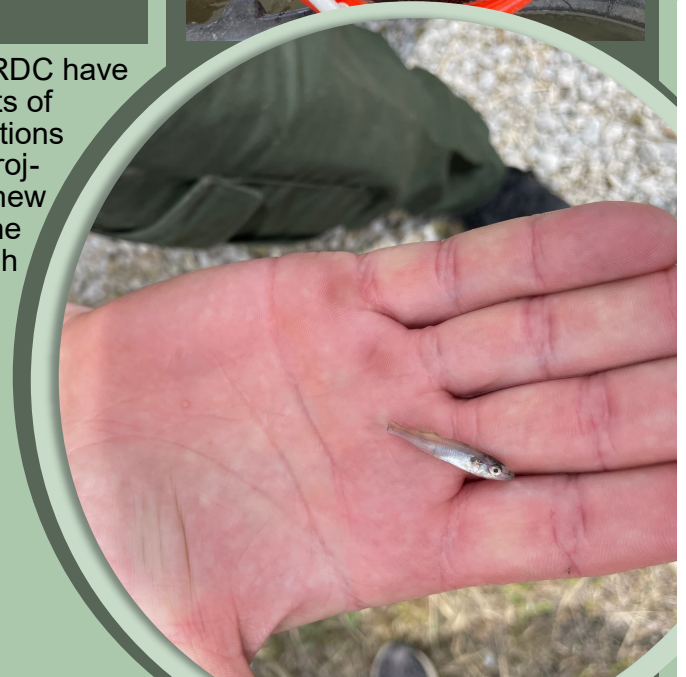


Biologists assist in the collection of hydrilla as part of the effort to determine biotype.

Since 2013, researchers at Texas Christian University and ERDC have conducted overseas surveys to locate biological control agents of hydrilla and conduct genetic analysis to match hydrilla populations in the native and introduced ranges. Beginning in 2020, the project team began work to identify the geographic extent of the new hydrilla introduction by conducting concentrated surveys in the vicinity of the CT River and more dispersed collections throughout the US in waterbodies that have not been previously sampled. The project team is working with Corps' Districts, State, and local partners to collect specimens from 18 states and over 100 sites to determine how widespread the newly introduced strain is in the US. Once known, management plans can be tailored to region or waterbody, depending on the type of hydrilla present. Based on preliminary results, the CT River had the most recent introduction of hydrilla (clade C) along an approximately 50-mile section that was sampled, and all other sites outside the CT River were the monoecious biotype. Work is ongoing through FY22 and final results should be available in FY23.

Partnership Results in Successful Fish Stocking Program

In partnership with the Illinois Department of Natural Resources and through the volunteer support of the Lake Shelbyville Fish Habitat Alliance and Eastern Illinois University, Lake Shelbyville was stocked with over 215,000 Fin and Feather Sauger in May, 2022. Stocked from brood ponds, the average length of fish stocked were 1.48" with a total stocked fish weight in excess of 170 pounds.



Paleontological Discoveries on the Columbia River

Article provided by **Brett Forge, Walla Walla District**

A mastodon jawbone was found on Apr. 14, 2022 by a member of the public while walking Corps lands on the Columbia River near Pasco, WA. The man notified USACE staff so that preservation could occur. With the help from experts at the Wanapum Heritage Center in Tri-Cities, the Walla Walla District Cultural Team and Tri-Rivers NRM staff were able to properly account for this piece of history. While surveying the site the cultural team also discovered petrified wood and a scapula, most likely from a large mammal such as an elk or bison, that lived in the area thousands of years ago. Fossils such as these are documented and protected by law. The long-term plan for the mastodon jawbone is to make it available for public viewing at the Walla Walla District Visitors Center.



Sharing: Department of Defense Avian Knowledge Network Program

A memo from the Office of the Assistant Secretary of Defense (OSD) provides endorsement for DoD Components to use Avian Knowledge Network (AKN) for their avian data needs to the maximum extent practicable. Additionally, the memo provides information on the DoD Legacy Resource Management Program's support of AKN.

<https://corpslakes.erc.dren.mil/employees/bird/pdfs/AKN-USA001065-22.pdf>



Photos (Clockwise beginning in upper left): Mastodon jawbone with scale, mastodon jawbone, scapula, petrified wood.

From USACE

U.S. Army Corps of Engineers announces completion of the Champlain Canal Aquatic Invasive Species (AIS) Barrier Phase I Study— The U.S. Army Corps of Engineers, New York District, in partnership with the Lake Champlain Basin Program (LCBP) and the non-Federal sponsor, New England Interstate Water Pollution Control Commission (NEIWPCC) announces the completion of the Champlain Canal Aquatic Invasive Species (AIS) Barrier Phase 1 Study. The purpose of the Phase 1 Study was to compare the costs, benefits, and effectiveness of different management alternatives that could best prevent the spread of aquatic invasive species between the Hudson and Champlain drainages via the Champlain Canal. The study's objectives were to examine alternatives to prevent the transfer of Aquatic Invasive Species between the Hudson River Basin and Lake Champlain Basin and recommend an alternative with a favorable cost to benefit ratio. The Phase 1 Study concluded that the Alternative 2 Physical Barrier Plan provides the most effective method for preventing the transfer of non-native aquatic invasive plant and animal species between the Lake Champlain and Hudson River Watersheds. Alternative 2 includes several measures to limit the transfer of non-native aquatic invasive plant and animal species including: a physical barrier across the canal, a large vessel lift, a vessel ramp, a cleaning station located north of the Glens Falls Feeder Canal and repairs to the existing lock seals. The estimated cost of Alternative 2 is approximately \$20,000,000.

Link: https://www.nan.usace.army.mil/Media/News-Releases/Article/3039909/us-army-corps-of-engineers-announces-completion-of-the-champlain-canal-aquatic/?utm_medium=email&utm_source=govdelivery

Master Plan Revisions: Norfolk Lake Example

Currently, over 150 master plans across USACE are either under revision or are scheduled for revisions to occur in the upcoming FY. One such example of a revision underway is at Norfolk Lake in the Little Rock District. The new master plan focuses on sustainability of future management while also incorporating the previous management. It allows for constructive growth without harming the natural resources of the project and allows competing interests to be managed in a more balanced manner. Potential effects on the natural and social environments, such as fish and wildlife, recreation opportunities, economics, land use, cultural and historical resources, aesthetics, and public health and safety were analyzed and taken into consideration the planning phase.

Due to high pool elevations over the past few years, several launch areas have not been accessible. As part of the revision process, highwater launches were identified and included in the plan for the project. Additionally, public meetings were held where members of the public were able to view the revisions being presented and speak with park rangers and USACE personnel regarding the update process. Public comment was received through a website established for the Master Plan revision; the level of public support for plan's update was high. The National Environmental Policy Act (NEPA) was conducted a part of the revision resulting in a Finding of No Significant Impact (FONSI) signed by the Little Rock District Commander.

The Master Plan Revision has been finalized, signed, and is available at <https://www.swl.usace.army.mil/Missions/Planning/Norfolk-Lake-Master-Plan-Revision/>. It will also be posted to the NRM Gateway.



PDT Mapping Team Meeting



Building Beaver Dam Analogues Below Chief Joseph Dam

Article shared by Matt McHugh, Chief Joseph Dam

Last year several groups partnered together to construct Beaver Dam Analogues (BDAs) in the Foster Creek drainage, which empties into the Columbia River directly downstream of Chief Joseph Dam. The basic idea of a BDA is to install an artificial beaver dam (using wooden posts and native plant material/branches) in sections of the river channel that ideally collect sediment, pool water and eventually start to widen the river channel, creating more riparian habitat. A majority of the Foster Creek drainage is channelized/incised but shows evidence of previously having a wide floodplain. Returning to, or getting close to a wider floodplain, is the end goal of this effort.



The Foster Creek Conservation District organized a significant portion of work related to the project. USACE staff were able to provide a lot of the material needed and hosted several work groups and public seminars. The Utah State University Restoration Consortium also partnered in the project by providing experts with experience in this type of habitat construction. The Consortium has been studying and implementing BDA strategy and were present to help explain the process and lead focused workshops. Additional information on the Consortium is found online at <https://lowtechpbr.restoration.usu.edu/>.

One of the more interesting things learned by USACE staff during this effort is that in many instances, as the river channel spreads out and slows down, beavers in the area will take up residence in the BDAs and will add on to them on their own. Beavers present in the general area have actually learned to use sagebrush to construct their dams; therefore, that material was used in the BDAs installed in the Foster Creek drainage.



National Funding For Sustainable Rivers Program—2023

POCs: John Hickey, Senior Hydraulic Engineer, (530) 756 - 1104 john.t.hickey@usace.army.mil

Sustainable Rivers Program (SRP) funding supports a mix of programmatic and location-based work. In broad terms, programmatic work focuses on developing strategies to generate more environmental benefits from water infrastructure and location-based work focuses on advancing, implementing, and incorporating environmental strategies at specific water infrastructure projects. Advancing involves defining potentially beneficial environmental strategies. Implementing involves testing the effectiveness and feasibility of the defined strategies. Incorporating involves including tested strategies in policies that guide how infrastructure is operated. Programmatic and location-based work are complementary with each generating new ideas, honing methods, and demonstrating the benefits of environmental actions. SRP relies on that tandem to promote strategies such as environmental flows, pool level management, habitat creation, and fish passage at general multi-purpose reservoirs, locks and dams, dry dams, and other infrastructure.

For FY23, SRP has the following objectives for location-based work:

1. Accelerate implementation and incorporation of beneficial environmental actions at existing SRP sites.
2. Expand SRP geographically.
3. Broaden the types of environmental actions being used by SRP to achieve sustainable management of water and ecosystems.
4. Continue to adapt SRP methods to other infrastructure types, especially locks and dams, dry dams, Section 7, and other structures (e.g., control structures, pump stations, etc.).

Ideas for location-based work are invited via Requests for Proposals (RFPs). In past years, separate RFPs were done for general, locks and dams, and dry dams. This year those are merged into this single RFP. Due dates are offset per infrastructure type to allow teams working on more than one type to best prepare proposals. As in past years, teams are welcome to submit proposals for any infrastructure type per the general due date. SRP will coordinate with teams to make sure proposals are considered wherever they will best compete.

Proposals are essentially brief descriptions of the intended environmental action(s) your team is interested in pursuing with SRP and the expected outcomes. Proposals should be formulated per SRPs advance, implement, incorporate process and should clearly describe how proposed work aligns with process. SRP is open to multi-year proposals. If the overall effort is expected to span more than one year, that can be included in the proposal. For example, proposals by teams with capacity to advance environmental strategies in the first year and implement in subsequent years would be welcome. A key component for successful FY23 proposals is inclusion of specific, demonstrable milestones to achieve incorporation, even if multiple fiscal years are required.

In addition to the objectives listed above, the following topics are of particular interest to SRP and are expected to compete well during review of proposals:

1. Preparation of scientific narratives about ecosystem responses to operational changes --- videography and photography efforts of ongoing location-based work are good examples
2. Organization of regional environmental strategy meetings --- many opportunities and challenges are consistent regionally, perhaps at a Corps Division-scale --- the recent North Atlantic Region Operations and Water Management meeting is a good example.
3. Management of water temperatures for environmental benefits, especially at multi-purpose reservoirs

Responses to this call for proposals are requested by October 13 for general and by October 27 for locks and dams and dry dams.

Increased budgets in FY20-22 have enabled rapid Program growth.

At the end of FY19, SRP involved 16 rivers and 5,083 river miles.

SRP now involves 44 rivers and 12,069 river miles.

And for the first time, SRP is in the FY23 Presidents Budget at \$5M, which means SRP expects to receive funds starting at the beginning of next fiscal year, even if federal budgets are administered through continuing resolutions.



Photo: Egret by Ann Marie DiLorenzo, NAD

Some Interesting Reading & Viewing



FROM DOD PARC

Question: What U.S. snake species eats other snakes (including those that are venomous), is colored black with white to yellow cross bars, and is confirmed present on approximately 40 military sites?

Answer: Eastern Kingsnake (*Lampropeltis getula*).

Learn more about the Eastern Kingsnake by watching the new DoD PARC Species Profile Video (see links below):

YouTube: <https://youtu.be/WTOHIK0c5N0>

 [Click here!](#)

Also, the 2021 PARC Annual Report is now available. Learn what PARC has been up to this past year and how DoD PARC fits into the larger PARC network. <https://parcplace.org/wp-content/uploads/2022/07/2021-Annual-Report-reduced.pdf>

 [Click here!](#)

1 ERDC Report: Identification and Preventative Treatment of Overwintering Cyanobacteria in Sediments: A Literature Review — By Alyssa J. Calomeni, Andrew D. McQueen, Ciera M. Kinley-Baird, and Gerard A. Clyde, Jr.

Abstract: Freshwaters can experience growths of toxin-producing cyanobacteria or harmful algal blooms (HABs). HAB-producing cyanobacteria can develop akinetes, which are thick-enveloped quiescent cells akin to seeds in vascular plants or quiescent colonies that overwinter in sediment. Overwintering cells produce viable “seed beds” for HAB resurgences and preventative treatments may diminish HAB intensity. The purpose of this literature review was to identify (1) environmental factors triggering germination and growth of overwintering cells, (2) sampling, identification, and enumeration methods, and (3) feasibility of preventative algaecide treatments. Conditions triggering akinete germination (light $\geq 0.5 \mu\text{mol m}^{-2}\text{s}^{-1}$, temperature 22-27) differ from conditions triggering overwintering *Microcystis* growth (temperature 15-30, nutrients, mixing). Corers or dredges are used to collect surficial (0-2 cm) sediment layers containing overwintering cells. Identification and enumeration via microscopy are aided by dilution, sieving, or density separation of sediment. Grow-out studies simulate environmental conditions triggering cell growth and provide evidence of overwintering cell viability. Lines of evidence supporting algaecide efficacy for preventative treatments include (1) field studies demonstrating scalability and efficacy of algaecides against benthic algae, (2) data suggesting similar sensitivities of overwintering and planktonic *Microcystis* cells to a peroxide algaecide, and (3) a mesocosm study demonstrating a decrease in HAB severity following preventative treatments. This review informs data needs, monitoring techniques, and potential efficacy of algaecides for preventative treatments of overwintering cells.

Link: <http://dx.doi.org/10.21079/11681/45063>

 [Click here!](#)

2 ERDC Report: The Use of US Army Corps of Engineers Reservoirs as Stopover Sites for the Aransas–Wood Buffalo Population of Whooping Crane — By Jacob F. Jung, Richard A Fischer, Chester McConnell, and Pam Bates.

Abstract: This technical report summarizes the use of US Army Corps of Engineers (USACE) reservoirs as spring and fall migration stopover sites for the endangered Aransas–Wood Buffalo population of whooping cranes (WHCR), which proved much greater than previously known. We assessed stopover use within the migration flyway with satellite transmitter data on 68 WHCR during 2009–2018 from a study by the US Geological Survey (USGS) and collaborators, resulting in over 165,000 location records, supplemented by incidental observations from the US Fish and Wildlife Service (USFWS) and the USGS Biodiversity Information Serving Our Nation (BISON) databases. Significant stopover use was observed during both spring and fall migration, and one reservoir served as a wintering location in multiple years. Future efforts should include (a) continued monitoring for WHCR at USACE reservoirs within the flyway; (b) reservoir-specific management plans at all projects with significant WHCR stopover; (c) a USACE-specific and range-wide Endangered Species Act Section 7(a) (1) conservation plan that specifies proactive conservation actions; (d) habitat management plans that include potential pool-level modifications during spring and fall to optimize stopover habitat conditions; and (e) continued evaluation of habitat conditions at USACE reservoirs.

Link: <http://dx.doi.org/10.21079/11681/44980>

 [Click here!](#)

3 Journal of Fish and Wildlife Management: Financial Analysis of Converting Rural Lawns to Pollinator Habitat in the Corn Belt. Posted to the NRM Gateway. Link: <https://corpslakes.ercd.dren.mil/employees/pollinator/resources.cfm>

 [Click here!](#)