

ANNUAL PERFORMANCE REPORT

For

Statewide Fisheries Investigation Project

Part I of III

Subsection I: Fisheries Habitat Branch



Project Leader: *Mike Hardin*, Assistant Director

Co-Project Leader: *Spencer Phillips*, Statewide Fisheries Habitat Biologist

Project Assistants: *Nick Keeton and Chad Nickell*, Fish and Wildlife Management Foremen



Department of Fish and Wildlife Resources
Fisheries Division



STATE: Kentucky

PROJECT NO: F-40-47

GRANT TYPE: Research and Survey

GRANT TITLE: Statewide Fisheries Investigations

SUBSECTION 1 TITLE: Fisheries Habitat Program

PERIOD COVERED: 1 April 2024 – 31 March 2025

RESEARCH AND SURVEY SECTION

Subsection III

Project 1: Largescale Fish Habitat Projects

Project Objective: To coordinate and develop largescale habitat projects that increase the volume of structural habitat for fisheries within Kentucky.

A. ACTIVITY

There was activity on two large scale fish habitat projects during this grant cycle. Projects included those at Green River Lake and Lake Cumberland.

The largescale fish habitat project at Green River Lake continued throughout 2024. During this grant cycle, we created an additional 22 sites using 158 large cedar trees. We plan to continue the largescale fish habitat project on Green River Lake. We also began a project using forward facing sonar to study current and past fish attractor sites. The study examines long-term breakdown of mainly cedar tree brush pile sites at Green River Lake. These efforts will help us understand how often brush piles likely last and when refurbishment is needed. Other data that can potentially be examined would be fish presence on the structure as well. Future work will likely include using the forward facing sonar in conjunction with a deepwater shocking system.

An additional largescale fish habitat project was started at Lake Cumberland in October 2024. Prior work included planning with lake managers and department staff. During this grant cycle, we created 72 sites, made from 651 cedar trees and 41 PVC pipe sections.

Staff spent a total of 152 days working on the Green River Lake and Lake Cumberland Largescale Fish Habitat Projects. This time included planning/coordination, habitat mapping, obtaining material, structure construction, habitat deployment, and staging area cleanup.

Activities were coordinated out of the headquarters office of the Kentucky Department of Fish and Wildlife Resources (KDFWR) located at #1 Sportman's Lane, Frankfort, KY, 40601. Additionally, work was completed out of two regional offices located in Calhoun and Morehead with their respective addresses being 1398 State Route 81 N, Calhoun, KY 42327 and 120 Fish Hatchery Rd. Morehead, 40351.

B. TARGET DATES FOR ACHIEVEMENT AND ACCOMPLISHMENTS

Planned Achievement Date: March 31, 2025

Work Accomplished: March 31, 2025

C. SIGNIFICANT DEVIATIONS

None.

D. REMARKS

Chad Nickell, Fish and Wildlife Management Foreman, joined the branch in August 2024, bringing much needed manpower and expertise to the branch to help us reach greater accomplishments for fish habitat in the eastern Kentucky districts.

The culmination of the specialized equipment and personnel showed its value in the amount of work accomplished at Lake Cumberland within 3 months.

E. RECOMMENDATIONS

None.

Project 2: Aquatic Habitat Technical Guidance

Project Objective: To improve and create aquatic habitat projects that increase angler opportunities in lake and streams in Kentucky.

A. ACTIVITY

During 1 April 2024 – 31 March 2025, the Habitat Branch assisted each of the seven Fisheries Districts with various phases of habitat project implementation. Project phases included planning/coordination, obtaining material, habitat deployment, and machinery delivery. Excluding Christmas trees, staff assisted with staging and deploying 984 structures for 129 habitat enhancement sites in 7 lakes. Staff spent a total of 81 working days on technical guidance projects.

The Christmas tree drop-off program resulted in 4888 trees from 31 drop-off sites and store donations. Department staff picked up over 1000 trees that were donated from large retailers/municipalities. Tree donations were slightly higher in 2024 as compared to 2023 (4810 trees) but lower than average for the previous three years (5216). There has been a continued effort with advertising and marketing to raise public awareness in hopes of increasing public participation with tree donations. The Information and Education Division staff created a Christmas tree recycling news release and social media post to promote the program and increase awareness. The news release was picked up by several local news stations from Lexington, Louisville, Owensboro, Bowling Green, Murray, Richmond, Paducah, Hazard, Hopkinsville, Benton, Beaver Dam, and Madisonville.

Activities were coordinated out of the headquarters office of the Kentucky Department of Fish and Wildlife Resources (KDFWR) located at #1 Sportman's Lane, Frankfort, KY, 40601. Additionally, work was completed out of two regional offices located in Calhoun and Morehead with their respective addresses being 1398 State Route 81 N, Calhoun, KY 42327 and 120 Fish Hatchery Rd. Morehead, 40351.

B. TARGET DATES FOR ACHIEVEMENT AND ACCOMPLISHMENTS

Planned Achievement Date: March 31, 2024

Work Accomplished: March 31, 2024

C. SIGNIFICANT DEVIATIONS

None.

D. REMARKS

None.

E. RECOMMENDATIONS

None.

Project 1: Largescale Fish Habitat Projects

Green River Lake

The second phase of the Green River Lake Largescale Fish Habitat Project was completed from June through September 2024. This included a total of 22 sites between the dam and Site One Boat Ramp. These 22 sites were brush piles constructed with cedar trees (158) and pallet-triangle structures (35) (Table 1). Sites were chosen without angler involvement and based on an area lacking existing habitat, proximity to other habitat sites, and certain bathymetric features. Sites spanned a much wider area than previous work, which we hope will give anglers a variety of options and reduce crowding.

Electrofishing of sites was forgone during this grant cycle and supplemented with forward facing sonar. A majority of habitat sites range from 17-20+ feet in depth during summer pool (675.0 ft). However, sites need to be shallow enough (<12ft) in depth for an effective electrofishing sample. There are only a limited number of sites to potentially sample with standard DC electrofishing. Instead, we utilized real-time, or forward-facing sonar (FFS) to understand our habitat structure degradation. We looked at structures on a seasonal basis to obtain a baseline height/bulk estimate for each structure. Recordings (2 minutes) were obtained for each structure analyzed to give a variety of view angles. In the future we hope that these recordings might serve to help us better understand the fish communities that inhabit these structures as well. This understanding will help us to refurbish or remove habitat sites from publicly available maps that are too far degraded. We have collected 136 videos to date, with plans to reduce sampling to twice a year (summer and fall) (Figures 3-6).

We have spent some time during this grant cycle to investigate developing a deepwater electrofishing system. This system would utilize our pre-existing DC electrofishing setups to allow us to sample deepwater (12+ feet) brush piles more effectively. To date, we have seen tested prototypes from Murray State University that could be used in future designs. Murray State University's prototype when paired with FFS proved successful for collecting sportfish such as Largemouth Bass, Bluegill, Yellow Bass, and even a 20+lbs Blue Catfish from 15-20ft depths.

The next project phase will be at one of two areas. We seek to conduct work in either the far Northeastern or far Southeastern section of the lake. Flooding at the lake for a majority of February and March 2025 have led us unable to conduct further work. Flooding has also prevented us for scouting a suitable work-area to conduct tree cutting, and dump barge loading. We hope to ascertain a suitable work area quickly into the next grant cycle in order to being the next phase of the project. Work will largely be conducted during spring and summer 2025, then moving onto the Lake Cumberland largescale fish habitat project in the fall-winter of 2025.

Lake Cumberland Largescale Fish Habitat Project

The first phase of the Lake Cumberland Largescale Fish Habitat Project was complete from October 2024 through January 2025. During that time, we constructed 72 sites, created with 651 cedar trees and 41 PVC structures (Table 2). All sites created during this grant cycle were within the Fishing Creek section of Lake Cumberland. This area was opportune logistically for equipment, material storage, and relatively shallow water depths. Additionally, the close proximity from our Southeastern Fishery District office in Somerset helped with project efficiency.

For other largescale and technical guidance projects, cedar trees are often harvested on-site. These trees are often adjacent to the shoreline and allow for ease of felling and immediate anchoring/dropping to create a fish habitat site. However, we did not have permission to cut trees around the shoreline at Lake Cumberland. Instead, we had to move trees from Meadow Creek Wildlife Management Area, about 30 minutes away from the United States Army Corp's Fishing Creek Boat Ramp (main work area). Additionally, we were unable to store trees at the work area for more than a week. We overcame these challenges for what has been a successful project to date.

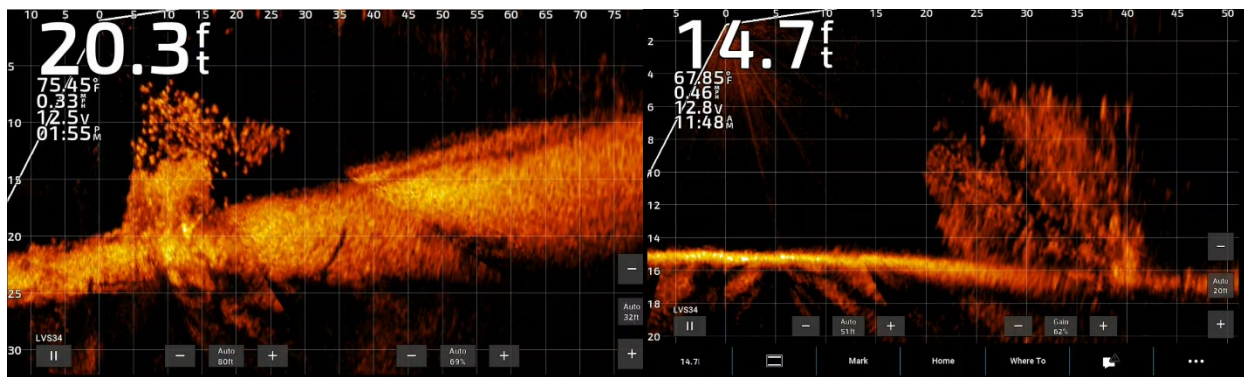
We seek to continue work at Lake Cumberland, during the next grant cycle. Work will be conducted at a different section of the lake. Beaver Creek (West-end of lake) is a potential candidate for working on the lakebed during fall/winter drawdown. Logistical constraints such as storage and material supply (Cedar Trees, anchoring material, and equipment) will be investigated. We also hope to conduct work near Cumberland Point (mid-lake) and use cull concrete structures to anchor down driftwood and create fish habitat reefs.

Table 1. Habitat material summary for the Green River Lake Largescale Fish Habitat Project.

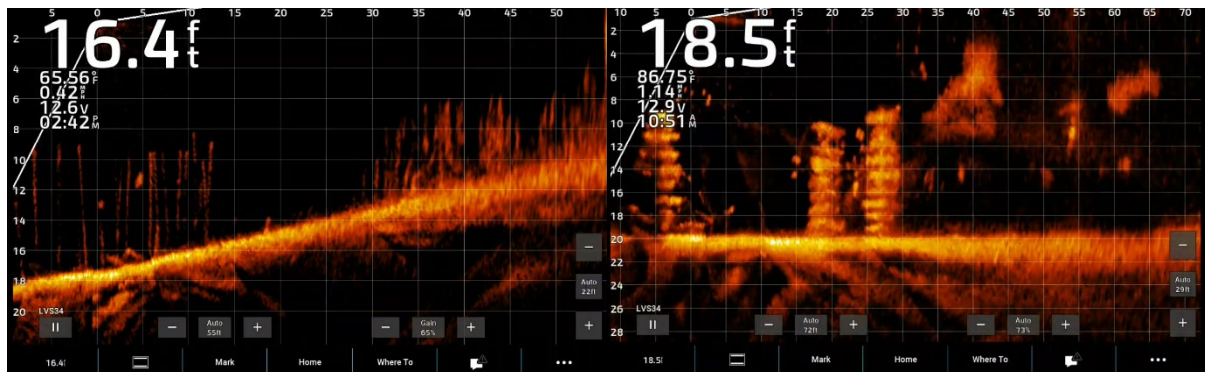
Phase	Location	Year	# of Sites	Cedar Trees	Pallet Structures	Total
1	Goat Island & Holmes Bend	2023	19	209	60	269
2	Site One	2024	22	146	35	181
Totals			41	355	95	450



Figure 2. Sites created at Green River Lake during the previous grant cycle. Also showcasing fishing access sites within the area as well.



Figures 3 (left) and 4 (right). Screenshot from livescope work. Gridlines denote depth (reversed Y-axis) and distance (X-axis) from the transducer. Figure 3 shows brush pile with a large school of fish directly above the brush pile. Figure 4 distinctly shows a few trees laying diagonally to create a robust brush pile.



Figures 5 (left) and 6 (right). Figure 5 shows a stakebed with a couple fish within. Figure 6 shows a group of plastic pallet trees with fish around them, and a few schools of young of the year shad that appear as cloud-like masses.



Figures 7 (left) and 8 (right). Example of Murray State University's dropper for deepwater electrofishing rig (Figure 7). The FFS system is used in conjunction with the dropper to ensure fish are targeted with the small field (Figure 8), so that the boat used turns on and off the electricity to more effectively obtain fish. The transducer is clamped to the gunwale of the boat and can freely rotate to help initially find structure to target fish on.

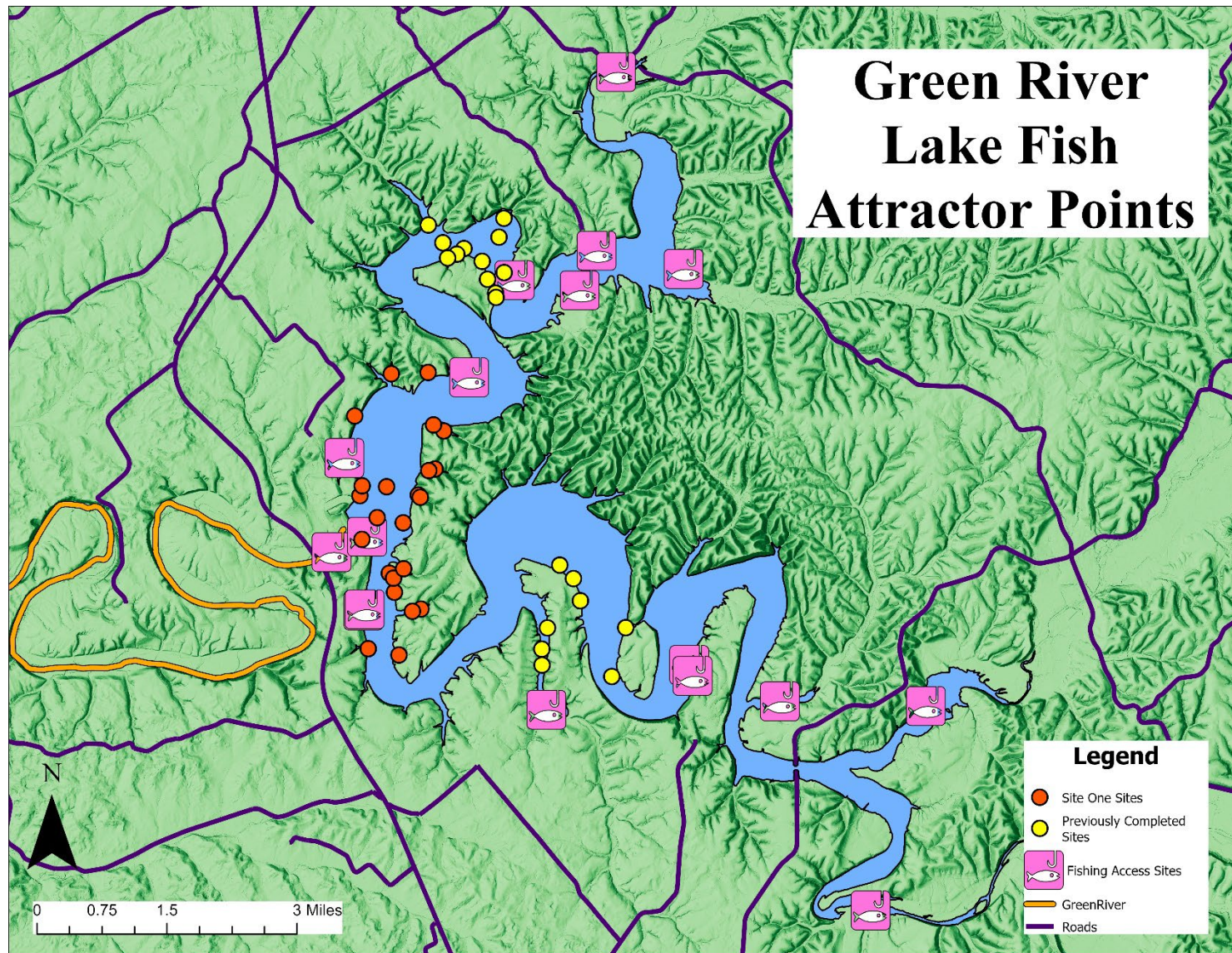


Figure 9. Fish attractor map of green river lake showing sites created during this grant cycle (Orange), along with sites created previously as part of the largescale fish habitat project.

Table 2. Habitat material summary for the Lake Cumberland largescale fish habitat project.

Phase	Location	Year	# of Sites	Cedar Trees	PVC Structures	Total
1	Fishing Creek	2024	72	651	41	692
Totals			72	651	41	692

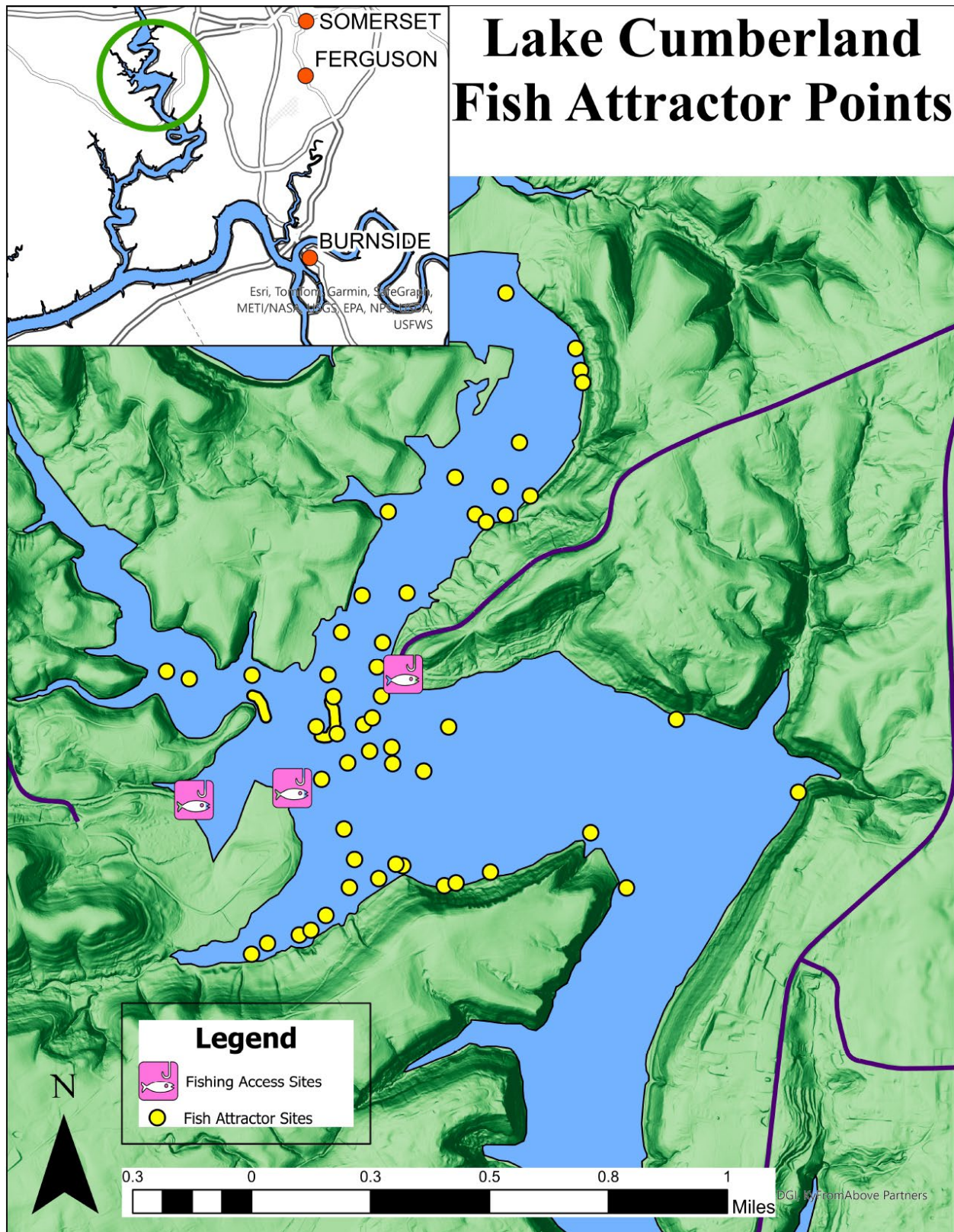


Figure 10. Fish Attractor points completed within Fishing Creek at Lake Cumberland in late 2024. Some points merged for the sake of visualization on the map.

Project II: Aquatic Habitat Technical Guidance

FINDINGS

During 1 April 2024 – 31 March 2025, the Habitat Branch assisted each of the seven Fisheries Districts with various phases of habitat project implementation. Project phases included planning/coordination, obtaining material, habitat deployment, and machinery delivery. Excluding Christmas trees, staff assisted with staging and deploying 984 structures for 129 habitat enhancement sites in 7 lakes (Table 3). Staff spent a total of 81 working days on technical guidance projects.

The Christmas tree drop-off program resulted in 4888 trees from 31 drop-off sites and store donations. Department staff picked up over 1000 trees that were donated from large retailers/municipalities. Tree donations were slightly higher in 2024 as compared to 2023 (Table 4) but lower the average for the previous three years (5216). There has been a continued effort with advertising and marketing to raise public awareness in hopes of increasing public participation with tree donations. The Information and Education Division staff created a Christmas tree recycling news release and social media post to promote the program and increase awareness. The news release was picked up by several local news stations from Lexington, Louisville, Owensboro, Bowling Green, Murray, Richmond, Paducah, Hazard, Hopkinsville, Benton, Beaver Dam, and Madisonville.

Table 3. Habitat branch technical guidance projects for this grant cycle. Does not include habitat branch assistance with Christmas Trees.

Date	Lake	Material Amount	# of Sites	Material Type
April 2024	Beaver	90	90	Catfish spawning boxes
July 2024	Kentucky	75	5	Mossback
July 2024	Barkley	525	21	Stakebeds
August 2024	Barren River	57	1	Reef Balls and Cedar Trees
August 2024	Cave Run	92	2	Reef Balls and hybrid plastic/brush
September 2024	Rough River	10000 pounds	6	Peagravel Bluegill Spawning Beds
September 2024	Greenbo	145	4	hybrid plastic/brush, pallet structures, and stake buckets
	Total	984	129	

Table 4. Summary of Christmas Tree donations by Fisheries District.

Fisheries District	2017	2018	2019	2020	2021	2022	2023	2024
Western	411	350	709	0	306	220	195	365
Northwestern	30	60	110	650	688	372	236	453
Southwestern	729	510	834	1000	700	315	222	322
Central	1189	1507	4101	3314	2321	3166	2950	2557
Southeastern	290	177	989	697	395	216	232	246
Northeastern	80	375	690	650	375	900	875	880
Eastern	330	150	750	495	523	341	100	65
Total	3059	3129	8183	6806	5308	5530	4810	4888



Figure 11. Photo of Mossback Trophy Tree XLs on dump barge being transported to drop site on Kentucky Lake. An example of a technical guidance project. This project only took one day to drop 75 structures between 5 sites.



Figure 12. Photo of reefball site at Barren River Lake. Reefballs were dropped during high water at summer pool, then trees were tied between the reefballs during low water at winter pool. Another example of a technical guidance project. This project was done with three days of fieldwork.