U.S. Army Corps of Engineers
Fiscal Year 2021
Handshake Program Application

Please review instructions before completing application!

Corps Lake/River Project Name: **Nolin River Lake, Rough River Lake**
District / Division:**LRL/LRD**
Handshake Proposal Title: **Reef ball shoreline erosion control**
Corps POC Name:**Chris Boggs**
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A. Checklist:

1.	Will the Handshake funds be spent on Corps facilities and resources that are being fully maintained by the Corps? (not in outgranted parks)	☒ **Yes** ☐ **No**
2.	Will the Challenge Partnership agreement be with a non-federal public or private entity(ies)?	☒ **Yes** ☐ **No**
3.	Is the proposed activity within current authorities and contained in the annual or 5-year work plan in the approved lake project OMP?	☒ **Yes** ☐ **No**
4.	Have all of the NEPA requirements been considered for this project?	☒ **Yes** ☐ **No**
5.	I am aware the Challenge Partnership Agreement must be reviewed and Approved by District Office of Counsel before sending to HQUSACE.	☒ **Yes** ☐ **No**
6.	If the full funding amount requested is not available, could a portion of this Handshake Project be completed with partial funding?	☒ **Yes** ☐ **No**
7.	I am aware that all government funds must be spent in accordance with FAR, DFAR and AFAR contracting laws and regulations, and that Handshake funds cannot be provided to the partner(s).	☒ **Yes** ☐ **No**
8.	Did you participate in a Handshake Webinar in 2019 or review a 2019 Handshake Webinar on the Gateway?	☒ **Yes** ☐ **No**

B. Handshake Funding Request (maximum $25,000): $24,985

C. Incentive Points Category: Check the appropriate box if your application qualifies to receive bonus points on the evaluation score.

☐ This project will be completed with a national MOU partner with which the Lake or Project hasn't previously partnered. (100 points).

☐ This project reduces O&M cost to the Corps over the lifecycle of the proposed project or improves existing infrastructure. (100 points).

D. <u>Describe your partnership and the proposed Handshake Partnership Project</u>:

Project applications will be evaluated on the categories below. Please complete each section as appropriate.

Summary Statement:

Shoreline erosion at USACE reservoirs is pervasive; erosion control methods are frequently cost prohibitive and/or logistically difficult due to lack of access & scope. This handshake proposal will purchase fiberglass molds which will be used to construct concrete reef balls (hollow, dome-shaped structures with numerous holes/passages to dissipate wave action). See attached photo & http://www.reefball.com/ Once completed, these structures can be placed with precision in front of eroded shoreline (location & water depth) using several different methods: transported onsite by heavy work boat, floated & towed by Jon boat, or hauled to the site after winter drawdown. We anticipate that dissipating wave action will reduce shoreline erosion, allowing sediment deposition behind the reef balls. Additional efforts to hydroseed native seed mixes & plant live stakes directly on the eroded shoreline area will 'jump start' vegetative growth, helping to stabilize the shoreline in the future. Active shoreline erosion is negatively affecting lake storage capacity through siltation. Sediment transported through erosion degrades water quality, increases potential HAB events, increases costs to local municipal water suppliers, & negatively impacts aquatic & terrestrial biological diversity. The overall result of this project will be a more aesthetic shoreline with reduced shoreline erosion, reduced sediment transport through the system, improved water quality, & positively impacted fisheries.

Handshake Funding Cost Break Down:

Fiberglass reef ball molds:

Pallet size (2.9' tall x 4 ' diameter base): $4,333.00 x 3 = $12,999.00

Bay-size (2' tall x 3' diameter base): $2,278 x 4 = $9,112.00

Mini-bay size (1.75' tall x 2.5' base): $1,437 x 2 = $2,874.00

Total: $24,985.00

Longevity / O&M description:

The fiberglass molds used to construct reef balls have an estimated life span of 25 years. In FY20, using a grant from the Reservoir Fisheries Habitat Partnership, Nolin River Lake and the Kentucky Department of Fish and Wildlife Resources purchased a small number of reef ball molds which will be used to provide habitat in deeper water. This Handshake application (including expenditures and anticipated work) is limited in scope to one year following receipt of funds (anticipated to be Oct 2021-Sept 2022). This project will address shoreline erosion at Nolin and Rough River Lakes. However, the molds can be used for the next ~25 years at multiple lakes. Under an agreement with the Reef Ball Foundation, the reef balls constructed with these forms can be used at any lake/reservoir in Kentucky. The Kentucky Department of Fish & Wildlife Resources plans to expand reef ball use beyond Nolin and Rough River lakes, initially targeting other local USACE lakes before expanding into other parts of the state; this work would be completed in part by KDFWR funding. Six other Louisville District lakes have expressed interest in out-year construction/placement of reef balls to reduce shoreline erosion, and they have said they will use project funds to purchase supplies/materials and for labor. Huntington and Nashville District lakes in KY would also be allowed to construct/install reef balls using these molds, but we have not yet reached out to them to determine their level of interest. While work at these additional projects is not within the scope of this proposal, it demonstrates the potential for long-term use of the reef ball molds at multiple USACE projects, yielding widespread benefits. Handshake funds used in this project will support erosion control measures at multiple USACE projects in Kentucky at an amortized cost of $1,000 per year for 25 years.

Partnership Value:

The Kentucky Department of Fish and Wildlife Resources (KDFWR), which is providing the majority of partner contributions, is responsible for fish and wildlife management at most Louisville District projects. USACE is responsible for all other management activities (water quality monitoring, administration of Shoreline Management Plans, erosion control, fee boundary inspection/maintenance, etc). USACE has worked with KDFWR on previous occasions to install habitat structures (recycled Christmas trees, brush piles, artificial

structures), and we are now branching out into erosion control and water quality initiatives. KDFWR personnel will be instrumental in the construction, transportation, placement, and monitoring of the reef balls; they are providing concrete and additives; additionally, we plan to use their work barges to transport the reef balls and other supplies/materials. KDFWR has been instrumental in reaching out to other potential partners to determine interest, not only for the initial year of work, but also for proposed work in outyears in other areas of the state. Planning and developing this proposal has already improved communication and interactions between KDFWR and USACE personnel and we look forward to continuing. Likewise, we regularly work with the Friends groups at Rough and Nolin River Lakes, but these projects have mainly been recreation-related. We are eager to involve the Friends in this Environmental Stewardship project. The Friends of Nolin Lake (FONL) will contribute $2,000 worth of volunteer labor to this project. FONL volunteers will be present on work days to document the work, pour concrete, and plant vegetation. They will also use their social media pages to promote this effort and seek to gain additional partners as work is accomplished. The Friends of Rough River Lake will purchase one reef ball mold, stating emphatically that they have wanted erosion due to wave action to be addressed for a long time. They will consider additional financial contributions in the future, but could not commit additional funds at this time.

Recreational Benefit:

Significant shoreline erosion is common at USACE reservoirs. Eroded shoreline is not visually appealing and affects visitors' recreational experience. Nolin and Rough River Lakes contain numerous points and small islands which are eroding away due to wave action. As these features erode further, they will become hazards which could result in damage to boats or injuries to people. Armoring the entire shoreline with rip rap would reduce or eliminate erosion, but would affect the aesthetic quality of our reservoirs. Armoring with rock could only be installed at an extremely high cost. If reef balls work as expected, we will be able to improve the aesthetics of badly eroded areas at participating reservoirs in Kentucky in a cost-effective manner. While not a part of this application (and not included in anticipated contributions), KDFWR has said that they plan to enhance the erosion control measures by installing artificial fish habitat structures in deeper water below the reef balls, which will improve fish habitat in these areas. Additionally, improved water quality may reduce the occurrence of HABs, which have had a significant negative impact on recreational use of Nolin and Rough River Lakes.

Environmental Stewardship Value:

Reducing shoreline erosion will have widespread ES benefits. Reducing active erosion will give terrestrial vegetation the opportunity to spread into disturbed areas, providing additional bank stabilitzation and additional wildlife habitat. Reducing the sediment load will improve water quality for recreators and aquatic wildlife and reduce loading in downstream channels. The reduction of suspended sediment also has the potential to reduce the occurrrence of HABs. While not a focus of this project, there will also be benefits to fisheries at the target lakes by providing habitat for smaller fish and other aquatic life in shallow water. Additional fisheries benefits will occur as KDFWR installs fish habitat structures in deeper water.

Communication & Education Value:

Nolin River Lake previously completed an erosion control project using Longitudinal Peaked Stone Toe Protection, which involved placing a triangular-shaped mound of riprap 6-8 feet off the bank along 900 feet of badly eroded shoreline. The project has functioned well, but required the use of a barge and excavator to reach an area that could not be accessed by land, which made the work very expensive. Nolin personnel have been in communication with ERDC about developing a planning tool and a manual to provide guidance on erosion control issues and possible innovative intervention methods. If this project works as anticipated, it could be included in this manual for communication Corps-wide. In terms of communication with the public, the project would be advertised in local media and on our very active Facebook pages to inform the public of opportunities to get involved with this project as volunteers, the value provided by our partners in this project, the efforts we are making to provide good stewardship of public lands, and the links this project has with related Corps missions (Recreation, Flood Risk Management, and Navigation).

Innovativeness:

Reef balls have been used extensively in marine habitats to reduce erosion, provide structure to encourage reef growth, and facilitiate beach beach restoration through natural deposition of sediment rather than renourishment or replenishment from outside sources. According to information received from the company, there are only two locations using these structures in freshwater environments (Tennessee and Arizona). However, the primary focus in these areas is fish habitat, where the reef balls are installed in deeper water (10-20 feet deep). To our knowledge, this would be the first application in a freshwater system focused on reduction of shoreline erosion by placing the reef balls in shallow water (2-3' deep). Most existing erosion control techniques developed and studied by USACE have focused on stream banks, coastal waterways, and navigational routes. There are no existing guidelines available to establish priorities to treat excessive shoreline erosion in reservoirs. If this project works as anticipated, it could set an example of an option for reducing or preventing erosion in relatively inaccessible areas at a relatively low cost.

Conclusion:

This revolutionary proposal will provide immediate benefits at two USACE projects, including benefits to the ES, REC, FRM, and Water Supply missions. Partners plan to expand this initiative to other USACE projects in Kentucky. This proposal can serve as an example of a method to address shoreline erosion in relatively inaccessible areas, allowing USACE and partners to address a widespread issue at a relatively low cost.

Double click on spreadsheet to access data entry fields and to enter Partner names.

You MUST enter partner names into the spreadsheet:

	Local Corps Offices (RRL & NRL)	Handshake Funds	KY Dept of Fish & Wildlife Resources	Reef Innovations	Friends of Rough River Lake	Friends of Nolin River Lake
Salaries	$16,000	N/A	$19,000	$0	$0	$0
Travel	$0	N/A	$0	$0	$0	$0
Materials and Supplies	$21,800	$24,985	$3,000	$0	$4,333	$0
Equipment Use	$0	$0	$4,000	$0	$0	$0
Funds Contributed	N/A	N/A	$0	$0	$0	$0
Personal Property	N/A	N/A	$0	$0	$0	$0
Volunteer	N/A	N/A	$0	$0	$0	$2,000
In-Kind Services	N/A	N/A	$0	$0	$0	$0
Other (explain below)	$1,200	$0	$0	$23,173	$0	$0
Total	**$39,000**	**$24,985**	**$26,000**	**$23,173**	**$4,333**	**$2,000**
Share of Total Cost	32.6%	20.9%	21.8%	19.4%	3.6%	1.7%
	53.5%					

	Partner 5	Partner 6	Partner 7	Partner 8	Partner 9	Partner 10
Salaries	$0	$0	$0	$0	$0	$0
Travel	$0	$0	$0	$0	$0	$0
Materials and Supplies	$0	$0	$0	$0	$0	$0
Equipment Use	$0	$0	$0	$0	$0	$0
Funds Contributed	$0	$0	$0	$0	$0	$0
Personal Property	$0	$0	$0	$0	$0	$0
Volunteer	$0	$0	$0	$0	$0	$0
In-Kind Services	$0	$0	$0	$0	$0	$0
Other (explain below)	$0	$0	$0	$0	$0	$0
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Share of Total Cost	0.0%	0.0%	0.0%	0.0%	0.0%	0

	Partner 11	Partner 12	Partner 13	Partner 14	Partner 15	Total
Salaries	$0	$0	$0	$0	$0	$35,000
Travel	$0	$0	$0	$0	$0	$0
Materials and Supplies	$0	$0	$0	$0	$0	$54,118
Equipment Use	$0	$0	$0	$0	$0	$4,000
Funds Contributed	$0	$0	$0	$0	$0	$0
Personal Property	$0	$0	$0	$0	$0	$0
Volunteer	$0	$0	$0	$0	$0	$2,000
In-Kind Services	$0	$0	$0	$0	$0	$0
Other (explain below)	$0	$0	$0	$0	$0	$24,373
Total	**$0**	**$0**	**$0**	**$0**	**$0**	$119,491
Share of Total Cost	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Explanations:
Local Corps office (NRL)—Other expenses: Shipping of reef ball molds: $1,200

Reef Innovations: Discount for purchasing through the Reef Ball Foundation instead of retail pricing: $23,173 (retail price of reef balls is $61,380). Through the Foundation, purchase price is $38,207 ($24,985 in Handshake Funds, $8,889 from Rough River Lake, and $4,333 from the Friends of Rough River Lake).

Local Corps offices supplies/materials breakdown:
RRL: Reef ball molds: $8,889
Concrete & additives: $4,111
NRL: Concrete & additives: $4,300
Live stakes/native seed mix: $2,000
Lumber used in constructing reef balls: $1,000
Replacement bladders: $500
Misc parts: $1,000
KDFWR: Concrete and additives: $3,000

Example reef ball.

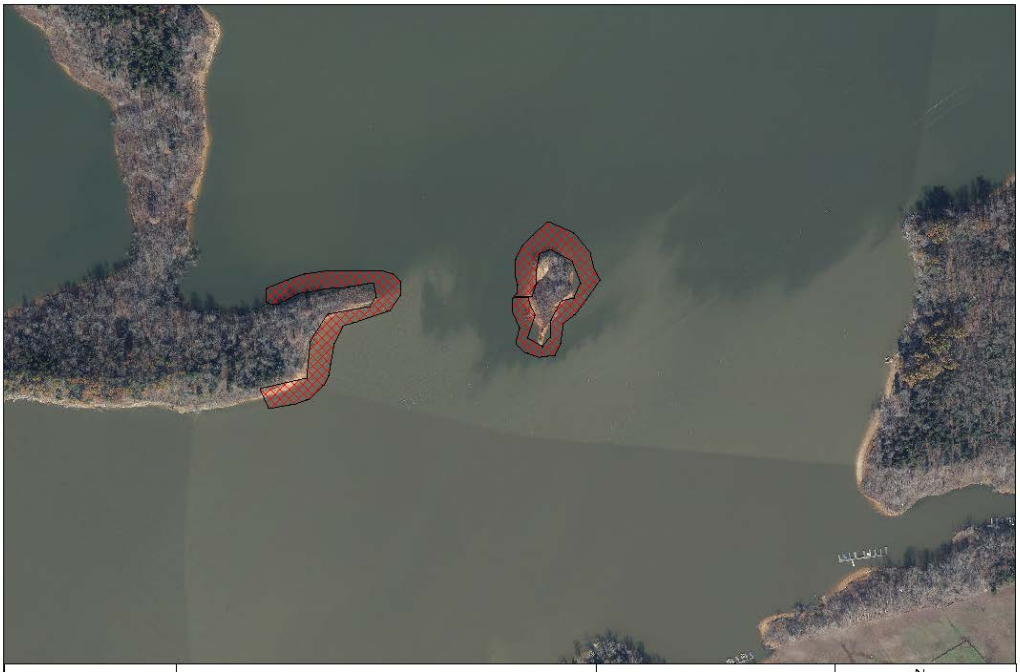
Typical eroded shoreline.

Proposed Rough River Lake Erosion Control Locations: Year 1

US Army Corps of Engineers

Axtel Campground
Erosion Control Area

N
Feet
0 140 280



US Army Corps of Engineers

Small Island/Aqua View
Erosion Control Area

N
Feet
0 280 560

Proposed Nolin River Lake Erosion Control Locations: Year 1