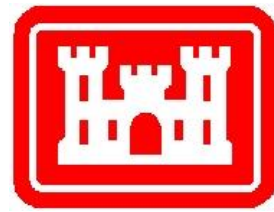




Assessing and Modeling the Impacts of Water Level Management on Overwintering Reptiles



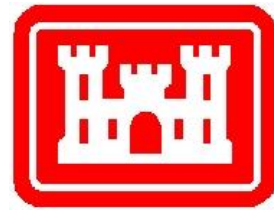
Principle Investigator Lead(s): Miranda Goss

Product Development Team: Eric Britzke, Jay Bennett, Kristine Gollinger, Sara Hammond





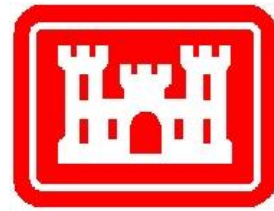
Project Purpose - Recap



- Need: Research and model development to determine overwintering habitat use of reptiles and to assess the potential impacts of lake level management on vulnerable populations.
- Purpose: The purpose of this project is to locate and characterize reptile overwintering habitat use in reservoirs and to assess impacts of water management strategies on overwintering reptiles in USACE reservoirs.



Multi-Year Approach



- **Task 1: Initial scouting visit and literature compilation (complete)**
 - Obtain permits, file IACUC approved protocol, complete a literature review
 - Confirm species presence at Brown Lake and at Lake Red Rock in
- **Task 2: Local field demonstration (complete)**
 - Initial effort at Brown Lake to perfect transmitter attachment techniques and identify any issues with equipment/tracking.
- **Task 3: Large-scale field testing at Lake Red Rock (data collect complete, data analysis incomplete)**
 - Overwinter tracking/relocation of turtles and snakes in Iowa
- **Task 4: Large-scale field testing in a comparable lake**
 - Overwinter tracking/relocation of turtles and snakes

Description: Initial transmitter attachment and tracking at Brown Lake

- Tagging and tracking methods proved effective
- Several turtles were recaptured and epoxy was secure
- Movement upstream after hibernation suggests the vast majority if not all tags stayed in place throughout winter. Movement and animal loss was minimal



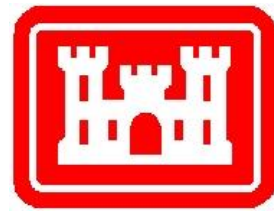
Brown Lake's main body



Animals captured and tagged in Brown Creek

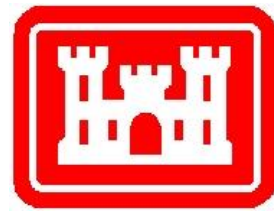


Transmitter Attachment



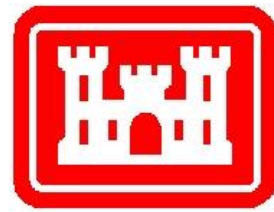


Lake Red Rock (FY 2022-2023)



- Nine turtles and one snake were captured and tagged.
- Turtles captured varied in size, sex, and condition, but population density was a concern
- Over all, populations appeared low and marked turtles were recaptured at high rates (of the 9 turtles initially tagged, 4 were recaptured)
- Recaptures occurred across traps- further suggesting low population density





- Originally, two coves were trapped using swim in and basking traps
- The southern cove had zero trap yield after two days
- Traps were moved to and effort was concentrated on the northern cove
- Three receivers were positioned around the cove

- Multi-antenna receiver towers were erected to gather location data
- Towers were active into freezing winter conditions (mid-November)
- Thousands of successful relocations recorded

Beeper Records:

Date	Time	Channel	BPM	Antenna	Power
09/14/22	13:27:43	800	46.4	1	24
09/14/22	13:27:45	800	43.4	1	33
09/14/22	13:27:47	800	42.0	1	59
09/14/22	13:27:49	800	54.1	1	44
09/14/22	13:27:55	800	31.3	1	32
09/14/22	13:29:02	711	31.4	3	36
09/14/22	13:29:04	711	31.4	3	45
09/14/22	13:29:06	711	31.5	3	42
09/14/22	13:29:07	711	31.4	3	43
09/14/22	13:29:09	711	31.5	3	41
09/14/22	13:29:14	650	32.8	1	48



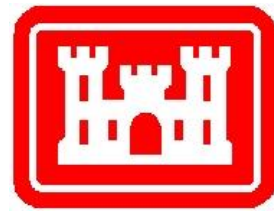


Snapshot Turtle Results for Lake Red Rock (a work in progress)



- Winter tracking difficulties- early ice over in the cove
- Silver lining- All but 2 animals were heard within the cove, and those that weren't heard have tracking records on file
- Receivers functioned through mid November and were successfully downloaded (several hundred thousand relocations are currently being processed in python)



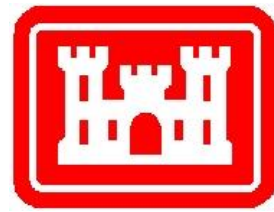


- Rocky habitat use approximately 20 feet from shoreline
- Initial site appeared to be well above winter water-level influence (dry, shallow location relatively near surface)





Summary



- Turtles in Mississippi were rarely immobile, even under freezing conditions and Brown Lake was silted in. However, we were still able to carry out trials on site in Brown Creek.
- Population density and species diversity were low at Lake Red Rock, but animals were still tagged and deployed.
- Seasonal relocation met with difficulties but remote receivers effective
- Data is currently being processed- python scripts are being written so that all movements/reservoir usage in the months before ice over can be mapped



Questions?

