



June 20, 2023

Army Corps of Engineers
CEMVK-PMP
4155 Clay Street
Vicksburg, MS 39183-3435

RE: Comments on the Integrated Draft Feasibility & Environmental Impacts Statement and Biological Assessment for the Pearl River Federal Flood Risk Management Project in Hinds & Rankin Counties, Mississippi

Please accept the following comments on behalf of the Center for Biological Diversity in response to the proposed Notice of Intent to prepare a Draft Environmental Impact Statement for the Pearl River Federal Flood Risk Management Project in Hinds & Rankin Counties, Mississippi. We have also attached several documents in support of our comments, and we ask that they be included as part of the administrative record for this project.

The Center for Biological Diversity is a nonprofit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental and administrative law. The Center has over 1.7 million members and online activists dedicated to the protection and restoration of endangered species and wild places. The Center has worked for more than 30 years to protect imperiled plants and wildlife, open space, air and water quality, and overall quality of life.

For the reasons explained below, the Center encourages the Army Corps of Engineers to prioritize nonstructural alternatives, including alternatives that may be included in Alternatives A and A1. Alternative C poses unacceptable risks and unnecessary costs, and it fails to adequately examine the impacts this project will have on several imperiled species, including the Gulf sturgeon, ringed map turtle, northern long-eared bat, and Pearl River Map turtle.

States throughout the United States are recognizing that the risks and costs of riverine dams far exceed the potential benefits of these structures, and the Army Corps is busy restoring the natural conditions of America's great waters. For example, in Florida the Army Corps has invested nearly a billion dollars to restore the natural conditions of the Kissimmee River, which was channelized in the name of flood control. The project has exceeded the Corps' expectations and is delivering significant wildlife benefits.¹ The Corps is also working hard to restore America's Everglades, which has been crippled by thousands of miles of levees, channels, canals, and other structures. It is considered the largest and most ambitious ecological restoration project in the world.² America's rivers, including the Pearl River, are national treasures and if anything, they need to be restored, not further altered and impounded by more dams, levees, channels, and other structures.

The Center urges the U.S. Army Corps of Engineers to reject Alternative C and consider nonstructural alternatives, including Alternatives A and A1, and the Green Heart of the Pearl proposal provided by the University of California at Berkeley engineering team.

I. BACKGROUND

The Pearl River basin is home to several imperiled species including the Gulf sturgeon, ringed map turtle, and northern long eared bat. In the case of the ringed map turtle and the Pearl River map turtle, these species are found nowhere else on Earth.

We provide important information about the biology, distribution, and threats facing each of these species below.

A. Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)

The Gulf Sturgeon traces its ancestry back 200 million years.³ A subspecies of the Atlantic sturgeon, the Gulf Sturgeon is a large, nearly cylindrical fish with an extended snout, vertical mouth, chin barbels, and with the upper lobe of the tail longer than the lower.⁴ Adult fish are bottom feeders and mostly eat invertebrates, including brachiopods, insect larvae, mollusks, worms, and crustaceans.⁵ Reaching lengths up to nine feet and weighing as much as 300 pounds, it can be found in the Northern Gulf of Mexico, bays, estuaries, and in major rivers in Florida, Alabama, Mississippi, and Louisiana.⁶ The species is anadromous-it spends most of the year in freshwater, where

¹ United States Army Corps of Engineers, Kissimmee River Restoration Project, at <http://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Kissimmee-River-Restoration/>

² John Zarella, "Ambitious Everglades Restoration Project Unrivaled in Scale, Cost," CNN.com (December 25, 2000) at <http://www.cnn.com/2000/NATURE/12/25/everglades.restoration/index.html>.

³ U.S. Fish & Wildlife Service, Panama City Field Office, Gulf Sturgeon, at <https://www.fws.gov/panamacity/gulfsturgeon.html>.

⁴ National Oceanic and Atmospheric Administration and U.S. Fish & Wildlife Service, Endangered and Threatened Wildlife and Plants; Threatened Status for the Gulf Sturgeon, 56 Fed. Reg. 49653-49658, 49653 (Sep. 30, 1991).

⁵ *Id.*

⁶ USFWS, *supra* note 3.

it reproduces and migrates to marine waters in the fall.⁷ In early spring, gulf sturgeon return to breed in the river system in which they were born.⁸

In listing the species as threatened under the ESA in 1991, the National Oceanic and Atmospheric Administration and U.S. Fish & Wildlife Service found that sturgeon stocks have been greatly reduced or extirpated throughout much of the historic range by overfishing, dam construction, and habitat degradation.⁹ Once ranging from the Mississippi River eastward to Florida's Tampa Bay area, the Service observed in its 1991 listing decision that three major rivers including the Pearl River in Mississippi, have been dammed, preventing use of upstream areas for spawning.¹⁰ Dam systems such as the Ross Barnett Dam have prevented sturgeon from moving further upstream, as sturgeon are unable to pass through dam systems.¹¹ Sturgeon, however, still access the lower 150 miles of the Pearl River and its tributaries and substantial spawning habitat remains in the Pearl River.¹²

In addition to structures such as dams preventing Gulf sturgeon from reaching spawning areas, dredging and soil deposition carried out in connection with channel improvement and maintenance pose a threat to the species.¹³ As the Services explained in their listing decision, deep holes and rock surfaces are important for spawning and modification of these features, particularly in rivers in which upstream migration is already limited by dams, "could further jeopardize the already reduced stocks of the Gulf sturgeon."¹⁴ In determining that the species continues to warrant protection as threatened under the ESA, the Services found in 2009 that:

Access to historic Gulf sturgeon spawning habitat continues to be blocked by existing dams and the ongoing operations of these dams also effect downstream habitat. Several new dams are being proposed that would increase these threats to the Gulf sturgeon and its habitat. Dams continue to impede access to upstream spawning areas and continue to adversely affect downstream habitat including both spawning and foraging areas.¹⁵

In view of these threats, the Recovery Plan for the Gulf sturgeon calls for the U.S. Fish & Wildlife Service to work with the U.S. Army Corps of Engineers to operate and/or modify existing dams to restore the benefits of historical flow patterns and sedimentation patterns as well as identify ways to restore and protect natural river habitat diversity.¹⁶

⁷ *Id.*

⁸ *Id.*

⁹ Threatened Status for the Gulf Sturgeon, *supra* note 4, at 49653.

¹⁰ *Id.* at 46955.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

¹⁵ National Marine Fisheries Service & U.S. Fish & Wildlife Service, Gulf Sturgeon (*Acipenser oxyrinchus desotoi*), 5-Year Review: Summary and Evaluation, 15-16 (Sep. 2009).

¹⁶ U.S. Fish & Wildlife Service and National Marines Fisheries Service, Gulf Sturgeon Recovery/Management Plan, at 52-53 (1995).

Dredging operations may also destroy benthic feeding areas, disrupt spawning migrations, and re-suspend fine sediments causing siltation over substrate in spawning habitat.¹⁷ The modification of the benthic areas affects the quality, quantity, and availability of prey.¹⁸ Poor water quality caused by pesticides, heavy metals, and industrial contaminants may also threaten the species.¹⁹ Pollution from industrial, agricultural, and municipal activities is believed to be responsible for a host of physical, behavioral, and physiological impacts to sturgeon throughout the world.²⁰

In 2003 the Services designated critical habitat for the Gulf sturgeon.²¹ This critical habitat designation identifies areas that are essential to the conservation of the species and may require special management considerations or protections.²² The entire project area includes critical habitat for the Gulf sturgeon (Unit 1).²³

B. Ringed Map Turtle (*Graptemys oculifera*)

The ringed map is a small turtle with a yellow ring bordered inside and outside with dark olive-brown on each shield of the upper shell or carapace and a yellow plastron.²⁴ This basking turtle is only found in the Pearl River system of Mississippi and Louisiana.²⁵

The species has specific habitat needs. It prefers wide sand beaches and a narrow channel with at least a moderate current, and it spends many hours basking in the sun on logs and debris over deep water. The river must be wide enough to allow sun penetration for several hours. Nesting habitat consists of large, high sand and gravel bars adjacent to the river.

The ringed map turtle was listed as threatened under the Endangered Species Act in 1986 due to a number of threats facing this species, primarily the loss of habitat due to reservoir construction and flood control.²⁹ In fact, the U.S. Fish & Wildlife Service cited numerous flood control projects, very similar to the One Lake project, as a primary reason for listing the species under the ESA.³⁰ The species is also threatened by habitat degradation caused by deterioration in water quality and a corresponding loss of mollusks on which the turtle feeds.³¹ Water quality is degraded when floodplain clearing and channelization contributes to sedimentation, and the increased turbidity

¹⁷ *Id.* at 17.

¹⁸ *Id.*

¹⁹ *Id.* at 46956.

²⁰ Gulf Sturgeon Five Year Review, *supra* note 15 at 18.

²¹ U.S. Fish & Wildlife Service and National Oceanic and Atmospheric Administration, Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Gulf Sturgeon, 68 Fed. Reg. 13370-13495 (Mar. 19, 2003) .

²² *Id.*

²³ *Id.* at 13391;13456.

²⁴ U.S. Fish & Wildlife Service, Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Ringed Map Turtle (*Graptemys Oculifera*), 51 Fed. Reg. 45907-45910 (Dec. 23, 1986).

²⁵ *Id.* at 45907.

²⁹ *See generally, supra* note 24.

³⁰ 51 Fed. Reg. at 45908-09.

³¹ *Id.* at 45907.

and siltation impacts the snails and other mollusks on which the turtle feeds.³² As the U.S. Fish & Wildlife Service stated in its decision to list the species under the ESA, the basking turtle is not able to inhabit large lake areas or polluted waters.³³

C. Pearl River Map Turtle (*Graptemys pearlensis*)

The Pearl River Map turtle is a moderate-sized, freshwater turtle with a high-domed shell, with a median keel, which has salient spines on the posterior portions of the anterior vertebral scutes.³⁴ These spines are much smaller than those of the ringed map.³⁵ The Pearl River Map turtle is endemic to medium sized creeks and large rivers in the Pearl River drainage of Mississippi and Louisiana.³⁶ They use sand bars as nesting sites and their diets largely consist of mollusks and snails.³⁷

The Pearl River map turtle is proposed for threatened status under the Endangered Species Act. Species proposed for listing by U.S. Fish and Wildlife Service receive protections under the Act.

The state of Mississippi has listed the species as a Species in Need of Management,⁴⁴ and the International Union for the Conservation of Nature (IUCN) considers the Pearl River Map Turtle endangered and possibly critically endangered, noting that the population has declined by 80-98% since 1950.⁴⁵

The Pearl River Map turtle was once more abundant in the Pearl River, but the population has declined significantly and beginning the 1990s, basking densities were lower than those of the ringed map.³⁹ As with many turtle species, habitat loss and degradation appears to be a leading cause for the decline in the Pearl River Map turtle population.⁴⁰

Threats include contaminants from urban and industrial sources, gravel mining, the modification of the downstream natural flow regime and its associated habitat changes caused by construction of the Ross Barnett Reservoir near Jackson.⁴¹ Ennen, et. al. (2016) observed that additional impoundment downstream of the reservoir would further impact downstream flow regimes and the species within the project area.⁴²

Sedimentation and other anthropogenic alterations within the Pearl River drainage basin may have also caused a decline in native mussel and gastropod populations, thus decreasing a significant prey source for female Pearl River map turtles.⁴³

³² *Id.* at 45908.

³³ *Id.* at 45907.

³⁴⁻³⁷ Ennen, J.R., Lovich, J.E., and Jones, R.L. 2016. *Graptemys pearlensis* Ennen, Lovich, Kreiser, Selman, and Qualls 2010-Pearl River Map Turtle. In: Rhodin, A.G.J., Pritchard, P.C.H., et al. Eds. Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs 5(9):094.1-8, doi: 10.3854/crm.5.094.pearlensis.v1.2016.

³⁸ The IUCN Red List of Threatened Species, *Graptemys pearlensis*, at icunredlist.org/details/184437/0 (citing Ennen, J.R., et. al. Genetic and morphological variation between populations of the Pascagoula Map turtle (*Graptemys gibbonsi*) in the Pearl River and Pascagoula Rivers with description of a new species. Chelonian Conservation and Biology 9(1):98-113).

³⁹⁻⁴³ Ennen, et. al. 2016, *supra* note 34.

D. Northern long-eared bat (*Myotis septentrionalis*)

The northern long-eared bat is a medium sized bat, which is distinguished from other *Myotis* species by its relatively long ears.⁴⁶ The species ranges across much of the eastern and north central United States. They feed nocturnally by catching insects in flight and picking insects from surfaces.⁴⁷ Most foraging occurs above the understory but under the forest canopy.⁴⁸

Northern long-eared bats predominately overwinter in hibernacula that include caves and abandoned mines.⁴⁹ During the summer they roost singly or in colonies underneath bark or in cavities or crevices of both live trees and snags.⁵⁰ The species appears to be flexible in tree roost selection, selecting various tree species and types of roosts throughout its range, such as black oak, northern red oak, silver maple, black locust, American beech, sugar maple, sourwood, and shortleaf pine.⁵¹ Canopy coverage at northern long-eared bat roosts varies greatly as well as the diameters of roost trees.⁵²

The species actively forms colonies in the summer and exhibit fission-fusion behavior, where members frequently coalesce to form a group (fusion), but composition of the group is in flux, with individuals frequently departing to be solitary or to form small groups (fission) before returning to the main unit.⁵³ The species also engages in short, spring staging, a period between winter hibernation and spring migration to summer habitat.⁵⁴ During this time bats emerge from hibernation, exit the hibernacula to feed, then re-enter hibernacula to resume torpor.⁵⁵ Between the summer and winter season seasons, northern long-eared bats engage in the swarming season.⁵⁶ During this time behavior may include: introduction of juveniles to potential hibernacula, copulation, and stopping over sites on migratory pathways between summer and winter regions.⁵⁷

During the winter, the species hibernates to conserve energy from increased thermoregulatory demands and reduced food sources. The species often

⁴⁴ *Id.*

⁴⁵ IUCN Red List of Threatened Species, *Graptemys pearlensis*, at <http://www.iucnredlist.org/details/184437/0> (last visited August 30, 2018).

⁴⁶ U.S. Fish & Wildlife Service, Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat With 4(d) Rule, 80 Fed. Reg. 17974-18033 (April 2, 2014).

⁴⁷ *Id.* at 17988.

⁴⁸ *Id.*

⁴⁹ *Id.* at 17984.

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² *Id.* at 17985.

⁵³ *Id.* at 17985-17986.

⁵⁴ *Id.* at 17986.

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Id.*

returns to the same location for a hibernaculum.⁵⁸ Seasonal migrations between seasonal habitats have also been documented.⁵⁹ Mating occurs from late July to early October.⁶⁰ The species has small maternal colonies (typically 30-60 individuals) and females give birth to a single pup.⁶¹ Northern long-eared bats exhibit site fidelity to their summer home range and roost and forage in forests.⁶² Home ranges may vary by sex.⁶³

In listing the northern long-eared bat as threatened under the ESA, the Service identified several threats to the species including, among many others, the loss of summer habitat resulting from forest conversion.⁶⁴ Forest conversion is the loss of forest to another land cover type, which may result in the loss of suitable roosting or foraging habitat; fragmentation of remaining forest patches, leading to longer flights between suitable roosting and foraging habitat; removal of travel corridors; and direct injury or mortality during active season clearing. Impacts often occur at a local scale by affecting individuals and colonies.⁶⁵

II. DISCUSSION

A. Alternative C Will Result in Adverse Impacts to Several Imperiled Wildlife Species.

Federal agencies must take a “hard look” at the environmental consequences of their actions and consider all foreseeable direct, indirect, and cumulative impacts.⁷⁹ Alternative C will result in adverse impacts to four federally listed species.

1. Impacts to the Gulf Sturgeon.

Gulf sturgeon have been observed in the One Lake project area. At least two tagged sturgeon have been confirmed within the proposed boundaries of the project.

The U.S. Fish & Wildlife Service has also noted the river passage of Gulf sturgeon in the 2018 study. The service also reports sturgeon in the general area of Interstate 55 and another 2 miles below the Ross Barnett spillway.⁸⁵

Dredging operations associated with channelization can destroy benthic feeding areas, disrupt spawning migrations, and re-suspend fine sediments causing siltation over substrate in spawning habitat.⁹⁰ The modification of the benthic areas affects the quality, quantity, and availability of prey.⁹¹ Impoundments and dams can adversely affect water quality by transporting sediments, organic matter, and nutrients.⁹²

⁵⁸⁻⁶⁵ *Id.* at 17987.

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ Letter from Joseph A. Ranson, Field Supervisor, Louisiana Ecological Services, to Michael Goff, August 16, 2018, Appendix A.

⁸⁶ See 40 C.F.R. § 1502.22.

⁸⁷ *National Parks Conservation Ass’n v. Babbitt*, 241 F.3d 722 (9th Cir. 2001).

⁸⁸ *Center for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1152 (D. Ariz. 2002).

⁸⁹ See DEIS at 200-01.

Poor water quality caused by pesticides, heavy metals, and industrial contaminants threaten the species and pollution has been documented to have a host of physical, behavioral, and physiological impacts to sturgeon throughout the world.⁹⁴

Alternative C would result in significant adverse impacts and the take of federally listed Gulf sturgeon.

2. Impacts to the Ringed Map Turtle.

Alternative C will also result in take of the ringed map turtle, a federally listed and protected species. The ringed map turtle continues to decline across much of its range, including in the Pearl River.⁹⁶ Flood control projects pose a significant threat to the species and the turtle is not able to inhabit large lake areas or polluted waters.

Research by Dr. Will Selman from 2017-2018 identifies significant impacts to the ringed map turtle that will result from the proposed One Lake project as outlined in Alternative C.⁹⁹ The objective of Dr. Selman's study was to determine the abundance of both the ringed map and Pearl River map turtle in the Pearl River and local oxbow lakes throughout Hinds and Rankin counties.¹⁰⁰ Three of the Pearl River stretches surveyed are inclusive of the proposed One Lake Project.¹⁰¹

In all river surveys during 2017 and 2018, Selman observed 5,643 turtles with ringed maps comprising 85.8% (4,843 individuals).¹⁰² Using a 20-30% visual correction factor for undetected individuals, the mean number of ringed maps that would be directly impacted by the One Lake project would be 1,690 individuals.¹⁰³ Further, Dr. Selman estimated an additional 2,138 individuals would be indirectly impacted in two other stretches of the river.¹⁰⁴

⁹⁰ *Id.* at 17.

⁹¹ *Id.*

⁹² Federal Interagency Stream Restoration Working Group. 1998. Stream corridor restoration-principles, processes, and practices.

⁹³ *Id.* at 46956.

⁹⁴ Gulf Sturgeon Five Year Review, *supra* note 15 at 18.

⁹⁵ In fact, there is very little baseline water quality data for this section of the Pearl River. See DEIS at 61.

⁹⁶ Jones, R.L. 2017. Long-Term Trends in Ringed Map (*Graptemys oculifera*) Growth, Survivorship, Sex Ratios, and Population Sizes in the Pearl River, Mississippi. *Chelonian Conservation and Biology* 16(2):215-228.

⁹⁷ DEIS at 202.

⁹⁸ *Id.* at 203.

⁹⁹ Selman, W. 2018. Diamonds in the Rough: Status of Two Imperiled *Graptemys* Species (*Graptemys oculifera* and *G. pearlensis*) in the Pearl River of Jackson, MS. Year 2.

¹⁰⁰ *Id.* at 3.

¹⁰⁴ *Id.*

As Dr. Selman explains, the One Lake Project will dramatically alter the hydrologic regime of the stretch of the Pearl River, transforming the existing lotic, riverine habitat to a lentic, lake setting.¹⁰⁵ Reduced river velocities will result in a lack of snag inputs along banks and minimize the annual scouring of sandbars that the ringed map depends on.¹⁰⁶ Generalist turtles would benefit at the expense of specialist riverine turtles (including the ringed map and Pearl Map turtle). Over time these generalist species would colonize the project area and the ringed map population would disappear over time.¹⁰⁷ Dr. Selman concludes that the project's impacts would be significant and long-lasting and negatively impact the recovery of the species.¹⁰⁸

In addition, the species is threatened by habitat degradation caused by a change in flow regimes, deterioration in water quality, and a corresponding loss of mollusks on which the turtle feeds.¹¹⁰ Water quality is degraded when floodplain clearing and channelization contributes to sedimentation, and the increased turbidity and siltation impacts the snails and other mollusks on which the turtle feeds.¹¹¹ As the U.S. Fish & Wildlife Service stated in its decision to list the species under the ESA, the basking turtle is not able to inhabit large lakes or polluted waters.¹¹²

The species could also be threatened by increased development resulting from the change in riverine conditions to a lake environment. Not only could an increased human presence result in greater exploitation (i.e., collection) of the species, but also an increase in recreational boating on the river and extended human presence on nesting sandbars (including the very islands the DEIS states would be created to mitigate impacts) could result in behavioral changes (limited basking), physiological changes (increased long-term stress) and direct mortalities from faster and larger boats.¹¹³

¹⁰⁵ *Id.* at 18.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ *Id.* at 19.

¹⁰⁹ The U.S. Fish & Wildlife Service also noted the absence of this information in its recent letter to the District. *See supra*, note 85.

¹¹⁰ 51 Fed. Reg. at 45907; Selman, W. and Jones, R.L. 2017. Population Structure, Status, and Conservation of Two Graptemys Species from the Pearl River, Mississippi. *Journal of Herpetology* 51(1):27-36.

¹¹¹ 51 Fed. Reg. at 45908.

¹¹² *Id.* at 45907.

¹¹³ Selman, W. and Jones, R.L. 2017. Population Structure, Status, and Conservation of Two Graptemys Species from the Pearl River, Mississippi. *Journal of Herpetology* 51(1):27-36.

The Fish and Wildlife concluded in its Five-Year Review of the Species:

An impoundment for flood control of the Pearl River within ringed map turtle habitat at Jackson, Mississippi, south of the existing Ross Barnett Reservoir, has been considered. A feasibility study was conducted by the Corps of Engineers on the formation of this impoundment; however, the future of the project is unclear. *If the proposed reservoir is completed, it would likely result in the extirpation of the known ringed map turtle at this location.* The population at this location represents the best-known population on the Pearl River south of the Ross Barnett Reservoir.¹¹⁶

Alternative C would result in take of the federally listed ringed map turtle and would adversely modify the habitat on which it depends.

3. Impacts to the Northern Long-Eared Bat.

The federally endangered Northern long-eared bat would be jeopardized by Alternative C and its habitat would be adversely modified by the One Lake Project.

According to the previous DEIS and draft feasibility study, the One Lake project:

would include the clearing of a *substantial amount* of existing forestland habitat within the project area that could be potential summertime habitat for the NLEB. Though the significance of the available habitat utilization by the NLEB is not known at this time, the *potential available habitat does exist* within the Project Area. In addition, *the availability of suitable NLEB habitat within close proximity to the Project Area is also substantial.* As a result, the potential direct, adverse impacts to the available NLEB habitat within the Project Area would be minor in intensity and long-term in duration.¹²⁴

A substantial amount of potential NLEB summertime habitat is within and in close proximity to the project area. Forest conversion may not only result in the loss of suitable roosting or foraging habitat, but it also results in fragmentation of remaining forest patches, leading to longer flights between suitable roosting and foraging habitat as well as the removal of travel corridors, affecting both individuals and colonies.¹²⁶ Depending on a number of factors including the extent of the NLEB population in the project area and the distance from other roost sites, the impacts could be significant and long-term.

¹¹⁶ U.S. Fish & Wildlife Service, Ringed map turtle (*Graptemys oculifera*), 5-Year Review: Summary and Evaluation (2010) (emphasis added).

¹²⁶ *Id.*

The project area is within the buffer zone for the summer hibernation area for the NLEB¹²⁸ and the U.S. Fish & Wildlife Service identified forest conversion the loss of summer habitat resulting from forest conversion as a threat to the species when it listed the NLEB as a threatened species in 2014 and again when it was uplisted to endangered in 2022.¹²⁹ Alternative C would cause take of the NLEB and adversely modify critical roosting habitat.

4. Impacts to the Pearl River Map Turtle.

The Pearl River map turtle is a federally listed species protected under the Endangered Species Act. The population has declined significantly since the 1980s and Dr. Selman's research in 2017- 2018 found densities lower during all surveys and in all stretches of the Pearl River in comparison to the ringed map.¹³⁹ Water quality and riverine regulation at the reservoir have likely impacted prey species.¹⁴⁰ Ultimately, as Dr. Selman explains, the chances of localized extinctions are higher in small populations like the Pearl River map turtle due to environmental and demographic stochastic events.¹⁴¹ Further, their absence in surveyed oxbows suggests that they may depend exclusively on riverine conditions for their survival.¹⁴²

As Dr. Selman estimates, 87 individuals would be directly impacted by the project with another 110 individuals indirectly affected upstream and downstream of the project area.¹⁴³ Impacts would be similar as those to the ringed map. As previously discussed, the One Lake Project will dramatically alter the hydrologic regime of the stretch of the Pearl River, transforming the existing lotic, riverine habitat to a lentic, lake setting.¹⁴⁴

Reduced river velocities will result in a lack of snag inputs along banks and minimize the annual scouring of sandbars that the ringed map depends on.¹⁴⁵ Generalist turtles would benefit at the expense of specialist riverine turtles (including the Ringed map and Pearl River Map turtle). Over time these generalist species would colonize the project area and the ringed map and Pearl River map turtle population would disappear over time.¹⁴⁶

¹²⁸ *Id.* at 199.

¹²⁹ *Id.* at 199. U.S. Fish & Wildlife Service, Environmental Conservation Online System, Northern long-eared bat.

¹³⁹ Selman (2018), *supra* note 99 at 17.

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ *Id.* at 2.

¹⁴⁴ *Id.* at 18.

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

As Selman and Jones (2017) explain both species are already experiencing a decline both upstream and downstream of the Ross Barnett Reservoir, likely as a result of impaired water quality from industrial and/or municipal effluents, associated impacts of reservoir flow regulation, collection by the pet trade, or a combination of these factors.¹⁴⁷ Dr. Selman concluded the project's impacts would be significant and long-lasting and negatively impact the recovery of the species.¹⁴⁸

In light of the project's likely impacts to the ringed map, Pearl River map turtle, and other imperiled species, the IUCN Tortoise and Freshwater Turtle Specialist Group (a global network of over 300 leading scientists and conservationists focused on tortoises and freshwater turtles) have urged decision makers to cancel its plans for the project.¹⁴⁹

I. CONCLUSION

Alternative C will result in take of four federally listed species and adversely modify the habitats that these species need for survival. The impacts of Alternative C will be both significant and long-term. In the case of species such as the ringed map and Pearl River map turtle, Alternative C will result in local extirpation, thereby putting these species at grave risk of extinction. We urge the Corps to reject Alternative C.

Instead, non-structural alternatives, which include portions of Alternative A and A1—and the Green Heart of the Pearl proposal provided by the University of California at Berkeley engineering team—will provide the safest, most widely supported, and most effective long-term flood control benefits.

Thank you for your consideration of our comments. We look forward to further engagement on this issue.

Sincerely,



Jason Totoiu

¹⁴⁷ Selman, W. and Jones, R.L. 2017. Population Structure, Status, and Conservation of Two Graptemys Species from the Pearl River, Mississippi. *Journal of Herpetology* 51(1):27-36.

¹⁴⁸ Selman (2018), *supra* note 99 at 19.

¹⁴⁹ Letter from IUCN SSC Tortoise and Freshwater Turtle Specialist Group (July 31, 2018).