

American Rivers ♦ Audubon Mississippi ♦ Healthy Gulf
National Audubon Society ♦ Sierra Club ♦ Sierra Club Mississippi

Comments on the
Draft Supplement No. 2 To The 1982 Yazoo Area Pump Project Final
Environmental Impact Statement (October 2020)

November 30, 2020

Submitted by Email to the Army Corps of Engineers: yzoobackwater@usace.army.mil
Delivered by Email to the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service

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American Rivers, Audubon Mississippi, Healthy Gulf, National Audubon Society, Sierra Club, and Sierra Club Mississippi (collectively, the Conservation Organizations) appreciate the opportunity to provide comments on the October 2020 Draft Supplement No. 2 To The 1982 Yazoo Area Pump Project Final Environmental Impact Statement (DSEIS).

The Conservation Organizations call on the Corps to abandon the Proposed Plan—which is prohibited by the 2008 Clean Water Act § 404(c) Final Determination and the Clean Water Act 404(b)(1) Guidelines—and withdraw the deeply flawed DSEIS. The Corps should permanently abandon all efforts to build the environmentally devastating, extremely costly, highly controversial, and long-vetoed Yazoo Pumps project and instead focus on opportunities for providing more effective, meaningful, sustainable, and immediate benefits to the communities in the Yazoo Backwater Area while restoring this ecologically critical region.

General Comments

As demonstrated throughout these comments, the DSEIS contains serious flaws that severely underestimate and obscure the significant adverse impacts of the Proposed Plan which is clearly prohibited by the 2008 Clean Water Act § 404(c) Final Determination and the Clean Water Act 404(b)(1) Guidelines. The Conservation Organizations urge the Corps to abandon the Proposed Plan and the deeply flawed DSEIS, and instead focus on opportunities for providing more effective, meaningful, sustainable, and immediate benefits to the communities in the Yazoo Backwater Area while restoring this ecologically critical region.

In 2008, the Environmental Protection Agency (EPA) used its Clean Water Act 404(c) authority to veto the Yazoo Pumps because the project would cause “unacceptable damage” to “some of the richest wetland and aquatic resources in the nation.”¹ This veto was upheld by the U.S. Court of Appeals for the Fifth Circuit, ensuring that EPA’s Clean Water Act 404(c) authority would continue to provide an unequivocal defense against this egregiously damaging project.

In clear violation of EPA’s overriding veto-authority under Clean Water Act Section 404(c), the DSEIS recommends construction of the same 14,000 cubic feet per second (cfs) pumping station whose purpose, structure, operation, and impacts fall squarely within the scope of the 2008 veto—which explicitly prohibits plans that would harm more than 28,400 acres of wetlands.² Even the DSEIS, which severely underestimates wetland impacts, acknowledges that the Proposed Plan will degrade more than 38,744 acres of wetlands³; a level of impacts that is unquestionably prohibited by the veto and the Clean Water Act 404(b)(1) Guidelines.

¹ The Environmental Protection Agency’s 2008 Clean Water Act 404(c) Final Determination garnered overwhelming support, including from: the U.S. Fish and Wildlife Service; more than 120 conservation organizations; 540 independent scientists; the Society of Wetland Scientists; the Association of State Wetland Managers; a former EPA Administrator; four former EPA Assistant Administrators for Water; a former Deputy Assistant Secretary of the Army for Civil Works; and 99.9% of the 48,000 comments submitted during the veto process, including 90% of comments submitted by Mississippi residents.

² The Clean Water Act 404(c) Final Determination covers impacts ranging from 28,400 to more than 67,000 acres of wetlands. Clean Water Act 404(c) Final Determination at iii, 73. The severely—and improperly—restricted wetland assessment in the DSEIS acknowledges a minimum of 38,744 acres of wetland impacts.

³ Draft Supplement No. 2 to the 1982 Yazoo Area Pump Project Final Environmental Impact Statement (October 2020) (DSEIS), Appendix F-5 (Wetlands) at 33.

The Yazoo Pumps could also create significant flood risks for communities in north Vicksburg and the Yazoo Backwater Area—concerns raised by both the conservation community and EPA during the June 2020 scoping period. The DSEIS disregards these concerns in a high-handed and conclusory manner by citing a model⁴ that is too flawed to provide any type of reliable analysis, as discussed in detail below. Operation of the Yazoo Pumps would put downstream communities on the receiving end of an additional 9 billion gallons of water per day when the Yazoo River is already at flood stage. Communities in the Yazoo Backwater Area would be at risk if that massive influx of water overtopped or damaged the Yazoo Backwater Levee, which is at risk of crevassing and is so low that it is not accredited to handle a 100-year flood.⁵ Collapse of this levee would cause catastrophic flooding for the very communities the Yazoo Pumps are purported to protect.

Notably, the DSEIS acknowledges that the unquestionably vetoed Yazoo Pumps would not prevent flooding. To the contrary, operation of the Pumps would leave 82% to 89% of flooded lands underwater and take weeks to months to drawdown floodwaters on the remaining lands.⁶

The DSEIS fails to consider even a single alternative to the vetoed Yazoo Pumps, in direct violation of the National Environmental Policy Act, the Clean Water Act, and modern approaches to floodplain management. The DSEIS makes no mention of repeated requests to consider alternatives, including from EPA and conservation organizations whose June 2020 scoping comments proposed a detailed proposal for [a suite of proven, low-cost, natural infrastructure and non-structural measures](#) that would provide immediate, effective, sustainable, and environmentally sound relief to communities in the Yazoo Backwater Area.

As discussed in detail below, the DSEIS suffers from many additional fundamental flaws. For example, the DSEIS ignores a wide array of devastating impacts to hemispherically significant wetlands. The DSEIS ignores critical impacts to the many rivers and streams in the project area. The DSEIS dramatically understates adverse impacts to the region's rich array of fish and wildlife, including to species listed under the Endangered Species Act. The DSEIS' conceptual mitigation plan does not come close to satisfying the Corps' obligations to fully mitigate the project's devastating impacts and it violates longstanding legal requirements. The DSEIS does not provide an estimate of the Proposed Plan's costs or benefits. And the DSEIS has not undergone the independent external peer review that is required for this project as a matter of law.

Critically, despite explicitly stating that it will address the concerns raised in the 2008 veto,⁷ the DSEIS does no such thing. Instead it relies on the very same flawed approaches that were decisively rejected by EPA in the veto because they severely underestimate and obscure the significant and unacceptable impacts of the pumps.

The Yazoo Pumps would damage up to 200,000 acres of ecologically rich wetlands that provide hemispherically significant habitat in the heart of the Mississippi River flyway. These wetlands support

⁴ DSEIS, Appendix G (Engineering) at 144-145, paragraph 177.

⁵ National Levee Database at <https://levees.sec.usace.army.mil/#/levees/system/5905000041/fema> (accessed November 6, 2020). Lack of accreditation means that the Yazoo Backwater Levee cannot protect Yazoo Backwater communities during flood events at or greater than the 1% chance of exceedance (100-year flood event).

⁶ DSEIS, Appendix C (Tables), Table 5.3. The "sloped pool" model is more accurate than the more optimistic "flat pool" model.

⁷ DSEIS at 18.

more than 450 species of birds, fish and wildlife, including migrating species like geese, ducks, pallid sturgeon, monarch butterflies, and American eels. Many thousands of these acres of wetlands are located in National Forest and National Wildlife Refuge lands, state-owned conservation lands, lands enrolled in federal conservation programs, and lands purchased and restored as mitigation for previously constructed federal water projects—lands that taxpayer dollars have long paid to protect and manage as wetland systems for people and wildlife.

The Lower Mississippi Alluvial Valley has already lost 80 percent of its original wetlands. The majority of those losses have been traced directly to the effects of federal flood control and drainage projects.⁸ From just the 1970s to 2006, the Yazoo Backwater Area lost 11 percent of its remaining forested wetlands.⁹ The loss of many tens of thousands of additional acres of wetlands from the Yazoo Pumps would have catastrophic implications for the ecology of the region and for the fish and wildlife that rely on those resources.

Detailed Comments

A. The Proposed Plan is Prohibited by the 2008 Clean Water Act 404(c) Final Determination

In 2008, the Environmental Protection Agency (EPA) used its Clean Water Act 404(c) authority to veto construction and operation of the Yazoo Pumps because they would cause “unacceptable damage” to “some of the richest wetland and aquatic resources in the nation.”¹⁰ This veto was upheld by the U.S. Court of Appeals for the Fifth Circuit, ensuring that EPA’s Clean Water Act 404(c) authority would continue to provide a critical last line of defense against this egregiously damaging project.

Despite this long-standing prohibition against construction and operation of the Yazoo Pumps—and in clear violation of EPA’s overriding Clean Water Act veto authority—the DSEIS recommends the same 14,000 cfs pumping station whose purpose, structure, operation, and impacts fall squarely within the scope of the 2008 veto.¹¹ In fact, the DSEIS explicitly states that the DSEIS Proposed Plan is the vetoed plan: “The proposed plan is Plan 5 from the 2007 FEIS.”¹²

⁸ Department of the Interior, *The Impact of Federal Programs on Wetlands, Volume I: The Lower Mississippi Alluvial Plain and the Prairie Pothole Region, A Report to Congress by the Secretary of the Interior*, October 1988 at 60.

⁹ Dahl, T.E., J. Swords and M. T. Bergeson. 2009. *Wetland inventory of the Yazoo Backwater Area, Mississippi - Wetland status and potential changes based on an updated inventory using remotely sensed imagery*. U.S. Fish and Wildlife Service, Division of Habitat and Resource Conservation, Washington, D.C. 30 p. (available at <https://www.fws.gov/wetlands/documents/Wetland-Inventory-of-the-Yazoo-Backwater-Area-Mississippi.pdf>).

¹⁰ The Environmental Protection Agency’s Clean Water Act 404(c) Final Determination garnered overwhelming support, including from: the U.S. Fish and Wildlife Service; more than 120 conservation organizations; 540 independent scientists; the Society of Wetland Scientists; the Association of State Wetland Managers; a former EPA Administrator; four former EPA Assistant Administrators for Water; a former Deputy Assistant Secretary of the Army for Civil Works; and 99.9% of the 48,000 comments submitted during the veto process, including 90% of comments submitted by Mississippi residents.

¹¹ The Clean Water Act 404(c) Final Determination covers impacts ranging from 28,400 to more than 67,000 acres of wetlands. The severely—and improperly—restricted wetland assessment in the DSEIS acknowledges at least 38,744 acres of wetland impacts, as discussed in detail in Section F.1 of these comments.

¹² DSEIS, Appendix G (Engineering) at 123.

The 2008 veto conclusively prohibits both construction and operation of the Yazoo Pumps, as repeatedly stated in the veto. For example:

The construction and operation of the proposed pumps would dramatically alter the timing, and reduce the spatial extent, depth, frequency, and duration of time that wetlands within the project area are inundated. After extensive evaluation of the record for this project, EPA has determined that these large-scale hydrologic alterations would significantly degrade the critical ecological functions provided by approximately 67,000 acres of wetlands in the Yazoo Backwater Area, including those functions that support wildlife and fisheries resources.¹³

* * *

EPA's Final Determination concludes that the discharge of dredged or fill material in connection with the construction of the proposed Yazoo Backwater Area Pumps Project (i.e., Plan 5 from the FSEIS), as well as the two alternative proposals offered by the Corps in February 2008 (i.e., Plan 6 from the FSEIS and Modified Plan 6) and subsequent operation of the 14,000 cfs pumping station would result in unacceptable adverse effects on fishery areas and wildlife. The administrative record developed in this case fully supports the conclusion that, as a result of alterations to the spatial extent, depth, frequency, and duration of inundation of wetlands within the project area, the proposed projects would significantly degrade the critical ecological functions provided by approximately 28,400 to 67,000 acres of wetlands (i.e., the range of wetland impacts as a result of Plan 5, Plan 6, and Modified Plan 6) in the Yazoo Backwater Area, including those functions that support wildlife and fisheries resources. Although not proposed to go forward, FSEIS Plans 3, 4, and 7, which also include a 14,000 cfs pumping station are expected to result in wetland impacts between approximately 28,400 and 118,400 acres (see FSEIS Main Report, Table 17, page 1-20). EPA has determined that each of these alternatives would also result in unacceptable adverse effects on fishery areas and wildlife. EPA does not believe that these adverse impacts can be adequately compensated for by the proposed mitigation, and are inconsistent with the requirements of the CWA. Further, these impacts should be viewed in the context of the significant cumulative losses across the Lower Mississippi River Alluvial Valley (LMRAV), which has already lost over 80 percent of its bottomland forested wetlands, and specifically in the Mississippi Delta where the proposed project would significantly degrade important bottomland forested wetlands.¹⁴

In fact, the adverse impacts resulting from operation of the Yazoo Pumps are the fundamental reason for the veto, as clearly stated by EPA:

The adverse effects associated with the prohibited projects are the result of a combination of operational factors including the capacity of the pumping station and its associated pump-on elevations.¹⁵

It is equally clear that small modification to the location of the Yazoo Pumps in the Proposed Plan does not exempt the Proposed Plan from the veto, for at least the following reasons:

¹³ Clean Water Act 404(c) Final Determination at i (emphasis added).

¹⁴ Clean Water Act 404(c) Final Determination at iii (emphasis added).

¹⁵ Clean Water Act 404(c) Final Determination at 73 (emphasis added).

- (1) As an initial matter, the Proposed Plan will dredge and fill some of the exact same wetlands as the 2007 plan, which is explicitly prohibited by the veto. The Proposed Plan uses the same borrow area near the Steele Bayou location that would have been used to construct the 2007 plan, as acknowledged in the DSEIS: “The borrow area identified for the previous design will be used for the new design.”¹⁶ This borrow area is “north of and adjacent to the Steele Bayou structure” and “was identified to provide fill material for the previous design.”¹⁷ This borrow area contains 23 acres of wetlands that will be directly impacted by dredging and filling.¹⁸ Indeed, reliance on the same borrow area means that the Proposed Plan in fact does not locate the Yazoo Pumps in an entirely new location.
- (2) The Proposed Plan places the Yazoo Pumps and the extensive related construction squarely within the same project area as the 2007 plan. This is true under each of the various definitions of the project area.¹⁹
- (3) The DSEIS explicitly states that the Proposed Plan is the same as the 2007 plan. As noted in the Engineering Appendix: “The proposed plan is Plan 5 from the 2007 FEIS.”²⁰
- (4) The Proposed Plan has the same objective as the 2007 plan. As recognized in the veto, the “basic objective of the [2007] proposed project is to limit the spatial extent, frequency, and length of time the Yazoo Backwater Area floods.”²¹ The DSEIS confirms that this is also the basic objective of the Proposed Plan: “The Proposed Plan would provide for the reduction in interior flooding during backwater flood events. When activated, the pumps will lower the water surface of floods greater than the 1-year frequency flood, which will reduce the extent and duration of the flood.”²²
- (5) The Proposed Plan includes the same 14,000 cfs pumping plant as the 2007 plan.²³
- (6) The Proposed Plan utilizes the same operating plan as the 2007 plan. Both have a year-round pump elevation of 87.0 feet, NGVD.²⁴

¹⁶ DSEIS, Appendix G (Engineering) at 160.

¹⁷ DSEIS, Appendix G (Engineering) at 160.

¹⁸ DSEIS at 73 and Appendix F-5 (Wetlands) at 72.

¹⁹ The 2007 FSEIS defines the “Yazoo Backwater Project Area” as “bounded on the west by the left descending bank of the mainline Mississippi River levee, on the east by the west bank levees of the Will M. Whittington Auxiliary channel and the connecting channel, and the Yazoo River on the south (926,000 acres).” 2007 FSEIS at SEIS-1. The 2007 FSEIS defines the “Yazoo Backwater Study Area” as the area “which encompasses those lands within the 100-year flood frequency, approximately 630,000 acres.” 2007 FSEIS at SEIS-1. The 2008 Clean Water Act 404(c) Final Determination refers to both these areas. The DSEIS defines the Yazoo Study Area as “located in west-central Mississippi immediately north of Vicksburg, Mississippi, and has historically been subject to flooding from backwater by the Mississippi River and headwater flooding from the Yazoo River, Sunflower River, and Steele Bayou. The triangular shaped study area extends northward about 65 miles to the latitude of Hollandale and Belzoni, Mississippi, and comprises about 1,446 square miles. Big Sunflower and Little Sunflower rivers, Deer Creek, and Steele Bayou flow through the study area.” DSEIS at 9.

²⁰ DSEIS, Appendix G (Engineering) at 123.

²¹ Clean Water Act 404(c) Final Determination at 47.

²² DSEIS at 15.

²³ Clean Water Act 404(c) Final Determination at i; DSEIS at 6.

²⁴ DSEIS at 20; Clean Water Act 404(c) Final Determination at 6.

- (7) The Proposed Plan pumps water from the same project area—the Yazoo Backwater Area—and the into the same river—the Yazoo River—as the 2007 plan.²⁵
- (8) Most critically, construction and operation of the Proposed Plan causes highly significant adverse impacts to hemispherically significant wetlands that are explicitly covered by the veto. As discussed throughout these comments, the DSEIS improperly restricts its assessment of adverse impacts, leading to a severe underestimate of the impacts of the Proposed Plan. However, even this severe underestimate acknowledges that the Proposed Plan will degrade at least 38,774 acres of wetlands in the 2-year floodplain; a level of harm that is explicitly prohibited by the veto because it would cause significant, unacceptable degradation of wetlands and other aquatic resources. The EPA veto prohibits “large-scale hydrologic alterations [that] would significantly degrade the critical ecological functions provided by at least 28,400 to 67,000 acres of wetlands in the Yazoo Backwater Area, including those functions that support wildlife and fisheries resources.”²⁶

The veto also states that “derivatives of the prohibited projects that involve only small modifications to the operational features or location of these proposals would also likely result in unacceptable adverse effects and would generate a similar level of concern and review by EPA.”²⁷ Because EPA rejected the notion that a slight change in location would alter the veto decision, any suggestion that the proposed new location exempts the Proposed Plan from the veto is nothing more than a red herring.²⁸

Moreover, in addition to explicitly stating that the Proposed Plan is the same as the 2007 plan (Plan 5),²⁹ the Corps continues to rely on analyses carried out for the 2007 plan. For example, the DSEIS does not provide any type of new analysis of alternatives, project benefits, or project costs. The DSEIS also presumably assumes that the non-federal sponsor cost-share waiver that applies to the 2007 plan also applies to the Proposed Plan.³⁰ Notably, the Corps provides no meaningful justification for the decision to slightly change the location of the Pumps, strongly suggesting that the change in location is nothing more than a transparent attempt to evade the veto.

In fact, the Proposed Plan plainly violates the 404(b)(1) Guidelines because it would cause even greater impacts than the 2007 plan. As discussed throughout these comments, moving the location of the Pumps causes additional adverse impacts that demonstrate that the Proposed Plan is not the least environmentally damaging practicable alternative, and thus is prohibited under the Clean Water Act 404(b)(1) Guidelines, as fully discussed in Section B of these comments. Moreover, the DSEIS provides no evidence to suggest that the significant adverse impacts that result from operating the Yazoo Pumps are less at the Deer Creek location than they would have been at the Steele Bayou location.

²⁵ Clean Water Act 404(c) Final Determination at i.

²⁶ Clean Water Act 404(c) Final Determination at 72.

²⁷ Clean Water Act 404(c) Final Determination at 73 (internal footnotes omitted) (emphasis added).

²⁸ See *Am. Methyl Corp. v. E.P.A.*, 749 F.2d 826, 838 (D.C. Cir. 1984) (purported reason for revocation of a decision was “at best an ancillary matter, unlikely to influence EPA’s final decision.”).

²⁹ DSEIS, Appendix G (Engineering) at 123.

³⁰ The Conservation Organizations strongly disagree with the Corps’ contention that it need not carry out these required analyses for the Proposed Plan, and the Corps’ implicit contention that the non-federal cost share waiver continues to apply to the Proposed Plan, as documented throughout these comments.

These facts underscore the perverse outcome created by the Corps' attempt to circumvent the veto. EPA prohibited the construction and operation of the Yazoo Pumps due to their unacceptable impacts and simultaneously encouraged the Corps to consider alternative, environmentally protective flood damage reduction measures. The DSEIS, however, does not consider any alternatives and instead fixates solely on an even-more-damaging pumps project that will cause unacceptable adverse impacts to the environment. This outcome is irreconcilable with the veto's plain language and would turn the veto on its head.

Allowing the Corps to evade the long-standing and extensively documented veto by slightly moving the location of the Pumps would insert a glaring loophole into Clean Water Act section 404(c). This loophole would allow federal agencies and non-federal permittees to unilaterally circumvent a Clean Water Act veto simply by slightly moving a project. This would effectively render the vitally important Clean Water Act § 404(c) an empty letter. Such a reading of the statute would eviscerate EPA's express statutory right to prohibit specification of disposal sites, and thereby render subsection 404(c) superfluous—a result to be avoided.³¹

The Corps is plainly aware that it cannot unilaterally circumvent the veto.³² In fact, EPA expressly advised the Corps that it must make a formal request to EPA to modify or withdraw the 2008 veto before EPA would consider doing so.³³ Furthermore, EPA would have a duty to comply with the critical elements of the Section 404(c) process in assessing whether (or not) to modify the veto.³⁴ Accordingly, EPA advised the Corps that any such request would require comprehensive supporting documentation,³⁵ and that EPA would then ensure a hearing and opportunity for the public to provide written comments on any recommended modification.³⁶ EPA can only modify the veto based on a final determination that documents findings that the proposed modification would not result in unacceptable adverse impacts.

³¹ See *Corley v. United States*, 556 U.S. 303, 314 (2009) (applying “one of the most basic interpretative canons, that a statute should be construed so that effect is given to all its provisions, so that no part will be inoperative or superfluous, void or insignificant”) (brackets and quotation marks omitted); *Mingo Logan Coal Co. v. U.S. E.P.A.*, 714 F.3d 608, 613–14 (D.C. Cir. 2013).

³² See Email from Lee Forsgren to Mary Walker, Re: Yazoo Pumps Discussion (July 22, 2019); see also Email from Lee Forsgren to Mary Walker, Re: Yazoo Pumps Discussion (Sept. 25, 2019). A copy of these email chains is provided as Attachment A to these comments; see 44 Fed. Reg. 58,076, 58,082 (Oct. 9, 1979) (“The Corps of Engineers cannot override a section 404(c) veto by the Administrator.”).

³³ Letter from Mary Walker, EPA Region 4 Administrator to Maj. Gen. R. Mark Toy, Commander U.S. Army Corps of Engineers Mississippi Valley Division, dated August 29, 2019. A copy of this letter is provided at Attachment B to these comments.

³⁴ EPA has never withdrawn a veto. In the few narrow circumstances where EPA has modified a veto, “the key elements of a Section 404(c) process were followed,” including public comment on a recommended determination and a final determination that the modification would not result in unacceptable adverse impacts. See, e.g., Modification of the 1985 Clean Water Act Section 404(c) Final Determination for Bayou aux Carpes in Jefferson Parish, LA, 74 Fed. Reg. 37,219 (July 28, 2009).

³⁵ EPA must make an independent assessment of evidence and not blindly defer to Corps—the very agency it is supposed to be policing. See 33 U.S.C. § 1344(c); see also *Mingo Logan Coal Co. Inc. v. U.S. Env'tl. Prot. Agency*, 70 F. Supp. 3d 151, 181 (D.D.C. 2014) (Section 404 “designates EPA as the ultimate decisionmaker with respect to the enumerated types of environmental consequences of section 404 discharges.”).

³⁶ See 33 U.S.C. § 1344(c) (requiring notice and comment “whenever” the Administrator determines that a discharge will cause unacceptable adverse impacts); see also *Consumer Energy Council of Am. v. Fed. Energy Regulatory Comm'n*, 673 F.2d 425, 446 (D.C. Cir. 1982) (“The value of notice and comment prior to repeal of a final rule is that it ensures that an agency will not undo all that it accomplished through its rulemaking without giving all parties an opportunity to comment on the wisdom of repeal.”).

B. The Proposed Plan is Prohibited by the Clean Water Act 404(b)(1) Guidelines

In addition to being prohibited by the Clean Water Act 404(c) veto, the Proposed Plan is prohibited by the Clean Water Act 404(b)(1) Guidelines, which strictly prohibit a “discharge into the aquatic ecosystem unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/ or probable impacts of other activities affecting the ecosystem of concern.”³⁷ The “degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by the[] Guidelines.”³⁸ These Guidelines are binding and are explicitly applicability to water resources projects planned or constructed by the Corps.³⁹

The DSEIS fundamentally fails to demonstrate that the Proposed Plan can be carried out without violating the 404(b)(1) Guidelines. First, the DSEIS fails to demonstrate that the Proposed Plan is the least environmentally damaging practicable alternative, a threshold error that renders the analysis arbitrary and capricious. Second, despite severely understating the adverse impacts of the Proposed Plan, the impacts acknowledged in the DSEIS will clearly cause significant—and conclusively unacceptable, as documented in the EPA veto—degradation of the aquatic ecosystem. Third, the DSEIS fails to demonstrate that those adverse impacts will be mitigated because it relies on a wholly conceptual mitigation proposal that is both woefully inadequate and infected by the very same fatal flaws identified by EPA in the veto. Fourth, the DSEIS fails to demonstrate that the Proposed Plan will not cause or contribute to violations of state water quality standards. Fifth, the DSEIS fails to demonstrate that the Proposed Plan will not jeopardize or adversely affect formally designated critical habitat.

1. The DSEIS Does Not—and Cannot—Demonstrate that the Proposed Plan Is the Least Environmentally Damaging Practicable Alternatives

The Corps has not satisfied its obligation to demonstrate that the Proposed Plan is the least environmentally damaging practicable alternative (LEDPA). The DSEIS disregards practicable, less-damaging alternatives proposed by EPA and the public, including a highly practicable Resilience Alternative. Instead, the DSEIS focuses solely on the already-vetoed Proposed Plan, which would cause far greater impacts to the environment and is undoubtedly not the LEDPA. In fact, the DSEIS demonstrates that the Proposed Plan is unquestionably not the LEDPA. This backwards analysis is arbitrary, capricious, and contrary to the binding 404(b)(1) Guidelines.

The Clean Water Act prohibits the Corps from dredging and filling wetlands if there is a less-environmentally damaging practicable alternative.⁴⁰ If such an alternative exists, “the CWA compels that the alternative be considered and selected unless proven impracticable.”⁴¹ Here, EPA and the Conservation Organizations identified less-environmentally damaging practicable alternatives to the Proposed Plan, including the Resilience Alternative submitted to the Corps with the Conservation

³⁷ 40 C.F.R. § 230.1(c) (emphasis added).

³⁸ 40 C.F.R. § 230.10(d).

³⁹ 33 CFR § 336.1(a); *See All. to Save the Mattaponi v. U.S. Army Corps of Engineers*, 606 F. Supp. 2d 121, 124 (D.D.C. 2009) (Stating that “the Corps must follow binding guidelines established by the Corps and the EPA (the “Guidelines” or the “404(b) Guidelines”), which are codified at 40 C.F.R. Part 230.”).

⁴⁰ *See* 40 C.F.R. § 230.10(a).

⁴¹ *Utahns for Better Transp. v. U.S. Dep't of Transp.*, 305 F.3d 1152, 1189 (10th Cir. 2002).

Organization scoping comments, which are provided at Attachments C and F to these comments. Yet, the Corps flatly refused to consider any alternatives in the DSEIS, a clear failing that violates the CWA.

EPA has repeatedly urged the Corps to consider non-structural solutions to reduce flood damages while protecting the critical wetland resources in the Yazoo Backwater Area,⁴² and the EPA veto encouraged the Corps to “evaluate alternative flood protection measures that are consistent with this Final Determination.”⁴³ That Determination prohibits multiple formulations of the Yazoo Pumps because the project would cause “unacceptable adverse effects on fishery areas and wildlife”⁴⁴ and “unacceptable damage” to “some of the richest wetland and aquatic resources in the nation.”⁴⁵ To that end, the veto urged the Corps to “conduct a comprehensive evaluation of the flood management needs in the region and the full range of options to effectively address those needs.”⁴⁶

EPA presented a detailed “non-structural reforestation alternative which would meet project objectives”⁴⁷ in its November 3, 2000 comments on the draft supplemental environmental impact statement for the 2007 Yazoo Pumps proposal. EPA restated its recommendation for the use of a non-structural reforestation alternative in its January 22, 2008 comments on the 2007 Yazoo Pumps final supplemental impact statement.⁴⁸ In the Recommended Veto, EPA proposed a less-environmentally damaging practicable alternative that would incorporate a suite of non-structural measures, including “reforestation of farmlands in the floodplain, relocation or flood proofing of flood-prone structures, conservation easements, localized flood protection structures including elevated transportation corridors, and expansion of insurance programs to compensate for economic losses from flooding.”⁴⁹ EPA reiterated the need to consider non-structural protection during the scoping period for this DSEIS, highlighting “the significant advancements in nonstructural approaches to flood damage reduction.”⁵⁰

During the scoping period on the DSEIS, the Conservation Organizations also urged the Corps to evaluate a detailed Resilience Alternative that satisfies all three criteria of a less environmentally damaging practicable alternative.⁵¹ First, the Resilience Alternative is practicable because it relies on available, fully-funded solutions that achieve the project purpose as stated by the Corps, which is “to provide reduced flood damages from the Mississippi and Yazoo Rivers to areas in the lower Mississippi Delta.”⁵²

⁴² Clean Water Act 404(c) Final Determination, Appx. 1 at 9. The U.S. Fish and Wildlife Service has also repeatedly recommended use of nonstructural and restoration approaches in lieu of the Yazoo Pumps. E.g., U.S. Fish and Wildlife Service, Fish and Wildlife Coordination Act Report (October 23, 2006), 2007 Final SEIS, Appendix 3 at 11.

⁴³ Clean Water Act 404(c) Final Determination at 70 (emphasis added).

⁴⁴ Clean Water Act 404(c) Final Determination at 70.

⁴⁵ Clean Water Act 404(c) Final Determination at 5, 73.

⁴⁶ Clean Water Act 404(c) Final Determination at 71.

⁴⁷ Environmental Protection Agency, Region 4, Comments on the Yazoo Backwater Area Draft Reformulation Report (DRR) and Draft Supplement No. 1 to the 1982 Yazoo Area Pump Project Final Environmental Impact Statement (DSEIS), Mississippi and Alabama; CEQ #000317 (November 3, 2000).

⁴⁸ Environmental Protection Agency, Region 4, Comments on the U.S. Army Corps of Engineer's (Corps) Final Yazoo Backwater Area Reformulation Report (FRR) and Final Supplement No. 1 to the 1982 Yazoo Area Pump Project Final Environmental Impact Statement; Washington, Humphries, Sharkey, Issaquena, Warren and Yazoo Counties, MS and Madison Parish, LA; CEQ# 20070486; ERP# COE-E36074-00 (January 22, 2008).

⁴⁹ EPA Recommended Veto at 60.

⁵⁰ EPA Scoping Letter (June 15, 2020), at 3.

⁵¹ Pursuant to 40 C.F.R. § 230.10(a), “no discharge of dredged or fill material shall be permitted if there is a [1] practicable alternative to the proposed discharge [2] which would have less adverse impact on the aquatic ecosystem, [3] so long as the alternative does not have other significant adverse environmental consequences.”

⁵² 2007 SEIS at 8; See 40 C.F.R. § 230.10(a)(2) (“An alternative is practicable if it is available and capable of being

This Resilience Alternative includes a combination of solutions employed by communities across the country to reduce flood risks, including purchasing wetland reserve and floodplain easements, voluntary buyouts and relocations, and flood-proofing infrastructure (including elevating homes, buildings and roads).⁵³ Second, the Resilience Alternative avoids the unacceptable adverse impacts of the Proposed Plan on wetlands and other aquatic resources.⁵⁴ Third, the Resilience Alternative avoids all other significant environmental impacts associated with the construction and operation of the Proposed Plan.⁵⁵ Accordingly, the Corps had an obligation to thoroughly consider and select this proposed Resilience Alternative.

The Corps, however, refused to undertake any analysis of alternatives in the DSEIS, as discussed in Section E of these comments. The Corps also refused to consider any alternatives in its draft 404(b)(1) Analysis. As a result, the Corps has failed to demonstrate that the Proposed Plan is the least environmentally damaging practicable alternative—a failure that plainly violates the 404(b)(1) Guidelines.⁵⁶

To the contrary, the DSEIS demonstrates that the Proposed Plan will cause far more impacts than the 2007 plan, and thus by definition, cannot, qualify as the LEDPA. Under the Proposed Plan, the Corps would construct the pumps at Deer Creek, which would destroy 84 acres of wetlands.⁵⁷ These direct impacts far exceed the Corps' 2007 plan, which would have directly impacted 38 acres of wetlands at the Steele Bayou Flood Control Structure.⁵⁸ Furthermore, the proposed plan eliminates 52,900 acres of restoration that was a much-touted component of the 2007 proposal, thereby exacerbating the adverse impacts to aquatic ecosystems.⁵⁹ Finally, the Proposed Plan also eliminates changes to the operation of the Steele Bayou Flood Control Structure that would allow water levels to rise naturally in the Yazoo Backwater Area by an additional three feet, abolishing the benefits that would have been created by this component of the 2007 plan.⁶⁰ As a result of this change to the operation of Steele Bayou, the Proposed Plan would increase “adverse effects to wetland function by 67.7 percent, aquatic spawning value by 79.7 percent, aquatic rearing value by 67.4 percent, and waterfowl foraging value by 100.0 percent,” as compared to the higher water level elevations proposed in the 2007 plan.⁶¹ Given these facts, there is

done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.”).

⁵³ See Section E of these comments and the related Attachment that includes the Resilience Alternative

⁵⁴ The 404(b)(1) Guidelines reinforce this point by creating a rebuttable presumption that that the Resilience Alternative, because it avoids impacts to wetlands, has “less adverse impacts on the aquatic ecosystem, unless clearly demonstrated otherwise.” 40 C.F.R. § 230.10(a)(3).

⁵⁵ 40 C.F.R. § 230.10(a)(2).

⁵⁶ See *All. to Save the Mattaponi*, 606 F. Supp. 2d at 130 (“The Corps must adequately explain why there is no less-damaging practicable alternative. If the Corps cannot so explain based on the record before it, it must reconsider its determination based on an adequate analysis of the alternatives.”)

⁵⁷ DEIS Appx. F-5 (wetlands) at 31; see also *id.* at Table 48 (identifying a loss of 444 AAFUCs).

⁵⁸ See 2007 SEIS at Appx. 10 at 2-3; *id.* at Table 10-20 (identifying a loss of 240 AAFUCs due to physical construction at Steele Bayou). This point is particularly clear given that the Corps has already destroyed wetlands at the Steele Bayou site to construct the intake and outlet channels. The Corps now proposes to construct another set of inlet and outlet channels, destroying far more wetlands and further wasting tax-payer money.

⁵⁹ DEIS 2 at 19-20.

⁶⁰ *Id.* at 22.

⁶¹ The 2007 Plan would modify the operation of the Steele Bayou water control structure to maintain water elevations between 70.0 and 73.0 feet (NGVD) during low water periods. DSEIS at 22. According to the Corps, these higher ponding levels would have “reduced adverse effects to wetland function by 67.7 percent, aquatic spawning value by 79.7 percent, aquatic rearing value by 67.4 percent, and waterfowl foraging value by 100.0 percent.” 2007 Appx. I (Mitigation) at 23; 2007 Appx. 11 (Aquatics) at 16-17. The Corps inexplicably eliminated

no plausible way that the Proposed Plan, which significantly increases impacts to the environment, constitutes the LEDPA.

2. The DSEIS Does Not—and Cannot—Demonstrate that the Proposed Plan Will Not Cause or Contribute to Significant Degradation of Waters of the United States.

The 404(b)(1) Guidelines strictly prohibit the discharge of dredge or fill material that “will cause or contribute to significant degradation of the waters of the United States.”⁶² As demonstrated in Section A of these comments, the Proposed Plan is clearly prohibited by the EPA veto, which concluded that the Yazoo Pumps would cause significant—and demonstrably unacceptable—degradation of some of the richest wetland and aquatic resources in the Nation. That finding decisively forecloses construction of the Proposed Plan.⁶³

In a blatant attempt to evade the veto’s clear prohibition on constructing the Yazoo Pumps, the DSEIS repeats the very same errors rejected by EPA in an arbitrary attempt to dramatically understate and obscure the Proposed Plan’s unquestionably significant and unacceptable degradation of the aquatic environment. However, even the severely and improperly restricted analysis in the DSEIS acknowledges that the Proposed Plan will degrade at least 38,774 acres of wetlands in the 2-year floodplain; a level of harm that is explicitly prohibited by the veto because it would cause significant, unacceptable degradation of wetlands and other aquatic resources.

(i) The DSEIS Acknowledges that the Proposed Plan Will Cause Significant Degradation to the Nation’s Waters

As documented in the veto, the Yazoo Backwater Area contains some of the richest wetland and aquatic resources in the Nation, which support a highly productive floodplain fishery, migratory bird foraging grounds of hemispheric significance, and some of the largest remaining bottomland hardwood forests.⁶⁴ The EPA veto explicitly prohibits construction of multiple formulations of the Yazoo Pumps that would damage 28,400 or more acres of wetlands.⁶⁵ Indeed, the veto determined that the significant degradation to more than 28,400 acres of nationally significant wetland and aquatic resources was so unacceptable that it was essential to use Clean Water Act 404(c) for just the 12th time in the history of the Clean Water Act to veto construction of the Yazoo Pumps.

The DSEIS shows that the Proposed Plan will degrade wetland functions on a minimum of 38,774 acres of wetlands,⁶⁶ which constitutes significant degradation as determined by EPA in the veto. As a result, the Proposed Plan would cause a degree of adverse impacts that falls squarely within the scope of the veto, rendering it clearly prohibited by the Clean Water Act 404(b)(1) Guidelines.

that benefit in the proposed plan, exacerbating the impacts to wetlands, aquatic resources, and wildlife.

⁶² 40 C.F.R. § 230.10(c).

⁶³ *Sierra Club v. U.S. Army Corps of Eng’rs*, 772 F.2d 1043, 1051 (2d Cir. 1985) (“[W]hen an agency approves a project that the record before a reviewing court reveals will have a significant adverse impact on marine wildlife, the agency determination must be reversed.”).

⁶⁴ Clean Water Act 404(c) Final Determination at 72.

⁶⁵ The Clean Water Act 404(c) Final Determination covers impacts ranging from 28,400 to more than 67,000 acres of wetlands. Clean Water Act 404(c) Final Determination at iii, 45, 72, 73. The severely—and improperly—restricted wetland assessment in the DSEIS acknowledges a minimum of 38,744 acres of wetland impacts.

⁶⁶ DSEIS F-5 (Wetlands) at Table 69.

(ii) The DSEIS Dramatically Understates the Full Extent of the Proposed Plan's Significant Degradation to the Nation's Waters

The DSEIS significantly understates the full extent of the Proposed Plan's significant degradation to the Nation's waters because the DSEIS fails to analyze a vast array of impacts to hemispherically significant wetlands and other aquatic resources, as summarized below and detailed throughout these comments.

First, the DSEIS arbitrarily and dramatically constrains its analysis of wetland impacts, as detailed in Section F of these comments. The DSEIS looks only at impacts to the small subset of wetlands located within the 2-year floodplain that receive ≥ 14 consecutive days of flooding—an approach explicitly rejected by EPA. The DSEIS further limits this assessment by looking only at changes to the duration of inundation on that small subset of wetlands.

The DSEIS' refusal to consider any factors other than the duration of inundation to determine what wetlands it needs to consider, is in direct violation of the multi-factor approach required by the 404(b)(1) Guidelines. As set forth at 40 C.F.R. § 230.11, the Corps must make factual determinations regarding the “short and long term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the environment.”⁶⁷ This analysis must consider any effects on wetlands, which are broadly defined as any “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.”⁶⁸ A site qualifies as a wetland if surveys indicate “the presence of hydrophytic vegetation, hydric soils, and wetland hydrology.”⁶⁹ The Corps' own guidance also “warns against using only one of the three parameters to determine a wetland boundary”⁷⁰ and explicitly states that such an approach can be “misleading.”⁷¹

True to that warning, EPA conclusively demonstrated in the veto that the Corps' single-factor approach misleadingly excludes known jurisdictional wetlands that must be analyzed under the 404(b)(1) Guidelines. As EPA emphasized in the veto, “[t]he wetlands identified by EMAP and agreed to by the Corps ARE jurisdictional wetlands by virtue of meeting the 3-parameters outlined in the Corps' 1987 Wetland Delineation Manual (i.e., having indicators of wetland hydrology, soils and vegetation).”⁷² Yet, due to its singular insistence on a 14-day flood duration, the veto determined that the Corps had falsely excluded 51,792 acres of jurisdictional wetlands in the two-year floodplain.⁷³ Accordingly, EPA rejected the Corps' approach as contrary to real world evidence and the 404(b)(1) Guidelines.

⁶⁷ 40 C.F.R. § 230.11.

⁶⁸ *Id.* § 230.3(t).

⁶⁹ Clean Water Act 404(c) Final Determination Appx. 5, Attachment A (EMAP Report) at 8; *see also* Corps of Engineers Wetland Delineation Manual (Y-87-1) at 9-10.

⁷⁰ Letter from James D Giattina, Director EPA Water Management Division to Kenneth Parrish (Dec. 6, 2005), Enclosure at 2.

⁷¹ Corps of Engineers Wetland Delineation Manual (Y-87-01) at 6 (“sole reliance on vegetation or either of the other parameters as the determinant of wetlands can sometimes be misleading”).

⁷² Clean Water Act 404(c) Final Determination Appx. 1 at 54 (emphasis in original). EPA's Environmental Monitoring and Assessment Program (EMAP) was used to carry out a statistically valid, field sample of wetlands in the Yazoo Backwater Area in 2003. A detailed discussion of the EMAP process and findings can be found in Section F.1 of these comments.

⁷³ Clean Water Act 404(c) Final Determination Appx. 5, Attach. A at 22 (Figure 6).

By repeating this foundational error, the DSEIS ignores significant degradation to wetlands caused by the pumps. For example, the Corps provides no analysis of the Proposed Plan's impacts on critically important wetlands that flood for less than 14 consecutive days, even though its own data shows that the Proposed Plan will reduce, if not eliminate, backwater flooding for at least 22,601 acres of these critical wetlands.⁷⁴ If the Proposed Plan reduces flooding on wetlands so that they no longer receive 8 consecutive days of inundation to a depth of one foot, as indicated by the Corps' data, those wetlands will no longer provide critical spawning habitat.⁷⁵ By disregarding these losses, the Corps once again vastly "underestimates the amount of aquatic spawning habitat adversely affected."⁷⁶ Likewise, if the Proposed Plan reduces flooding to a 5-year or greater return interval, which is also indicated by the Corps' hydrologic data, then these wetlands could shift from the riverine backwater wetland subclass to the flats wetland subclass. "This change in HGM subclass would result in the complete loss, by definition, of the functions performed by riverine backwater wetlands (i.e., temporary storage of surface water, organic carbon export and pollutant removal and sequestration functions)."⁷⁷ Again though, the Corps entirely overlooked this significant degradation by "wear[ing] blinders that Congress has not chosen to impose."⁷⁸ This "head in the sand" approach is arbitrary and capricious.⁷⁹

Instead of addressing the failure to comply with the 404(b)(1) Guidelines documented in the veto,⁸⁰ the DSEIS reuses the same flawed methodologies to categorically exclude vast areas of ecologically significant wetlands from its analysis. As a result, the DSEIS looks only at a small subset of impacts to a small subset of wetlands in the Yazoo Backwater Area, which infects the entire analysis. The DSEIS then greatly exacerbates these foundational errors by ignoring the statistically valid, field sampled EMAP analysis and the impacts of the dramatic reductions in flood elevations on the area's wetlands. See Section F.1 of these comments.

Second, the DSEIS greatly compounds its underestimate of impacts to wetlands and other aquatic resources by using yet another methodology decisively rejected in the veto to assess lost wetland functions, and by completely ignoring impacts to the project area's many rivers, streams, and bayous. As a result, the DSEIS understates, obscures, or entirely fails to consider significant and unacceptable degradation caused by the Proposed Plan, as detailed in Sections F.1 and F.2 of these comments.

Aquatic ecosystems: The 404(b)(1) Guidelines require a comprehensive analysis of "the nature and degree of effect that the proposed discharge will have, both individually and cumulatively, on the structure and function of the aquatic ecosystem and organisms."⁸¹ However, the DSEIS abjectly fails to do this by once again relying on methodologies decisively rejected by EPA in the veto to severely

⁷⁴ See Email from Kenneth Parrish to Margaret Strand, Re: (Jan. 29, 2020), at 17. A copy of this email is provided at Attachment D to these comments.

⁷⁵ DSEIS, Appendix F-8 (Aquatic Resources) at 3.

⁷⁶ Clean Water Act 404(c) Final Determination Appx. 6 at 2.

⁷⁷ Clean Water Act 404(c) Final Determination at 50.

⁷⁸ See *Riverside Irrig. Dist.*, 758 F.2d at 512.

⁷⁹ See *Am. Wild Horse Pres. Campaign v. Perdue*, 873 F.3d 914, 932 (D.C. Cir. 2017) (vacating an agency's action that "brushed aside critical facts" and failed to "adequately explain" or "adequately analyze" its policy choice). The discussion in Section F of these comments identifies additional flaws in the Corps' analysis, which further highlight the Corps' failure to comply with the 404(b)(1) Guidelines.

⁸⁰ Clean Water Act 404(c) Final Determination Appx I at 28-29, 54.

⁸¹ 40 C.F.R. § 230.11(e).

underestimate the impacts to wetland functions and obscure the significant impacts of those lost functions on fish and wildlife resources. For example:

- The DSEIS fails to provide the requisite analysis, even for the small subset of wetlands it considered. The DSEIS looks only at changes to the duration of inundation, and thereby fails to consider changes in the depth of inundation, even though both of these metrics are critical to aquatic ecosystem functions.⁸²
- The DSEIS both understates and obscures the impacts to wetland functions by relying on a scientifically unsound methodology decisively rejected by EPA in the veto, as discussed in detail in Section F.1 of these comments.⁸³ As a result, the DSEIS arbitrarily assumes that the Proposed Plan will cause no impacts to four of the eight wetlands functions used in the Corps' HGM Approach, even for those wetlands that will experience a decrease in flood duration.⁸⁴ The DSEIS also significantly understates the adverse impacts to the wetland function involving the export of organic carbon, contradicting its own scientific studies.⁸⁵ The DSEIS compounds these false assumptions by manipulating the data to obscure the significant impacts to wetland functions and fish and wildlife habitat.⁸⁶
- The DSEIS dramatically understates the adverse impacts to aquatic habitats required by the region's vital fisheries, as discussed in detail in Section F.1 and F.8 of these comments. For example, as documented in the veto, riverine wetlands in the Yazoo Backwater Area perform a series of unique functions that depend on a backwater flood-return frequency of five years.⁸⁷ Riverine wetlands also provide essential habitat for many species of fish and wildlife, including critical spawning habitat that requires at least 8 consecutive days of overbank flooding to a depth of at least one foot. The Corps simply excluded these critical wetlands from analysis based on an arbitrary limitation that defies the science and ignores EPA's expert judgment.
- The DSEIS fails entirely to evaluate impacts to the many rivers, streams, and bayous in the Yazoo Backwater Area, as discussed in Section F.2 of these comments.

Hydrologic Regime: The 404(b)(1) Guidelines require factual determinations regarding the impacts of a project "individually and cumulatively on water, current patterns, circulation including downstream flows, and normal water."⁸⁸ The DSEIS, however, entirely overlooks or arbitrarily understates the Proposed Plan's "significant changes in the hydrologic regime."⁸⁹ For example:

- The DSEIS does not analyze any type of hydrologic changes to wetlands located above the 2-year

⁸² See 40 C.F.R. § 230.11(e); see Section F.1.c of these comments.

⁸³ See Clean Water Act 404(c) Final Determination Appx. 6; see also Section F.1.b of these comments.

⁸⁴ Compare Clean Water Act 404(c) Final Determination, Appendix 6 at 1 with DSEIS Appx. F-5 (Wetlands) at Tables 70-79.

⁸⁵ See Section F.1.b of these comments.

⁸⁶ *Id.*

⁸⁷ Clean Water Act 404(c) Final Determination at 27 (identifying at least three critical functions that are not provided by non-riverine wetlands—detaining floodwater, exporting organic carbon, and removing elements and compounds).

⁸⁸ 40 C.F.R. § 230.11(b).

⁸⁹ *Id.*

floodplain, does not analyze hydrologic changes to wetlands in the 2-year floodplain that receive less than 14 consecutive days of flooding, and does not analyze changes to the depth of inundation to any wetlands.

- The DSEIS does not assess the effects of the Proposed Plan on low flow conditions in the Yazoo Backwater Area. Intensive agricultural groundwater pumping has depleted the Mississippi River Alluvial Aquifer, creating a cone of depression that captures baseflows in rivers, streams, and headwater tributaries throughout the Yazoo Basin. According to the DSEIS, the resultant low flow conditions in the fall and winter can adversely affect aquatic habitat.⁹⁰ Yet, the DSEIS fails to analyze the fact that the Proposed Plan will limit the ability of backwater floods to recharge the aquifer, which in turn will reduce baseflows.⁹¹ The DSEIS also fails to assess the potential for exacerbating low flow conditions as a result of increased irrigation due to the agricultural intensification that accounts for 80% of the benefits of the Yazoo Pumps. As a result, the DSEIS overlooks potentially significant effects on water levels and circulation, in violation of the 404(b)(1) Guidelines.⁹²
- The DSEIS fails to adequately analyze the impacts of the Proposed Plan on “circulation including downstream flows” along the Yazoo River which will receive the water discharged from the Yazoo Pumps when the Yazoo River is already at flood stage.⁹³ EPA and the Conservation Organizations have raised significant concerns about the effects of downstream flooding along the Yazoo River, including increased flood risks to communities located along or near the Yazoo River and increased risk of overtopping or otherwise undermining the integrity of the Yazoo Backwater Levee, as discussed in detail in Section C of these comments. An expert hydrologist has also identified serious deficiencies in the hydrological model used by the Corps. As a result, the Corps “lacks sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.”⁹⁴

Cumulative Effects on Aquatic Ecosystems: The 404(b)(1) Guideline require an analysis of the cumulative impacts to the aquatic ecosystem “attributable to collective effect of a number of individual discharges of dredged or fill material.”⁹⁵ This analysis is critical because cumulative effects “can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems.” Accordingly, the EPA veto analyzed the Yazoo Pumps impacts in the context of the significant cumulative losses across the Lower Mississippi River Alluvial Valley (LMRAV), which has already lost over 80 percent of its bottomland forested wetlands, as well as the Yazoo Backwater Area.⁹⁶ Those historic losses further compelled a finding of significant degradation.⁹⁷

Yet, the DSEIS includes no analysis of these cumulative impacts, even though additional wetland losses continue to plague the region. Indeed, if the wetland baseline numbers in the DSEIS are accurate, it means that at least 96,139 acres of wetlands have been lost from the 2-year floodplain since 2003, when

⁹⁰ DSEIS Appx. F-8 (Aquatic Resources) at 14.

⁹¹ Clean Water Act 404(c) Final Determination at 51.

⁹² 40 C.F.R. § 230.11(b).

⁹³ 40 CFR 230.11(b).

⁹⁴ 40 C.F.R. § 230.12(a)(3)(iv).

⁹⁵ 40 C.F.R. § 230.11(g).

⁹⁶ Clean Water Act 404(c) Final Determination at iii.

⁹⁷ *Id.*

the EMAP survey was conducted. Such a tremendous loss of wetlands from the 2-year floodplain mandates protection of the remaining wetlands in the project area. At the absolute minimum, the DSEIS must fully account for these highly significant losses in its 404(b)(1) analysis. The failure to do so—despite these purported declines and EPA’s insistence on this issue—is arbitrary and capricious.

In short, there is no rational basis for the Corps’ counterfactual assertion that the Proposed Plan will not cause or contribute significant degradation. To the contrary, even the fundamentally incomplete analysis in the DSEIS confirms that the Proposed Plan will cause significant degradation and thus cannot be constructed.

3. The DSEIS Fails To Mitigate the Significant and Unacceptable Adverse Impacts of the Proposed Plan

The 404(b)(1) Guidelines require the Corps to minimize any unavoidable adverse impacts to wetlands or aquatic resources caused by the proposed pumps.⁹⁸ To satisfy that obligation, the Corps must first avoid adverse impacts to wetlands. The Corps must then minimize any adverse impacts that cannot be avoided. Finally, the Corps must ensure compensatory mitigation to address the adverse impacts that cannot be avoided or minimized. As a threshold matter, the Corps has not taken any steps to avoid and minimize wetland impacts, as documented throughout these comments. The wholly conceptual mitigation proposed in the DSEIS is entirely inadequate to offset the “unavoidable adverse impacts to wetlands, terrestrial, aquatic, and waterfowl resources,”⁹⁹ as detailed in Sections F and H of these comments.

Notably, the DSEIS fails to identify compensatory mitigation measures that are “commensurate with the *amount and type* of impact that is associated with a particular [dredge and fill] permit.”¹⁰⁰ In addition, the DSEIS fails to provide the mandatory detailed mitigation plan that identifies the proposed mitigation site, documents baseline conditions, and demonstrates that the mitigation will be “sufficient to replace lost aquatic resource functions.”¹⁰¹ The Corps also fails to identify performance standards, monitoring requirements, and adaptive management measures to ensure the short and long-term ecological success of the proposed mitigation.¹⁰² The failure to comply with these obligations takes on even more force and importance where, as here, the proposed project would cause significant, unacceptable degradation that violate the Clean Water Act.¹⁰³

The DSEIS, like the Corps’ 2007 proposal, fails to satisfy these critical mitigation requirements. In 2008, EPA identified a series of shortfalls in the Corps’ conceptual proposal to reforest 10,662 acres of unidentified lands.¹⁰⁴ As a threshold matter, the proposed mitigation was woefully inadequate due to

⁹⁸ 40 C.F.R. § 230.10(d).

⁹⁹ DSEIS at 21.

¹⁰⁰ 40 C.F.R. § 230.93(a) (emphasis added).

¹⁰¹ *Id.* §§ 230.94(c)(1)-(14), 293.93(f)(2).

¹⁰² *Id.* § 230.94(c)(10), (12). *See also* Section H of these comments (documenting the Corps’ failure to ensure adequate mitigation to satisfy NEPA and the Water Resources Development Act).

¹⁰³ *See* 33 U.S.C. 1344(c) (authorizing EPA to prohibit discharge that causes “an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas.”); 40 C.F.R. § 231.230.10(c) (prohibiting any discharge that “will cause or contribute to significant degradation of the waters of the United States.”); *Id.* § 230.94(c)(1) (“the level of detail of the mitigation plan should be commensurate with the scale and scope of the impacts”).

¹⁰⁴ Clean Water Act 404(c) Final Determination at 60-62; *see also* Clean Water Act 404(c) Final Determination Appx.

the Corps' severe underestimate of the pumps' impacts on aquatic resources.¹⁰⁵ Furthermore, the Corps failed to identify any mitigation sites and instead relied on an unrealistic analysis to create the impression of adequate mitigation when that was not the case.¹⁰⁶ The Corps also failed to provide the necessary mitigation work plans, performance standards, monitoring requirements, or adaptive management measures to ensure the success of any reforestation.¹⁰⁷ Due to the many shortcomings, EPA concluded that the Corps' conceptual plan was insufficient to satisfy the 404(b)(1) Guidelines and ensure "impacts will be reduced permanently below the threshold of significant degradation."¹⁰⁸

The DSEIS repeats many of these same errors, and then adds even more, resulting in a woefully inadequate mitigation proposal that again violates the 404(b)(1) Guidelines. For example, the DSEIS fails to fully assess a wide array of adverse impacts, so cannot know how much mitigation would be required to offset those impacts. The DSEIS proposes to reforest just 2,405 acres of unidentified lands—an amount that is significantly less than in the Yazoo Pumps proposal vetoed by EPA.¹⁰⁹ The Corps has attempted to—but cannot—mask this severe shortfall by recycling the same faulty and inconsistent analysis rejected by EPA.¹¹⁰ The Corps proposes to construct 34 groundwater wells far outside of the project area that would cause even more drawdown of the already severely-depleted Mississippi Alluvial Plain aquifer. This out-of-kind mitigation is counter-productive and was decisively rejected in a comprehensive watershed plan due to its unacceptable *adverse* impacts. Yet, the Corps disregarded that watershed plan, as well as basic hydrological principles, in an unrealistic, uninformed, and unfounded attempt to claim mitigation credits. See Section H.2 of these comments for more information on the problems with the groundwater wells.

4. The DSEIS Fails to Demonstrate that the Proposed Plan Will Not Cause or Contribute to Violations of State Water Quality Standards

The Corps may not permit the discharge of dredge and fill material for a project if it causes or contributes to violations of any applicable State water quality standard.¹¹¹ Here, the Yazoo Backwater Area already suffers from degraded water quality due to excessive agricultural pollution, which has resulted in elevated levels of pollutants such as sediment, pesticides, and low dissolved oxygen/excessive nutrients. As explained in greater detail in Section F.6, the Proposed Plan will further impair water quality by (1) significantly degrading critical wetland functions that are directly related to water quality, (2) inexplicably eliminating thousands of acres of reforestation that were included in the 2007 plan to offset the pumps' impairment of water quality standards, (3) increasing agricultural production and the use of fertilizers and pesticides, and (4) exacerbating low flow conditions in the late

8.

¹⁰⁵ Clean Water Act 404(c) Final Determination Appx. 8 at 1. EPA had duty to challenge the Corps' mitigation under 404(c) and did so. *Mingo Logan Coal Co. Inc. v. U.S. Evtl. Prot. Agency*, 70 F. Supp. 3d 151, 174 (D.D.C. 2014) ("[I]t is EPA that is challenging the notion that those mitigation measures are satisfactory, which is precisely what EPA is authorized to do under section 404(c).").

¹⁰⁶ Clean Water Act 404(c) Final Determination Appx. 8 at 1.

¹⁰⁷ Clean Water Act 404(c) Final Determination at 61.

¹⁰⁸ Clean Water Act 404(c) Final Determination at 62.

¹⁰⁹ The Corps also removed x acres of conservation easements, thereby eliminating any offsetting effects associated with those measures.

¹¹⁰ Clean Water Act 404(c) Final Determination Appx. 8 at 4.

¹¹¹ See 40 C.F.R. § 230.10(b); see also *id.* § 131.21(d) (stating that state water quality standards must be used in "evaluating proposed discharges of dredged or fill material under section 404").

summer and early Fall. Yet, the DSEIS disregards these issues, and thereby fails to ensure the Proposed Plan will not cause or contribute to violations of state water quality standards.

5. The DSEIS Fails to Ensure that the Proposed Plan Will Not Jeopardize Listed Species or Adversely Modify Critical Habitat

To comply with the 404(b)(1) Guidelines, the Corps must demonstrate that the proposed project will not jeopardize any listed species or adversely modify critical habitat.¹¹² To fulfill that obligation, the Corps must comply with the Endangered Species Act's procedural requirements, which "call for a systematic determination of the effects of a federal project on endangered species. If a project is allowed to proceed without substantial compliance with those procedural requirements, there can be no assurance that a violation of the ESA's substantive provisions will not result. The latter, of course, is impermissible."¹¹³

As explained in greater detail in Section F.8 of these comments, however, the Corps has failed to provide a systematic determination of the Proposed Plans' effects on listed species and critical habitat. As an initial matter, the DSEIS provides no analysis of the Proposed Plan's impacts on the pondberry, an endangered species that is extremely susceptible to changes in backwater hydrology. As a result, there are no assurances—procedural or substantive—that the Proposed Plan will not jeopardize this species. Second, the DSEIS fails to thoroughly analyze the impacts to other listed species that rely on the Yazoo Backwater Area and will be adversely impacted by the pumps, including the wood stork, least tern, pallid sturgeon, and several species of mussels. Due to these omissions, the Corps cannot approve the Proposed Plan until it reinitiates consultation with the FWS and ensures that the Proposed Plan will not jeopardize the survival or recovery of these species, or adversely modify their critical habitat.

C. The Proposed Plan Does Not Prevent Flooding and It Will Likely Increase Flood Risks for Some Communities

The DSEIS shows that the Proposed Plan will not prevent flooding in the Yazoo Backwater Area. Even with the Pumps operating, the vast majority of flooded lands would still be underwater and it would take weeks to months to drawdown floodwaters on the remaining lands. The Corps' own data also shows that the Yazoo Pumps will significantly increase flood risks for some communities.

1. The Proposed Plan Does Not Prevent Flooding

The DSEIS clearly acknowledges that the Proposed Plan will not prevent flooding:

The common perception of the Yazoo Backwater Project is that the pump will eliminate all flooding within the basin. This is far from the truth, because the Project will only address backwater flood events, and it will not even be put into operation during headwater flood events.¹¹⁴

¹¹² 40 C.F.R. § 230.10(b)(3).

¹¹³ *Thomas v. Peterson*, 753 F.2d 754, 764 (9th Cir. 1985).

¹¹⁴ 2020 DSEIS Appendix G at para. 170

Even when the Pumps are operating, the Proposed Plan would leave 82% to 89% of flooded lands underwater and take weeks to months to drawdown floodwaters on the remaining lands.¹¹⁵

For example, had the Yazoo Pumps been in operation during the 2019 flood, 442,195 acres—**83% of the lands that flooded in 2019**—would still have been underwater, based on data provided by the Corps.¹¹⁶ Just 17% of the acreage that flooded in 2019 would have been drained by the Yazoo Pumps.

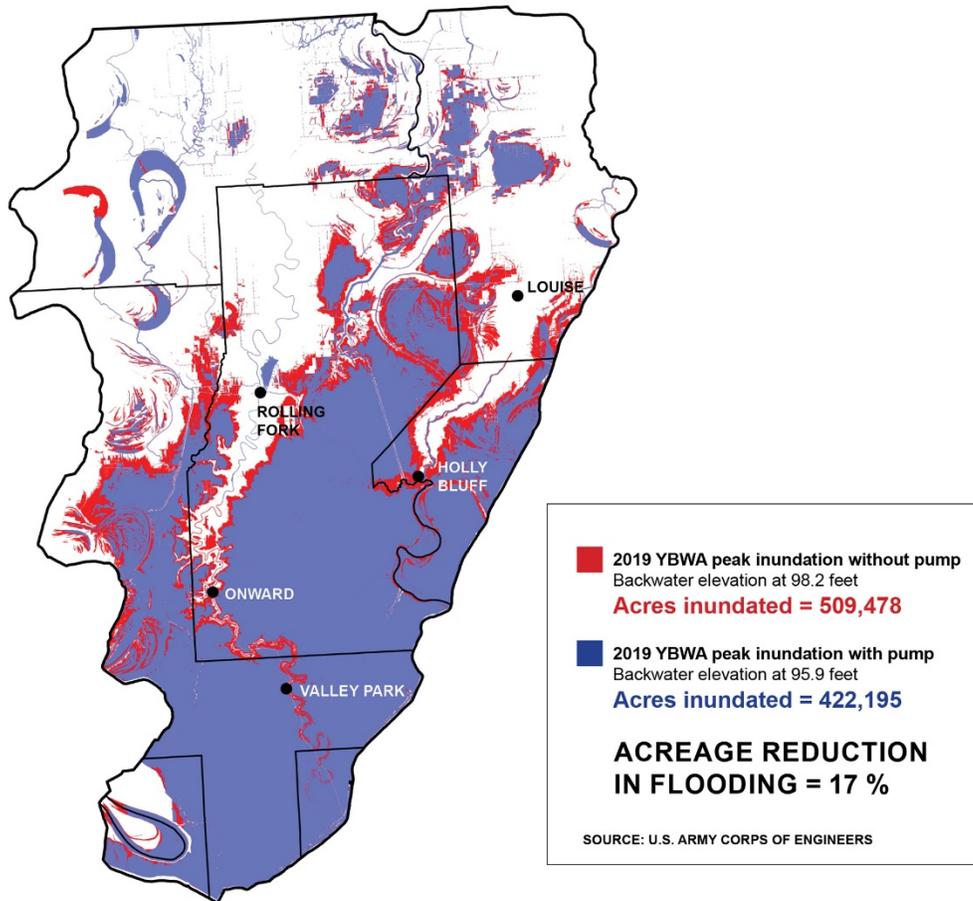


Figure 2, 2019 Flood Inundation Map With and Without the Pumps

¹¹⁵ DSEIS, Appendix C (Tables), Table 5.3. The “sloped pool” model is more accurate than the more optimistic “flat pool” model.

¹¹⁶ This data was provided to the Conservation Organizations in response to a November 2, 2020 Freedom of Information Act request submitted by Earthjustice.

Even using the clearly less reliable flat pool calculations provided in the DSEIS, operating the Yazoo Pumps would still leave 65% of lands that would have flooded without the Pumps underwater, and would take weeks to months to drawdown floodwaters on the remaining lands.¹¹⁷

The DSEIS also shows the small amount of acreage that would see any kind of benefits from the Yazoo Pumps. For example, during a 20-year flood event, the Proposed Plan would reduce flood damages on just 71,000 acres as measured through the more reliable sloped pool data; and just 115,000 acres as measured through the less reliable flat pool data.¹¹⁸ This highly limited area has significant implications for the required—but not carried out—assessment of project benefits and calculation of the benefit-cost ratio, as discussed in Section F.11 of these comments.¹¹⁹

The sloped pool data is more reliable because it accounts for headwater flooding, which the DSEIS acknowledges already occurs frequently and is projected to occur more frequently due to climate change.¹²⁰ The sloped pool data is also more reliable because the Yazoo Pumps are only turned on when precipitation in the Yazoo Basin is causing flooding (i.e., headwater flooding) and the Steele Bayou gates are closed to stop backwater flooding from the Mississippi and Yazoo Rivers in the Yazoo Backwater Area. In situations where there is significant headwater flooding, the Yazoo Pumps will not be able to pump water out of the Yazoo Backwater Area fast enough to prevent flooding.¹²¹

The Conservation Organizations also note that the DSEIS' inclusion of modeling results showing reductions in stage, volume and area of inundation during the 100-year flood event is both unrealistic and highly misleading.¹²² This is because it would be irresponsible for the Corps to operate the Yazoo Pumps during a 100-year flood event when the additional water being pumped into the Yazoo River (up to 9 billion gallons of water a day) would likely overtop the Yazoo Backwater Levee, potentially threatening the levee's integrity and the safety of the 40,000 people who live and work in the Yazoo Backwater Area—the very people that the Pumps purport to protect. The Yazoo Backwater Levee has an elevated risk of crevassing as a result of overtopping and is not accredited due to its low elevation, which is well below the requisite base flood elevation plus three-feet of freeboard.¹²³

We also note that because construction and operation of the Yazoo Pumps will not affect the accreditation status of the Yazoo Backwater Levee, the Proposed Plan will not provide flood insurance relief for homeowners in the Yazoo Backwater Area because the entire area will still be mapped as a special flood hazard zone.

¹¹⁷ DSEIS, Appendix G (Engineering) at 123, Table 2-26.

¹¹⁸ DSEIS, Appendix C (Tables) at Table 5.3 and 5.4. Less acreage is protected during smaller flood events, and slightly more acreage is protected during a 50 or 100-year flood event, according to these tables.

¹¹⁹ In calculating any benefits on these lands, the Corps' calculation of benefits would also have to account for the probability of a particular flood event occurring, and would have to account for the impacts caused before the water is pulled off the land by the Pumps. Without these analyses, the Corps would be overcounting benefits.

¹²⁰ DSEIS Appendix G (Engineering) at para. 25-26; and at para. 171: "All of the basin will continue to receive many more headwater floods than backwater floods over the years to come."

¹²¹ See DSEIS Appendix G (Engineering) at para. 157 ("The extent and magnitude of flooding with the SPF [Standard Project Flood] would not be greatly affected by the 14,000-cfs pumping station because the storm was a very intense, short duration event with inflow rates much in excess of the pump capacity.")

¹²² DSEIS Appendix G (Engineering) at Table 2-26 and Figure 2-108.

¹²³ National Levee Database at <https://levees.sec.usace.army.mil/#/levees/system/5905000041/fema> (accessed November 6, 2020). Lack of accreditation means that the Yazoo Backwater Levee cannot protect Yazoo Backwater communities during flood events at or greater than the 1% chance of exceedance (100-year flood event).

2. The DSEIS Relies on an Indefensible Hydrological Model to Assess Downstream Flood Impacts and Obscures the Findings of that Indefensible Model

EPA and the Conservation Organizations have raised significant concerns about the Yazoo Pumps increasing flood risks for communities located along or near the Yazoo River, and increasing flood risks within the Yazoo Backwater Area through overtopping or otherwise undermining the integrity of the Yazoo Backwater Levee.

The DSEIS disregards these concerns in a high-handed and conclusory manner by referencing the findings¹²⁴ of a report entitled “Impacts of the Yazoo Backwater Pumps to Downstream Stages 22 November 2019”¹²⁵ that relied on model that is too flawed to provide any type of reliable analysis. A detailed review of this model was carried out by William Fleenor, Ph.D., an expert with more than 25 years of experience with hydrologic modeling.¹²⁶ Dr. Fleenor’s review concludes that the model used by the Corps is fundamentally unreliable and “cannot be trusted to get a correct answer” regarding the impact of the Yazoo Pumps on flood levels in the Yazoo River:

The U.S. Army Corps of Engineers used a one-dimensional hydrodynamic HEC-RAS model¹²⁷ to assess the downstream impacts of the Yazoo Backwater Pumps on water elevations (stage) in the Yazoo River during the peak 2019 event. Review of that Model demonstrates that it is not capable of accurately examining stage changes in the Yazoo River because it provides a poor and very inaccurate representation of the Yazoo River, does not properly match measured stages and flows, uses obviously inappropriate boundary conditions, and is not sufficiently calibrated.

More specifically, the Model represents the lower reach of the Yazoo River (the area most likely to be affected by the Yazoo Pumps) as being 17.5 miles, or 37.5%, longer than it actually measures, and this added length alone disqualifies the Model from being reliable. The Model also includes many cross-sections for the Yazoo River that are wider than justified, which results in the Model producing a Yazoo River that can convey more water than reality. The Model demonstrates extraordinarily little tendency to match the amount of timing of the measured flow in the lower reach of the Yazoo River, with the modeled flows at the USGS Redwood gage location (the closest upstream gage to the proposed location of the Yazoo Pumps) often peaking while flows measured by the Redwood gage are in a trough, and the six-month simulation of the Model producing modeled flow at the Redwood gage with 76.2 billion cubic feet less than measured by that gage. Due to the use of inappropriate flow boundary conditions, the Model predicts stage and flow levels that do not match the levels measured by gages in 2019. The base model performance of stage and flow at Yazoo River gages indicates that the Model was not calibrated and thus cannot be trusted to get a correct answer under any type of changes, such as the additional flows generated by the pumps.

¹²⁴ DSEIS, Appendix G (Engineering) at 144-145, paragraph 177.

¹²⁵ This study is not included in the DSEIS, but is posted on the Corps’ Yazoo Backwater Area Study website at <https://www.mvk.usace.army.mil/Portals/58/docs/PP/YazooBackwaterReport/YBW%20Pump%20Downstream%20Impacts%2019Dec2019.pdf>.

¹²⁶ Dr. Fleenor’s CV is provided at Attachment E to these comments.

¹²⁷ This model, referred to in this report as the Model or the 1-D Model, utilizes both Mississippi River reaches, and tributary Yazoo River reaches.

The Model must be more accurately defined, and the boundary conditions better established before the Model can be properly calibrated, and then used to assess the impacts of the Yazoo Backwater Pumps. Use of a two-dimensional model would provide a much better assessment of stage elevations in the primary area of interest due to many of the flows being across the main Yazoo River channel and the crossflow area from the Mississippi River.¹²⁸

The DSEIS nevertheless relies on this indefensible model to justify its assertion that the Yazoo Pumps would not increase flood risks downstream, noting that the model “showed an increase of 0.2 feet at Vicksburg, and 0.3 feet at Steele Bayou Riverside with a 14,000-cfs pumping station” if the Yazoo Pumps had been operating during the 2019 flood event.¹²⁹

In reality, however, a detailed review of the Corps’ flawed model shows that had the Pumps been operating at the Steele Bayou location in 2019, they would have caused at least a 0.45 foot rise in some portions of the Yazoo River with a margin of error of plus or minus 0.5 feet. Thus, the Corps’ own model shows that the Yazoo Pumps could increase flood stage in the Yazoo River by 0.95 feet—almost one extra foot of water when the Yazoo River is already at flood stage. However, even this major increase significantly understates the risks. This is because the Corps’ model relied on much lower flow levels on both the Yazoo and Mississippi Rivers than the levels that were actually reached in 2019.¹³⁰ In short, the Corps not only relies on a flawed model but mischaracterizes the findings of that flawed model..

The risks associated with the Corps’ flawed model are highly significant. An accurate understanding of the Proposed Plan’s impact on stage levels in the Yazoo River is critical to knowing whether operation of the Pumps would increase flood levels in the Yazoo River, which would: increase the risks to the integrity of the Yazoo Backwater Levee; affect communities and business located along the Yazoo River, including communities in north Vicksburg that already suffer from excessive flooding; and risk inundating the International Paper wastewater treatment ponds which would release significant amounts of toxic wastewater into the Yazoo River.

D. The Proposed Plan is Not Authorized

The Proposed Plan and its 87-foot activation level vastly exceeds the scope of the project’s Congressional authorization. As extensively documented in the 2008 veto, the authorization for the Yazoo Pumps designates lands “located below 90 feet, NGVD, in elevation to serve as a sump area for surface water storage.”¹³¹ In 1959, the Corps determined that the authorized level of protection had been met:

Since the original authorization for Yazoo Backwater Protection, important hydraulic changes have taken place due to improvement of channel efficiency in the Mississippi River and to reservoirs and channel improvement in the Yazoo Basin headwater area. These have resulted in less frequent flooding, and shorter duration of flooding, which makes it feasible to develop a simplification of the authorized plan by eliminating pumping at a large saving in project cost. . . .

¹²⁸ William E. Fleenor, Ph.D., Analysis of the HEC-RAS 1D Model Used by the U.S. Army Corps of Engineers in Assessment of their report: “*Impacts of the Yazoo Backwater Pumps to Downstream Stages 22 November 2019*”, November 1, 2020 at 1. A copy Dr. Fleenor’s report and CV are provided at Attachment E to these comments.

¹²⁹ DSEIS, Appendix G (Engineering) at 144-145, paragraph 177.

¹³⁰ Fleenor Report at 2, 4, and Appendix.

¹³¹ Clean Water Act 404(c) Final Determination at 7-9.

It is apparent that a protection plan for the Yazoo Backwater Area involving levees and floodgates only, which was not feasible under earlier conditions, is now feasible, and will provide a high degree of protection for the foreseeable future without the necessity of pumping.¹³²

The DSEIS provides further evidence that the authorized level of flood protection has been met, through its contention that the “new and more complete” period of record (1978-2019) shows that the Holly Bluff cut-off (which was completed in 1958) and the Yazoo Backwater Levee (which was completed in 1978) caused a one to three foot reduction in the 2-year floodplain elevation.¹³³

E. The DSEIS Violates NEPA Because it Does Not Evaluate Alternatives

The DSEIS violates NEPA because it does not evaluate alternatives. The failure to analyze alternatives also results in the Proposed Plan being prohibited by the Clean Water Act 404(b)(1) Guidelines because the Corps cannot demonstrate that the Proposed Plan is the least environmentally damaging alternative (and in fact, the Proposed Plan is demonstrably not the LEDPA), as discussed in Section B.1 of these comments.

To comply with NEPA, the DSEIS must “[r]igorously explore and objectively evaluate all reasonable alternatives.”¹³⁴ This fundamental NEPA mandate clearly applies to supplemental environmental impact statements,¹³⁵ which means that “the existence of reasonable but unexamined alternatives” renders the DSEIS “inadequate.”¹³⁶

The Council on Environmental Quality has made clear that “[r]easonable alternatives include those that are practical or feasible from a technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.”¹³⁷ Critically, the DSEIS must also include “reasonable alternatives not within the jurisdiction of the lead agency.”¹³⁸

¹³² Id. (quoting Vicksburg District Corps, MR&T Comprehensive Review Report, Annex L, Yazoo Backwater Project Mississippi at 20 (November 1959)).

¹³³ Appendix F-5 (Wetlands) at 35-36.

¹³⁴ 40 C.F.R. § 1502.14.

¹³⁵ *Holy Cross Neighborhood Ass'n v. U.S. Army Corps of Engineers*, No. CIV.A. 03-370, 2011 WL 4015694, at *7 (E.D. La. Sept. 9, 2011) (holding that Army Corps violated NEPA by failing to “re-evaluate” alternatives in a SEIS in light of significant new information); *Natural Res. Def. Council v. U.S. Forest Serv.*, 421 F.3d 797, 813–14 (9th Cir. 2005) (holding that “where changed circumstances affect the factors relevant to the development and evaluation of alternatives,” an agency’s SEIS “must account for such change in the alternatives it considers.”) (citation omitted); *Sierra Forest Legacy v. Ray*, 577 F.3d 1015, 1021-22 (9th Cir. 2009) (holding that additional alternatives analysis was required in an SEIS due to “altered ... modeling techniques” and “substantively new objectives” since preparation of the original EIS); 40 CFR §1502.9 (c) (applying same standards to preparing an EIS and an SEIS). See *High Country Conservation Advocates v. United States Forest Serv.*, 951 F.3d 1217, 1227 (10th Cir. 2020) (holding that agency arbitrarily eliminated an alternative from detailed study in a SEIS).

¹³⁶ *Ctr. for Biological Diversity v. United States Dep't of the Interior*, 623 F.3d 633, 642 (9th Cir. 2010); *Westlands Water Dist. v. U.S. Dep't of Interior*, 376 F.3d 853, 868 (9th Cir. 2004); *Morongo Band of Mission Indians v. Fed. Aviation Admin.*, 161 F.3d 569, 575 (9th Cir. 1998); *Oregon Natural Desert Ass'n v. Bureau of Land Management*, 531 F.3d 1114, 1121 (9th Cir. 2008).

¹³⁷ Forty Most asked Questions Concerning CEQ’s NEPA Regulations, 46 Fed. Reg. 18,026 (March 23, 1981).

¹³⁸ 40 CFR §1502.14(c).

Congress has long recognized the importance of the Corps carefully assessing wetland restoration, nonstructural measures and reasonable alternatives that are not within the agency's jurisdiction when evaluating alternatives. For example, the Conference Report for the Water Resources Development Act of 1996 states:

The conferees have included several provisions in section 202 which modify the flood control program of the Corps of Engineers, reflecting an evolution in national flood control policy. The conferees have deleted the provision in the House bill to allow additional review of the proposal without prejudice to its substance. The conferees expect the Corps to continue to consider nonstructural alternatives as required by existing law, and encourage the Corps to improve its efforts at considering nonstructural alternatives in its project study and formulation. Such consideration should include watershed management, wetlands restoration, elevation, and relocation. The Corps is also encouraged to explore alternatives which may be implemented by others, beyond the authority of the Corps. Examples of such alternatives include changes in zoning or development patterns by local officials. Because the Corps has no authority to implement such recommendations, such options are generally not explored or displayed in Corps study documents. However, such alternatives could, in some cases, result in a more effective flood protection program at reduced cost to both Federal and non-Federal interests.

Such alternatives are consistent with current approaches to flood control and recent congressional actions related to reducing Federal expenditures for flooding. For example, Congress enacted the Hazard Mitigation and Flood Damage Reduction Act of 1993, in direct response to the disastrous flooding in the Midwest in 1993. This law allows for increased use of relocation in response to flooding. It would be prudent for the Corps to also increase its review of nonstructural alternatives prior to flooding.¹³⁹

In developing and selecting alternatives, the DSEIS must also comply with the full suite of federal laws and policies designed to protect the environment. These include, the Endangered Species Act, the Clean Water Act, the Fish and Wildlife Coordination Act, the Migratory Bird Treaty Act, and the mitigation requirements applicable to Corps civil works projects. To comply with the Water Resources Development Acts, the Corps also must consider non-structural alternatives and practicable "natural infrastructure alternatives,"¹⁴⁰ and the DSEIS must select an alternative that protects and restores the functions of natural systems.¹⁴¹

In short, the DSEIS must evaluate a full range of reasonable alternatives—including nonstructural, natural, and nature-based solutions—that would protect and restore the natural functions of the rivers, streams, and wetlands in the Yazoo Backwater Area. The Corps must ultimately select an alternative that achieves these objectives while causing the least possible amount of harm to the environment.

The DSEIS, however, does none of these things. Instead, it examines just one alternative—the same 14,000 cfs pumping station whose purpose, structure, operation, and impacts fall squarely within the

¹³⁹ H.R. Rep. No. 104-843, at 146 (1996) (Water Resources Development Act of 1996 Conference Report) (discussing the same section that waived the non-federal cost share for the Yazoo Pumps if they are located at Steele Bayou).

¹⁴⁰ 33 U.S.C. 701b-11, 33 USC 2230; 33 USC 2289(a)(2).

¹⁴¹ 42 USC 1962-3.

scope of the 2008 veto, as discussed in Section A of these comments.¹⁴² This single alternative is also prohibited by the Clean Water Act 404(b)(1) Guidelines, as detailed in Section B of these comments.

1. New Information Mandates a Comprehensive Analysis of Alternatives

The DSEIS states explicitly that it does “not reexamine the broad array of alternatives formulated in the 2007 FSEIS”¹⁴³ and “will not reformulate the broad array of alternatives examined in the 2007 FSEIS.”¹⁴⁴ Rather, the DSEIS will “analyze the Proposed Plan in light of new environmental and hydraulic data”¹⁴⁵ and “reevaluate the recommended plan as described in the 2007 FSEIS considering new environmental data.”¹⁴⁶ However, a comprehensive review of alternatives is required precisely because of new environmental and hydraulic data.¹⁴⁷

For example, according to the DSEIS, the “new and more complete” period of record (1978-2019) shows that completion of the Holly Bluff Cut-off in 1958 and the Yazoo Backwater Levee in 1978 caused a significant reduction in flood stages in the Yazoo Backwater Area:

The median $\geq 5.0\%$ flood duration elevation threshold was lowered approximately one to three feet as a result of implementation of the flood risk reduction features, translating to a large aerial decrease in potential wetland areas when superimposed on the Yazoo Study Area.¹⁴⁸

In addition, according to the DSEIS, 96,139 acres of wetlands that were in the 2-year floodplain in 2003 are no longer in the 2-year floodplain.¹⁴⁹ The DSEIS claims that 57,000 of these acres are no longer in the 2-year floodplain because of the reduction in the 2-year floodplain elevation noted above.¹⁵⁰

The DSEIS also provides new information demonstrating the relative ineffectiveness of the Proposed Plan. The DSEIS acknowledges that the Proposed Plan would not prevent flooding, as discussed in Section C of these comments. To the contrary, even when the Pumps are operating, the Proposed Plan would leave 82% to 89% of flooded lands underwater and take weeks to months to drawdown

¹⁴² The Conservation Organizations recognize that the DSEIS also looks at the no action alternative, but it is clear that the Corps has never had any intention of recommending that no action alternative. To the contrary, the entire focus of the DSEIS and the NEPA process employed by the Corps has been to approve construction of the already-vetoed Proposed Plan.

¹⁴³ DSEIS at 6.

¹⁴⁴ DSEIS at 8.

¹⁴⁵ DSEIS at 8.

¹⁴⁶ DSEIS at 6.

¹⁴⁷ E.g., *Holy Cross Neighborhood Ass'n v. U.S. Army Corps of Engineers*, No. CIV.A. 03-370, 2011 WL 4015694, at *7 (E.D. La. Sept. 9, 2011) (holding that Army Corps violated NEPA by failing to “re-evaluate” alternatives in a SEIS in light of significant new information); *Natural Res. Def. Council v. U.S. Forest Serv.*, 421 F.3d 797, 813–14 (9th Cir. 2005) (holding that “where changed circumstances affect the factors relevant to the development and evaluation of alternatives,” an agency’s SEIS “must account for such change in the alternatives it considers.”) (citation omitted); *Sierra Forest Legacy v. Ray*, 577 F.3d 1015, 1021-22 (9th Cir. 2009) (holding that additional alternatives analysis was required in an SEIS due to “altered ... modeling techniques” and “substantively new objectives” since preparation of the original EIS); 40 CFR §1502.9 (c) (applying same standards to preparing an EIS and an SEIS).

¹⁴⁸ DSEIS, Appendix F-5 (Wetlands) at 35-36.

¹⁴⁹ This means that the 2-year floodplain has lost an area of wetlands more than twice the size of Washington, DC; a tremendous loss of wetlands that must be accounted for.

¹⁵⁰ DSEIS Appendix F-5 (Wetlands) at 35-36.

floodwaters on the remaining lands.¹⁵¹ Importantly, data that supports the DSEIS (but was not provided in the DSEIS) demonstrates that the Proposed Plan could actually increase flood risks for some communities, as discussed in Section C of these comments.

The DSEIS also shows that the total amount of acres that will see any reduction in flooding during a 20-year flood is 71,000 acres as measured through the more reliable sloped pool data; and 115,000 acres as measured through the less reliable flat pool data.¹⁵² This highly limited area has significant implications for the required—but not carried out—assessment of project benefits and calculation of the benefit-cost ratio. See Section C of these comments for additional information.

Notably, the DSEIS also shows that the Proposed Plan will not prevent flooding in the Yazoo Backwater Area even when the Pumps are operating, as discussed in Section C of these comments. To the contrary, with the Pumps operating, 83% of flooded lands would still be underwater and it will take weeks to months to drawdown floodwaters on the remaining lands. The Corps' own data also shows that the Yazoo Pumps will significantly increase flood risks for some communities. The minimal flood damage reduction benefits that will result from the Proposed Plan, and the high risk that the Proposed Plan will actually increase flood risks for some communities demonstrates the vital need for a rigorous and comprehensive assessment of alternatives.

This data, along with the vast quantity of new environmental data and science—and the changed conditions on the ground that were documented with the Resilience Alternative, discussed below—demonstrates that the DSEIS must in fact conduct a full, rigorous, and objective evaluation of alternatives. This analysis must include a full assessment of the highly practicable Resilience Alternative presented by the Conservation Organizations. The DSEIS must then select the least environmentally damaging alternative that protects and restores the natural functions of the Yazoo Backwater Area.

2. The DSEIS Must Assess the Highly Practicable Resilience Alternative that Will Quickly Provide Sustainable Benefits While Restoring the Environment

During the scoping period on the DSEIS, the Conservation Organizations submitted a [detailed Resilience Alternative](#) for the Corps' consideration that would provide immediate, effective, sustainable, and environmentally sound relief to communities in the Yazoo Backwater Area.

The Resilience Alternative utilizes sustainable solutions that are being employed by communities across the country to reduce flood risks, including purchasing wetland reserve and floodplain easements, voluntary buyouts and relocations, and flood-proofing infrastructure (including elevating homes, buildings and roads). These solutions can be carried out under existing federal programs that are currently funded and available for use in the Yazoo Backwater Area, including: U.S. Department of Agriculture easement programs; Federal Emergency Management Agency Building Resilient Infrastructure and Communities "BRIC" program; and Federal Emergency Management Agency post-disaster recovery programs.

¹⁵¹ DSEIS, Appendix C (Tables), Table 5.3. The "sloped pool" model is more accurate than the more optimistic "flat pool" model.

¹⁵² DSEIS, Appendix C (Tables) at Table 5.3 and 5.4. Less acreage is protected during smaller flood events, and slightly more acreage is protected during a 50 or 100-year flood event, according to these tables.

The scoping comments submitted by the Conservation Organizations also provided extensive documentation of the practicability and appropriateness of selecting the Resilience Alternative, including documentation of: the strong interest in enrolling lands in conservation easements; the elimination of restriction on enrolling the wettest Yazoo Backwater Area lands into existing conservation easement programs; established conservation priorities for the Yazoo Backwater Area and beyond; and the significant farm subsidy payments that already flow to farms in the Yazoo Backwater Area. This evidence is set forth at pages 11 through 29 of the scoping comments and the attached Resilience Alternative. The Resilience Alternative is provided as Attachment C to these comments. The Conservation Organizations scoping comments are provided as Attachment F to these comments.

As discussed in Section B of these comments, the Resilience Alternative also satisfies all three of the Clean Water Act 404(b)(1) Guideline criteria of a less environmentally damaging practicable alternative.¹⁵³ First, the Resilience Alternative is practicable because it relies on available, fully-funded solutions that achieve the project purpose as stated by the Corps, which is “to provide reduced flood damages from the Mississippi and Yazoo Rivers to areas in the lower Mississippi Delta.”¹⁵⁴ Second, the Resilience Alternative avoids the unacceptable adverse impacts of the Proposed Plan on wetlands and other aquatic resources.¹⁵⁵ Third, the Resilience Alternative avoids all other significant environmental impacts associated with the construction and operation of the Proposed Plan.¹⁵⁶ Accordingly, the Corps had an obligation to thoroughly consider and select this proposed Resilience Alternative.

EPA also reiterated the need to consider non-structural alternatives during the scoping period for this DSEIS, highlighting “the significant advancements in nonstructural approaches to flood damage reduction.”¹⁵⁷ Moreover, as discussed in detail in Section B of these comments, EPA has repeatedly urged the Corps to consider non-structural solutions to reduce flood damages while protecting the critical wetland resources in the Yazoo Backwater Area, including in the 2008 veto, along with the Fish and Wildlife Service and the Department of the Interior.¹⁵⁸

The Conservation Organizations once again call on the Corps to fully examine the Resilience Alternative which fully complies with the Nation’s environmental laws, and will avoid flood risks and reduce flood damages to impacted communities while protecting and restoring—instead of harming—the ecologically rich Yazoo Backwater Area.

¹⁵³ Pursuant to 40 C.F.R. § 230.10(a), “no discharge of dredged or fill material shall be permitted if there is a [1] practicable alternative to the proposed discharge [2] which would have less adverse impact on the aquatic ecosystem, [3] so long as the alternative does not have other significant adverse environmental consequences.”

¹⁵⁴ 2007 FSEIS at 8; See 40 C.F.R. § 230.10(a)(2) (“An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.”).

¹⁵⁵ The 404(b)(1) Guidelines reinforce this point by creating a rebuttable presumption that the Resilience Alternative, because it avoids impacts to wetlands, has “less adverse impacts on the aquatic ecosystem, unless clearly demonstrated otherwise.” 40 C.F.R. § 230.10(a)(3).

¹⁵⁶ 40 C.F.R. § 230.10(a)(2).

¹⁵⁷ EPA Scoping Letter (June 15, 2020), at 3.

¹⁵⁸ Clean Water Act 404(c) Final Determination, Appx. 1 at 9. The U.S. Fish and Wildlife Service has also repeatedly recommended use of nonstructural and restoration approaches in lieu of the Yazoo Pumps. E.g., U.S. Fish and Wildlife Service, Fish and Wildlife Coordination Act Report (October 23, 2006), 2007 Final SEIS, Appendix 3 at 11.

F. The DSEIS Violates NEPA Because it Fails to Analyze Direct, Indirect, and Cumulative Impacts

In assessing alternatives, the DSEIS must examine, among other things, the direct, indirect, and cumulative environmental impacts of alternatives, the conservation potential of those alternatives, and the means to mitigate adverse environmental impacts that cannot be avoided.¹⁵⁹ These assessments are essential for: understanding the impacts of the various alternatives; determining whether less environmentally damaging alternatives are available; making a reasoned choice among alternatives; identifying the least environmentally damaging alternative, as required by the Clean Water Act; ensuring compliance with the Endangered Species Act; and identifying alternatives that would protect and restore the functions of the Yazoo Backwater Area, as required by the National Water Resources Planning Policy.¹⁶⁰

Direct impacts are caused by the action and occur at the same time and place as the action. Indirect impacts are also caused by the action, but are later in time or farther removed from the location of the action.¹⁶¹ Cumulative impacts are:

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.¹⁶²

The cumulative impacts analysis ensures that the agency will not “treat the identified environmental concern in a vacuum.”¹⁶³ The cumulative impacts analysis must examine the cumulative effects of federal, state, and private projects and actions.¹⁶⁴ The cumulative impacts analysis must also evaluate the cumulative impacts of climate change.¹⁶⁵

Importantly, as the Council on Environmental Quality has made clear, in situations like those in the Yazoo Backwater Area where the environment has already been greatly modified by human activities, it is **not** sufficient to compare the impacts of the proposed alternative against the current conditions.

¹⁵⁹ 40 C.F.R. § 1502.16.

¹⁶⁰ 42 USC 1962–3(a).

¹⁶¹ 40 C.F.R. § 1508.8.

¹⁶² 40 C.F.R. § 1508.7.

¹⁶³ *Grand Canyon Trust v. FAA*, 290 F.3d 339, 346 (D.C. Cir. 2002).

¹⁶⁴ The requirement to assess non-Federal actions is not “impossible to implement, unreasonable or oppressive: one does not need control over private land to be able to assess the impact that activities on private land may have” on the project area. *Resources Ltd., Inc. v. Robertson*, 35 F.3d 1300, 1306 (9th Cir. 1993).

¹⁶⁵ *See Center for Biological Diversity v. Nat’l Hwy Traffic Safety Administration*, 538 F.3d 1172, 1217 (9th Cir. 2008) (holding that analyzing the impacts of climate change is “precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct” and that NEPA requires analysis of the cumulative impact of greenhouse gas emissions when deciding not to set certain CAFE standards); *Center for Biological Diversity v. Kempthorne*, 588 F.3d 701, 711 (9th Cir. 2009) (NEPA analysis properly included analysis of the effects of climate change on polar bears, including “increased use of coastal environments, increased bear/human encounters, changes in polar bear body condition, decline in cub survival, and increased potential for stress and mortality, and energetic needs in hunting for seals, as well as traveling and swimming to denning sites and feeding areas.”).

Instead, the baseline must include a clear description of how the health of the resource has changed over time to determine whether additional stresses will push it over the edge.¹⁶⁶

The DSEIS must provide “quantified or detailed information” on the impacts, including the cumulative impacts, so that the courts and the public can be assured that the Corps has taken the mandated hard look at the environmental consequences of the project.¹⁶⁷ If information that is essential for making a reasoned choice among alternatives is not available, the Corps must obtain that information unless the costs of doing so would be “exorbitant.”¹⁶⁸

The DSEIS must be based on “high quality” science and information and the Corps must “insure professional integrity, including scientific integrity, of the discussions and analysis in environmental impact statements.”¹⁶⁹

To properly analyze impacts from the Proposed Plan, it is also essential that the DSEIS provide a detailed operating plan for the Yazoo Pumps, and examine the full suite of impacts in light of that operating plan and reasonably foreseeable deviations from that plan because the Corps retains the ability to modify operating plans. The DSEIS must also fully analyze and account for the potential for additional or more intensive harm to conservation lands and other sensitive habitats from operating the Pumps at the new Deer Creek location, which is closer to the Delta National Forest and other conservation lands than the original Steele Bayou site.

The DSEIS falls woefully short of meeting these longstanding NEPA requirements.

1. The DSEIS Severely Underestimates Adverse Impacts to Hemispherically Significant Wetlands

The DSEIS analysis of wetland impacts is abjectly flawed and lacks even the most basic level of scientific integrity.¹⁷⁰ It repeats errors that were decisively rejected by EPA in the 2008 veto; improperly assesses only a small subset of impacts to a smaller subset of wetlands in the project area; ignores profound shifts in flood inundation levels; and disregards statistically valid, field sampled wetland data. As a result, the DSEIS significantly understates the adverse impacts of the Yazoo Pumps on the hemispherically significant wetlands of the Yazoo Backwater Area—an error that infects the entire analysis.

Notably, the DSEIS does not even mention the extensive critique of the Corps’ wetlands assessment methodologies documented by EPA in the 2008 veto. Indeed, the only three sentences in the DSEIS that

¹⁶⁶ Council on Environmental Quality, *Considering Cumulative Effects Under the National Environmental Policy Act* at 41 (January 1997).

¹⁶⁷ *Neighbors of Cuddy Mountain v. U. S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998); *Natural Resources Defense Council v. Callaway*, 524 F.2d 79, 87 (2d Cir. 1975).

¹⁶⁸ 40 C.F.R. § 1502.22 (emphasis added).

¹⁶⁹ 40 C.F.R. § 1502.24 (“Agencies shall insure professional integrity, including scientific integrity, of the discussions and analysis in environmental impact statements”); *Earth Island Inst. v. U.S. Forest Service*, 442 F.3d 1147, 1159-60 (9th Cir. 2006) (quoting 40 CFR §1502.24).

¹⁷⁰ The Conservation Organizations also note that the Wetland Appendix released for public comment with the DSEIS is marked “DRAFT—NOT FOR DISTRIBUTION”. As a result, the public has no way of knowing whether this Wetland Appendix is in fact the one that the Corps intended to release for public comment.

mention the veto state only that the veto was issued.¹⁷¹ Instead of modifying its wetlands assessment to address the extensively documented critiques in the 2008 veto, the DSEIS ignores EPA's expertise and relies on the very same flawed approach that was decisively rejected by EPA in the veto.

The Yazoo Pumps would drain an area that:

contains some of the richest natural resources in the nation including a highly productive floodplain fishery, one of only a few remaining examples of the bottomland hardwood forest ecosystem which once dominated the Lower Mississippi Alluvial Valley, and is one of only four remaining backwater ecosystems with a hydrological connection with the Mississippi River."¹⁷²

Forested wetlands have long been recognized as vitally important and as being "among the Nation's most important wetlands."¹⁷³ The bottomland hardwood wetlands of the Lower Mississippi River Valley:

"are prime overwintering grounds for many North American waterfowl, including 2.5 million of the 3 million mallards of the Mississippi Flyway, nearly all of the 4 million wood ducks and many other migratory birds. Numerous finfishes depend on the flooded hardwoods for spawning and nursery grounds. These wetlands support many other species of wildlife, including deer, squirrel, raccoon, mink, beaver, fox and rabbit. They also play a vital role in reducing flooding problems by temporarily storing large quantities of water and by slowing the velocity of flood waters. In the process, these wetlands remove chemicals such as fertilizers and pesticides from the water, trap soil eroding from nearby farmlands, and recharge ground water supplies."¹⁷⁴

As the 2008 Clean Water Act 404(c) Final Determination makes clear, the "construction and operation of the proposed Pumps would dramatically alter the timing, and reduce the spatial extent, depth, frequency, and duration of time that wetlands within the project area are inundated."¹⁷⁵ The ecological implications of these changes are enormous, because hydrology is "the single most important determinant of the establishment and maintenance of specific types of wetlands and wetland processes."¹⁷⁶

¹⁷¹ DSEIS at 14 ("No Record of Decision was signed due to the EPA vetoing the project in August 2008 under Section 404(c) of the Clean Water Act (CWA) citing 'adverse impacts on wetlands and their associated fisheries and wildlife resources are unacceptable.'"); DSEIS at 18 ("The 2007 Main Report had been finalized prior to 2008 when EPA indicated it would exercise a veto of the document citing concerns related to Section 404(c) of the CWA and unacceptable effects on fishery areas and wildlife."); DSEIS, Appendix F-4 (HTRW) at 2 ("No Record of Decision (ROD) was signed due to the U.S. Environmental Protection Agency (EPA) vetoing the 2007 Final Supplement No. 1 to the 1982 Yazoo Area Pump Project Final Environmental Impact Statement (2007 FSEIS) in August 2008 due to "adverse impacts on wetlands and their associated fisheries and wildlife resources are unacceptable" citing Section 404(c) of the Clean Water Act.).

¹⁷² U.S. Fish and Wildlife Service, Fish and Wildlife Coordination Act Report (October 23, 2006), 2007 Final SEIS, Appendix 3 at 1.

¹⁷³ Report to Congress, Secretary of the Interior, Impact of Federal Programs on Wetlands, 1988, Volume I at 39.

¹⁷⁴ Id.

¹⁷⁵ Clean Water Act 404(c) Final Determination at i.

¹⁷⁶ William J. Mitsch and James G. Gosselink, *Wetlands* (5th ed.) (2015) at 112 (emphasis in original).

Among many other things:

Hydrology affects species composition and richness, primary productivity, organic accumulation, and nutrient cycling in wetlands. . . . Water depth, flow patterns, and duration and frequency of flooding, which are the result of all the hydrologic inputs and outputs, influence the biochemistry of the soils and are major factors in the ultimate selection of the biota of wetlands. . . . the hydrology of a wetland directly modifies and changes its physiochemical environment (chemical and physical properties), particularly oxygen availability and related chemistry, such as nutrient availability, pH, and toxicity (e.g., the production of hydrogen sulfide). Hydrology also transports sediments, nutrients, and even toxic materials into wetlands, thereby further influencing the physiochemical environment. . . . Hydrology also causes water outflows from wetlands that often remove biotic and abiotic material, such as dissolved organic carbon, excessive salinity, toxins, and excess sediments and detritus.”¹⁷⁷

Critically, even small alterations in wetland hydrology can produce significant, ecosystem-wide changes, as the seminal textbook on wetlands makes clear:

When hydrologic conditions in wetlands change even slightly, the biota may respond with massive changes in species composition and richness and in ecosystem productivity.¹⁷⁸

Wetlands maintained by overbank flooding are particularly productive: “Pulse-fed wetlands are often the most productive wetlands and are the most favorable for exporting materials, energy, and biota to adjacent ecosystems.”¹⁷⁹ The Yazoo Pumps would cut off the hydrological cycle of overbank flooding that is well recognized as being “critically important to maintenance of project-area wetland and aquatic habitat values, including fisheries production” and that provides the biochemical link to the rest of the lower Mississippi Alluvial Valley ecosystem.¹⁸⁰

The Corps recognizes that pulse-fed riverine wetlands provide at least three critical functions that are not provided by non-riverine wetlands (detaining floodwater, exporting organic carbon, and removing elements and compounds).¹⁸¹ Riverine wetlands provide essential habitat for many species of fish and wildlife, including critical spawning habitat.¹⁸²

¹⁷⁷ Id. at 111-112.

¹⁷⁸ Id. at 112 (emphasis added).

¹⁷⁹ Id. at 119.

¹⁸⁰ U.S. Fish and Wildlife Service, Fish and Wildlife Coordination Act Report (October 23, 2006), 2007 Final SEIS, Appendix 3 at 11.

¹⁸¹ USACE Engineer Research and Development Center, *A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Functions of Forested Wetlands in the Mississippi Alluvial Valley*, ERDC/EL TR-13-14 (July 2013) at 27. This HGM Guidebook assigns 6 functions to pulse-fed wetlands with a return interval of 5 years or less (detain floodwater, export organic carbon, detain precipitation, cycle nutrients, maintain plant communities, and provide fish and wildlife habitat), but assigns just 4 functions to non-riverine wetlands (detain precipitation, cycle nutrients, maintain plant communities, and provide fish and wildlife habitat). The Corps’ 2002 HGM Guidebook, developed for the Yazoo Pumps project, assigns a third function that is only supplied by pulse-fed riverine wetlands (remove elements and compounds). USACE Engineer Research and Development Center, *A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Selected Regional Wetland Subclasses, Yazoo Basin, Lower Mississippi River Alluvial Valley*, ERDC/EL TR-02-4 (April 2002).

¹⁸² See, e.g. Clean Water Act 404(c) Final Determination, Technical Appendices.

The Corps' 2013 Guidebook on the Hydrogeomorphic Approach (HGM) to Assessing Functions of Forested Wetlands in the Mississippi Alluvial Valley (which includes the Mississippi Yazoo Backwater Area) states that the 5-year floodplain is the cut-off between riverine and other types of wetlands: "a wetland must be in the 5-year floodplain of a stream system to be included within the Riverine Class. This return interval is regarded as sufficient to support major functions that involve periodic connection to stream systems."¹⁸³

Despite the importance of wetlands in the 5-year floodplain and of wetlands that receive less than 14 consecutive days of flooding (often referred to as "short-hydroperiod wetlands"), the 2007 FSEIS arbitrarily and inappropriately excluded consideration of these types of wetlands.¹⁸⁴ The 2007 FSEIS acknowledges that it did not evaluate impacts to short-hydroperiod wetlands, and did not evaluate impacts to wetlands sustained by sources other than backwater flooding.¹⁸⁵

As a result of these arbitrary limits, the 2007 FSEIS completely excluded consideration of impacts to at least 24,000 acres of wetlands in the 2-year floodplain and to all wetlands located outside the 2-year floodplain, as recognized in the 2008 Clean Water Act 404(c) Final Determination:¹⁸⁶

EPA's concerns regarding this proposed project are amplified because we believe the spatial extent of wetlands potentially impacted by the proposed project is much greater than that estimated in the FSEIS. As discussed in Appendix 5, EPA's Environmental Monitoring and Assessment Program (EMAP) analysis identified approximately 52,000 acres of wetlands which are located on the 2-year floodplain but outside of the wetland assessment area established in the FSEIS (Figure 5). EPA believes that as much as 24,000 acres of these 52,000 acres of wetlands are connected to backwater flooding and will be adversely impacted by the project to an even greater degree than the wetlands considered in the FSEIS. However, the FSEIS did not evaluate impacts to these wetlands.¹⁸⁷

The gross underestimate of wetland impacts in the 2007 FSEIS was also documented in a January 2008 independent hydrology analysis prepared by Nutter & Associates, which concluded that the Corps' 2007 SEIS failed to account for at least 37,000 additional acres of wetlands that would be completely drained

¹⁸³ USACE Engineer Research and Development Center, A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Functions of Forested Wetlands in the Mississippi Alluvial Valley, ERDC/EL TR-13-14 (July 2013) at 27.

¹⁸⁴ The many additional failings in the 2007 FSEIS are documented in the May 5, 2008 comments of American Rivers, Delta Land Trust, Earthjustice, Environment America, Environmental Defense Fund, Gulf Restoration Network, National Audubon Society, National Wildlife Federation, Sierra Club, and the Surfrider Foundation—Central Gulf Coast Chapter on the Proposed Determination to prohibit the use of disposal sites for dredged or fill material in connection with the construction of the Yazoo Backwater Area Project. These comments are provided at Attachment G to these comments. Many other commenters also highlighted the major problems with the 2007 FSEIS, making it fundamentally inappropriate for the Corps to tier this SEIS to the 2007 FSEIS.

¹⁸⁵ 2007 FSEIS Main Report at 141. The 2007 FSEIS also acknowledged that if it had calculated impacts based on the "upper 90 percent confidence" range, it would have concluded that operation of the Yazoo Pumps would affect 95,200 acres of wetlands, with 44,600 acres of wetlands becoming non-jurisdictional and an additional 50,600 acres of wetlands suffering changes in the duration of inundation. 2007 FSEIS Main Report at 142. The 2007 FSEIS did not explain why it did not rely on this confidence range.

¹⁸⁶ Clean Water Act 404(c) Final Determination at iii, 3, 45.

¹⁸⁷ Clean Water Act 404(c) Final Determination at 45-47.

by the Yazoo Pumps, and failed to account for the harm to a substantial number of additional wetland acres due to changes to the duration and extent of inundation of those wetlands.¹⁸⁸

In light of the significant ecological value of the Yazoo Backwater Area wetlands—and the significant implications of Yazoo Pumps-induced damage to the area’s wetlands and streams for fish and wildlife, water quality, flood damage reduction, and project costs and benefits, among many other things—it is essential that the DSEIS properly account for the full extent of wetland impacts that will be caused by construction and operation of the Yazoo Pumps.

The DSEIS, however, clearly does not do this as discussed in detail below. Instead, the DSEIS arbitrarily and inappropriately constrains its analysis of wetland impacts by repeating the errors that were decisively rejected by EPA in the 2008 veto. As a result, the DSEIS dramatically understates the impacts of the Yazoo Pumps on the rich array of wetlands, rivers, streams, aquatic resources, and wildlife in the project area.

a. The DSEIS Arbitrarily Constrains Its Analysis of Impacts to Wetlands

Repeating errors explicitly rejected as improper by EPA in the 2008 veto, the DSEIS arbitrarily and dramatically constrains its analysis of impacts to wetlands. The DSEIS looks only at impacts to the small subset of wetlands located within the 2-year floodplain that receive ≥ 14 consecutive days of flooding. The DSEIS further limits this assessment by looking only at changes to the duration of inundation on that small subset of wetlands.

The DSEIS does not analyze any type of hydrologic changes to wetlands located above the 2-year floodplain, does not analyze hydrologic changes to wetlands in the 2-year floodplain that receive less than 14 consecutive days of flooding, and does not analyze changes to the depth of inundation to any wetlands. Each of these types of changes can have highly significant impacts that must be evaluated to understand the full scope of impacts from the Yazoo Pumps, as made clear by EPA in the 2008 veto. For example, if riverine wetlands in the project area were to no longer receive 8 consecutive days of at least 1 foot of overbank flooding as a result of the Yazoo Pumps, those wetlands would lose all of their fish spawning habitat functions.¹⁸⁹ Even small changes in the extent and level of inundation of wetlands in the Yazoo Backwater Area could cause “massive changes in species composition and richness and in ecosystem productivity.”¹⁹⁰

Because of these arbitrary restrictions, the DSEIS examines potential impacts to just 39% of the total wetland acres in the project area. There are 212,284 total acres of wetlands in the Yazoo Backwater Area 100-year floodplain,¹⁹¹ many of which are hydrologically connected to stream channels, as

¹⁸⁸ Nutter & Associates, Inc., Technical Memorandum No. 07-059.01, Review of the USACE Yazoo River Backwater Area Reformulation Report, Prepared for National Wildlife Federation American Rivers, January 22, 2008. A copy of this report is provided at Attachment H to these comments.

¹⁸⁹ DSEIS, Appendix F-8 (Aquatic Resources) at 3.

¹⁹⁰ William J. Mitsch and James G. Gosselink, *Wetlands* (5th ed.) (2015) at 112.

¹⁹¹ In 2003, EPA in coordination with the Corps, the U.S. Fish and Wildlife Service, and the Natural Resources Conservation Service, conducted a field based, statistical survey of wetlands in the Yazoo Backwater Area using EPA’s Environmental Monitoring and Assessment Program (EMAP) protocols. This survey identified 212,284 acres of wetlands in the study area. Clean Water Act 404(c) Final Determination, Appendix 5 at 1. The DSEIS does not contend that these baseline wetland numbers are invalid.

documented in the 2008 veto.¹⁹² However, the DSEIS looks at changes to the duration of inundation on just 82,981 acres of wetlands.¹⁹³

Notably, however, even this arbitrary and severely limited assessment of just one type of impact to a small subset of wetlands in the project area acknowledges adverse impacts to 38,774 acres of wetlands in the 2-year floodplain. As discussed in Section A of these comments, this level of impact is explicitly prohibited by the 2008 veto. As discussed in Section B of these comments, this level of impact is unquestionably prohibited by the Clean Water Act 404(b)(1) Guidelines.

EPA conclusively demonstrated in the veto that the Corps' decision to look only at changes to the duration of inundation misleadingly excludes known jurisdictional wetlands that must be analyzed under the 404(b)(1) Guidelines. As EPA emphasized in the veto, "[t]he wetlands identified by EMAP and agreed to by the Corps ARE jurisdictional wetlands by virtue of meeting the 3-parameters outlined in the Corps' 1987 Wetland Delineation Manual (i.e., having indicators of wetland hydrology, soils and vegetation)."¹⁹⁴ Yet, due to its singular insistence on a 14-day flood duration, the veto determined that the Corps had falsely excluded 51,792 acres of jurisdictional wetlands in the two-year floodplain.¹⁹⁵ Accordingly, EPA rejected the Corps' approach as contrary to real world evidence and the 404(b)(1) Guidelines.¹⁹⁶

The Corps' own data also demonstrates that the DSEIS' arbitrary and improper restrictions dramatically understate wetland impacts. For example, modeling data in the Corps' files (but not included in the DSEIS) shows that the Proposed Plan will reduce, if not eliminate, backwater flooding on at least 22,601 acres of wetlands that currently flood for less than 14 consecutive days.¹⁹⁷ According to the DSEIS Migratory Bird Appendix, an MVK hydrologic analysis shows that the Proposed Plan would cause a loss of "up to 34,000 acres of inundated habitat including 23,500 acres of inundated floodplain forest for water- and wetland-dependent birds (e.g., herons, egrets, ibises) that utilize this habitat for foraging or breeding" in the 25% exceedance elevation, which was not accounted for in the DSEIS wetlands assessment.¹⁹⁸ If the Proposed Plan reduces flooding on wetlands so that they no longer receive 8 consecutive days of inundation to a depth of one foot, as indicated by the Corps' data, those wetlands

¹⁹² Clean Water Act 404(c) Final Determination, Appendix 7 (Wetland Connectivity Analysis).

¹⁹³ DSEIS, Appendix F-5 (Wetlands) at Table 85. By comparison, the 2007 Yazoo Pumps EIS looked at the potential for impacts to 189,600 acres of wetlands which it determined were both in the 2-year floodplain and received ≥ 14 consecutive days of flooding. Notably, the 2008 veto determined that EPA's statistically valid, field based survey had "identified approximately 52,000 acres of wetlands which are located on the 2-year floodplain but outside of the wetland assessment area" that the Corps used in 2007 and concluded that "EPA believes that as much as 24,000 acres of these 52,000 acres of wetlands are connected to backwater flooding and will be adversely impacted by the project to an even greater degree than the wetlands considered in the FSEIS." Clean Water Act 404(c) Final Determination at 45.

¹⁹⁴ Clean Water Act 404(c) Final Determination Appx. 1 at 54 (emphasis in original). EPA's Environmental Monitoring and Assessment Program (EMAP) was used to carry out a statistically valid, field sample of wetlands in the Yazoo Backwater Area in 2003. A detailed discussion of the EMAP process and findings can be found in Section F.1 of these comments.

¹⁹⁵ Clean Water Act 404(c) Final Determination Appx. 5, Attach. A at 22 (Figure 6).

¹⁹⁶ See

¹⁹⁷ See Email from Kenneth Parrish to Margaret Strand, Re: (Jan. 29, 2020), at 17. A copy of these email is provided at Attachment D to these comments.

¹⁹⁸ DSEIS, Appendix H (in the Migratory Bird section of this Appendix) at 6.

will no longer provide critical spawning habitat.¹⁹⁹ Likewise, if the Proposed Plan reduces flooding to a 5-year or greater return interval, which is also indicated by the Corps' hydrologic data, then these wetlands could shift from the riverine backwater wetland subclass to the flats wetland subclass. "This change in HGM subclass would result in the complete loss, by definition, of the functions performed by riverine backwater wetlands (i.e., temporary storage of surface water, organic carbon export and pollutant removal and sequestration functions)."²⁰⁰

There is no scientific basis, or any other type of rational justification, for failing to evaluate impacts to wetlands located above the 2-year floodplain or to wetlands that receive less than 14 consecutive days of overbank flooding. To the contrary, the EPA veto; the 404(b)(1) Guidelines; the Corps' own Hydrogeomorphic (HGM) Approach protocols; and the fundamental science of wetland functions and values, ecological processes, ecosystem services, and fish and wildlife habitat requirements make clear that the DSEIS has imposed arbitrary, improper, and severe limitations on its analysis of wetland impacts. This "head in the sand" approach to assessing wetland impacts is arbitrary and capricious.²⁰¹

b. The DSEIS Wetland Analysis Cannot Be Reconciled with the Baseline Wetland Acreage Identified Through the Statistically Valid, Field Sample Survey of Wetlands Carried Out Under the EPA EMAP Protocol

The DSEIS wetland analysis cannot be reconciled with the baseline wetland acreage identified through the statistically valid, field sample of wetlands carried out under EPA's Environmental Monitoring and Assessment Program (EMAP).

EPA carried out its EMAP survey in 2003, in coordination with the Corps, the U.S. Fish and Wildlife Service, and the Natural Resource Conservation Service, to identify the extent of wetlands in the Yazoo Backwater Area that meet the 3-parameters of a wetland.²⁰² That process relied on flood models and satellite imagery to remotely identify wetlands, which were then verified on the ground with field surveys at 150 randomly-distributed sites.²⁰³ That EMAP analysis determined that there are 212,284 total acres of wetlands in the Yazoo Backwater Area 100-year floodplain, including 179,120 acres of wetlands in the 2-year floodplain.²⁰⁴ The DSEIS does not contend that this EMAP analysis is no longer valid, and indeed the single sentence in the DSEIS that mentions the EMAP analysis relies on the EMAP findings.²⁰⁵ The DSEIS instead relies on modeled data to claim that there are now just 82,981 acres of

¹⁹⁹ DSEIS, Appendix F-8 (Aquatic Resources) at 3.

²⁰⁰ Clean Water Act 404(c) Final Determination at 50.

²⁰¹ See *Am. Wild Horse Pres. Campaign v. Perdue*, 873 F.3d 914, 932 (D.C. Cir. 2017) (vacating an agency's action that "brushed aside critical facts" and failed to "adequately explain" or "adequately analyze" its policy choice). The discussion in Section F of these comments identifies additional flaws in the Corps' analysis, which further highlight the Corps' failure to comply with the 404(b)(1) Guidelines.

²⁰² See Clean Water Act 404(c) Final Determination Appx. 5, Attachment A (EMAP Report) at 7-8. EMAP stands for Environmental Monitoring and Assessment Program.

²⁰³ *Id.* at 7-10.

²⁰⁴ Clean Water Act 404(c) Final Determination, Appendix 5 at 1 and Table 2. The veto concluded that the EMAP survey demonstrated that the Corps' 2007 FSEIS improperly excluded 51,792 acres of jurisdictional wetlands in the two-year floodplain and, as a result, overlooked the pumps' degradation of at least 24,000 acres of short hydroperiod wetlands (less than 14-days). This glaring omission undermined the Corps 2007 FSEIS and further supported EPA's finding of significant and unacceptable degradation. Clean Water Act 404(c) Final Determination at 72.

²⁰⁵ DSEIS, Appendix G (Engineering) at 141 ("The 2004 three tiered EMAP wetland sampling study identified

wetlands in the 2-year floodplain of the Yazoo Backwater Area. DSEIS, Appendix F-5 (Wetlands), Table 85 at 106.

Thus, according to the DSEIS, 96,139 acres of wetlands that were in the 2-year floodplain in 2003 are no longer in the 2-year floodplain.²⁰⁶ The DSEIS claims that 57,000 of these acres are no longer in the 2-year floodplain because the “new and more complete” period of record (1978-2019) shows that the Holly Bluff cut-off (which was completed in 1958) and the Yazoo Backwater Levee (which was completed in 1978) caused a one to three foot reduction in the 2-year floodplain elevation. Appendix F-5 (Wetlands) at 35-36. However, any changes wrought by those two projects would have been reflected in the 2003 EMAP survey which was carried out when the Holly Bluff cut-off had been in place for 45 years and the Yazoo Backwater Levee had been in place for 25 years.

The dramatic difference between the 2003 EMAP statistically valid field sampled survey and the wetland baseline acreage number used in the DSEIS strongly suggest that the DSEIS wetland baseline acreage numbers are incorrect. As EPA emphasized in the veto, “[t]he wetlands identified by EMAP and agreed to by the Corps ARE jurisdictional wetlands by virtue of meeting the 3-parameters outlined in the Corps’ 1987 Wetland Delineation Manual (i.e., having indicators of wetland hydrology, soils and vegetation).”²⁰⁷ In fact, the DSEIS wetland maps exclude known jurisdictional wetland sites that were ground-truthed by EPA, NRC, and the Corps with field surveys.²⁰⁸ The Corps’ reliance on the flawed estimates in the DSEIS is “error, particularly in the face of contrary-real world data.”²⁰⁹

The Corps “cannot avoid its duty to confront these inconsistencies by blinding itself to them.”²¹⁰ Yet, the Corps makes no effort to examine the survey data in the EMAP Report or address the errors in its analysis. In fact, the Corps explained that it no longer has a complete set of the EMAP data, which it “lost when a hard-drive failed.”²¹¹ The Corps must obtain that information from EPA so that it can identify and correct the errors in its baseline wetland estimate.²¹²

The DSEIS wetland baseline also appears to be incompatible with the significant increase in lands enrolled in, and restored to wetlands through, the Wetland Reserve Easement program in the Yazoo Backwater Area since the 2008 veto and with the extensive amount of conservation land in the Yazoo Backwater Area. There are currently an estimated 250,000 acres of conservation lands in the Yazoo Backwater Area, and many of these lands are managed as wetland systems:

wetlands in every flood frequency zone (one to 100-year).”).

²⁰⁶ This means that the 2-year floodplain has lost an area of wetlands more than twice the size of Washington, DC; a tremendous loss of wetlands that must be accounted for.

²⁰⁷ Clean Water Act 404(c) Final Determination Appx. 1 at 54 (emphasis in original). EPA’s Environmental Monitoring and Assessment Program (EMAP) was used to carry out a statistically valid, field sample of wetlands in the Yazoo Backwater Area in 2003. A detailed discussion of the EMAP process and findings can be found in Section F.1 of these comments.

²⁰⁸ Compare Clean Water Act 404(c) Final Determination Appx. 5, Attach. A at 22 (Figure 6) with DSEIS Appx F-5 (Wetlands) at Fig. 11.

²⁰⁹ *W. Virginia v. E.P.A.*, 362 F.3d 861, 867 (D.C. Cir. 2004).

²¹⁰ *Humane Soc. of U.S. v. Locke*, 626 F.3d 1040, 1051 (9th Cir. 2010)

²¹¹ See Email from Shane Lauritzen to Stuart Gillespie, Re: FOIA Yazoo Area Pump Project Draft SEIS 2 (Nov. 13, 2020) at 2. A copy of this email is provided at Attachment I to these comments.

²¹² See *Am. Wild Horse Pres. Campaign*, 873 F.3d at 932 (vacating an agency’s action that “brushed aside critical facts” and failed to “adequately explain” or “adequately analyze” its policy choice).

Conservation Lands in the Yazoo Backwater Area	
Category	Acres
National Fish and Wildlife Refuges	25,000
National Forest	20,000
State Wildlife Management Areas	118,000
NRCS Easements	50,000
NGO Easements	7,000
Conservation Reserve Program	30,000
Total	250,000

However, if the wetland baseline numbers in the DSEIS are accurate, it means that at least 96,139 acres of wetlands have been lost in the 2-year floodplain since 2003, when the EMAP survey was conducted. Such a tremendous loss of wetlands mandates protection of the remaining wetlands in the project area. At the absolute minimum, the DSEIS must fully account for these highly significant losses in its impacts analyses (including cumulative impacts), mitigation analysis, and in the required—but not carried out—analyses of alternatives, and project costs and benefits.

Even if the 96,139 acres of wetlands continue to exist but are now located above the 2-year floodplain as a result of the highly significant 1 to 3 foot reduction in the project area flood elevations acknowledged in the DSEIS,²¹³ the resulting change in the level and duration of inundation to those 96,139 acres of wetlands will be enormous and likewise demands protection of the remaining wetlands in the project area. At the absolute minimum, the DSEIS must fully account for these highly significant changes in its impacts analyses (including cumulative impacts), mitigation analysis, and in the required—but not carried out—analyses of alternatives, and project costs and benefits.

c. The DSEIS Severely Underestimates the Significant Impacts to the Small Subset of Wetlands that Were Examined

In addition to accurately assessing the areal extent of hydrologic changes, a meaningful analysis of wetland impacts must accurately assess the ecological implications of those changes. For example, the Pumps-induced adverse impacts could, among many other impacts:

- Significantly undermine flood storage, leading to more flooding in the Yazoo Backwater Area since “[w]ooded wetlands in particular increase flood storage, reduced flood peaks and increase peak travel time.”²¹⁴
- Significantly undermine nutrient and sediment removal capabilities since “reconnection of bottomland hardwood wetlands to their surrounding watershed through the restoration of surface hydrology is necessary to restore wetland functions important to nutrient and sediment removal.”²¹⁵
- Cause “massive changes in species composition and richness and in ecosystem

²¹³ DSEIS, Appendix F-5 (Wetlands) at 36-37.

²¹⁴ Acreman, M., Holden, J. 2013. How wetlands affect floods. *Wetlands*, 33 (5). 773-786. 10.1007/s13157-013-0473-2.

²¹⁵ Hunter, R.G., Faulkner, S.P. & Gibson, K.A. The importance of hydrology in restoration of bottomland hardwood wetland functions. *Wetlands* 28, 605–615 (2008). <https://doi.org/10.1672/07-139.1>.

productivity.”²¹⁶

- Further deplete the already significant low stream flows in the Yazoo Backwater Area and the significantly depleted groundwater in the Mississippi Delta by impacting large swaths of wetlands that contribute to the protection and restoration of stream flow and groundwater recharge.

A comprehensive discussion of the many significant ecological values of riverine wetlands can be found in the 2008 veto (including the Technical Appendices), and comments on the 2007 SEIS submitted by the U.S. Department of the Interior, U.S. Fish and Wildlife Service, and EPA, among others. This critical feedback from these expert agencies should have been fully considered and addressed by the Corps in preparing this DSEIS, but was not.

Instead, the DSEIS relies on modeling assumptions and factors that were decisively rejected by EPA in the 2008 veto to conduct its assessment of lost wetland functions. The DSEIS acknowledges that “the [Functional Capacity Indices] scores reported in the 2007 FSEIS were selected to conduct the current analysis.” DSEIS, Appendix F-5 (Wetlands) at 26. These “Functional Capacity Indices (FCI) are the result of combining the [Hydrogeomorphic Approach] assessment’s hydrologic, plant, soil and landscape indicators to estimate a change in function as the result of change in indicators.”²¹⁷

However, the 2008 veto explicitly rejected the use of the modeling assumptions and factors used by the Corps in 2007 to develop the Functional Capacity Indices because they were fundamentally unreliable:

EPA believes that certain modeling assumptions and factors used by the Corps in the application of [the 2007 Hydrogeomorphic Approach and Habitat Evaluation Procedure] tools lead to a significant underestimation of the proposed pumping station’s adverse impacts on the aquatic ecosystem, as well as a significant overestimation of the project’s environmental benefits.²¹⁸

By using the same Functional Capacity Indices rejected by EPA in 2008, the DSEIS relies on a clearly flawed functional assessment that does not account for the ecological implications of the Yazoo Pumps-induced wetland losses. For example:

- (i) The DSEIS states that the Yazoo Pumps will cause no impacts to four of the eight wetlands functions used in the Corps’ HGM Approach, even for those wetlands that will experience a decrease in flood duration. For example, each of Tables 70-79 in the Wetlands Appendix, which are meant to show changes in AAFcUs due to various changes in flood duration, list zero impacts to the Detain Precipitation, Cycle Nutrients, and Maintain Plant Communities wetland functions. Each of the tables but one also list zero impacts to the Detain Floodwater function; with Table 70 listing just 7 lost AAFcUs to the Detain Floodwater function. The lack of impacts to these four key functions is

²¹⁶ William J. Mitsch and James G. Gosselink, *Wetlands* (5th ed.) (2015) at 112.

²¹⁷ Clean Water Act 404(c) Final Determination at 28.

²¹⁸ Clean Water Act 404(c) Final Determination at 47. A full analysis of the problems with the Corps’ 2007 Hydrogeomorphic Approach analysis can be found at Appendix 6 of the 2008 Clean Water Act 404(c) Final Determination. This Appendix, along with the entire 2008 Clean Water Act 404(c) Final Determination, of course must be fully considered in the DSEIS and included in the administrative record.

scientifically unsupportable as highlighted by EPA in the 2008 veto.²¹⁹ For example, the 2008 veto highlights the failure to account for losses to the Detain Floodwater function as a primary concern because “this is one of the functions which the proposed pumping project is designed to most dramatically impact.”²²⁰ By ignoring impacts to these functions, the DSEIS significantly understates the impacts to wetland functions in the small subset of wetlands that it looked at.

- (ii) The DSEIS significantly underestimates declines in the Export Organic Carbon function. As recognized in a study authored by a Corps scientist:

the flood frequency variable has significant implications for the export organic carbon function, representing a switch effect (or switch index; Smith et al. 2013) with the capacity to either turn the function on/off or weight the impact of other assessment variables on the level of wetland function. If a BHW forest is not subject to flooding then the export of organic carbon to downstream environments cannot occur and the resultant function capacity will remain zero. In contrast if flooding (and potential organic carbon export) does occur, the functional capacity is weighted based upon the frequency of flood events with locations exhibiting flood frequencies ≤ 2 years having that capacity to achieve the highest possible level of function (i.e., 1.0 functional capacity index).²²¹

The DSEIS completely ignores this reality by assigning Export Organic Carbon functions to wetlands that will no longer flood. The DSEIS assigns an Export Organic Carbon score of 0.39 for wetlands that will no longer flood (i.e., 0% flood duration) with the Pumps in place in Table 73, and an Export Organic Carbon score of 0.26 for wetlands that will no longer flood (i.e., 0% flood duration) with the Pumps in place in Table 70. DSEIS, Appendix F at 94 and 91. As a result, the DSEIS significantly underestimates the impacts of the Yazoo Pumps on the Export Organic Carbon function in the small subset of wetlands that it looked at.

- (iii) The DSEIS could be masking critical adverse impacts as a result of using “the mid-point of each flood duration range” in all of its HGM calculations. DSEIS, Appendix F-5 (Wetlands) at 28. The DSEIS provides no justification for using this mid-point in each and every HGM calculation. Utilizing this midpoint could mask critical adverse impacts because the length and level of inundation has significant implications for ecological services and outcomes.

²¹⁹ Clean Water Act 404(c) Final Determination, Appendix 6 at 1.

²²⁰ Clean Water Act 404(c) Final Determination, Appendix 6 at 1.

²²¹Berkowitz, J.F. Quantifying Functional Increases Across a Large-Scale Wetland Restoration Chronosequence. *Wetlands* 39, 559–573 at 570 (2019). <https://doi.org/10.1007/s13157-018-1103-9>.

- (iv) The DSEIS then compounds the many problems with its functional assessments by manipulating the data to obscure significant wetland and fish and wildlife impacts. This manipulation was explicitly rejected in the 2008 veto:

EPA's primary concerns include:

The summation of assessment units (i.e., Functional Capacity Units and Habitat Units) in the FSEIS obscures significant wetland, fish, and wildlife impacts. For example, the HGM assessment evaluated eight functions performed by affected wetlands and estimated how these functions would decrease at wetlands adversely impacted by the proposed pumping and increase at reforestation/mitigation sites. These functions are: *detain floodwater, detain precipitation, cycle nutrients, export organic carbon, physical removal of elements and compounds, biological removal of elements and compounds, maintain plant communities, and provide wildlife habitat.* In drawing its conclusion that the proposed project would result in an overall 19.5 percent increase in wetland functions, not only does the FSEIS factor in unsubstantiated and improbable benefits associated with the proposed restoration as discussed below, it also adds the losses and gains for each of the eight functions. This kind of comparison is of concern because it allows large predicted gains in functions such as maintaining plant communities to obscure losses, or significant degradation in other critical water quality related functions.²²²

- (v) The DSEIS then relies on this flawed manipulation of data to create the impression that it has mitigated the impacts of the project on wetlands functions, when in fact it has failed entirely to do so.

The DSEIS adds together all the Pumps-created losses to AAFCUs across all of the eight wetland function categories into a single number of 11,054 lost AAFCUs. DSEIS, Appendix F-5 (Wetlands), Table 80 at 101. That composite figure is almost entirely attributable to losses in three hydrologically-driven wetland functions: Export Organic Carbon, Physical Removal of Elements and Compounds, and Biological Removal of Elements and Compounds; information that is not included with this summation. The DSEIS then relies on this summation of the lost AAFCUs to assert in Table 82 that just 2,405 acres of compensatory mitigation will compensate for this total loss of AAFCUs. DSEIS, Appendix F-5 (Wetlands), Table 82 at 103.

This assertion is fundamentally incorrect, however, as clearly documented in the DSEIS. For example, the DSEIS states that the proposed mitigation would generate 813 AAFCUs for Export Organic Carbon (Table 80). However, Tables 70-79 state that the Pumps will cause a loss of 3,588 AAFCUs for Export Organic Carbon. To mitigate for those losses to the Export Organic Carbon function, the DSEIS would have to provide 10,641 acres of mitigation—more than four times the amount of mitigation proposed. The DSEIS similarly fails to mitigate for the identified losses to the Biological Removal of Elements and Compounds functions. Oddly, the proposed mitigation mainly provides AAFCUs in the areas of Detain Floodwater, Detain Precipitation, Cycle Nutrients, and Maintain

²²² Clean Water Act 404(c) Final Determination, Appendix 6 at 1 (emphasis in original).

Plant Communities, as shown in Table 80, despite the Corps' impacts analysis (which is clearly inadequate) which shows no impacts to those functions.

As a result, it is clear that the proposed mitigation does not address even the significant underestimate of lost wetland functions acknowledged in the DSEIS. Additional significant problems with the mitigation proposed in the DSEIS are addressed in Section H of these comments.

d. The DSEIS Does Not Account for Impacts to Wetlands from the Highly Significant Reduction in Flood Elevation Levels

The DSEIS does not evaluate the impacts of massive reductions in flood stages that have occurred in the project area as a direct result of Corps water resources projects. These changes are highly significant and must be fully accounted for in the DSEIS impacts analyses (including cumulative impacts), mitigation analysis, and in the required—but not carried out—analyses of alternatives, and project costs and benefits. The DSEIS must also ensure that the new stage elevations are used consistently for all analyses in the DSEIS, including for determining project benefits.

According to the DSEIS, completion of the Holly Bluff Cut-off in 1958 and the Yazoo Backwater Levee in 1978 caused a significant reduction in flood stages in the Yazoo Backwater Area:

The median $\geq 5.0\%$ flood duration elevation threshold was lowered approximately one to three feet as a result of implementation of the flood risk reduction features, translating to a large aerial decrease in potential wetland areas when superimposed on the Yazoo Study Area.

DSEIS, Appendix F-5 (Wetlands) at 35-36. Notably, the DSEIS also must explain why, in the face of these significant changes in flood elevation, the authorized level of flood protection (as set forth in the 1941 project authorization) has not already been achieved. Additional information on this important issue is provided in Section D of these comments.

e. The DSEIS is Tainted by Its Improper Reliance on Berkowitz 2019

The DSEIS draws improper conclusions from Berkowitz 2019²²³ to support its arbitrarily restricted assessment of impacts to the small subset of wetlands evaluated by the study. These improper conclusions taint the entire SEIS.

The Berkowitz study looked at “56 forested wetland study sites throughout the Yazoo Basin” that were chosen “based upon access to public lands, mapped flood frequency and duration (where available), and site condition to include analyses of mature second growth forest and reforested farmed wetlands.”²²⁴ Of these sites, 44 were monitored for less than one year, “from November 2010 until October 2011.” Only 12 sites were monitored for more than that extremely limited amount of time: “12 wetland monitoring locations were maintained for three to eight years during the 2011–2018 period” in order “to evaluate trends across multiple years.” Based on the extremely limited monitoring at the equally limited and non-representative sample locations, the study provides an even more limited conclusion: “Data suggest that most wetlands examined (87%) would persist in the absence of flooding, and that

²²³ Berkowitz, J.F., D.R. Johnson, and J.J. Price, “Forested Wetland Hydrology in a Large Mississippi River Tributary System”, *Wetlands* (December 2019) (available at <https://link.springer.com/article/10.1007/s13157-019-01249-5>).

²²⁴ *Id.*

duration and inundation patterns differed with dominant water source.”²²⁵

As demonstrated below, relying on Berkowitz 2019 to justify the arbitrarily restricted wetlands assessment in the DSEIS demonstrates a stunning lack of scientific integrity and a willful refusal to account for the vitally important functions provided by riverine and other wetlands:

- (i) **The DSEIS improperly extrapolates the Berkowitz 2019 findings to the entire Yazoo Pumps project area.**²²⁶ This extrapolation is improper because, as clearly documented in Berkowitz 2019, that study is based on a non-randomized, non-statistically valid sample of wetland locations. As a result, any findings from the Berkowitz study may not be applied—because they in fact do not apply—to the entire project area. Any attempt to extrapolate the Berkowitz findings to the project area must be rejected as unsound.
- (ii) **The DSEIS improperly extrapolates the Berkowitz 2019 conclusions, which were based on an extremely short monitoring period, to the 50+ year life of the Yazoo Pumps.** As noted above, of the 56 forested sites examined in the Berkowitz study, 44 were monitored for less than one year, “from November 2010 until October 2011.” Only 12 sites were monitored for a longer period, “three to eight years during the 2011–2018 period” in order “to evaluate trends across multiple years.”²²⁷ The DSEIS appears to recognize the limitations of the short monitoring period, highlighting in its discussion of Berkowitz 2019 that “locations exhibited no influence of flood inputs during the study.” DSEIS, Appendix F-5 (Wetlands) at 10 (emphasis added). The extremely limited monitoring data in the Berkowitz study cannot account for long-term variability in flooding and precipitation conditions and as a result, cannot be relied upon to draw conclusions regarding the long-term and cumulative impacts of the Yazoo Pumps.
- (iii) **The DSEIS attempts to justify its limited hydrology assessment at least in part on the Berkowitz conclusion that wetlands would “persist” due to rainfall.** Even if this Berkowitz conclusion were correct—which, given the severe limitations of the study, is highly unlikely—it fails to provide any type of meaningful information; it has no meaning in the context of assessing ecological harm (including lost wetland functions and values); and it has no meaning in the context of properly carrying out the NEPA and Clean Water Act assessments required for the Yazoo Pumps, for at least the following three reasons.

First, as noted above, Berkowitz 2019 may not be extrapolated to cover the entire project area, and because it is based on an extremely limited monitoring record the study also cannot provide the information needed to draw conclusions regarding the long-term and cumulative impacts of the Yazoo Pumps.

Second, on its face the Berkowitz 2019 study excludes consideration of hydrologic conditions needed to maintain vital wetland functions. Berkowitz 2019 defines wetland saturation events as “periods where soil inundation or water tables remained within ≤ 30

²²⁵ Id. (emphasis added).

²²⁶ The Corps repeated this improper conclusion during the virtual public hearing on the project.

²²⁷ Berkowitz, J.F., D.R. Johnson, and J.J. Price, “Forested Wetland Hydrology in a Large Mississippi River Tributary System”, Wetlands (December 2019).

cm of the soil surface for ≥14 consecutive days.”²²⁸ This definition ignores the major functional differences between riverine and other wetlands. For example, under the Berkowitz definition, wetlands whose saturated soils are located no higher than 11.8 inches below the surface of the land are treated the same as wetlands inundated with a foot of flood waters. Clearly, however, wetlands maintained by underground saturation, even if it occurs all year long, do not provide the same functions as wetlands that experience overbank flooding. For example, underground saturation provides no habitat for spawning fish or for many species of migratory waterfowl.

Third, as EPA explained in the veto, if there is a “change in predominant water source from flooding on a 2-year return to precipitation (the result of flooding less frequently) certain functions are lost and others are performed at different levels.”²²⁹ Likewise, the Fish and Wildlife Service explained why backwater flooding is critical to maintaining aquatic habitat.

Ponds that are fed entirely from local precipitation often suffer from low dissolved oxygen, high levels of algae and high temperatures. Episodic hydrologic events, such as a 2-5 year flood event, rejuvenate these shallow water ponds.²³⁰

Thus, while a wetland may “persist” with precipitation or subsurface water, that assertion simply overlooks the fact that “the functions performed by that wetland change.”²³¹

The Corps’ HGM Guidebook similarly recognizes the separate ecological functions provided by backwater flooding and precipitation and that these roles are not interchangeable. For example, the Guidebook recognizes that “low gradient, riverine and river-connected depression wetlands are linked to the stream channel through overbank and backwater flooding. In the case of the Export of Organic Carbon function, the latter reason is of greatest importance.”²³² The Guidebook also recognizes that the remove elements and compounds function “is defined as the ability of the wetland to permanently remove or temporarily immobilize nutrients, metals, and other elements and compounds that are imported to the wetland from various sources, **but primarily via flooding.**”²³³ By contrast, precipitation only accounts “for a **small proportion** of the total quantity of elements and compounds imported to the wetland.”²³⁴

Fourth, as clearly highlighted by EPA in the 2008 veto, a wetland can suffer significant degradation and still “persist.” The 2008 veto highlighted the fact that the Yazoo Pumps would cause thousands of acres to “shift from the riverine backwater wetland subclass to the flats wetland subclass (see Table 2),”²³⁵ which would constitute significant

²²⁸ Id. at 129.

²²⁹ Clean Water Act 404(c) Final Determination Appx I at 39.

²³⁰ Clean Water Act 404(c) Final Determination Appx. I at 67.

²³¹ Clean Water Act 404(c) Final Determination Appx I at 52-53.

²³² HGM Guidebook (2002) at 56.

²³³ HGM Guidebook (2002) at 58.

²³⁴ HGM Guidebook (2002) at 59.

²³⁵ Clean Water Act 404(c) Final Determination at 50.

degradation in violation of the Clean Water Act. Indeed, saying that a wetland would “persist” means nothing more than that it would continue to exist in some form (presumably, but not necessarily, as a jurisdictional wetland).

2. The DSEIS Fails to Analyze Impacts to Streams

The DSEIS fails to analyze the adverse impacts of the Proposed Plan on the many rivers, streams, and bayous in the Yazoo Backwater area. This is a fundamental oversight given the hydrological connectivity between streams, rivers, bayous, and wetlands, which collectively affect the physical, chemical, and biological integrity of downstream waters.

EPA recently undertook a state-of-the-art scientific review that documented the hydrological connections and mechanisms by which streams and wetlands, singly or in aggregate, affect the physical, chemical, and biological integrity of downstream waters. The report, titled “Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence,”²³⁶ makes five major conclusions summarized below:

- The scientific literature unequivocally demonstrates that streams, regardless of their size or frequency of flow, are connected to downstream waters and strongly influence their function.
- The scientific literature clearly shows that wetlands and open waters in riparian areas (transitional areas between terrestrial and aquatic ecosystems) and floodplains are physically, chemically, and biologically integrated with rivers via functions that improve downstream water quality. These systems act as effective buffers to protect downstream waters from pollution and are essential components of river food webs.
- There is ample evidence that many wetlands and open waters located outside of riparian areas and floodplains, even when lacking surface water connections, provide physical, chemical, and biological functions that could affect the integrity of downstream waters. Some potential benefits of these wetlands are due to their isolation rather than their connectivity. Evaluations of the connectivity and effects of individual wetlands or groups of wetlands are possible through case-by-case analysis.
- Variations in the degree of connectivity are determined by the physical, chemical and biological environment, and by human activities. These variations support a range of stream and wetland functions that affect the integrity and sustainability of downstream waters.
- The literature strongly supports the conclusion that the incremental contributions of individual streams and wetlands are cumulative across entire watersheds, and their effects on downstream waters should be evaluated within the context of other streams and wetlands in that watershed.

(1) Given these hydrological connections and mechanisms, the DSEIS must analyze and mitigate the impacts of the Proposed Plan on the rivers, streams, and bayous in the Yazoo Backwater Area, including: Changes to water temperature;

²³⁶ EPA, Connectivity of Streams and Wetlands To Downstream Waters: A Review and Synthesis of the Scientific Evidence (Final Report, 2015), *available* at <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=296414>.

- (2) Changes to flow, including changes that result from eliminating floodplain wetlands and further reductions in groundwater;
- (3) Change to water quality, including increased sedimentation, nutrient pollution, and toxic contamination; and lower levels of dissolved oxygen (*see* Section F.6 of these comments for more information on required assessments of water quality impacts);
- (4) Changes to the form and function of stream and river channels, which are typically driven by changes in flow patterns, reductions in flow, reduction or loss of natural flood-pulse, and loss of overbank flooding;
- (5) Changes to the floodplain, including particularly to floodplain wetlands; and
- (6) Changes to in-stream and floodplain habitats.

This comprehensive analysis is essential given that the Proposed Pumps would drain vast areas of wetlands and thereby eliminate critical wetland functions that are directly related to water quality. As explained in Section F.6 of these comments, the loss of these wetland functions will degrade water quality, impairing numerous water bodies in the Yazoo Backwater Area. In addition, the Proposed Pan would intensify agricultural production in the Yazoo Backwater Area, resulting in increased cultivation, additional fertilizer and pesticide use, and potential land clearing that further degrade the area's streams. Increased agricultural production will also deplete the regional aquifer, capturing critical baseflows and impairing hydrologically connected rivers, streams, and bayous. The DSEIS overlooks or assumes away these critical impacts, and thereby underestimates the far-reach impacts of the Proposed Plan on hydrologically-connected rivers, streams, and bayous.

3. The DSEIS Fails to Analyze Impacts on Downstream Flooding on the Yazoo River.

EPA and the Conservation Organizations have raised significant concerns about the Yazoo Pumps increasing flood risks for communities located along or near the Yazoo River, and increasing flood risks within the Yazoo Backwater Area through overtopping or otherwise undermining the integrity of the Yazoo Backwater Levee.

The DSEIS disregards these concerns in a high-handed and conclusory manner by citing a model²³⁷ that is too flawed to provide any type of reliable analysis. A detailed review of this model was carried out by William Fleenor, Ph.D., an expert with more than 25 years of experience with hydrologic modeling.²³⁸ Dr. Fleenor's review concludes that the model used by the Corps is fundamentally unreliable and "cannot be trusted to get a correct answer" regarding the impact of the Yazoo Pumps on flood levels in the Yazoo River. The flaws with this model are discussed in detail in Section C of these comments, and Dr. Fleenor's review is provided at Attachment E to these comments.

The DSEIS nevertheless relies on this indefensible model to justify its assertion that the Yazoo Pumps would not increase flood risks downstream, noting that the model "showed an increase of 0.2 feet at Vicksburg, and 0.3 feet at Steele Bayou Riverside with a 14,000-cfs pumping station" if the Yazoo Pumps

²³⁷ DSEIS, Appendix G (Engineering) at 144-145, paragraph 177.

²³⁸ Dr. Fleenor's CV is provided at Attachment E to these comments.

had been operating during the 2019 flood event.²³⁹ In reality, however, the Corps' flawed model shows that had the Pumps been operating at the Steele Bayou location in 2019, they would have caused at least a 0.45 foot rise in some portions of the Yazoo River with a margin of error of plus or minus 0.5 feet, as discussed in Section C of these comments. Thus, the Corps' own model shows that the Yazoo Pumps could increase flood stage in the Yazoo River by 0.95 feet—almost one extra foot of water when the Yazoo River is already at flood stage. However, even this major increase significantly understates the risks. This is because the Corps' model relied on much lower flow levels on both the Yazoo and Mississippi Rivers than the levels that were actually reached in 2019.²⁴⁰ In short, the Corps not only relies on a flawed model but mischaracterizes the findings of that flawed model.

The DSEIS must address the failings identified in the review carried out by Dr. Fleenor, and must fully and carefully assess the impacts of the Proposed Plan on increasing: flood stages in the Yazoo River; flood risks to communities and businesses located along the Yazoo River; the risk of inundating the International Paper wastewater treatment ponds and releasing significant amounts of toxic wastewater into the Yazoo River; and increasing the risk of overtopping and/or undermining the integrity of the Yazoo Backwater Levee, which could lead to a catastrophic levee failure that would threaten the safety of the very communities the Pumps are purported to protect.

4. The DSEIS Fails to Analyze Impacts to Conservation Lands

The DSEIS fails to evaluate the impacts of the project on conservation lands in the Yazoo Backwater Area and on the wetlands and streams located on those lands. The ecological implications of these impacts—and significance of those implications—must be assessed in light of the significant contribution of these conservation lands to the fish, wildlife, and plant resources in the Yazoo Backwater Area, and throughout the Mississippi River Alluvial Valley.

Conservation lands in the Yazoo Backwater Area include:

- The Yazoo National Wildlife Refuge Complex, which includes Panther Swamp National Wildlife Refuge, Yazoo National Wildlife Refuge, Holt Collier National Wildlife Refuge, and Theodore Roosevelt National Wildlife Refuge;
- Delta National Forest, which is the only bottomland hardwood forest in the National Forest System;
- Twin Oaks Mitigation Area, which provides mitigation for wetland losses caused by previously constructed federal flood control projects;
- Mahannah Wildlife Management Area, which provides mitigation for wetland losses caused by previously constructed federal flood control projects;
- Lake George Wildlife Management Area, which provides mitigation for wetland losses caused by previously constructed federal flood control projects;
- Phil Bryant Wildlife Management Area; and
- The extensive acreage enrolled in the Wetland Reserve Easement and Conservation Reserve Programs.

²³⁹ DSEIS, Appendix G (Engineering) at 144-145, paragraph 177.

²⁴⁰ Fleenor Report at 2, 4, and Appendix, provided at Attachment E to these comments.

Collectively, these conservation lands cover approximately 250,000 acres in the Yazoo Backwater Area:

Conservation Lands in the Yazoo Backwater Area	
Category	Acres
National Fish and Wildlife Refuges	25,000
National Forest	20,000
State Wildlife Management Areas	118,000
NRCS Easements	50,000
NGO Easements	7,000
Conservation Reserve Program	30,000
Total	250,000

In addition, as of November 25, 2003, the Corps also owned 19,463.08 acres of flooding and flowage easements in the Yazoo Backwater project area.²⁴¹ Indeed, the DSEIS recognizes that Yazoo Backwater Area “acts like a dry dam, as it stores water during flood events” and explains that the Yazoo Backwater Area is designed to flood prior to the Mississippi River and Tributaries Project Design Flood peak to protect downstream communities along the Mississippi River.²⁴² Since the area is designed to flood to protect other areas, it is illogical to install pumps to remove the water during flood events. Instead, the Corps should focus on implementing more effective flood risk reduction measures as outlined in the Resilience Alternative. This should be prioritized if the Corps has failed to advise residents of the flood risk where flowage easements were purchased.

In addition to fully assessing the adverse ecological impacts to these conservation and flood easement lands, it is critical that no agricultural or other flood damage reduction benefits be calculated for the conservation and flood easement lands in the Yazoo Backwater Area—the vast majority of which have been purchased and are being managed for conservation purposes using federal and state taxpayer dollars. Instead, the value of the ecosystem services lost due to adverse project impacts on these lands must be quantified and accounted for as a project cost in the required, but not carried out, benefit-cost assessment.

5. The DSEIS Fails to Analyze Operational Impacts Associated with Siting the Pumps at Deer Creek

By moving the Yazoo Pumps to the Deer Creek site, the Proposed Plan places the 14,000 cfs pumping plant much closer to the Delta National Forest (which is managed as a bottomland hardwood wetland system) and other important conservation lands. While the DSEIS provides some information on the direct impacts that will occur at the Deer Creek site, it provides no assessment of the potential impacts to sensitive habitats from operating the Yazoo Pumps at the new location. The DSEIS must carefully analyze whether the Delta National Forest and other conservation lands located near the Deer Creek site would suffer additional or more intensive harm from operating the Pumps at the Deer Creek site.

²⁴¹ U.S. Army Corps of Engineers Response to August 12, 2003 Freedom of Information Act Request for Flowage Easement Data Submitted by American Rivers.

²⁴² DSEIS Appendix G (Engineering) at 21-22 paragraphs 19-20.

6. The DSEIS Fails to Analyze Impacts to Water Quality

The Yazoo Backwater Area already suffers from degraded water quality due to pollutants such as sediment, pesticides, and excessive nutrients/low dissolved oxygen. The Proposed Plan would further impair water quality by (1) degrading thousands of acres of wetlands that play a crucial role in filtering pollutants, (2) inexplicably eliminating thousands of acres of reforestation that were specifically included in the 2007 plan to offset the pumps' impairment of water quality standards, (3) increasing agricultural production and the use of fertilizers and pesticides, and (4) exacerbating low flow conditions in the late summer/early Fall. Yet, the DSEIS disregards these issues, and thereby fails to ensure the Proposed Plan will not cause or contribute to violations of state water quality standards.

First, wetlands perform a series of critical functions that reduce the excessive pollutant levels in the Yazoo Backwater Area. For example, wetlands remove and sequester elements and compounds, which reduces the load of nutrients, heavy metals, pesticides, and other pollutants in rivers and streams.²⁴³ Despite this critical pollutant-filtering role, however, the DSEIS arbitrarily excludes consideration of wetlands in the 5-year floodplain and of wetlands that receive less than 14 consecutive days of flooding (often referred to as "short-hydroperiod wetlands"). As a result, the DSEIS fails to acknowledge the fact that the destruction and degradation of these wetlands by the Proposed Plan would contribute to violations of state water quality standards, as documented by EPA in the veto:

Given that the Yazoo Backwater Area already contains CWA section 303(d)-listed impaired waterbodies (see Appendix 7), the extensive loss of pollutant filtering and removal functions by wetlands impacted by the proposed project could exacerbate the elevated concentrations of the pollutants of concern, potentially causing or contributing to violations of applicable state water quality standards (40 CFR 230.10(b)).²⁴⁴

This problem has only gotten worse. Since EPA issued the veto, the Mississippi Department of Environmental Quality (MDEQ) has issued numerous additional TMDLs for streams and rivers in the Yazoo Backwater Area, as identified in the Conservation Organizations' scoping comments.²⁴⁵ The DSEIS must therefore undertake a comprehensive analysis of the pumps' impacts on wetland functions to ensure the project does not violate state water quality standards, as predicted by EPA.

In fact, the DSEIS demonstrates that the Proposed Plan will degrade wetland functions that "can be directly associated with water quality."²⁴⁶ For the narrow subset of wetlands considered in the DSEIS, the Corps identifies a loss of 3,588 AAFUCs for the wetland functions of export carbon and biological removal of pollutants, as well as a loss of 3,356 AFFUCs for physical removal of pollutants.²⁴⁷ The DSEIS

²⁴³ HGM Guidebook at 58-59.

²⁴⁴ Clean Water Act 404(c) Final Determination at 30.

²⁴⁵ For example, in 2006, MDEQ listed numerous rivers in the Yazoo backwater Area as impaired for nutrients (total phosphorous and nitrogen), including Steele Bayou and the Yazoo River. *See, e.g., See TMDL Total Nitrogen and Total Phosphorus For Selected Large Rivers in the Delta* (June 2008), at 4 (available at https://www.mdeq.ms.gov/wp-content/uploads/TMDLs/Yazoo/Delta_Large_Rivers_FINAL_Nutrients_TMDL_35411.pdf)

²⁴⁶ FSEIS Appx. 16 (Water Quality) ("Three of these functions, Export of Organic Carbon and the Physical and Biological Removal of E/C, can be directly associated with water quality.").

²⁴⁷ DSEIS Appx. F-5 (Wetlands) at Tables 70-79.

must assess the impacts of these lost functions on water quality for impaired waters in the Yazoo Backwater Project Area, as it did in the 2007 FSEIS.²⁴⁸

This analysis is critical for two critical reasons. First, the Corps' data shows that the Proposed Plan will cause or contribute to the impairment of listed water bodies in the Yazoo Backwater Area.²⁴⁹ In the 2007 FSEIS, the Corps concluded that Plan 4, by degrading wetland functions in the three areas just mentioned, would cause a six-percent decline in streams listed as impaired for sediment and pesticides, as well as five-percent decline for nutrients and three-percent decline for organic enrichment.²⁵⁰ The Proposed Plan would cause a similar loss of wetland functions, according to the Corps' analysis, thereby further impairing water quality. Yet, the DSEIS omits any analysis of this issue—an approach directly at odds with the 2007 FSEIS and contrary to the Corps' obligation to ensure no violations of water quality standards.

Furthermore, MDEQ has completed numerous additional TMDLs for streams and rivers in the Yazoo Backwater Area since the 2007 FSEIS, including the following TMDLs:

- Organic Enrichment / Low Dissolved Oxygen (DO) for Swiftwater Bayou Watershed (February 2014)
- Total Nitrogen and Total Phosphorus For Silver Creek (June 2008)
- Total Nitrogen and Total Phosphorus For Jaynes Bayou (June 2008)
- Total Nitrogen and Total Phosphorus For Lake Jackson (June 2008)
- Total Nitrogen and Total Phosphorus For Cypress Lake (June 2008)
- Total Nitrogen and Total Phosphorus For Selected Large Rivers in the Delta (June 2008)
- Yazoo River Basin Designated Oxbow Lakes for Sediment (April 2008)
- Total Nitrogen, Total Phosphorus, and Organic Enrichment / Low Dissolved Oxygen For the False River (April 2008)
- Yazoo River Basin Delta Region for Impairment Due to Sediment (April 2008)
- Total Nitrogen, Total Phosphorus, and Organic Enrichment / Low Dissolved Oxygen For Deer Creek (June 2008)
- Total Nitrogen, Total Phosphorus, and Organic Enrichment / Low Dissolved Oxygen For Snake Creek (June 2008)
- Total Nitrogen, Total Phosphorus, and Organic Enrichment / Low Dissolved Oxygen For Collins Creek (June 2008)

These TMDLs contain significant new information regarding environmental conditions and water quality requirements in the Yazoo Backwater Area, which must be analyzed in the DSEIS, but were not.²⁵¹

Second, the Corps provides no explanation of how the Proposed Plan ensures compliance with water quality standards, despite eliminating 52,900 acres of restoration and reducing the amount of reforestation for mitigation by 8,257 acres as compared to the 2007 proposal. In the 2007 FSEIS, the Corps identified reforestation as the linchpin of offsetting the Yazoo Pumps' adverse impacts on wetland functions and ensuring compliance with water quality standards:

²⁴⁸ FSEIS Appx. 16 (Water Quality) at 16-104 (“Results of the HGM analysis were combined with results from the stormwater runoff analysis to address project impacts to TMDL and impaired water bodies.”).

²⁴⁹ *Id.* at Table 16-29.

²⁵⁰ FSEIS Appx. 16 (Water Quality) at Table 16-29.

²⁵¹ See 40 C.F.R. § 1502.9(c)(1).

Reforestation would remove 55,600 acres of agricultural land from production and reduce sediment, pesticide, and nutrient yield in stormwater runoff by 11, 2, and 9 percent, respectively. Scientific analysis of wetland functions shows that reforestation of cleared land will increase the wetland functional capacity for the removal of sediment, nutrients, and historic pesticides from out-of-bank floodwaters by 4, 7, and 9 percent, respectively. Combined benefits from reforestation would be a 15 percent decrease in sediment loading, a 6 percent decrease in legacy pesticide loading, and a 16 percent decrease in nutrient loading.²⁵²

The Proposed Plan, however, abruptly eliminates the vast majority of the proposed reforestation. Without these critical measures, the Proposed Plan will cause a 15 percent *increase* in sediment loading, a 6 percent *increase* in legacy pesticide loading, and a 16 percent *increase* in nutrient loading, as compared to the 2007 plan. That increase would degrade already-impaired water bodies in the Yazoo Backwater Area, violating state water-quality standards.²⁵³ Yet, the DSEIS provides no explanation for how it will ensure state water-quality standards, despite abruptly eliminating these critical restoration measures.

The DEIS also fails to address the inadequacies in the conceptual mitigation proposal, which proposes significantly less reforestation than the amount already deemed inadequate by EPA. As explained in greater detail below, the proposed reforestation fails to offset the lost wetland functions that are directly associated with maintaining water quality. The Proposed Plan will therefore significantly reduce these critical wetland functions, thereby causing or contributing to the degradation of water quality.

Third, the DSEIS fails to analyze whether the “net result” of the Yazoo Pumps—the loss of wetland capacity coupled with increased agricultural production—would impermissibly degrade waterways in the Yazoo Backwater Area or exceed the limits established in the area’s TMDLs. By draining the Yazoo Backwater Area, the proposed pumps would not just eliminate critical wetland functions, as discussed, but also enable agricultural intensification that accounts for 80% of the benefits of the Yazoo Pumps in the 2007 FSEIS. In fact, the Proposed Plan would encourage agricultural intensification on an even greater acreage than the 2007 plan by (1) eliminating from the Proposed Plan conservation easements on thousands of acres of agricultural lands and (2) reducing water levels behind the Steele Bayou Gate during low flow conditions.²⁵⁴ The combined result would be a loss in nutrient uptake/transformation by wetlands, and an increase in the nutrient loading from agricultural uses of fertilizer and pesticides. The DSEIS disregards these impacts

Fourth, the DSEIS mischaracterizes the impacts of low dissolved oxygen concentrations in a self-serving attempt to disclaim responsibility for the Proposed Plan’s impacts on an extremely productive fishery. As explained in Section F.8 below, however, there is no scientific basis for the Corps’ sweeping assertion that hypoxia has degraded all aquatic habitat by 60 percent.

²⁵² 2007 FSEIS Appx. 16 (Water Quality) at S-1.

²⁵³ Without reforestation, Plan 5 in the FSEIS would increase sediment levels by 11 percent, pesticides by two percent, and nutrients by 9 percent. See FSEIS Appx. 16 (Water Quality) at Table 16-29.

²⁵⁴ DSEIS at 22.

Furthermore, as explained in the 2007 FSEIS and confirmed in the DSEIS, excessive agricultural pumping is the principal cause of low-dissolved oxygen conditions during the late summer between July and October, “when low DO conditions have the greatest potential for adverse effects to the aquatic environment (the critical period).”²⁵⁵ The Proposed Plan will, however, exacerbate those conditions in three ways that the DSEIS fails to consider. First, the Yazoo Pumps would reduce the ability of floodwaters to recharge the aquifer to levels that would sustain baseflows.²⁵⁶ By interfering with this recharge process, the pumps would, in turn, “reduce the amount of water that returns to area streams as baseflow.”²⁵⁷ Second, the Yazoo Pumps are designed to encourage agricultural intensification, which in turn would lead to additional groundwater pumping for irrigation and other farming purposes from the already severely-depleted aquifer, thereby leading to additional depletions in baseflows during the late summer and early fall. Third, the proposed groundwater wells will further deplete the aquifer, thereby causing unacceptable *adverse* impacts as discussed in greater detail below.

Due to these errors, the Corps has failed to analyze the impacts of the Proposed Plan on water quality, and thereby failed to ensure compliance with state water quality standards.

7. The DSEIS Fails to Analyze Impacts to Groundwater

The DSEIS fails to evaluate the impacts of the Yazoo Pumps on further depleting groundwater levels, and the cascading impacts to stream flows and fish and wildlife in the Yazoo Backwater Area and beyond.

Intensive agricultural groundwater pumping has depleted the Mississippi River Alluvial Aquifer, causing some of the most severe groundwater declines in the United States and highly damaging low-flow conditions in many Delta streams. Agricultural groundwater pumping creates a cone of depression that has captured baseflows in rivers, streams, and headwater tributaries throughout the Yazoo Basin. The resultant low flows can adversely affect fish and aquatic habitat as recognized in the DSEIS.²⁵⁸

Farms in the Mississippi Delta withdraw an estimated 9 billion gallons of groundwater per day for irrigation from the upper-most aquifer underlying the Mississippi Alluvial Plain. This aquifer is the third largest provider of groundwater in the United States, according to the U.S. Geological Survey. USGS studies show that groundwater levels in parts of the region have dropped more than 100 feet since 1870. This is among the most significant declines of groundwater levels of any region in the United States. Computer models suggest that these significant declines will expand in the coming decades. Groundwater declines and resulting low-flow conditions in many Delta streams are contemporaneous with increases in irrigation, according to the USGS. Low flows in streams threaten fish, mussels and other aquatic life. Low flows also impair water quality and threaten the ability of streams to assimilate wastewater discharges. Government agencies are investing millions of dollars to characterize groundwater declines in the region and implement conservation measures.²⁵⁹

²⁵⁵ FSEIS Appx. 16 (Water Quality) at 16-78.

²⁵⁶ Clean Water Act 404(c) Final Determination at 51.

²⁵⁷ *Id.*

²⁵⁸ DSEIS Appx. F-8 (Aquatic Resources) at 14.

²⁵⁹ Killian, C.D., Asquith, W.H., Barlow, J.R.B. *et al.* Characterizing groundwater and surface-water interaction using hydrograph-separation techniques and groundwater-level data throughout the Mississippi Delta, USA. *Hydrogeol J* 27, 2167–2179 (2019) (available at <https://doi.org/10.1007/s10040-019-01981-6>); 2019 Mississippi Water Resources Conference Proceedings (available at https://www.wrri.msstate.edu/pdf/2019_wrri_proceedings.pdf); M.L. Reba, J.H. Massey, M.A. Adviento-Borbe, D. Leslie, M.A. Yaeger, M. Anders, and J. Farris, *Aquifer Depletion in the Lower Mississippi River Basin: Challenges and Solutions*, Universities Council on Water Resources Journal of

The proposed Yazoo Pumps project will likely exacerbate groundwater declines and low flows in the project area's streams in at least the following four key ways, but the DSEIS fails to evaluate these potential impacts:

First, the Yazoo Pumps will limit the ability of backwater floods to recharge the aquifer, which in turn will reduce stream baseflows, as recognized by EPA in the veto.²⁶⁰

Second, the Pumps-induced wetland losses and adverse impacts will exacerbate the area's already significant groundwater declines. Recent studies demonstrate the significant value of wetlands to groundwater recharge in the Yazoo Backwater Area.²⁶¹

Third, the fundamental purpose of the Yazoo Pumps is to facilitate agricultural intensification—which, according to the 2007 FSEIS, will produce 80% of project benefits—and this intensification almost certainly will lead to increased irrigation and additional groundwater declines in the Yazoo Backwater Area. These declines in turn, will harm the area's remaining wetlands and exacerbate the area's already significant low flow problems (since groundwater provides some base flow in the Yazoo Backwater Area rivers, streams, and bayous).

Fourth, the project's 34 groundwater wells that will be located far outside the project area will cause even more drawdown of the already severely-depleted Mississippi Alluvial Plain aquifer. As described in detail in Section H.2 of these comments, this out-of-kind mitigation is counter-productive and was decisively rejected in a comprehensive watershed plan due to its unacceptable *adverse* impacts. The Corps ignored this watershed plan, as well as basic hydrological principles and monitoring data, in an unrealistic, uninformed, and unfounded attempt to claim mitigation credits.

Contemporary Water Research & Education Issue 162, Pages 128-139, December 2017 (available at <https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/j.1936-704X.2017.03264.x?download=true>); 2014. Mississippi Executive Order 1341 (establishment of the Governor's Delta Sustainable Water Resources Task Force, signed by Gov. Phil Bryant, April 26, 2014) (<https://www.mdeq.ms.gov/wp-content/uploads/2018/11/View-Executive-Order-1341.pdf>); Mississippi Water Resources Research Institute, Mississippi State University (available at <https://www.wrri.msstate.edu/>); 38th Annual Mississippi Water Resources Research Conference, Session A panel discussion proceedings (available at <https://www.wrri.msstate.edu/pdf/sessionA.pdf>); 2018 annual report. Mississippi Water Resources Research Institute, Mississippi State University (available at <https://www.wrri.msstate.edu/pdf/2018annual.pdf>); Proceedings of the 37th annual Mississippi Water Resources Conference. Agricultural Water Use in the Mississippi Delta, Shane Powers, Yazoo Mississippi Delta Joint Water Management District (available at <https://www.wrri.msstate.edu/pdf/powers07.pdf>).

²⁶⁰ Clean Water Act 404(c) Final Determination at 51.

²⁶¹ Ying Ouyanga, et al., *Estimating impact of forest land on groundwater recharge in a humid subtropical watershed of the Lower Mississippi River Alluvial Valley*, Journal of Hydrology: Regional Studies 26 (2019) 100631 (wetlands in the lower Yazoo River Basin provide the highest rates of groundwater recharge while agricultural lands provide the lowest rates). A copy of this study is provided at Attachment J to these comments. Michael Gratzner, et al., *Quantifying Recharge to the Mississippi River, Valley Alluvial Aquifer from Oxbow Lake-Wetland Systems*, (2017) (oxbow lake wetlands near Belzoni, MS produce "significant vertical recharge" into the Mississippi River Valley Alluvial Aquifer). Copies of both of these articles are provided with the Conservation Organizations Scoping Comments which are appended to these comments at Attachment F (the articles can be found at attachment D to the scoping comments).

The implications of Yazoo Pumps-induced groundwater declines will not stop at the borders of the Yazoo Backwater Area. To the contrary, such declines will affect all areas that rely on the upper-most aquifer underlying the Mississippi Alluvial Plain.

8. The DSEIS Fails to Properly Analyze the Impacts to Fish and Wildlife, Including Listed Species

EPA issued the 2008 veto because the Yazoo Pumps “would result in unacceptable adverse effects on fishery areas and wildlife.” Indeed, the veto “is based solely on environmental harms to fisheries and wildlife in the Yazoo Backwater Area” as “is appropriate given the structure and language of the CWA and case law.”²⁶² In its comments on the 2007 FSEIS, the Department of the Interior similarly concluded that the Yazoo Pumps “will have unacceptable adverse effects on fishery areas, including spawning and breeding areas” and “unacceptable adverse effects on wildlife, specifically to the area’s breeding and migratory birds, including landbirds, shorebirds, wading birds, and waterfowl.”²⁶³

Given these findings, it is critical that the DSEIS accurately assess the impacts of the Proposed Plan on fish and wildlife resources, but the DSEIS does not do so.

a. The DSEIS Severely Underestimates the Adverse Impacts to Birds and Waterfowl

The DSEIS’s examination of the direct, indirect, and cumulative impacts of the Yazoo Pumps on birds and waterfowl that depend on the Yazoo Backwater Area is technically deficient and scientifically unsound – a wholly unacceptable assessment given the anticipated extensive and irreversible ecological impacts associated with the Proposed Plan.

Approximately 60 percent of all North American bird species depend upon the Mississippi River basin's habitats, including 40 percent of all waterfowl and shorebirds that migrate along the Mississippi River Flyway. Located in the heart of this major continental migration corridor, the Yazoo Backwater Area provides hemispherically significant wetlands that support 257 bird species, including several species recognized as state and/or federally threatened or endangered, or as a Species of Greatest Conservation Need.²⁶⁴

As described in the 2008 Clean Water Act 404(c) Final Determination, adverse impacts caused by the Yazoo Pumps must be considered in the context of the significant cumulative losses across the Lower Mississippi River Alluvial Valley (LMRAV), which has already lost over 80 percent of its bottomland forested wetlands, and specifically in the Mississippi Delta where the proposed project would significantly degrade important bottomland forested wetlands.²⁶⁵ Stated further by the U.S. Fish and Wildlife Service (FWS) in the Fish and Wildlife Coordination Act Report prepared for the 2007 SEIS, the Yazoo Backwater Area provides the “greatest potential” for meeting breeding bird habitat restoration

²⁶² Clean Water Act 404(c) Final Determination at 70.

²⁶³ U.S. Department of the Interior Comments on the 2007 FSEIS at 7, 9.

²⁶⁴ Clean Water Act 404(c) Final Determination Appendix 2 “Yazoo Backwater Area Faunal Species Lists”. Species of Greatest Conservation Need (SGCN) are aquatic or terrestrial animals that have been recognized by the State of Mississippi as at risk or in decline, and as such are identified in the 2015 State Wildlife Action Plan as the species most in need of conservation action.

²⁶⁵ Clean Water Act 404(c) Final Determination at iii.

and protection needs within the LMRAV.²⁶⁶ Therefore, the Yazoo Backwater Area represents one of the last existing and most substantial tracts of highly productive bottomland hardwood forests in the LMRAV, which provides vital foraging, nesting, breeding, and migration habitat to annually support millions of waterfowl, shorebirds, wading birds, colonial nesting waterbirds, and songbirds.

The 2020 DSEIS, however, completely fails to acknowledge or respond to any of the bird and waterfowl concerns raised in the 2008 EPA veto. In fact, the DSEIS limits its review to a qualitative—not quantitative—impact assessment for a handful of bird species, which does not serve as a comprehensive assessment of the vast abundance of birdlife that use the LMRAV and rely on the project area.²⁶⁷ This narrow assessment stands in grave contradiction to the DSEIS’s acknowledgement that, “Lands within the Yazoo Study Area are regionally, nationally, and hemispherically important due to the habitat provided to a myriad of species.”²⁶⁸

The 2008 EPA veto was unequivocal in the Pumps’ harm to birds and waterfowl:

The loss of the productive shallowly flooded wetlands, especially in the spring months when the proposed pumps will typically be in operation, will impact migratory birds such as shorebirds and waterfowl as they stopover and forage in preparation for their seasonal migration. Fewer shallowly flooded wetlands will reduce foraging habitat, which will equate to reduced nutritional uptake and could result in higher mortality or reduced reproductive fitness as the birds travel the great distances between their southern wintering areas and their breeding areas in the northern U.S., Canada, and the Arctic. Breeding for many species could be adversely affected during the spring-time nesting season because foraging areas would be reduced. As a result of the reduction in flooding, adult birds will have to travel longer distances to find food, which equates to longer times away from the nest or foraging for food and may ultimately lead to higher nest mortality and lower recruitment (Appendix 4).²⁶⁹

Also, the EPA veto described:

500,000-1,000,000 shorebirds, migrate on a biannual basis. FWS also notes that natural springtime flooding in the area’s riverine backwater wetlands coincides with two major events in the LMRAV: 1) native bird and waterfowl migration that requires suitable and productive stopover and foraging habitats to meet migratory energy needs; and 2) breeding bird and waterfowl nesting that requires adequate nesting and foraging habitats to meet reproductive and rearing needs.²⁷⁰

The DSEIS blatantly ignores these concerns, concluding that the Proposed Plan will have no direct, no cumulative, and minimal indirect, adverse impacts.²⁷¹

²⁶⁶ U.S. Fish and Wildlife Service, Fish and Wildlife Coordination Act Report (October 23, 2006), 2007 Final SEIS, Appendix 3 at 7.

²⁶⁷ DSEIS Appendix H at 90.

²⁶⁸ DSEIS at 49.

²⁶⁹ Clean Water Act 404(c) Final Determination at 57.

²⁷⁰ Clean Water Act 404(c) Final Determination at 26.

²⁷¹ DSEIS at 75.

Moreover, the DSEIS Migratory Bird Appendix states that an MVK hydrologic analysis shows that the Proposed Plan would cause a loss of “up to 34,000 acres of inundated habitat including 23,500 acres of inundated floodplain forest for water- and wetland-dependent birds (e.g., herons, egrets, ibises) that utilize this habitat for foraging or breeding” in the 25% exceedance elevation.²⁷² Given that these backwater habitats support a complex array of diverse life cycle needs by hundreds of bird species, it is illogical for the DSEIS to conclude that the Proposed Plan will have no direct, no cumulative and just minimal indirect adverse impacts on bird species.

Rather, the DSEIS characterizations of the Proposed Plan’s impacts to birds and waterfowl lack objective, peer-reviewed analyses and robust science. For example, the DSEIS concludes that except for the pondberry, there is a low probability that any other ESA listed species occur in the project area; this assertion is in direct contradiction to information contained in the DSEIS and is not accompanied by source references used to make those occurrence determinations.²⁷³

Audubon’s eBird abundance analysis, presented in greater detail below, scientifically substantiates the Proposed Plan’s threat to 180 migratory landbird and waterbird species, finding that over 10 million birds and more than 18 million birds use the Yazoo Backwater Area annually during spring and fall migration, respectively. Additionally, Audubon’s analysis of 17 overwintering waterfowl species found that over 6.3 million use of the Yazoo Backwater Area from December-February.

Audubon’s analysis and findings reinforce the concern that the DSEIS is sloppy and downplays the Proposed Plan’s consequences to birds and waterfowl. Likely, the proposed Pumps would be operated during the winter and spring months when the impact to migratory birds would be greatest; the loss of shallowly flooded wetlands would significantly reduce the stopover and forage habitat birds rely on to fuel their seasonal migration. Resident waterfowl and other bird species would be expected to experience similar habitat losses and associated resulting impacts.

The DSEIS asserts that most of 29 bird species it analyzed—an extremely limited species sample—“should experience few negative impacts with implementation of the Updated Recommended Plan”.²⁷⁴ Although the DSEIS does acknowledge that bottomland hardwood wetlands located above elevation 87 feet “will likely experience changes in structure and function due to altered hydrologic regimes from the Pumps’ operation”²⁷⁵, its discussion on the resulting impacts to birdlife is limited to a single paragraph that acknowledges wading birds and migratory shorebirds are not directly addressed. The DSEIS’ qualitative assessment of impacts to birdlife by the Proposed Plan is simply unacceptable.

In reviewing the 2007 FSEIS and CWA 404(c) Proposed Determination, the FWS found that the Yazoo Pumps, “would reduce flooding on all four NWRs by 59 percent (6,695 acres) within the 2- to 5-year floodplain – significantly reducing the extent of habitat for migratory birds and the capability of these NWRs to achieve the purpose for which they were congressionally established.”²⁷⁶ These multiple natural resource designations bestowed on lands in the Yazoo Backwater reinforce the vast array of ecologic benefits these habitats provide, and punctuate just how widespread and far reaching the

²⁷² DSEIS, Appendix H (in the Migratory Bird section of this Appendix) at 6.

²⁷³ DSEIS Appendix H at 9.

²⁷⁴ DSEIS Appendix H Migratory Birds Appendix at 16.

²⁷⁵ DSEIS Appendix H Migratory Birds Appendix at 17.

²⁷⁶ Clean Water Act 404(c) Final Determination at 64.

Pumps' environmental threats pose to the Lower Mississippi Alluvial Valley and the Mississippi River Flyway.

In the veto EPA acknowledged that:

The proposed project would reduce the extent of flooding within wetlands in the 2- to 5-year floodplain potentially from January through June. The reductions to late winter and spring flooding would result in significant adverse impacts to those birds which not only utilize the Yazoo Basin, but are dependent upon backwater flooding during these periods....The reduction in the extent and duration of the spring flood pulse would accelerate the decline of many bird species that depend upon the wetland habitats of the lower Yazoo River (Appendix 4).²⁷⁷

The 2020 DSEIS proposal reinforces the reality of landscape-scale hydrologic alterations because operation of the Yazoo Pumps would not only be limited to large flood events. In addition to the Pumps' direct environmental impacts from its construction and operations, secondary and cumulative alterations and subsequent loss of habitats will also occur in the Lower Mississippi River Delta in areas located outside the Yazoo Backwater Area, for which waterfowl, shorebirds, wading birds, colonial nesting water birds, and songbirds depend on for foraging, nesting, breeding, and migration.

The many thousands of wetland acres that will be drained by the Yazoo Pumps include a myriad of state and/or federally managed refuge, forest, and wildlife management areas, many of which are recognized as Important Bird Areas (IBAs) for resident and migratory birds and waterfowl. These properties include Delta National Forest, Panther Swamp and Yazoo National Wildlife Refuges, and Mahannah Wildlife Management Area, as well as Eagle Lake in Warren County.²⁷⁸

Furthermore, the DSEIS's analyses for birds and waterfowl are incredibly limited and anecdotal, and do not properly account for the different life-cycle requirements of the many species that utilize the project area for the purposes of foraging, nesting, breeding, and/or migration periods. Audubon's eBird abundance analysis, discussed below, highlights several bird species to better demonstrate the vital role wetlands and flood frequency play to support the health and survival of many millions of birds that use the project area each year. Rather than limiting its assessment to a few bird species, the DSEIS should select a wider, more representative sample of species that have different habitat needs at different times of the year and include any species that has outlier habitat needs, particularly for species of concern.

A clear example of these deficiencies is the DSEIS's assessment on migratory birds, which describes the only field investigation to collect data on avian species in the Yazoo Backwater Area was done opportunistically over a 2-week period in mid-July.²⁷⁹ Three wildlife biologists collected data on visual and aural observations at 53 HEP sampling sites along with incidental detections that occurred while walking or driving between the sampling points. The numerous deficiencies with the scenario described include:

²⁷⁷ Clean Water Act Final (404) Determination at 58.

²⁷⁸ An Important Bird Area (IBA) is an area that has been identified using an internationally agreed to set of criteria as being globally important for the conservation of bird populations. National Audubon Society administers this program in the United States. Source: National Audubon Society website at <https://www.audubon.org/important-bird-areas/state/mississippi> (last visited November 16, 2020).

²⁷⁹ DSEIS Appendix H Migratory Birds Appendix at 89.

- Other than “well-versed in visual and aural detections of birds”, no supporting documentation was provided on the level of birding expertise (formal or informal) or ornithological experience of any of the three wildlife biologists.
- The avian field observations were collected in an ancillary, “opportunistic” fashion that were coordinated around 53 sampling points whose locations were selected for other field purposes. This approach is wholly inadequate and distorted given the global importance of the Yazoo Backwater habitats to supporting birdlife. Rather, a robust bird survey must be designed and executed by professionals trained in bird science and the survey must include a representative sample of habitats and conservation areas (i.e. state and federal lands, conservation-enrolled properties) throughout the backwater as well as the broader LMRAV region so as to provide a comprehensive picture of bird use and movement in the ecoregion.
- The window to collect bird observations was limited to a single 2-week window in mid-July. This highly selective, narrow period in mid-summer is completely nonsensical as it misses the spring and fall migrations seasons, as well as the overwintering season. Importantly, it also misses the peak of the breeding season for many migratory songbirds, and took place during the cessation of breeding when songbirds are relatively quiet and hard to detect. The DSEIS’s approach is completely inappropriate and fails to apply scientific method and analysis to comprehensively assess the Pumps’ impacts to birdlife.

A related deficiency includes several instances where the DSEIS implies data sources are more up-to-date than they really are. This is particularly in the case of citations that appear current because of re-publication by The Cornell Lab of Ornithology in 2020, but are actually outdated by 20 years or more. In the Wood Stork discussion, for example, the “Coulter et al. 2020” reference was written in 1999, and the Least Tern discussion reference to “Thompson et al. 2020” was last updated in 1997.²⁸⁰ In both cases, more recent peer-reviewed published data contradict several of the statements and assumptions around these species’ population sizes, distributions, and migratory pathways.

Another example of how the DSEIS minimizes the Pumps’ impacts to waterfowl can be found in its assessment of Duck Use Days (DUDs). The estimated loss of 1.3 million DUDs due to the Proposed Plan would represent a 12.4% loss in the total DUDs annually, a substantial sum that indicates significant harm to overwintering waterfowl population, rather than the DSEIS’ conclusion that minimal or non-existent adverse impacts.

Notably, the 2020 DUD analysis is limited to just Mallards (DSEIS Appendix F-7: Waterfowl). Given the abundance and diversity of winter waterfowl species outlined by Audubon’s analysis below, the DUD analysis should be expanded to include other species with different life-cycle needs.

Also, in addition to the major shortcomings of the DSEIS’s proposed mitigation discussed in Section H of these comments, the compensatory benefits for wintering waterfowl will take 20 years to begin accruing and would continue for another 30 years.²⁸¹ This would not only negatively impact recreational and economic opportunities around waterfowl hunting for local businesses and landowners, but also this timeline extends well beyond the realistic planning horizons of natural resource agencies and public-

²⁸⁰ See DSEIS Appendix H at 13 and 20, respectively.

²⁸¹ DSEIS Appendix F-7 at 13.

private conservation initiatives. Cropland or habitat conversion to productive, healthy bottomland hardwood forest habitat is a significant undertaking and requires active management and monitoring, both of which are not mentioned.

(i) Summary of the eBird Abundance Model Analysis

Audubon has developed an eBird abundance model summary analysis (“abundance analysis”) for 180 species of migratory birds found in the region using data from the [Cornell Lab of Ornithology](#) and the [Partners in Flight Population Estimates Database](#) from [Bird Conservancy of the Rockies](#).^{282,283} Although these data sources also were used in the DSEIS’ assessment on migratory birds (DSEIS at Appendix H Migratory Birds Appendix at 5), an important difference is that much of the DSEIS’s migratory bird assessment used eBird data that is only based on raw observational data, not accounting for incomplete sampling and other survey biases.

This approach is substantially less meaningful than Audubon’s approach in using modeled bird-habitat relationships to estimate relative abundance, which was then compared to continental population size estimates. Specifically, Audubon’s abundance analysis was developed to better evaluate and quantify the population-level importance of a geographic location for a bird species during the fall/spring migration, and/or overwintering seasons, so as to strengthen the effectiveness of bird conservation efforts. This model analysis has been peer-reviewed, and a summary of Audubon’s methodology is provided in Figure 2, below.²⁸⁴

²⁸² Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, O. Robinson, S. Ligocki, B. Petersen, C. Wood, I. Davies, B. Sullivan, M. Iliff, S. Kelling. 2020. eBird Status and Trends, Data Version: 2018; Released: 2020. Cornell Lab of Ornithology, Ithaca, New York (available at <https://doi.org/10.2173/ebirdst.2018>).

²⁸³ Will, T., J.C. Stanton, K.V. Rosenberg, A.O. Panjabi, A.F. Camfield, A.E. Shaw, W.E. Thogmartin, and P.J. Blancher. 2020. Handbook to the Partners in Flight Population Estimates Database, Version 3.1. PIF Technical Series No 7.1 (available at pif.birdconservancy.org/popest.handbook.pdf).

²⁸⁴ DeLuca, W, Meehan, T, Seavy, M, Jones, A, Pitt, J, Deppe, J, & Wilsey, C, ‘The Colorado River Delta and California’s Central Valley are critical for many migrating North American landbirds’, *The Condor: Ornithological Applications* (In press).

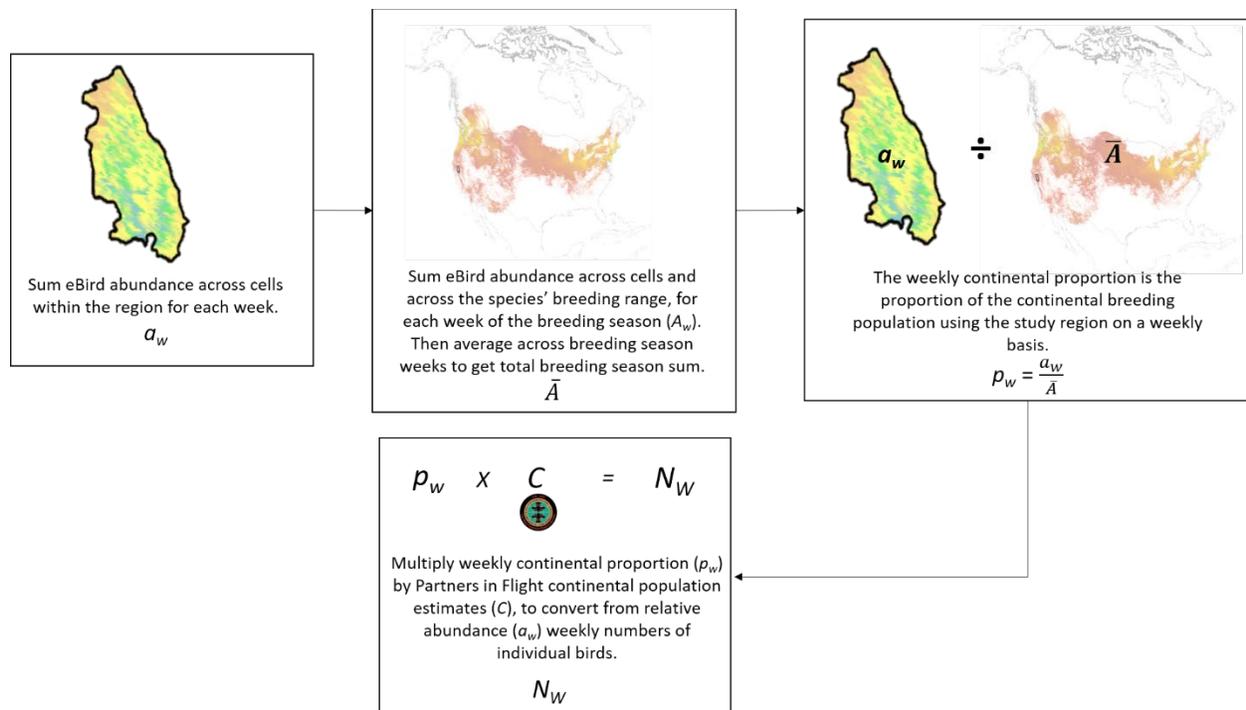


Figure 2, Illustration of the methodology developed by Audubon for its eBird abundance analysis, which was first completed for the Colorado River Delta and California's Central Valley. This serves as a graphical and mathematical description of the process Audubon used to go from the weekly eBird abundance raster surface in the Sacramento study region to an estimate of total number of individual birds using the region for a given week.

Audubon's abundance analysis was used to develop an estimate of annual spring migration (April-May) and fall migration (August-October) landbird and waterbird use of the Yazoo Backwater Area, as well as estimated annual overwintering waterfowl use (December-February). Audubon's findings substantially reinforce long-standing assessments made by natural resource agencies, scientists, conservation groups, and many others that the Yazoo Backwater Area is a major ecologic lynchpin of the Lower Mississippi River Alluvial Valley because it provides hemispherically significant habitat for many migrating landbirds and waterbirds, and for overwintering waterfowl.

The 2008 veto showcased the rich biodiversity of the region, which includes identifying 257 bird species known to occur in Yazoo Backwater Area.²⁸⁵ Audubon's analysis focused on 180 landbird and waterbird species with a reasonable potential to regularly use the Yazoo Backwater Area during spring or fall migration, and that would be reasonably represented by the eBird models, specifically 116 species of landbirds and 64 species of waterbirds.

The analysis found that over 10 million birds (~5.9 million landbirds and ~4.3 million waterbirds) use the Yazoo Backwater Area during spring migration, and more than 18 million birds (~9.1 million landbirds and ~9.6 million waterbirds) use Yazoo Backwater Area during fall migration. The finding that habitats in the project area annually support an estimated 29 million migrating birds unequivocally demonstrates the population-level importance of the Yazoo Backwater Area for many migrating landbirds and waterbirds.

²⁸⁵ Clean Water Act 404(c) Final Determination Appendix 2 "Yazoo Backwater Area Faunal Species Lists".

The line graphs in Figure 3 below show weekly bird migration during spring and fall. The lines represent the estimated number of birds in each guild (i.e., landbirds, waterbirds) using the Yazoo Backwater Area in each week of each season, and the colored ribbon represents a 95% confidence intervals around those estimates. During spring migration, the results demonstrate that waterbirds pass through relatively consistently between March and mid-May, whereas landbirds peak in early May. During fall migration, the analysis found that waterbirds tended to peak early, whereas landbird numbers were more stable over time.

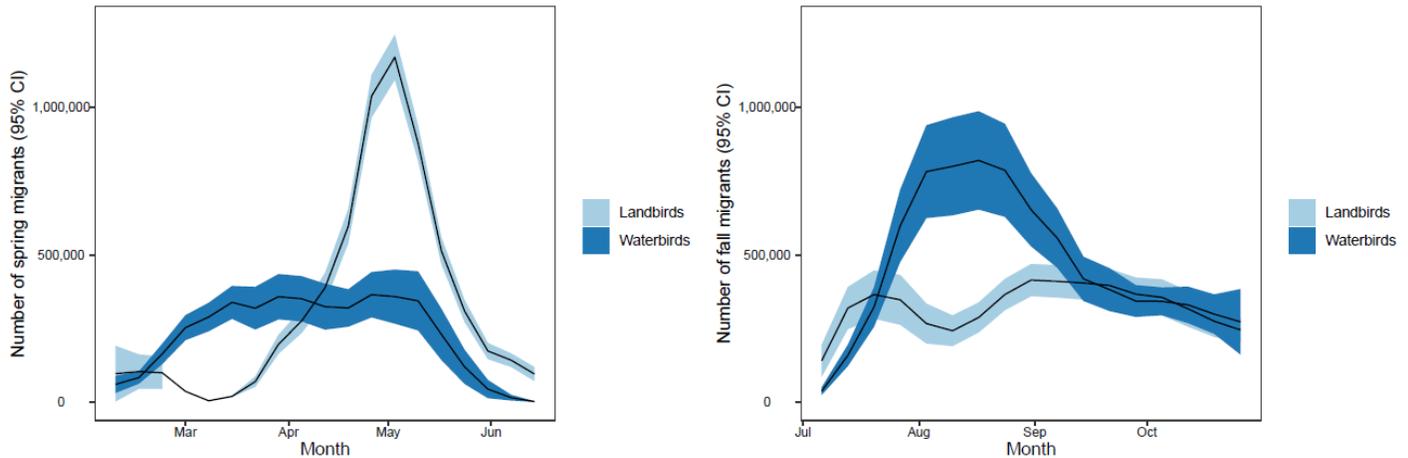


Figure 3, Line graphs showing the estimated number of landbirds and waterbirds using the Yazoo Backwater Area in each week of the spring and fall migration seasons. The colored ribbon in Figure 3 represents a 95% confidence intervals around those estimates. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends](#) from the [Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database](#) from [Bird Conservancy of the Rockies](#)

The analysis illustrates the total number landbird and waterbird species within each of four categories to summarize the proportion of species' North American breeding population that use the Yazoo Backwater Area during spring and fall migrations (see Figures 4 and 5, below). To provide population-level importance of the Yazoo Backwater Area to migrating species, Audubon used BirdLife International's Global Important Bird Area criteria A4, which allows a site to qualify as globally significant if it regularly holds congregations of $\geq 1\%$ of the global population of one or more species. Any species in either the low, moderate, or high categories meets this $\geq 1\%$ criterion. The delineation of the four categories are as follows: **below 1%** – greater than zero but less than 1% of the species population uses the site; **low** – the percent of species populations that use the site is $\geq 1\%$ but within the bottom third of the data range; **moderate** – the percent of species populations that use the site is in the middle third of the data range; **high** – the percent of species populations that use the site is in the upper third of the data range.

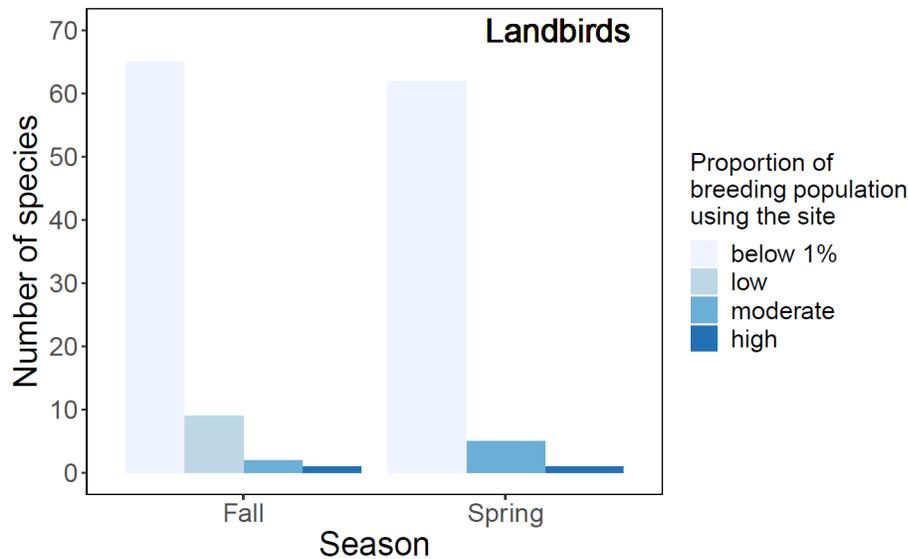


Figure 4, The proportion of the total North American population of landbirds that migrate through the Yazoo Backwater Area during fall and spring. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends](#) from the [Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database](#) from [Bird Conservancy of the Rockies](#)

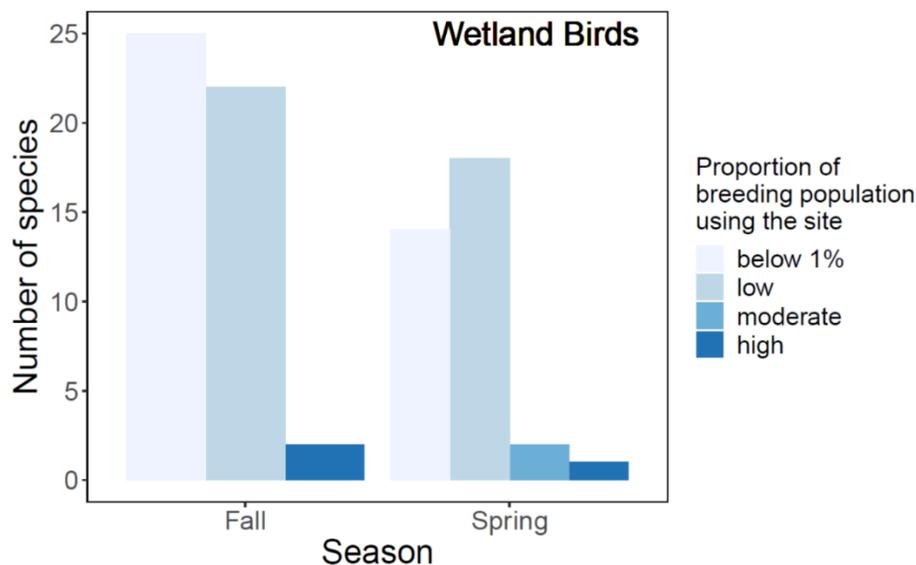


Figure 5, The proportion of the total North American population of waterbirds that migrate through the Yazoo Backwater Area during fall and spring. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends](#) from the [Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database](#) from [Bird Conservancy of the Rockies](#)

In comparing these results to the Species of Greatest Conservation Need (SGCN) identified in Mississippi’s State Wildlife Action Plan²⁸⁶, there were nine SGCN species that trigger the $\geq 1\%$ continental population threshold for either spring or fall migration through the Yazoo Backwater Area. These were:

²⁸⁶ Mississippi Museum of Natural Science (2014). *Endangered Species of Mississippi*. Mississippi Department of Wildlife, Fisheries, & Parks, Mississippi Museum of Natural Science, Jackson, MS (available at https://www.mdwfp.com/media/3231/endangered_species_of_mississippi.pdf) (visited June 10, 2020).

- Dunlin (spring)
- Interior Least Tern (fall, Endangered Species Act listed)
- Lesser Scaup (spring)
- Peregrine Falcon (fall)
- Prothonotary Warbler (spring) (see Figure 6, below)
- Snowy Egret (fall)
- Tricolored Heron (fall)
- Western Sandpiper (fall)
- Yellow-crowned Night-Heron (spring and fall)

For example, the analysis found that nearly 21,000 Prothonotary Warblers use the Yazoo Backwater Area during spring migration. Upon comparing this estimate of Prothonotary Warbler numbers during peak spring migration to the estimate of what proportion of the species' global population that represents; the Yazoo Backwater Area supports almost 1% of the species' total global population.

The Prothonotary Warbler is one of the 29 bird species reviewed in the DSEIS (DSEIS Appendix H Migratory Birds Appendix at 97; note the species initially was misspelled as "Prothonary"). The life-cycle of this cavity-nesting species is highly dependent on rivers and bottomland hardwood forests, resulting in it being common throughout the Mississippi River Flyway.²⁸⁷ However, the species is experiencing a significant population decline because of the loss of forested wetlands in the United States and mangroves on its wintering grounds.

The DSEIS fails to provide a substantive, science-based discussion of how the Proposed Plan will impact the species and the DSEIS concludes that more detailed modeling is needed.²⁸⁸ This is bookended by an uncorroborated assertion that the loss of up to 23,500 acres of forested wetland habitat will be offset by "unrealized habitat gain in bottomland hardwoods". Audubon's findings clearly demonstrate that the Yazoo Backwater Area provides ecologically significant wetland habitat that is vital to the global population health of the Prothonotary Warblers. Wetland losses due to the Yazoo Pumps will have a far-reaching and lasting impact on the viability of this species far beyond the DSEIS's incomplete, lackluster assessment.

²⁸⁷ Cornell Lab of Ornithology, All About Birds website, https://www.allaboutbirds.org/guide/Prothonotary_Warbler/overview (visited November 18, 2020).

²⁸⁸ DSEIS Appendix H Migratory Birds Appendix at 13.

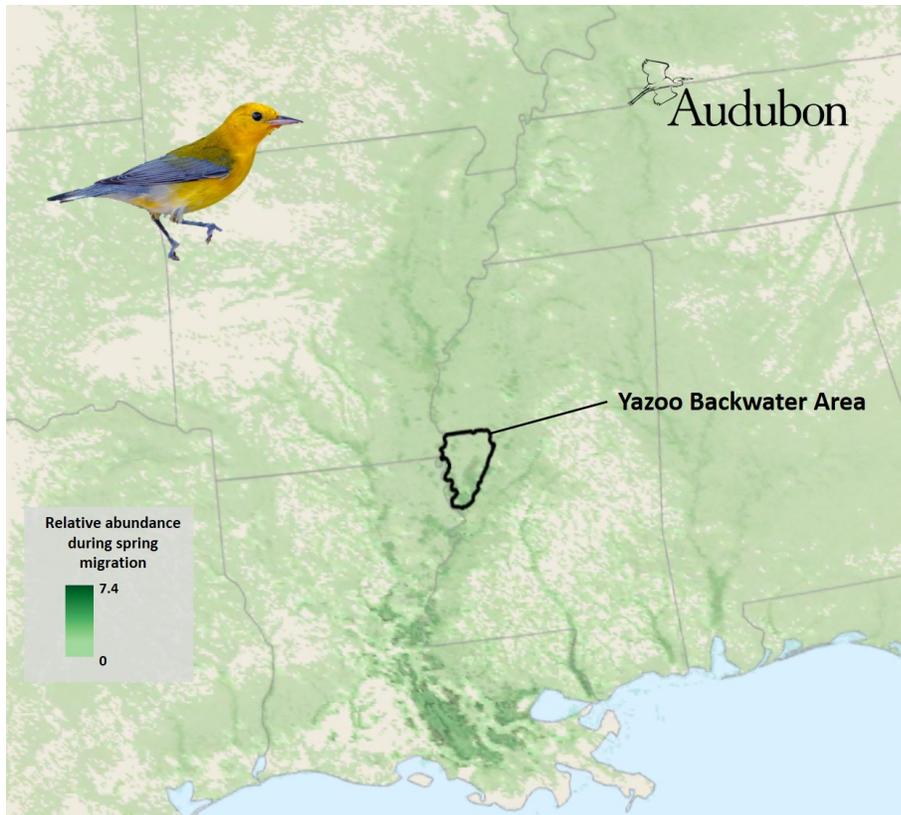


Figure 6, This map shows the relative abundance of Prothonotary Warblers using the Yazoo Backwater Area across the entire spring migration season. Up to nearly 21,000 Prothonotary Warblers use the Yazoo Backwater Area during spring migration. This represents almost 1% of the species' total global population. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends](#) / [Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database](#) / [Bird Conservancy of the Rockies](#). Photo by Lorraine Minns/Audubon Photography Awards

Also, the analysis identified 12 bird species that exceeded the 10% continental population threshold for spring and/or fall migration through the Yazoo Backwater Area:

- American Golden-Plover (spring)
- Blue-winged Teal (spring and fall)
- Greater White-fronted Goose (fall)
- Least Sandpiper (spring and fall)
- Lesser Yellowlegs (spring and fall)
- Long-billed Dowitcher (fall)
- Pectoral Sandpiper (spring and fall) (see Figure 7, below)
- Roseate Spoonbill (fall)
- Semipalmated Sandpiper (fall)
- Snowy Egret (fall)
- Stilt Sandpiper (spring and fall)
- White-rumped Sandpiper (spring)

EPA has acknowledged that, "If the frequency of spring flooding in the Yazoo Backwater Area is significantly reduced, then the loss of this seasonal habitat would result in lower survival rates, and

therefore, reduced northward shorebird migrations.”²⁸⁹ EPA highlighted the importance of the project area’s shallowly flooded wetlands as prime spring migration stopover habitat, especially for Pectoral Sandpipers. This shorebird often nests in the Arctic Tundra and winters in southern South America, resulting in a round-trip migration of nearly 19,000 miles every year.²⁹⁰ The population of Pectoral Sandpipers is in decline and the species is on the Partners in Flight Yellow Watch List.

Audubon’s abundance analysis found that significant numbers of Pectoral Sandpipers migrate through the Yazoo Backwater Area annually, especially in the fall. The analysis found that up to nearly 500,000 Pectoral Sandpipers use the project area during one week of peak fall migration, or about 30% of the species’ total global population. Audubon’s findings on Pectoral Sandpipers profoundly demonstrate the hemispheric importance of the Yazoo Backwater habitats to the global population health of this species, thereby reinforcing the serious threat the Yazoo Pumps pose to this and many other migrating species.

Comparatively, the DSEIS offers no quantitative assessment of the Proposed Plan on shorebirds or migratory species. An example of the DSEIS’s short comings on this matter is demonstrated through its claim about a few migratory shorebird species it considered; namely that, “Most of these species could potentially occur for brief periods during the fall and/or spring migration seasons....”²⁹¹ In contrast, Audubon’s spring/fall migration analyses found the project area supports sizeable global populations of several species included on the DSEIS’s finite list, specifically American Golden-Plover (spring), Semipalmated Sandpiper (fall), Dunlin (spring), Lesser Yellowlegs (spring and fall) and Interior Least Tern (fall; Endangered Species Act listed).

Also, the DSEIS downplays the likelihood that a handful of migratory shorebird species use the project area and is generally dismissive of the impacts constructing and operating the Pumps will have on various backwater habitats during migration seasons.²⁹² The DSEIS suggests that the Pumps’ operation may significantly reduce shallowly flooded habitats that would impact migratory species, but minimizes the concern by rationalizing some flooded acreage would still exist and mitigation could be possible. The DSEIS claims do not track with those of Audubon’s peer-reviewed abundance analysis nor the concerns raised in the 2008 Final Determination.

²⁸⁹ Clean Water Act 404(c) Final Determination at 58.

²⁹⁰ Cornell Lab of Ornithology, All About Birds website, https://www.allaboutbirds.org/guide/Pectoral_Sandpiper/overview (visited November 18, 2020).

²⁹¹ DSEIS Appendix H Migratory Birds Appendix at 8.

²⁹² DSEIS Appendix H Migratory Birds Appendix at 8.



Figure 7, This map shows an example week during peak fall migration for Pectoral Sandpipers using the Yazoo Backwater Area. Up to nearly 500,000 Pectoral Sandpipers use the Yazoo Backwater Area during 1 week of peak fall migration. The Yazoo Backwater was found to support almost 30% of their global population. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends/Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database/Bird Conservancy of the Rockies](#). Photo by Jamie Lyons/Audubon Photography Awards

Additionally, Audubon performed an overwintering waterfowl analysis to determine 17 species' use of the Yazoo Backwater Area during the period of December-February. The results found more than 6.3 million of these 17 waterfowl species²⁹³ were estimated to use the area during the winter (see Figure 8, below). This represents 8% of their total North American population with the most notable use by Greater White-fronted Geese and Snow Geese, at 17.6% and 32.1%, respectively, of their North American population (see Figures 9 and 10, below).

Applying BirdLife International's Global Important Bird Area criteria A4 discussed earlier, 7 of the 17 species modeled were found to meet or exceed the $\geq 1\%$ continental population threshold for overwintering in the Yazoo Backwater Area:

- Gadwall
- Greater White-fronted Goose (see Figure 9, below)
- Green-winged Teal
- Mallard (see Figure 11, below)

²⁹³ The 17 waterfowl species modeled were American Wigeon, Blue-winged Teal, Bufflehead, Canada Goose, Canvasback, Gadwall, Greater White-fronted Goose, Green-winged Teal, Hooded Merganser, Lesser Scaup, Mallard, Northern Pintail, Northern Shoveler, Ring-necked Duck, Ruddy Duck, Snow Goose, and Wood Duck.

- Northern Shoveler
- Short-billed Dowitcher
- Snow Goose (see Figure 10, below)

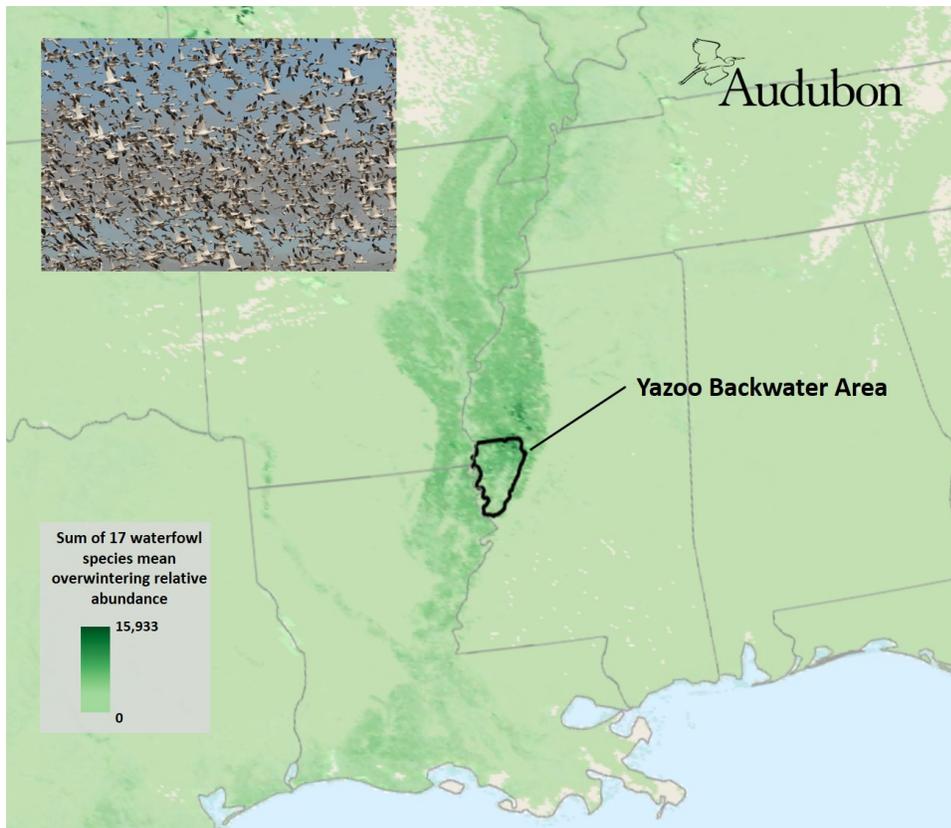


Figure 8, This map shows the total relative abundance of 17 waterfowl species using the Yazoo Backwater Area from December-February. Annually, more than 6.3 million of these species were estimated to overwinter in the area. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends / Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database / Bird Conservancy of the Rockies](#). Photo credit: Walker Golder / National Audubon Society

These waterfowl abundance results reinforce the significance of the Yazoo Backwater Area as a key ecologic lynchpin of the LMRAV, particularly in providing important wintering habitat for waterfowl. Audubon’s analysis found that nearly 137,000 Mallards overwinter in the project area, or 1.2% of their global population, and six other species modeled also met or exceeded the $\geq 1\%$ continental population threshold for overwintering in the Yazoo Backwater Area (see Figure 11, below).



Figure 11, This map shows the maximum weekly relative abundance of Mallards using the Yazoo Backwater Area from December-February. Nearly 137,000 Mallards were estimated to overwinter in the area, which represents over 1.2% of their global population. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends/Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database/Bird Conservancy of the Rockies](#). Photo credit: Robert Bunch / Audubon Photography Awards



Figure 9, This map shows the maximum weekly relative abundance of Greater White-fronted Geese using the Yazoo Backwater Area from December-February. Over 600,000 Greater White-fronted Geese were estimated to overwinter in the area, which represents 17.6% of their global population. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends](#)/[Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database](#)/[Bird Conservancy of the Rockies](#). Photo credit: Lou Orr/Great Backyard Bird Count

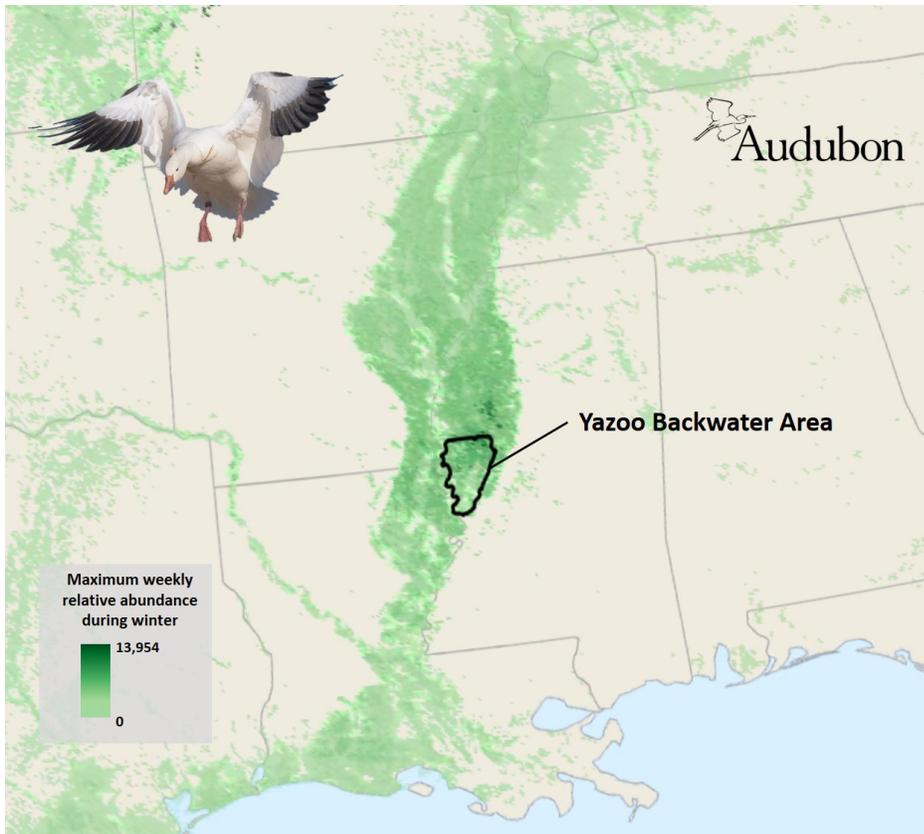


Figure 10, This map shows the maximum weekly relative abundance of Snow Geese using the Yazoo Backwater Area from December-February. Nearly 5 million Snow Geese were estimated to overwinter in the area, which represents over 32% of their global population. Source: The findings were based on analyses by the National Audubon Society, using data from [eBird Status & Trends/Cornell Lab of Ornithology](#) and [Partners in Flight Population Estimates Database/Bird Conservancy of the Rockies](#). Photo credit: Jamie Lyons / Audubon Photography Awards

(ii) Newly Funded Migratory Bird Project Demonstrates Widespread Interest in Habitat Conservation in the Yazoo Backwater Area and Beyond

Finally, the Mississippi Department of Environmental Quality recently announced a project, “Migratory Bird Habitat Creation in the Lower Mississippi River Valley”²⁹⁴, to be funded through the National Fish and Wildlife Foundation’s (NFWF) Gulf Environmental Benefit Fund as part of the state’s recovery to the 2010 Deepwater Horizon oil disaster. The goal of the \$4.55 million project is to create and enhance over 7,600 acres of migratory bird habitat in the Lower Mississippi River Valley to benefit waterfowl, shorebirds, and wading birds. This proposal focuses on public lands, namely state-managed Wildlife Management Areas and National Wildlife Refuges, which will serve to complement a similar NFWF-funded project from years ago that focused on private lands located in the same geography. The proposal will benefit public lands in seven counties, five of which are in the Yazoo Backwater, namely Humphreys, Issaquena, Sharkey, Warren, and Yazoo (see Figure 12, below). This effort demonstrates there is widespread, sustained interest to direct further investments in the habitat conservation,

²⁹⁴ Mississippi Department of Environmental Quality, *Migratory Bird Habitat Creation in the Lower Mississippi River Valley*, Accessed from www.restore.ms on November 16, 2020 (available at <https://www.mdeg.ms.gov/wp-content/uploads/2020/11/NFWF-Migratory-Bird-Habitat-Creation-in-the-Lower-Mississippi-River-Valley-2020.pdf>).

protection, and management of this critical ecoregion, particularly the Yazoo Backwater Area. The Yazoo Pumps only serve to undermine efforts like these.

Click to save a picture to your desktop.

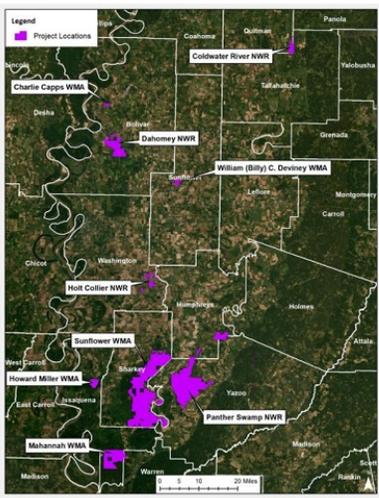
2020 NEW PROJECT

2020 NFWF-GEBF

- Phase 1 investment in private wetland reserve program to restore migratory bird habitat
- This Proposal will Fund Phase 2
- Focuses on public land: Wildlife Management Areas with MDWFP & National Wildlife Refuges with USFWS

Project Partners: Ducks Unlimited and Delta Wildlife

Project Cost: \$4.3 million



NFWF

Figure 12, Migratory Bird Habitat Creation in the Lower Mississippi River Valley project announced on November 10, 2020, by the State of Mississippi (Source: Mississippi Department of Environmental Quality, [2020 “Virtual” Restoration Summit public webinar](#))

In summary, the DSEIS fundamentally fails to evaluate all direct, indirect, and cumulative environmental impacts to birds and waterfowl that would be caused by the Proposed Plan, and vastly understates the true scope of the project’s impacts. Notably, the Resilience Alternative proposed by the Conservation Organizations would deliver co-benefits for birds and their habitats, while providing meaningful flood relief for communities.

b. The DSEIS Severely Underestimates the Adverse Impacts to Aquatic Species

The Yazoo Backwater Area contains a highly productive floodplain fisheries sustained by a network of riverine backwater wetlands.²⁹⁵ The Proposed Plan would significantly degrade this ecosystem by eliminating critical spawning habitat, degrading rearing habitat, and impairing aquatic food webs. Rather than analyzing these far-reaching impacts, however, the DSEIS instead tries to ignore the problem by severely containing its analysis to only a fraction of a fraction of the Proposed Plan’s impacts. Even then, the DSEIS relies on a series of unfounded and arbitrary moves to obscure, mask, and ultimately disclaim the impacts of the Proposed Plan. This self-serving analysis is unrealistic, contrary to the science, and does not withstand scrutiny.

The Yazoo Backwater Area contains a highly productive floodplain fisheries that supports at least 95 different species, if not more.²⁹⁶ Of these, the U.S. Fish and Wildlife Service (FWS) estimates that over 58 species depend on backwater flooding and access to the floodplain to fulfill numerous life history requirements.²⁹⁷ In order to spawn, many fish species depend on a minimum water depth of one foot

²⁹⁵ Clean Water Act 404(c) Final Determination at 34.

²⁹⁶ Clean Water Act 404(c) Final Determination at 34.

²⁹⁷ *Id.*

for at least 8 consecutive days from March to May.²⁹⁸ These depth and timing requirements are critical. For example, “if the water recedes too rapidly off the floodplain, organic matter, nutrients, and newly hatched aquatic organisms may be carried into the river instead of remaining in the floodplain and permanent backwaters.”²⁹⁹ Many fish species also rely on the floodplain to provide rearing habitat.³⁰⁰ For example, extended periods of shallow inundation in hardwood and other vegetated areas provide critical nursery habitat for growth and escape from predators. Accordingly, any reduction in extent or duration of inundation of flooded bottomland hardwood wetlands would reduce the fish productive capacity of the wetland.³⁰¹

The construction and operation of the proposed Pumps would dramatically alter the timing, and reduce the spatial extent, depth, frequency, and duration of time that wetlands within the project area are inundated.³⁰² These changes would significantly degrade the aquatic ecosystem, as underscored by EPA and FWS:

Reduction in access to the floodplain, as a result of the project, would result in decreased fishery production through loss of physical spawning habitat, loss of spawning opportunity (i.e., adequate period of time when habitat is available) or reduced fecundity and/or physiological condition resulting from poorer nutrition (Brunson, 1998).³⁰³

EPA also criticized the 2007 FSEIS due to its severe underestimate of the Yazoo Pumps’ impacts on these aquatic resources. As noted above, the 2007 FSEIS failed to consider impacts to wetlands in the 5-year floodplain and wetlands that flood for less than 14-consecutive days. As a result, EPA concluded that the Corps overlooked impacts to some portion of “39,000 acres of suitable fish spawning habitat that meets the criterion of 8 days of inundation which will become unsuitable after project implementation. Therefore, these impacts appear underestimated in the FSEIS’s Aquatics Appendix (FSEIS, Appendix 11).”³⁰⁴

Rather than addressing these flaws, however, the DSEIS simply repeats them and then further constrains its analysis based on a series of additional assumptions that are as unfounded as they are unscientific. First, the Corps impermissibly limits its analysis to only a small subset of wetlands located within the 2-year floodplain that receive ≥ 14 consecutive days of flooding.³⁰⁵ As a result, the DSEIS does not consider the adverse impacts of the Proposed Plan on aquatic habitat located between the 2-year and 5-year floodplain, or any aquatic habitat that floods for less than 14 consecutive days. This threshold error leads to a severe underestimate of the Proposed Plan’s impacts on aquatic resources. For example, the DSEIS does not evaluate how many acres would no longer flood to a depth of at least one foot for 8 consecutive days with the Pumps in place, even though the DSEIS makes clear that all fish spawning habitat would be lost in such areas.³⁰⁶

²⁹⁸ Clean Water Act 404(c) Final Determination at 56; *see also* DSEIS Appx. F-8 (Aquatic Resources) at 3.

²⁹⁹ *Id.*

³⁰⁰ Clean Water Act 404(c) Final Determination at 34.

³⁰¹ Clean Water Act 404(c) Final Determination at 56.

³⁰² Clean Water Act 404(c) Final Determination at i.

³⁰³ Clean Water Act 404(c) Final Determination at 55.

³⁰⁴ Clean Water Act 404(c) Final Determination at 57.

³⁰⁵ *See* Section F.1.a. of these comments.

³⁰⁶ *See* DSEIS Appx. F-8 (Aquatic Resources) at 3.

Second, even within that unduly narrow scope of analysis, the DSEIS inexplicably constrains its assessment to just a fraction of what it considered in the 2007 FSEIS, which itself was a severe underestimate. In the 2007 FSEIS, the Corps calculated the baseline quantity of aquatic habitat as 87,966 AAHUs for rearing.³⁰⁷ In the DSEIS, however, the Corps claims that rearing habitat shrunk by a staggering 81 percent to just 16,269 AAHUs.³⁰⁸ This severe contraction cannot be reconciled with the Corps' monitoring data for fish assemblages, which show no decline over this timeframe.³⁰⁹

Furthermore, the percentage decline in rearing habitat (81%) is almost twice the purported decline in wetland acreage over this timeframe (44%).³¹⁰ The DSEIS provides no explanation for this discrepancy. Nor does it explain why the decline in rearing habitat (81% decline) is over twice the decline in spawning habitat (33% decline), even though the latter is far more susceptible to changes in the depth of inundation (as the Corps claims has occurred over the new period of record). These illogical discrepancies are the hallmark of an arbitrary analysis.

Third, the Corps further obscures the impacts to wetland functions by relying on an unrealistic approach already rejected by EPA, as discussed in Section F.1 of these comments. For example, the DSEIS arbitrarily assumes that the Yazoo Pumps will cause no impacts to four of the eight wetland functions used in the Corps' HGM Approach, even for those wetlands that will experience a decrease in flood duration.³¹¹ The DSEIS also significantly understates the adverse impacts to the wetland function involving the export of organic carbon, contradicting its own scientific studies.³¹² The DSEIS compounds these false assumptions by manipulating the data to obscure the significant impacts to wetland functions and fish and wildlife habitat.³¹³

Fourth, in addition to repeating these analytical errors, the DSEIS now disclaims 60 percent of the pumps' impacts on fisheries based on a clearly-flawed mischaracterization of the effects of hypoxia. The DSEIS shows that the pumps would eliminate 2,838 and 3,232 habitat units for spawning and rearing, respectively.³¹⁴ The DSEIS, however, drastically discounts those impacts based on the sweeping assertion that hypoxia has degraded *all* aquatic habitat in the Yazoo Backwater Area by 60 percent.³¹⁵ Accordingly, the Corps writes down the impacts of the Proposed Pan, claiming that it is only responsible for impacts to 1,703 and 1,939 habitat units for spawning and rearing, respectively.³¹⁶

As an initial matter, the Corps has not justified this striking change in course, which contradicts the findings underlying the 2008 FSEIS.³¹⁷ In the 2007 FSEIS, the Corps calculated habitat suitability values

³⁰⁷ FSEIS Appx. 11 (Aquatics) Tables 7 & 8.

³⁰⁸ DSEIS Appx. F-8 (Aquatic Resources) Table 2.

³⁰⁹ *Id.* at 13.

³¹⁰ The 2007 Yazoo Pumps EIS looked at the potential for impacts to 189,600 acres of wetlands, while the DSEIS only looks at 82,981 acres. DSEIS, Appendix F-5 (Wetlands) at Table 85.

³¹¹ *Compare* Clean Water Act 404(c) Final Determination, Appendix 6 at 1 *with* DSEIS Appx. F-5 (Wetlands) at Tables 70-79.

³¹² *See* Section F.1.c. of these comments.

³¹³ *Id.*

³¹⁴ DSEIS Appx. F-8 (Aquatic Resources) at 4

³¹⁵ *Id.* at 5.

³¹⁶ *Id.* The Corps duplicated this same inconsistent analysis for spawning habitat. *Id.* As such, the errors identified here for rearing habitat apply equally to spawning habitat, underscoring the magnitude of the Corps' error.

³¹⁷ *State Farm*, 463 U.S. at 57 ("an agency changing its course must supply a reasoned analysis"). Here, the Corps is not writing on a blank slate and must provide a "reasoned explanation" for disregarding its prior factual findings.

based on the available monitoring data of fish populations. The DSEIS relies on those same habitat suitability values, but applies a downward 60 percent reduction based on fish sampling data from 1990 to 2008.³¹⁸ That data was, however, largely available to the Corps in the 2007 SEIS and did not warrant any such deduction then, let alone the striking 60 percent discount contained in the DSEIS. The Corps provides no reasoned basis for its remarkable change in course. If anything, the facts defy this change. If aquatic habitat did decline by 60 percent, one would expect a sharp downward trend in the fish assemblage since 2007. The evidence is exactly to the contrary—“Major changes have *not* been observed in the Big Sunflower drainage fish assemblage since 1993”—confirming that there is no rational basis for the Corps’ self-serving claim of a 60 percent decline in habitat.³¹⁹

Furthermore, the Corps’ indiscriminate approach bears no rational relationship to the scientific literature or the Corps’ own data about the variable effects of hypoxia on the aquatic environment. Hypoxia can occur during backwater floods when stagnant flows limit the ability of re-aeration to maintain dissolved oxygen concentrations at lower depths in the water column.³²⁰ Low-dissolved oxygen conditions do not, however, occur uniformly across the water column, but rather are stratified by layer. The Corps own data clearly depicts this point, showing dissolved oxygen levels above 3.0 mg/l³²¹ within the surface layer (depth of approximately 5 feet) across various streams in the Yazoo Basin that experienced hypoxia during the 2015 flood.³²² Due to that stratification, fish species can escape low dissolved oxygen conditions.³²³ For example, the DSEIS explains how “the surface layer can serve as refuge” and “[u]nobstructed backwaters also provide horizontal and lateral avenues of escape from hypoxic waters.”³²⁴ This surface-layer refuge encompasses 1,712,943.5 acre feet of water (approximately 58% of the water in the Yazoo Study Area), which plainly refutes the Corps’ across-the-board assertion that hypoxia degrades *all* aquatic habitat.³²⁵

If anything, the DSEIS’ analysis confirms the fact that the Proposed Plan will exacerbate the effects of hypoxia on aquatic resources. As explained above, the pumps will eliminate critical spawning habitat and short-hydroperiod wetlands that provide critical refuge for fish. As a result, “once eggs hatch, larval fish moving into deeper water encounter hypoxic conditions that likely lead to higher mortality.”³²⁶ Yet, the DSEIS entirely fails to evaluate these impacts, as noted above, and instead relies on unfounded,

See California by & through Becerra v. United States Dep’t of the Interior, 381 F. Supp. 3d 1153, 1165 (N.D. Cal. 2019).

³¹⁸ DSEIS Appx. F-8 (Aquatic Resources) at 5.

³¹⁹ *Id.* at 13.

³²⁰ DSEIS Appx. I (water quality) at 31.

³²¹ The DSEIS distinguishes between “hypoxic (dissolved oxygen < 3.0 milligrams per liter, mg/l) and normoxic (> 3.0 mg/l).” DSEIS Appx. F-8 (Aquatic Resources) at 5.

³²² *Id.* at 19 Fig. 2-7. This point is even more apparent given that the Corps’ sampling sites do not even include small backwater tributaries or short hydroperiod wetlands, which provide refugia from hypoxic conditions. Instead of taking representative samples from those locations, the Corps only sampled dissolved oxygen levels along the Big Sunflower River and its major tributaries. *See* DSEIS Appx. I (Water Quality) at 12 Fig. 2-1. But these river locations are not representative and cannot therefore be extrapolated to the entire Yazoo Backwater Basin, contrary to the Corps’ flawed attempt to do so and falsely assert hypoxia effects all aquatic habitat.

³²³ Clean Water Act 404(c) Final Determination Appx. I at 47 (“when hypoxic conditions develop, intolerant species will move away from the adverse conditions and seek more suitable habitat”).

³²⁴ DSEIS Appx. F-8 (Aquatic Resources) at 8.

³²⁵ DSEIS Appx. F-8 (Aquatic Resources) at Table 5.

³²⁶ *Id.* at 14.

faulty reasoning to impermissibly skew the analysis and disclaim the pumps' significant, adverse impacts.

Fifth, on top of all these errors, the Corps uses non-representative average habitat values to mask the adverse impacts of the pumps on aquatic resources. The DSEIS selects nine fish species to assess the value of various habitat types for spawning.³²⁷ The DSEIS then averages these habitat scores across all of the species to create an average habitat score, which it then uses to quantify the pumps' impacts of this critical resource.³²⁸ But this exercise in averaging has a real-world limitations because "different species of fish require different sorts of habitat."³²⁹ As explained by EPA, the fish species used by the Corps do not all depend on the same habitat to the same degree for spawning. For example, two of the selected species—ghost shiners and speckled chubs—spawn primarily in rivers.³³⁰ A third species, threadfin shad, generally spawns in open river channels.³³¹ As explained by EPA, the Corps' "inclusion of species not as dependent on backwater areas as others causes the 'average' effect of the project (i.e., averaging of habitat scores across all species) to appear less severe."³³² The Corps never acknowledged, let alone fixed, this fundamental bias in its assessment of impacts to spawning habitat.

Sixth, the DSEIS' proposed mitigation is woefully inadequate to offset the pumps' far-reaching impacts on aquatic resources, as discussed in Section H of these comments.

c. The DSEIS Fails to Analyze Impacts to Amphibians and Reptiles

The DSEIS contains no analysis at all of the Proposed Plan's impacts on amphibians and reptiles, despite the many species found in the Yazoo Backwater Area, the significance of the area's wetlands and flood pulse for their survival, and the specific and detailed request to carefully evaluate the impacts on these species in the Conservation Organizations' scoping comments.

The 2008 veto documents 21 species of amphibians and 37 species of reptiles in the Yazoo Backwater Area,³³³ virtually all of which "benefit from the flood pulse."³³⁴ The veto concludes that the Yazoo Pumps would adversely impact virtually all of these species:

"the proposed hydrologic alterations will adversely impact approximately 21 species of amphibians and 32 species of reptiles by disrupting their reproductive cycles and feeding opportunities and thereby reducing overall productivity."³³⁵

This is because:

Reducing the spatial extent, depth, frequency, and duration of time wetlands in the project area are inundated will also adversely impact all 21 amphibian as well as 32 of the reptile species in the Yazoo River Basin that depend upon wetlands for breeding and foraging habitat. The life

³²⁷ 2007 FSEIS. Appx. 11 at 12.

³²⁸ *Id.* at Table 6.

³²⁹ *Env'tl. Def. v. U.S. Army Corps of Engineers*, 515 F. Supp. 2d 69, 79 (D.D.C. 2007).

³³⁰ Clean Water Act 404(c) Final Determination , Appx. 6 at 2.

³³¹ *Id.*

³³² *Id.*

³³³ Clean Water Act 404(c) Final Determination at 32.

³³⁴ Clean Water Act 404(c) Final Determination at 32-33.

³³⁵ Clean Water Act 404(c) Final Determination at 60.

cycles of amphibians and reptiles in alluvial floodplain ecosystems are linked to hydrology as well as soil conditions and climate (Jones and Taylor, 2005). Abiotic factors that influence habitat conditions within floodplains include hydrologic regime, flood pulse intensity and duration, topography, wetland permanence (hydroperiod), water quality, and connectivity to rivers or streams. For many amphibians, the hydrology associated with floodplain wetlands is necessary for breeding and egg laying (Appendix 4).

All the amphibian species listed as occurring in the Yazoo Backwater Area (Appendix 2) require wetlands and/or ephemeral pools for breeding (Jones and Taylor, 2005). The proposed project would reduce the amount of surface water that reaches these floodplain habitats making it difficult for portions of the amphibian population to survive (Semlitsch, 2005). For example, newts (*Notophthalmus viridescens*) require wetlands for breeding and egg deposition, while requiring vernal and ephemeral pools for adult life stages. The proposed project would also adversely affect reptile and amphibian species by reducing flood pulses and wetland water recharge, modifying river-wetland connectivity, and increasing habitat fragmentation. The reduction in flooding would also adversely affect the ability of amphibians to disperse to other suitable habitats (Jones and Taylor, 2005). Further, amphibians provide a valuable prey base for aquatic insects, fish, crayfish, birds, and mammals. Thus, a decline in amphibian and reptile populations will impact food resources for other animal groups.³³⁶

In light of these findings, it is particularly critical that the DSEIS carefully assess the impacts to amphibians and reptiles from the Proposed Plan. It is also essential to assess the cumulative impact of the amphibian habitat losses resulting from the Proposed Plan in the context of the dire conditions currently facing amphibian populations worldwide. Amphibians thrive in cool wetland environments and small, isolated wetlands play especially important roles in amphibian productivity.³³⁷ Amphibian populations thrive when there are a variety of small ecosystems within a regional landscape in which a “dynamic equilibrium” of different populations becomes established.³³⁸ Habitat fragmentation can disturb this dynamic equilibrium by disruption patterns of amphibian emigration and immigration.

Amphibians, in general, are at critical risk worldwide. In the United States, the IUCN Red List of Threatened Species lists 56 amphibian species and 37 reptile species as known to be critically endangered, endangered, or vulnerable.³³⁹ Worldwide, at least 1,950 species of amphibians are threatened with extinction of which 520 species are critically endangered, 783 are endangered, and 647 species are vulnerable. This represents 30 percent of all known amphibian species.³⁴⁰ In 2004, scientists

³³⁶ Clean Water Act 404(c) Final Determination at 55.

³³⁷ Gibbons, J. Whitfield, Christopher Winne, et. al. 2006. Remarkable Amphibian Biomass and Abundance in an Isolated Wetland: Implications for Wetland Conservation. Conservation Biology Volume 20, No. 5, 1457–1465.

³³⁸ Mann, W., P. Dorn, and R. Brandl. 1991. Local distribution of amphibians: The importance of habitat fragmentation. Global Ecology and Biogeography Letters 1:36-41.

³³⁹ IUCN Red List version 2013:2, Table 5: Threatened species in each country (totals by taxonomic group), available at http://cmsdocs.s3.amazonaws.com/summarystats/2013_2_RL_Stats_Table5.pdf (visited on November 24, 2013.)

³⁴⁰ IUCN Red List version 2013:2, Table 3a: Status category summary by major taxonomic group (animals), available at http://cmsdocs.s3.amazonaws.com/summarystats/2013_2_RL_Stats_Table3a.pdf (visited on November 24, 2013).

estimated that most of 1,300 other amphibian species are also threatened though sufficient data are currently lacking to be able to accurately assess the status of those species.³⁴¹

A recent study demonstrates the increasingly dire conditions of amphibians worldwide:

“Current extinction rates are most likely 136–2707 times greater than the background amphibian extinction rate. These are staggering rates of extinction that are difficult to explain via natural processes. No previous extinction event approaches the rate since 1980 (Benton and King, 1989).

Despite the catastrophic rates at which amphibians are currently going extinct, these are dwarfed by expectations for the next 50 yr (Fig. 1). If the figure provided by Stuart et al. (2004) is true (but see Pimenta et al., 2005; Stuart et al., 2005), one-third of the extant amphibians are in danger of extinction. This portends an extinction rate of 25,000–45,000 times the expected background rate. Episodes of this stature are unprecedented. Four previous mass extinctions could be tied to catastrophic events such as super volcanoes and extraterrestrial impacts that occur every 10 million to 100 million years (Wilson, 1992). The other mass extinction seems to be tied to continental drift of Pangea into polar regions leading to mass glaciation, reduced sea levels, and lower global temperatures (Wilson, 1992). The current event far exceeds these earlier extinction rates suggesting a global stressor(s), with possible human ties.”³⁴²

Recent studies also point to the role of global climate change in promoting potentially catastrophic impacts to amphibian populations. For example:

- Global climate change will result in changes to weather and rainfall patterns that can have significant adverse effects on amphibians. Drought can lead to localized extirpation. Cold can induce winterkill in torpid amphibians. It is possible that the additional stress of climate change, on top of the stresses already created by severe loss of habitat and habitat fragmentation may jeopardize many amphibian species.³⁴³
- Recent studies suggest that climate change may be causing global mass extinctions of amphibian populations. Particularly alarming is the fact that many of these disappearances are occurring in relatively pristine area such as wilderness areas and national parks.³⁴⁴ One recent study suggests that climate change has allowed the spread of a disease known as chytridiomycosis

³⁴¹ Science Daily, Amphibians In Dramatic Decline; Study Finds Nearly One-Third Of Species Threatened With Extinction (October 15, 2004), available at <http://www.sciencedaily.com/releases/2004/10/041015103700.htm> (visited on November 24, 2013).

³⁴² McCallum, M. L. (2007). “Amphibian Decline or Extinction? Current Declines Dwarf Background Extinction Rate. *Journal of Herpetology* 41 (3): 483–491. [doi:10.1670/0022-1511\(2007\)41\[483:ADOECD\]2.0.CO;2](https://doi.org/10.1670/0022-1511(2007)41[483:ADOECD]2.0.CO;2).

³⁴³ Sjogren, P. 1993a. Metapopulation dynamics and extinction in pristine habitats: A demographic explanation. Abstracts, Second World Congress of Herpetology, Adelaide, Australia, p. 244; Sjogren, P. 1993b. Applying metapopulation theory to amphibian conservation. Abstracts, Second World Congress of Herpetology, Adelaide, Australia, p. 244-245.

³⁴⁴ Pounds, J. A., and M. L. Crump. 1994. Amphibian declines and climate disturbance: The case of the golden toad and the harlequin frog. *Conservation Biology* 8:72-85; Lips, K. R. 1998. Decline of a Tropical Montane Amphibian Fauna. *Conservation Biology* 12:106-117; Lips, K., F.Brem, R. Brenes, J.D. Reeve, R.A. Alford, J. Voyles, C. Carey, L. Livo, A. P. Pessier, and J.P. Collins 2006. Emerging infectious disease and the loss of biodiversity. *Proceedings of the National Academy of Sciences* 103:3165-3170.

which has led to extinctions and declines in amphibians. Climate change has allowed this disease to spread by tempering the climate extremes that previously kept the disease in check.³⁴⁵ About two-thirds of the 110 known harlequin frog species are believed to have vanished during the 1980s and 1990s because of the chytrid fungus *Batrachochytrium dendrobatidis*. Other studies indicate that amphibians may be particularly sensitive to changes in temperature, humidity, and air and water quality because they have permeable skins, biphasic life cycles, and unshelled eggs.³⁴⁶

- Climate change may also affect amphibian breeding patterns.³⁴⁷ Amphibians spend a significant part of the year protecting themselves from cold or shielding themselves from heat. They receive cues to emerge from their shelters and to migrate to ponds or streams to breed from subtle increases in temperature or moisture. As the earth warms, one potential effect on amphibians is a trend towards early breeding, which makes them more vulnerable to snowmelt-induced floods and freezes common in early springs. Some studies already indicate a trend towards earlier breeding in certain amphibian species.³⁴⁸
- Increases in UV-B radiation in the northern hemisphere due to ozone depletion is also having an adverse impact on amphibians.³⁴⁹ One study suggests that ultraviolet-B (UV-B) radiation adversely affects the hatching success of amphibian larvae.³⁵⁰ High levels of UV-B also induced higher rates of developmental abnormalities and increased mortality in certain species (*Rana clamitans* and *R. sylvatica*) than others that were shielded from UV-B.³⁵¹ UV-B also can have detrimental effects on embryo growth.

³⁴⁵ Pounds, J.A., M.P.L. Fogden, J.H. Campbell. 2006. Biological response to climate change on a tropical mountain. *Nature* 398, 611-615.

³⁴⁶ Carey, C., and M. A. Alexander. 2003. Climate change and amphibian declines: is there a link? *Diversity and Distributions* 9:111-121.

³⁴⁷ Carey, C., and M. A. Alexander. 2003. Climate change and amphibian declines: is there a link? *Diversity and Distributions* 9:111-121.

³⁴⁸ Beebee, T. J. C. 1995. Amphibian Breeding and Climate. *Nature* 374:219-220; Blaustein, A. R., L. K. Belden, D. H. Olson, D. M. Green, T. L. Root, and J. M. Kiesecker. 2001. Amphibian breeding and climate change. *Conservation Biology* 15:1804-1809; Gibbs, J. P., and A. R. Breisch. 2001. Climate warming and calling phenology of frogs near Ithaca, New York, 1900-1999. *Conservation Biology* 15:1175-1178.

³⁴⁹ Blither, M., and W. Ambach. 1990. Indication of increasing solar ultraviolet-B radiation flux in alpine regions. *Science* 248:206-208; Kerr, J. B., and C. T. McElroy. 1993. Evidence for large upward trends of ultraviolet-B radiation linked to ozone depletion. *Science* 262:1032-1034.

³⁵⁰ Blaustein, A. R., P. D. Hoffman, D. G. Hokit, J. M. Kiesecker, S. C. Walls, and J. B. Hays. 1994a. UV repair and resistance to solar UV-B in amphibian eggs: A link to population declines? *Proceedings of the National Academy of Science* 91:1791-1795.

³⁵¹ Grant, K. P., and L. E. Licht. 1993. Effects of ultraviolet radiation on life history parameters of frogs from Ontario, Canada. Abstracts, Second World Congress of Herpetology, Adelaide, Australia, p. 101.

d. The DSEIS Fails to Analyze Impacts to Listed Species and Critical Habitat

The Yazoo Backwater Area is home to a number of threatened and endangered species protected under the Endangered Species Act (ESA), including the pondberry, wood stork, least tern, pallid sturgeon, fat pocketbook mussel, sheepsnose mussel, and rabbitsfoot mussel.³⁵² Yet, the DSEIS overlooks critical threats to these species caused by the Proposed Plan and thereby fails to ensure the project will not jeopardize listed species or adversely modify critical habitat, as required by the ESA and Clean Water Act.³⁵³ The DSEIS also fails to assess impacts to many state listed species found in the Yazoo Backwater Area, including the Louisiana black bear, swallow tailed kite, peregrine falcon, Bewicks wren, pyramid pigtoe, spike, and southern redbelly dace.

As an initial matter, the DSEIS fails to provide any analysis of the Proposed Plan's impacts on the endangered pondberry, claiming that there is not enough data to make an effects determination.³⁵⁴ This omission forecloses the public's ability to meaningfully comment on the DSEIS. It also violates the Corps' obligation under the ESA to ensure the Proposed Plan will not jeopardize the species in violation of the ESA. Accordingly, the Corps must reinitiate formal consultation with the FWS and comprehensively assesses the impacts of the Proposed Plan on the survival and recovery of the species.

Through formal consultation, the Corps and FWS must comprehensively analyze the impacts of the Proposed Plan on the 5-year floodplain, which contains the majority of pondberry colonies in the Yazoo Backwater Area. As explained by the FWS, the pondberry is a wetland plant found in habitats that experience regular overbank flooding—such as many of the populations within bottomland hardwood forests of Mississippi.³⁵⁵ In the Yazoo Backwater Area, “most colonies/sites are located on the more frequently flooded 0-5 year floodplain,” as shown by the Corps' data.³⁵⁶ The Proposed Plan would significantly alter the hydrology of these sites, as discussed in detail above, highlighted by the EPA in the veto, and documented by the FWS in the 2007 Biological Opinion. Accordingly, the Corps must consider: (1) the extent to which the Proposed Plan will reduce flooding in relation to baseline conditions; (2) the change in hydrology due to a reduction in backwater flood frequency; (3) the extent that changes in backwater flooding by the project will alter the hydrology of known sites in the Yazoo Backwater Area, including the Delta National Forest; and (4) the response of the pondberry to these hydrological changes.

As part of this analysis, the Corps and FWS must carefully identify the survival and recovery needs of the pondberry (*i.e.*, tipping points) to evaluate whether the species will be jeopardized. A tipping points analysis is critical because the Proposed Plan will significantly alter the hydrology of the Yazoo Backwater Area, degrading some of the few known remaining populations in the species' range.³⁵⁷

³⁵² 2018. Mississippi Natural Heritage Program. Listed Species of Mississippi. (available at <https://www.mdwfp.com/museum/seek-study/science-resources/endangered-species/> accessed November 29, 2020).

³⁵³ See 16 U.S.C. §1536(a)(2).

³⁵⁴ DSEIS Appx. H (TES and MBTA) at 1.

³⁵⁵ U.S. Fish and Wildlife Service Pondberry Final Biological Opinion (July 2, 2007) at 62 [hereinafter “BiOp”]; see also U.S. Fish and Wildlife Service, Southeast Region Mississippi Field Office, Pondberry, 5-Year Review: Summary and Evaluation (2014), available at https://ecos.fws.gov/docs/five_year_review/doc4358.pdf [hereinafter “5-Year Review”].

³⁵⁶ 2007 Biological Opinion at 62.

³⁵⁷ 2007 Biological Opinion at 117.

Accordingly, a tipping point analysis is essential to ensure that the Proposed Plan does not push the species across the line to eventual extinction, or past a point from which recovery is impossible.

Through the consultation process, the Corps and FWS must also consider significant new information regarding the pondberry's endangered status. In 2014, the FWS undertook a 5-year review and found that "some pondberry colonies have become extirpated on the [Delta National] Forest, while others have experienced recent declines, potentially related to stem dieback, hydrology, interspecific plant competition, and natural canopy disturbances."³⁵⁸ The Corps must factor these recent declines into the baseline condition and evaluate the synergistic impacts of the Proposed Plan on the species' survival and recovery.

Furthermore, the Corps and FWS must fully evaluate the purported severe decline in wetland acreage in the 2-year floodplain. According to the DSEIS, there has been a one to three foot reduction in the 2-year floodplain elevation, which has resulted in the loss of at least 96,139 acres of wetlands in the 2-year floodplain since 2003. If those numbers are indeed accurate, the Corps must assess how those declines have impacted pondberry colonies and the extent to which the Proposed Plan could exacerbate the problem and jeopardize the species.³⁵⁹

In addition, the Corps and FWS must reevaluate the conservation measure proposed in the Biological Opinion. In order to avoid a jeopardy determination, the Corps agreed to establish two new pondberry populations in areas where the hydrology would not be adversely affected.³⁶⁰ As made clear in the FWS' recent 5-year review, however, attempts to transplant pondberry populations have been "met with limited success."³⁶¹

In Mississippi, experimental outplantings of naturally rooted pondberry stems were established at Leroy Percy State Park and Yazoo National Wildlife Refuge in Washington County as well as Hillside and Morgan Brake National Wildlife Refuges in Holmes County (Devall et al. 2004a). Survival one year after transplanting ranged from 35% to 84%. The current status of these transplants is unknown. In addition, plants cloned from populations in Sharkey and Bolivar Counties, Mississippi using micropropagation techniques (cf. Hawkins et al. 2007) were successfully transplanted to a research facility in Sharkey County (cf. Lockhart et al. 2006). This site is essentially a garden plot and well-maintained. It is unknown how these clones would perform in the wild.³⁶²

This new data undercuts the Corps' reliance on transplanting efforts to ensure against jeopardy to the species.

As part of the consultation process, the Corps and FWS must also address a series of unfounded assertions in the DSEIS regarding the adverse impacts of the Proposed Plan on other listed or threatened

³⁵⁸ 5-Year Review at 14.

³⁵⁹ The 5-Year Review highlights how large flood control projects within the Mississippi Alluvial Valley have likely contributed to the decline of pondberry populations within bottomland hardwood forests of this area, particularly within the Big Sunflower River and Yazoo River drainages of Mississippi. 5-Year Review at 22. In the absence of such regular flood regimes, pondberry may be outcompeted by other vegetation. *Id.*

³⁶⁰ 2007 Biological Opinion at 115.

³⁶¹ 5-Year Review at 20.

³⁶² 5-Year Review at 21.

species in the Yazoo Backwater Area. First, the Corps' entire analysis of listed species is infected by its severe underestimate of the Proposed Plan's impacts on the hydrology of the Yazoo Backwater Area, including the complete failure to assess the impacts to wetlands in the five-year floodplain and short hydro-period wetlands. As a result, the Corps reaches conclusions that are unfounded and contradicted by the evidence in the record. For example, the Corps claims that any impacts to the Wood Stork are insignificant or discountable because "there should be sufficient remaining wetland foraging habitat for non-breeding Mexican Wood Storks."³⁶³ But that assertion simply ignores the far-reaching consequences of the Proposed Plan on the species' foraging habitat, which includes shallow depressions that concentrate fishes during periods of low water.³⁶⁴ Furthermore, the Corps' baseless assertion cannot be squared with EPA's veto, which unequivocally found that the proposed pumps would "significantly degrade critical habitat for over 40 wetland dependent bird species," including the Wood Stork.³⁶⁵

In addition, the DSEIS Migratory Bird Appendix states that an MVK hydrologic analysis shows that the Proposed Plan would cause a loss of "up to 34,000 acres of inundated habitat including 23,500 acres of inundated floodplain forest for water- and wetland-dependent birds (e.g., herons, egrets, ibises) that utilize this habitat for foraging or breeding" in the 25% exceedance elevation.³⁶⁶ Such a massive change could have significant implications for listed species, but it was not accounted for in the DSEIS' assessment of impacts to wetlands or the species that rely on them.

Second, the Corps dismisses the adverse impacts of the Yazoo Pumps on listed species based on conclusory or counterfactual statements that are contrary to the best available scientific data. For example, the DSEIS claims that the Proposed Plan will have minimum adverse impacts on potential foraging habitat for the Least Tern.³⁶⁷ This assertion is doubly flawed. It underestimates the Proposed Plan's impacts on backwater hydrology, as just noted. Furthermore, it assumes an "absence of Least Terns" from the Yazoo Backwater Area.³⁶⁸ As noted above, however, Audubon's spring/fall migration analyses found the project area supports sizeable global populations of several species, including the Interior Least Tern. This available data plainly refutes the Corps' conclusory assumptions.

The DSEIS also claims that the Proposed Plan will not adversely affect the endangered pallid sturgeon because no data supports routine movement of the species from the Mississippi River into the Yazoo drainage.³⁶⁹ To the contrary, available habitat mapping shows use of the Yazoo Backwater Area by the species.³⁷⁰ The Corps must consider this available data and reassess its flawed conclusion.

³⁶³ DSEIS Appx. H (TES and MBTA) at 14.

³⁶⁴ *Id.* at 13.

³⁶⁵ Clean Water Act 404(c) Final Determination at 54.

³⁶⁶ DSEIS, Appendix H (in the Migratory Bird section of this Appendix) at 6.

³⁶⁷ DSEIS, Appendix H (TES and MBTA) at 21.

³⁶⁸ *Id.*

³⁶⁹ *Id.* at 26.

³⁷⁰ See, e.g., <https://platteriverprogram.org/target-species/pallid-sturgeon> (mapping Pallid Sturgeon Current Range to include the Yazoo Backwater Area); <https://www.inaturalist.org/taxa/112106-Scaphirhynchus-albus> (same);); <https://www.inaturalist.org/taxa/112106-Scaphirhynchus-albus> (same); 2014. Mississippi Department of Wildlife, Fisheries and Parks & Mississippi Museum of Natural Science. Endangered Species of Mississippi. Available at <https://www.mdwfp.com/museum/seek-study/science-resources/endangered-species/> accessed November 29, 2020 (known range map for pallid sturgeon includes the Yazoo and Big Sunflower Rivers).

The DSEIS also totally fails to consider how the elimination of critical spawning habitat, degradation of rearing habitat, and impairment of aquatic food webs will impact the host fishes for the threatened and endangered mussel species that likely inhabit the Yazoo Backwater Area. As noted in Section F.8.b of these comments, floodplain fisheries are sustained by a network of riverine backwater wetlands³⁷¹ and the Proposed Plan would significantly degrade this ecosystem. The Corps must consider how loss of spawning and rearing habitat will further impact mussel species.

9. The DSEIS Fails to Analyze Cumulative Impacts

The cumulative impacts analysis is a critical component of NEPA review because it ensures that the reviewing agency will not “treat the identified environmental concern in a vacuum.”³⁷² A meaningful assessment of cumulative impacts must therefore identify “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.”³⁷³ The DSEIS abjectly fails to satisfy this obligation and simply ignores other past, present or reasonably foreseeable actions that will exacerbate the Proposed Plan’s significant degradation of the environment.

First, the DSEIS entirely fails to consider the incremental consequences of the Proposed Plan in light of the asserted drastic declines in wetland baseline numbers. According to the DSEIS, 96,139 acres of wetlands that were in the 2-year floodplain in 2003 are no longer in the 2-year floodplain. The DSEIS cannot brush these declines aside. Instead, it must fully account for these highly significant losses in its cumulative impacts analysis and assess whether the Proposed Plan, which would cause significant degradation on its own will “represent the straw that breaks the back of the environmental camel.”³⁷⁴

Second, the DSEIS fails to consider the Proposed Pumps’ significant degradation of the aquatic ecosystem in the context of the Lower Mississippi River Alluvial Valley. This oversight simply ignores EPA’s insistence that the pumps’ impacts must be considered:

“in the context of the significant cumulative losses across the Lower Mississippi River Alluvial Valley (LMRAV), which has already lost over 80 percent of its bottomland forested wetlands, and specifically in the Mississippi Delta where the proposed project would significantly degrade important bottomland forested wetlands.”³⁷⁵

The majority of those losses have been traced directly to the effects of federal flood control and drainage projects.³⁷⁶ Moreover, from just the 1970s to 2006, the Yazoo Backwater Area lost 11 percent of its remaining forested wetlands.³⁷⁷

³⁷¹ Clean Water Act 404(c) Final Determination at 34.

³⁷² *Grand Canyon Trust v. FAA*, 290 F.3d 339, 346 (D.C. Cir. 2002).

³⁷³ 40 C.F.R. § 1508.7 (emphasis added).

³⁷⁴ *Grand Canyon Trust*, 290 F.3d at 343.

³⁷⁵ Clean Water Act 404(c) Final Determination at iii.

³⁷⁶ Department of the Interior, *The Impact of Federal Programs on Wetlands, Volume I: The Lower Mississippi Alluvial Plain and the Prairie Pothole Region, A Report to Congress by the Secretary of the Interior*, October 1988 at 60.

³⁷⁷ Dahl, T.E., J. Swords and M. T. Bergeson. 2009. Wetland inventory of the Yazoo Backwater Area, Mississippi - Wetland status and potential changes based on an updated inventory using remotely sensed imagery. U.S. Fish and

This analysis is even more critical, given the Corps' newfound assertion that flood-control measures have resulted in an even greater decline in baseline wetland acres since the veto.

Third, the DSEIS fails to consider the Proposed Plan's adverse impacts in the context of the staggering declines suffered by multiple species, including amphibians and bird species. For example, a recent article in Science Magazine reported on the staggering loss of three billion north American birds since 1970, including species that will be adversely impacted by the Proposed Plan.³⁷⁸ Furthermore, in 2019, Audubon released a groundbreaking report, *Survival by Degrees: 389 Bird Species on the Brink*, which found two-thirds (389 of 604) North American bird species are at risk of extinction from climate change.³⁷⁹ The Proposed Pumps would accelerate these declines by altering the hydrology of the Yazoo Backwater Area and eliminating thousands of acres of habitat for these species. As EPA warned, "[t]he reduction in the extent and duration of the spring flood pulse would accelerate the decline of many bird species that depend upon the wetland habitats of the lower Yazoo River (Appendix 4)." Yet, the DSEIS contains no analysis of these cumulatively significant losses.

Fourth, the DSEIS entirely fails to consider the impacts of climate change, although this is "precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct."³⁸⁰ As documented in the Conservation Organizations' scoping comments, climate change is already causing significant impacts in the Mississippi River Valley and these impacts will likely grow, as recognized by the recently released Fourth National Climate Assessment.³⁸¹ These impacts will exacerbate the Proposed Pumps impacts on aquatic resources, migratory birds, and amphibians. The DSEIS simply ignores this overwhelming scientific literature and thereby overlooks a critical issue.

10. The DSEIS Fails to Analyze Environmental Justice Implications

To comply with NEPA, the Corps must take a hard look at the environmental justice implications of the Proposed Plan.³⁸² The Corps abdicated that duty in the 2007 FSEIS by failing to address the adverse impacts of the Yazoo Pumps on communities of low income and color , all while asserting benefits "that

Wildlife Service, Division of Habitat and Resource Conservation, Washington, D.C. 30 p. (available at <https://www.fws.gov/wetlands/documents/Wetland-Inventory-of-the-Yazoo-Backwater-Area-Mississippi.pdf>).

³⁷⁸ Elizabeth Pennisi, Three billion North American birds have vanished since 1970, surveys show, Science, September 19, 2019 (available at <https://www.sciencemag.org/news/2019/09/three-billion-north-american-birds-have-vanished-1970-surveys-show>).

³⁷⁹ Audubon, *Survival by Degrees* (2019), available at <https://www.audubon.org/climate/survivalbydegrees>.

³⁸⁰ *Center for Biological Diversity v. Nat'l Hwy Traffic Safety Administration*, 538 F.3d 1172, 1217 (9th Cir. 2008); *Center for Biological Diversity v. Kempthorne*, 588 F.3d 701, 711 (9th Cir. 2009) (NEPA analysis properly included analysis of the effects of climate change on polar bears, including "increased use of coastal environments, increased bear/human encounters, changes in polar bear body condition, decline in cub survival, and increased potential for stress and mortality, and energetic needs in hunting for seals, as well as traveling and swimming to denning sites and feeding areas.")

³⁸¹ The SEIS should fully consider and carefully evaluate the information contained in the Fourth National Climate Assessment, which can be accessed at <https://nca2018.globalchange.gov/>.

³⁸² See *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, 255 F. Supp. 3d 101, 140 (D.D.C. 2017) ("the Corps did not properly consider the environmental-justice implications of the project and thus failed to take a hard look at its environmental consequences."). A comprehensive environmental justice analysis is also essential to the Corps "public interest review," which must consider the "probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest." 33 C.F.R. § 320.4.

may not be realized.”³⁸³ In the DSEIS, the Corps once again disregards the adverse impacts on communities of low income and color, while falsely overstating the benefits. This “skewed analysis” impedes a “full and fair discussion” of the Proposed Plan’s environmental justice impacts.³⁸⁴ The DSEIS also withheld any discussion of alternative solutions, depriving environmental justice communities of any choice in the decision. Compounding these errors, the DSEIS failed to ensure that communities of low income could meaningfully participate in the DSEIS and provide critical feedback.

The DSEIS entirely overlooks a series of adverse and disproportionate impacts to communities with environmental justice issues, i.e. communities that have high populations of vulnerable peoples (Black, low-income, poorly educated, etc) who are disproportionately exposed to environmental threats (pollution, elevated cancer risk, flooding, etc). First, the proposed pumps would discharge 14,000 cfs into the Yazoo River at flood stages, increasing flood risks to homes, businesses, and communities located along or near the Yazoo River. Although EPA highlighted these concerns in its scoping comments, the Corps dismissed these risks based on a fundamentally flawed hydrological model that “cannot be trusted to get a correct answer under any type of changes, such as the additional flows generated by the pumps.”³⁸⁵ As a result, the DSEIS entirely overlooks the disproportionate threats of increased flooding caused by the Proposed Plan on communities of low income and color located along the Yazoo River, and particularly in north Vicksburg.

Second, the Corps falsely claims that the “the project would NOT negatively affect hunting and fishing, which some populations of low income rely on for subsistence.”³⁸⁶ But that emphasis underscores the DSEIS’s abject failure to analyze and mitigate the significant adverse impacts of the project on aquatic resources and waterfowl, as thoroughly exposed in Sections F.8 and H of these comments. For example, the DSEIS entirely ignores the fact that the Proposed Plan will reduce, if not eliminate, backwater flooding on at least 22,601 acres of wetlands that currently flood for less than 14 consecutive days and provide crucial fish spawning habitat. There is no mitigation for these losses. In fact, the DSEIS fails to even mitigate the significant impacts to the narrow subset of aquatic habitat it did consider. Likewise, the DSEIS contains no discussion of the Corps’ own data, which shows that the Proposed Plan would eliminate 1.3 million Duck Use Days. While that figure severely underestimates the Proposed Plan’s impacts, it nonetheless represent a 12.4% loss in the total DUDs annually and indicates significant harm to overwintering waterfowl population. The resultant degradation of these aquatic and hunting resource will disproportionately impact people that are economically disadvantaged in the backwater area. Thus, just as EPA explained in the veto, “it is likely the project could adversely impact minority and/or low income populations that depend on the Yazoo Backwater Area’s natural resources for subsistence.”³⁸⁷

At the same time, the Corps vastly overstates the benefits of the Proposed Plan, which “may not be realized.”³⁸⁸ First, the Corps claims that environmental justice communities can expect improved aquatic conditions and more opportunities for subsistence fishing as a result of the low-flow supplemental groundwater wells.³⁸⁹ But that conclusory assertion is defied by the evidence, which

³⁸³ Clean Water Act 404(c) Final Determination at 65-69 (identifying flaws in Corps’ environmental justice analysis).

³⁸⁴ *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 965 (9th Cir. 2005).

³⁸⁵ Fleenor Report at 2.

³⁸⁶ DSEIS Appx. F-1 (Environmental Justice) at 6.

³⁸⁷ Clean Water Act 404(c) Final Determination at 67.

³⁸⁸ Clean Water Act 404(c) Final Determination at 66.

³⁸⁹ DSEIS Appx. F-1 (Environmental Justice) at 9.

shows the wells would cause unacceptable adverse impacts. If anything, the purported benefits of the groundwater wells are vastly overstated, if not entirely illusory, as discussed in Section H of these comments. The DSEIS not only fails to address these inadequacies, it also fails to disclose the fact that the Corps has significantly *reduced* the amount of mitigation—a counter-productive reversal that accentuates the impacts of the Proposed Plan on low-income and minority communities.

Second, the Corps claims that the Proposed Plan will benefit communities of low income and color by lowering elevations greater than 1-year flood. As discussed in Section C above, however, the Yazoo Pumps will not provide meaningful protection to communities. For example, had the Yazoo Pumps been in operation during the 2019 flood, 442,195 acres—83% of the lands that flooded in 2019—would still have been underwater. Just 17% of the acreage that flooded in 2019 would have been drained by the Yazoo Pumps.

Third, the Corps has not fully analyzed the impact of the Proposed Plan on potential economic development in communities with potential EJ concerns. The DSEIS claims that the proposed pumps would benefit agricultural production.³⁹⁰ As EPA explained though, “the primary agricultural beneficiaries have declined over 50 years from 2,913 farmers who owned 140 acres each to 192 farmers who own 2,036 acres each.”³⁹¹ There has likely been even greater consolidation of farm ownership since the veto was issued in 2008. There is no evidence that benefiting these few farmers would result in economic benefits to communities of low income and communities of color, especially given that such large-scale farming increasingly relies on mechanization.

In addition to the flawed analysis of impacts, the DSEIS refused to consider any alternative approaches that would provide sustainable benefits to communities that are already disproportionately impacted by environmental and social justice issues in the Yazoo Backwater Area, while restoring the environment in a manner that promotes economic and social equity. For example, the Conservation Groups proposed the Resilience Alternative as a sustainable way to reduce flood risks, including purchasing wetland reserve and floodplain easements, voluntary buyouts and relocations, and flood-proofing infrastructure (including elevating homes, buildings and roads). These options will improve economic security and improve water quality. The DSEIS, however, withheld that option and instead presents a false choice between the No Action Alternative—and the Proposed Plan—both of which will disproportionately impact communities that are already struggling due to economic and racial injustice. In reality, this is no choice at all. The DSEIS must remedy this error by providing the public with a robust analysis of alternatives and a meaningful comparison of the environmental justice implications of the Proposed Plan as compared to other alternative solutions, such as the Resilience Alternative.

The Corps also failed to ensure that communities of low-income and color had an opportunity to meaningfully participate in this DSEIS process and voice their concerns and preferences. As part of the Section 404(c) veto process, EPA engaged in significant outreach with local communities to understand their concerns and expectations regarding the proposed pumps.³⁹² By contrast, the Corps held one “virtual public meeting” during the public scoping period, without even considering whether this online format was accessible to communities of color and low-income. This was a significant oversight given that NEPA requires agencies to assess whether affected communities can access available

³⁹⁰ *Id.*

³⁹¹ Clean Water Act 404(c) Final Determination at 66.

³⁹² *Id.* at 68.

information.³⁹³ The online platform used by the Corps, however, was largely inaccessible to the vast majority of local residents impacted by the proposed pumps.³⁹⁴

As these flaws demonstrate, the Proposed Plan will cause greater impacts than acknowledged by the DSEIS, while providing far fewer benefits. The Corps has not provided communities of color and low income with a fair assessment of the Proposed Plan's environmental justice implications. Nor has the Corps provided those communities with sustainable solution or a meaningful opportunity to participate in the process.

11. The DSEIS Fails to Evaluate the Economic Costs and Benefits of the Proposed Plan

The DEIS fails to examine the economic costs and benefits of the Proposed Plan. These analyses are essential in light of the new data, changed conditions, cost increases, new project components, and new project location, among other things. This update is also critical given the many deficiencies in the 2007 FSEIS economic assessment.

In assessing project benefits, the DSEIS must pay careful attention to the limited acreage areas that will be drained by the Proposed Plan, as discussed in Section C of these comments. In assessing benefits for these acres, the DSEIS must also account for the flood frequencies and length of time that it takes the Pumps to drain water off the landscape when calculating benefits. The DSEIS must ensure that the same criteria used to assess the geographic extent of wetland impacts is also used to assess the geographic extent of flood damage reduction benefits. The DSEIS must ensure that benefits are not derived from reductions in flooding on any of the 250,000-plus acres of conservation lands in the Yazoo Backwater Area—lands that are being managed precisely for their wetland values. The DSEIS must ensure that benefits are not derived from reductions in flooding on any of the 19,463-plus acres of flooding and flowage easements owned by the Corps in the Yazoo Backwater project area.³⁹⁵

a. Costs of Construction, Mitigation, and Operations and Maintenance

The DSEIS should develop a completely new estimate of project costs, including mitigation costs. A simple update based on the Corps' Construction Cost Index is insufficient to meaningfully account for the increases in project costs given the passage of 15 years (the 2007 estimate was based on 2005 price levels), the many changes in the project area, the increased costs associated with restoring wetlands on frequently flooded agricultural lands, the proposed Deer Creek site location—which will requires significant additional construction than would be required at Steele Bayou, and the costs of the newly proposed well fields, among many other things.³⁹⁶

³⁹³ NEPA requires that "agencies shall consider the ability of affected [communities] to access electronic media" when "selecting appropriate methods for public involvement." 40 C.F.R. §1506.6(b).

³⁹⁴ Internet adoption in Issaquena County, Mississippi is 0-20% and broadband access is 0%, both of which underscore the barriers to participating in an online meeting. See https://www.fcc.gov/reportsresearch/maps/connect2health/index.html#l=32.7122,-90.953064&z=10&t=broadband&bbm=wn_dl&dmf=none (last visited Nov. 28, 2020).

³⁹⁵ U.S. Army Corps of Engineers Response to August 12, 2003 Freedom of Information Act Request for Flowage Easement Data Submitted by American Rivers.

³⁹⁶ The Corps' 2007 SEIS estimated construction costs at more than \$220 million based on 2005 price levels. Updating those costs using the Corps' Civil Works Construction Cost Index and current mitigation costs puts the cost of construction including required compensatory mitigation at well over \$300.6 million based on 2018 price levels. The additional promised reforestation brings the total project construction costs to \$438.5 million. The

Project costs should also include the quantified value of the ecosystem services that will be lost to the Yazoo Pumps, as required by the March 2013 Principles and Requirements for Federal Investments in Water Resources and the December 2014 Interagency Guidelines that implement those Principles and Requirements (collectively, the PR&G). The PR&G apply to Corps projects, and the Corps has been directed to develop agency specific guidelines to ensure full implementation.

The March 2013 Principles and Requirements state that evaluation methods “should apply an ecosystem services approach in order to appropriately capture all effects (economic, environmental and social) associated with a potential Federal water resources investment.” The December 2014 Interagency Guidelines state that “Federal investment impacts on the environment or ecosystem may be understood in terms of changes in service flows. The process of identifying, evaluating, and comparing these changes provides a useful organizing framework to produce a complete accounting. Reduced service flows over time amount to costs, and increased services flows over time amount to benefits.” The Guidelines also state: “Agencies must provide an explicit list of the services that flow from the existing study area ecosystems and infrastructure (including operational plans) with identification of those services that are likely to meaningfully change within the larger context of the watershed because of the Federal investment.”

b. Non-Federal Cost Share

The DEIS must carefully assess whether locating the Yazoo Pumps at the Deer Creek location results in the loss of the non-federal cost share waiver enacted in 1997. The non-federal cost share waiver applies “to any project” or “separable element thereof” on which physical construction is initiated after April 30, 1986.³⁹⁷ For purposes of this provision, “physical construction shall be considered to be initiated on the date of the award of a construction contract.”³⁹⁸

The Water Resources Development Act of 1986 imposed a 25% non-federal cost share for all flood control projects on which physical construction was initiated after April 30, 1986 (33 U.S.C. § 2213). This provision established a non-federal cost share for the Yazoo Pumps. A construction contract had been awarded for inlet and outlet channel and cofferdam at the Steele Bayou location of the Yazoo Pumps on March 25, 1986, but construction did not begin until May 5, 1986.

The Water Resources Development Act of 1996 exempted the Yazoo Pumps from the non-federal cost share that had been implemented in 1986, while raising the non-federal cost share for all other flood control projects to 35%. That exemption was created by the addition of the following language to the cost share provision: “For the purpose of the preceding sentence, physical construction shall be considered to be initiated on the date of the award of a construction contract.”³⁹⁹ Notably, the Yazoo Pumps project was not mentioned by name in the provision that enacted the exemption.

The contract award that triggered the Yazoo Pumps cost-share waiver was the contract to construct the entrance and exit channel and cofferdam for the pump station at the Steele Bayou location. This work was completed in 1987 at a cost of approximately \$2,500,000. However, this construction is only a

2007 SEIS estimated operations and maintenance costs at \$2.1 million each year.

³⁹⁷ 33 USC 2213(e).

³⁹⁸ 33 USC 2213(e).

³⁹⁹ 33 USC 2213 (e)(1).

component of the Yazoo Pumps project **if** the Pumps are located at Steele Bayou. The already-constructed entrance and exit channel and cofferdam could serve no purpose whatsoever for the Yazoo Pumps—and will not be a component of the Yazoo Pumps project—if the Pumps are moved to the Deer Creek location. See Figure 13, below.⁴⁰⁰ As a result, the date of the award of the contract for these components would no longer act to waive the non-federal cost share requirement.

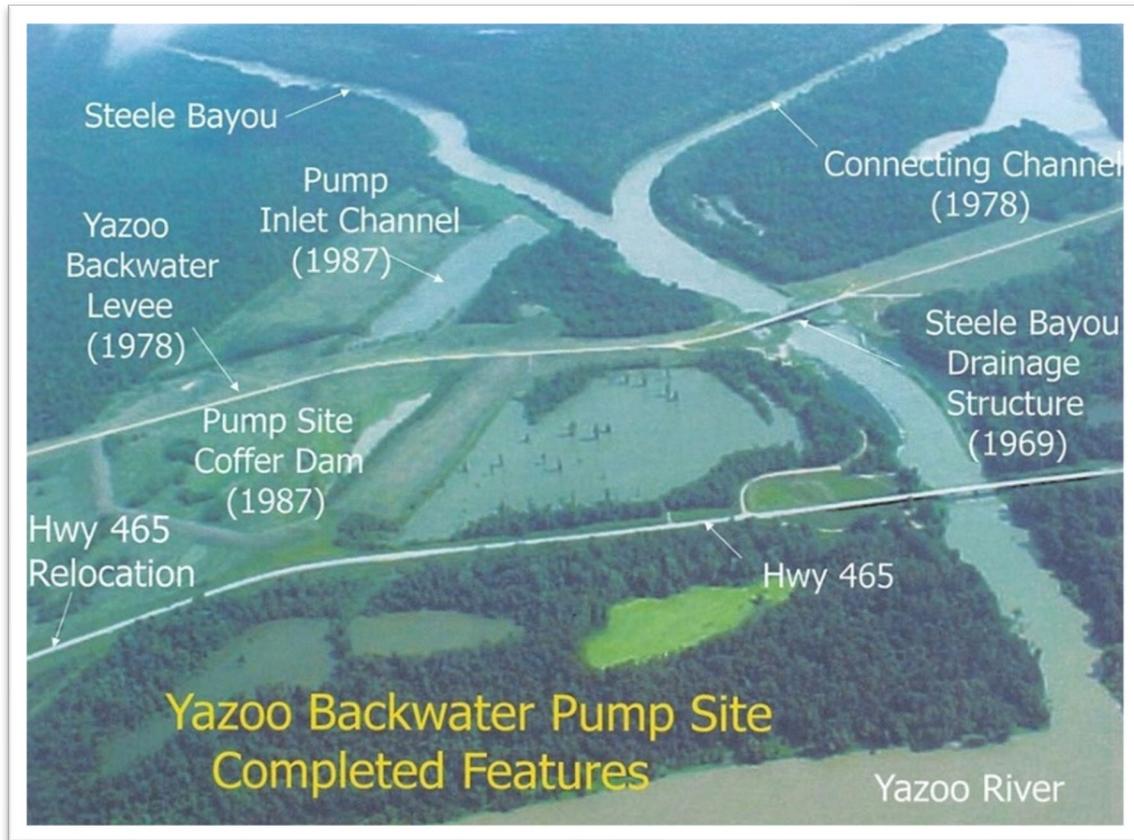


Figure 13, Completed Construction at Steele Bayou Location from USACE Presentation to EPA, Yazoo Backwater Project Brief Region IV 15 May 2019

In short, if the Yazoo Pumps are moved to the Deer Creek location, the project could not proceed unless a non-federal sponsor could provide the non-federal cost share of 35% of total project costs (including mitigation). So, for example, if it costs \$440 million to build the Yazoo Pumps at the Deer Creek location, the non-federal sponsor would be required to contribute \$154 million of those costs, plus all necessary lands, easements, and rights of way. If construction costs increase, the costs to the non-federal sponsor would also increase since the non-federal cost share is based on a percentage of total project costs (including mitigation).

c. Flood Damage Reduction Benefits—Agriculture

The 2007 SEIS determined that more than 80% of the alleged benefits from the Yazoo Pumps will come from increased agricultural production—which makes it clear that agricultural drainage is the project’s true primary purpose. As the Corps is well aware, draining wetlands to promote increased agricultural

⁴⁰⁰ This slide was obtained through a Freedom of Information Act request.

production is an archaic concept from another era, and is in direct conflict with current federal law and policy.

The 2007 analysis of agricultural benefits also contained many extensive flaws, as documented by an independent economic review prepared in cooperation with the Environmental Protection Agency.⁴⁰¹ The DEIS must make sure that these flaws are not repeated in the new economic analysis. To this end, it is essential that the DSEIS start over from scratch and conduct a fundamentally new and comprehensive assessment of agricultural benefits that carefully assesses and accounts for at least the following:

- (1) A full and accurate accounting of land use in the Yazoo Backwater Area. Agricultural benefits must be carefully assessed only on agricultural lands that would see reduced levels of inundation during the growing season sufficient to justify more intensive agricultural practices. No agricultural or other flood damage reduction benefits should be calculated for conservation and easement lands in the Yazoo Backwater Area. Instead, the value of the ecosystem services lost due to adverse project impacts on these lands must be quantified and accounted for as a project cost in the benefit-cost assessment. In addition, no agricultural or other flood damage reduction benefits should be calculated for lands used for mitigation for the Yazoo Pumps or other projects, or on lands that will engage in voluntary reforestation pursuant to the Proposed Plan.
- (2) A comprehensive assessment of whether the Yazoo Pumps would in fact provide any statistically significant benefit to agricultural production, or would instead harm agricultural production in the Yazoo Backwater Area. A scientific study conducted in the Yazoo River basin strongly suggests that the Yazoo Pumps would harm—not help—agricultural production in the Yazoo Backwater Area.⁴⁰²

This study looked at the riverine hydrological and regional climatic regime relationships to agriculture (cotton, soybeans) and the principal riverine fish stocks in the upper Yazoo River basin. The study looked at 31 years of data (from 1964 to 1994) to compare flooding in the study area with soybean and cotton production. It found that **“no factor associated with flood events adversely influence production of cotton and soybeans.** However, with regard to soybeans, the amount of area flooded two years prior to a crop was positively related to soybean yield. **From a long-term perspective therefore, the data suggest that flooding may benefit agricultural enterprises associated with soybean production.”**⁴⁰³ The study also found that **cotton yield was positively correlated with maximum area flooded during the same year**, noting that this was

⁴⁰¹ Leonard Shabman & Laura Zepp Review Comments on “Yazoo Backwater Reformulation” dated September 24, 2000; *see also* Leonard Shabman & Laura Zepp, An Approach for Evaluating Nonstructural Actions with Application to the Yazoo River (Mississippi) Backwater Area (February 7, 2000) (prepared in cooperation with the U.S. Environmental Protection Agency, Region 4). Both of these documents were submitted with the Environmental Protection Agency Comments on the 2007 Draft SEIS.

⁴⁰² Jackson, D. C. and Q. Ye. 2000. Riverine fish stock and regional agronomic responses to hydrologic and climatic regimes in the upper Yazoo River basin. Pages 242-257 in I. G. Cowx, Editor. Management and Ecology of River Fisheries. Fishing News Books. Blackwell Science. London. This study was submitted into the record for the veto process on May 5, 2008.

⁴⁰³ *Id.*(emphasis added).

likely due to increased soil moisture which benefits cotton production. This was true even though floods resulted in fewer acres of cotton being planted during flood years.⁴⁰⁴

The study did note, however, that a different pattern appeared to emerge over shorter time periods “which may explain the public perception that flooding adversely impacts agriculture in the area. During the 5 year period from 1990-1994, high precipitation was negatively related to area planted in cotton and the percent of the area planted in soybeans that was actually harvested. However, flooding during this period did not significantly affect overall yield of cotton and soybeans.”⁴⁰⁵ And again, there was a positive correlation between cotton yields and the maximum area flooded during the same year.

That same study also shows that flooding benefits fisheries in the area, finding a positive relationship between flooding and positive fish stock characteristics, which the study defines as more and bigger fish. The study also noted that much of the productive potential for fisheries in floodplain river ecosystems is determined by the dynamics of overbank flooding and riparian vegetation.⁴⁰⁶

- (3) The ability to plant crops even during years with large flood events. Even during the prolonged 2019 flood event, 316,000 acres of crops were grown in the Yazoo Backwater Area (more than 55% of the 10-year average acreage of crops grown in the Yazoo Backwater Area), according to USDA data.⁴⁰⁷ In addition, the Conservation Organizations understand that farmers were eligible to receive disaster relief or other forms of compensation to minimize economic losses due to the inability to plant crops on the Yazoo Backwater Area lands that could not be planted as a result of the 2019 flood event.

In 2008, then Mississippi Governor Haley Barbour stated on Mississippi Public Radio that even during the 100-year flood of 1973, farmers had good soybean crops. Indeed, we understand that many farmers prefer to plant after floods because it is cheaper to do so. Post-flood planting reduces the amount of chemicals that must be applied to the land to clear the fields, and reduces the amount of fertilizer needed due to the nutrients provided by the flooding.

- (4) A full assessment of documentation demonstrating the amount of uninsured and/or unsubsidized crop losses per year for each farm in the Yazoo Backwater Area, and the elevation of lands on which the lost crops were planted. Only uninsured losses that could be reduced by operation of the Yazoo Pumps should be accounted for in the benefits assessment.
- (5) A full assessment of farm subsidy payments in the Yazoo Backwater Area to assess whether additional subsidies to intensify agricultural production are in fact necessary or an appropriate investment of federal taxpayer dollars. As the Corps is aware, an

⁴⁰⁴ Id.

⁴⁰⁵ Id.

⁴⁰⁶ Id.

⁴⁰⁷ USDA National Agricultural Statistics Service, CropScape Cropland Data Layer.

extensive and independent economic review determined that the Yazoo Pumps would do nothing more than “**help landowners grow crops on land that is farmed only to earn farm subsidy payments,**” based on the economic data used by the Corps in the 2007 SEIS.⁴⁰⁸ That review also determined that the Yazoo Pumps could not be economically justified even at what was then a \$207 million projected construction cost.⁴⁰⁹

- (6) A full assessment of farm ownership in the areas of the Yazoo Backwater Area that would be able to intensify agricultural production due to operation of the Yazoo Pumps, to ensure that the concentration of benefits warrants the large investment of federal taxpayer dollars that would be required to construct and operate the Pumps. The 2007 FSEIS noted that there were only 192 farms in the project area with an average size of 2,913 acres.⁴¹⁰ The 2007 FSEIS did not provide any information on the elevation of those farms, so it was not possible to assess what percentage of the total farms in the project area might allegedly benefit from the Yazoo Pumps. The FSEIS also did not provide farm ownership information, so it is was possible to discern whether some landowners or corporations own multiple farms in the project area.
- (7) A full assessment of farm elevations in the Yazoo Backwater Area, to ensure that only those farms in areas that could see reduced flood inundation are accounted for in the benefits analysis, and to ensure that no benefits are counted for farms lying being the 90-foot elevation since the Yazoo Pumps authorization does not authorize pumping below the 90-foot elevation.

d. Flood Damage Reduction Benefits—Homes, Businesses, Structures

In assessing flood damage reduction benefits to homes, businesses, and other structures, the DSEIS should utilize an up-to-date inventory of all structures and roads in the Yazoo Backwater Area that provides precise elevation data. The DSEIS should also ground-truth its quantification of flood damage reduction benefits, including by comparing the predicted benefits with the limited, and highly concentrated, structural damage incurred during the 2019 flood.

Before assessing potential flood damage reduction benefits for the Eagle Lake Community, the Corps should conduct a detailed after-action assessment of the cause of the 2019 Eagle Lake area flooding. Factors that likely influenced the 2019 flooding of homes near Eagle Lake include the Lake’s water control management regime and actions associated with maintaining the stability of the portion of the Mississippi River mainline levee that abuts Eagle Lake. If these factors played a role in the flooding surrounding Eagle Lake, it is likely that the area would have flooded in 2019 even if the Yazoo Pumps were in operation. The multiple risk factors facing Eagle Lake must be accounted for when calculating any flood damage reduction benefits for the Yazoo Pumps.

⁴⁰⁸ Leonard Shabman & Laura Zepp Review Comments on “Yazoo Backwater Reformulation” dated September 24, 2000 (emphasis in original); see also Leonard Shabman & Laura Zepp, An Approach for Evaluating Nonstructural Actions with Application to the Yazoo River (Mississippi) Backwater Area (February 7, 2000) (prepared in cooperation with the U.S. Environmental Protection Agency, Region 4). Both of these documents were submitted with the Environmental Protection Agency Comments on the 2007 Draft SEIS.

⁴⁰⁹ Id.

⁴¹⁰ 2017 FSEIS Main Report at 24.

The DSEIS should also ensure that it does not overstate potential benefits as it clearly did in the 2007 FSEIS. Some of the most egregious examples of these overstatements include:

- Flood damage reduction benefits – automobiles. The 2007 FSEIS claims that the average household in the project area has two automobiles valued at \$15,000 per car. The Corps says that despite the low velocity flooding typical in the study area that about 1/3 of these cars will get flood damages estimated at \$298,000 per year. These estimates make no sense given the economics in the project area. At the time these values were assessed, the average per capita income in Sharkey and Issaquena counties was \$11,187, and one third of the population lived below the poverty level. Median household income was approximately \$20,000 to \$22,000 depending on the county. Based on these economic realities, it is highly unlikely that each home would have two cars valued at \$15,000 sitting in the driveway, or that if this were the case, it is even more unlikely that the owners would not simply drive their cars to higher ground during the typical slow-moving flood event.
- Flood damage reduction benefits – home values. The Corps bases its flood damage reduction benefits on inflated home values in the region, which in turn inflates flood damage reduction benefits for contents of homes (see below). The 2007 FSEIS asserts that the average residential home in the project area is valued at \$44,000 based on data collected by a local contractor from 2000-2005.⁴¹¹ This contrasts considerably with data that the Corps supplied to Dr. Shabman and Laura Zepp in 2000. In 2000, the Corps identified residential one-story building average values at \$22,405. Accuracy in the valuation of homes is particularly important in calculating flood damages in this case because the estimate of contents damage is directly correlated to property value.
- Flood damage reduction benefits – home contents. For one- and two-story homes in the project area, the Corps assumed that contents are equal to 100 percent of the home value, and for mobile homes the Corps assumes that contents are equal to 50 percent of the structure's value. Given the lower average income levels that exist in the project area counties, these assumptions would appear to have overstated potential damages, and failed to correlate with the experience of the National Flood Insurance Program.

e. Benefits of Nonstructural, Natural, and Nature-Based Measures

The many flood damage reduction benefits (and the cost-effectiveness) of nonstructural, natural, and nature-based measures must be fully accounted for to ensure proper assessment of these approaches.

There are extensive, and well-established tools for the assessing ecosystem services provided by healthy natural systems, and these should be used by the Corps in developing the SEIS. A Duke University, Nicholas Institute report *Valuing Ecosystem Services from Wetland Restoration in the Mississippi Alluvial Valley* is provided with the Conservation Organizations Scoping Comments. An Earth Economics report *The Value of Restoring the Mississippi River Delta* is provided with the Conservation Organizations Scoping Comments. The Conservation Organizations will supply additional ecosystem services valuation studies upon request. In addition to fully accounting for the ecosystem service values, the DSEIS should also account for benefits associated with avoiding flood-fighting costs, the additional cost avoidance

⁴¹¹ 2007 FSEIS, Appendix 7 at 77.

benefits discussed below, and National Flood Insurance Rate reduction benefits when assessing the benefits of these measures.

- **Cost Avoidance Benefits:** Enrolling cropped wetlands in WRE reduces the costs of commodity, federal crop insurance, and noninsured crop disaster assistance programs. A recent study documents these avoidance benefits (present value of avoided costs less the Wetlands Reserve easement and restoration costs) in Mississippi at \$870 per acre. *Wetland Reserve Easement Program Economic Assessment: Estimated Commodity Program and Crop Insurance Premium Subsidy Cost Avoidance Benefits*, prepared for the Nature Conservancy (June 2, 2018) (authored by retired U.S. Department of Agriculture economist Dr. Doug Lawrence).
- **National Flood Insurance Program Rate Reductions:** Protecting floodplains has the largest impact on lowering National Flood Insurance Program (NFIP) rates for communities participating in the voluntary Community Rating System Program (CRS). Participation in the CRS can reduce NFIP rates from 15% to 45%. The CRS credits over 90 elements of comprehensive floodplain and watershed management, including providing significant credits for protecting the natural functions of riverine floodplains by preserving natural floodplain open space, acquiring flood-prone land and returning it to its natural state, and protecting and restoring natural floodplain functions and habitat.⁴¹²

G. The DSEIS Violates NEPA Because it Lacks Scientific Integrity

"Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."⁴¹³ Accordingly, the DEIS must be based on "high quality" science and information and the Corps must "insure professional integrity, including scientific integrity, of the discussions and analysis in environmental impact statements."⁴¹⁴ Importantly, if information that is essential for making a reasoned choice among alternatives is not available, the Corps **must** obtain that information unless the costs of doing so would be "exorbitant."⁴¹⁵

An EIS must utilize "quantified or detailed information" when analyzing impacts.⁴¹⁶ The DEIS may not rely "on conclusory statements unsupported by data, authorities, or explanatory information."⁴¹⁷ Accordingly, the DEIS must supply supporting data and authorities, and explain how and why it has drawn the conclusion it has reached.

⁴¹² Federal Emergency Management Agency Fact Sheet, *The Community Rating System works to Protect Natural Floodplains* (2015) (available at <https://www.fema.gov/media-library-data/1459276443255-663d02584edc3ac6cda2f4a7f337100b/Natural-Functions-and-CRS.pdf>).

⁴¹³ 40 C.F.R. § 1500.1(b).

⁴¹⁴ 40 C.F.R. § 1502.24 ("Agencies shall insure professional integrity, including scientific integrity, of the discussions and analysis in environmental impact statements"); *Earth Island Inst. v. U.S. Forest Service*, 442 F.3d 1147, 1159-60 (9th Cir. 2006) (quoting 40 CFR §1502.24).

⁴¹⁵ 40 C.F.R. § 1502.22.

⁴¹⁶ *Neighbors of Cuddy Mountain v. U. S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998); *Ecology Center v. Castaneda*, 574 F.3d 652, 666 (9th Cir. 2009) (requiring "quantified or detailed data"); *Natural Resources Defense Council v. Callaway*, 524 F.2d 79, 87 (2^d Cir. 1975).

⁴¹⁷ *Id.*

The Corps must also candidly disclose the risks of its proposed action and respond to adverse opinions held by respected scientists:⁴¹⁸

Where scientists disagree about possible adverse environmental effect, the EIS must inform decision-makers of the full range of responsible opinion on the environmental effects.’ Where the agency fails to acknowledge the opinions held by well respected scientists concerning the hazards of the proposed action, the EIS is fatally deficient.⁴¹⁹

It is not sufficient to include the statements of the well-respected scientists in an Appendix or some other document, the expert comments must be included and appropriately responded to in the impacts section of the DSEIS.⁴²⁰

The DSEIS falls woefully short of meeting these longstanding NEPA requirements, as discussed throughout these comments and as made clear by the following three examples.

First, the DSEIS repeatedly relies on scientific methodologies and approaches decisively rejected by EPA in the veto, as discussed throughout these comments. However, the DSEIS does not even reference—let alone address—the detailed findings outlining the significant problems with those methodologies prepared by EPA experts. Indeed, the DSEIS and Appendices make just three passing references to the veto that do nothing more than acknowledge that it was issued.⁴²¹

Second, the DSEIS appears to be modeling across non-equivalent elevation datum. Over time, sea level changes, ground subsidence, and uplift, coupled with more sensitive measuring technology has led to adjustments in elevations. The modern standard elevation unit, used by the Corps National Levee Database and Flood Insurance Rate Maps, is 1988 North American Vertical Datum (NAVD88). Older elevation data is typically based on the 1929 National Geodetic Vertical Datum (NGVD29). These elevation baselines can deviate by as much as 30 feet throughout North America and require conversion.

In the Yazoo Backwater Area region, most NAVD88 elevations are between 0.0 inches and 7.87 inches below the NGVD29 elevations, on average.⁴²² However, the DSEIS appears to apply data from at least three datums as if they are equivalent. For example, the DSEIS variously states that pumps would turn

⁴¹⁸ Seattle Audubon Soc’y v. Mosely, 798 F.Supp. 1473, 1482 (W.D. Wash. 1992) (citing Friends of the Earth v. Hall, 693 F.Supp. 904, 934, 937 (W.D.Wash. 1988)).

⁴¹⁹ Friends of the Earth v. Hall, 693 F. Supp. 904, 934 (W.D. Wash. 1988)(citations omitted).

⁴²⁰ *Id.*

⁴²¹ DSEIS at 14 (“No Record of Decision was signed due to the EPA vetoing the project in August 2008 under Section 404(c) of the Clean Water Act (CWA) citing ‘adverse impacts on wetlands and their associated fisheries and wildlife resources are unacceptable.’”); DSEIS at 18 (“The 2007 Main Report had been finalized prior to 2008 when EPA indicated it would exercise a veto of the document citing concerns related to Section 404(c) of the CWA and unacceptable effects on fishery areas and wildlife.”); DSEIS, Appendix F-4 (HTRW) at 2 (“No Record of Decision (ROD) was signed due to the U.S. Environmental Protection Agency (EPA) vetoing the 2007 Final Supplement No. 1 to the 1982 Yazoo Area Pump Project Final Environmental Impact Statement (2007 FSEIS) in August 2008 due to ‘adverse impacts on wetlands and their associated fisheries and wildlife resources are unacceptable’ citing Section 404(c) of the Clean Water Act.”)

⁴²² NOAA National Geodetic Survey. <https://geodesy.noaa.gov/TOOLS/Vertcon/vertcon.html> accessed November 18, 2020.

on at 87.0 feet (NGVD29)⁴²³, at 87.0 feet (NAVD88)⁴²⁴, and when water levels reach 87.0-foot Mean Sea Level (MSL).⁴²⁵ These elevations are not equivalent. The DSEIS also fails to clearly identify the elevation datum in a number of tables and figures.⁴²⁶ The DSEIS does not state whether or not the various elevations were converted to equivalent units.⁴²⁷

Use of these non-equivalent elevation datum call into question the results of critical calculations in the DSEIS. These include calculations regarding: the number of days the pumps could have been or will be in use during backwater flood events; adjustments to the flood frequency elevations and the spatial extent of the 2-year floodplain, which the Corps uses to determine wetlands impacts; and the calibration of all the Corps' models.

To ensure the accuracy of these calculations, the Corps should convert all elevation datum to NAVD88. Converting to NAVD88 would also provide the flood stage elevations in units that could be compared to elevation data in the National Levee Database and the Flood Insurance Rate Maps, which is essential for understanding downstream flood impacts and any potential impacts to flood insurance rates in the Yazoo River floodplain and backwater area.

Third, as discussed in Section C of these comments, the DSEIS dismisses significant concerns regarding the Proposed Plan's potential to increase flood risks for communities and businesses by relying on a model that is so unreliable that it "cannot be trusted to get a correct answer" regarding the impact of the Yazoo Pumps on flood levels in the Yazoo River. The Corps also mischaracterizes the findings of that flawed model. A detailed review of this model, which was carried out by William Fleenor, Ph.D., an expert with more than 25 years of experience with hydrologic modeling, is provided at Attachment E these comments.

The risks associated with this flawed model are significant. An accurate understanding of the Proposed Plan's impact on stage levels in the Yazoo River is critical to knowing whether operation of the Pumps would increase flood levels in the Yazoo River, which would: increase the risks to the integrity of the Yazoo Backwater Levee; affect communities and business located along the Yazoo River, including communities in north Vicksburg that already suffer from excessive flooding; and risk inundating the International Paper wastewater treatment ponds which would release significant amounts of toxic wastewater into the Yazoo River.

Fourth, in addition to these substantive errors, the Corps hindered the public's ability to meaningfully comment on the DSEIS by withholding critical data. For example, the Corps did not provide the public with the purportedly new "environmental data" underlying the DSEIS, contradicting its obligation and promise to provide that information.⁴²⁸ Furthermore, the Corps failed to provide critical documents and

⁴²³ DSEIS, Appendix G (Engineering) at 48, paragraph 56.

⁴²⁴ DSEIS, Appendix G (Engineering) at 55, paragraph 63.

⁴²⁵ DSEIS Appendix G (Engineering) at 93, Table 2-21.

⁴²⁶ The following figures and tables in Appendix G (Engineering) do not include properly labeled elevation datum units: Figures 2-101 – 2-104, Figures 2-53 – 2-58, Figures 2-71 – 2-82, Table 2-16, Tables 2-22 – 2-25.

⁴²⁷ DSEIS Para. 18 lists the updated data collected for the 2020 DSEIS, including new elevation data. But fails to clarify whether the new elevation data was based on the NAVD88 datum or the NGVD29 datum. It also does not mention whether the Corps converted any non-equivalent elevation datum.

⁴²⁸ See 33 U.S.C. § 2342 (emphasis added) (the "Secretary shall make publicly available, including on the Internet, all data in the custody of the Corps of Engineers on . . . the planning, design, construction, operation, and maintenance of water resources development projects . . . as quickly as practicable after the data is generated by

analysis regarding the Proposed Plan.⁴²⁹ When the Conservation Organizations promptly requested the missing data on October 26, 2020,⁴³⁰ the Corps needlessly denied that request and continued to withhold the data contained in its own files.⁴³¹ The agency's noncompliance forced the Conservation Organizations to file an additional Freedom of Information Act request.⁴³² Even then, the Corps did not produce any data until November 13, 2020—an inexcusable delay of over four weeks since the start of the comment period. As a result, the Corps deprived the Conservation Organizations and the public of its right to analyze that data and provide critical feedback to the Corps regarding the flaws in its analysis. The Corps also failed to provide the public with a meaningful public hearing and failed to respond to critical questions regarding the proposed project.⁴³³ The Conservation Organizations thus requested a 30-day extension of the comment period so that they could meaningfully analyze the data and assist the Corps in correcting its flawed DSEIS.⁴³⁴ The Corps did not respond to this reasonable request.

H. The DSEIS Violates Mandatory Mitigation Requirements and NEPA Because it Does Not Properly Evaluate Needed Mitigation and Does Not Include a Detailed Mitigation Plan

The DSEIS violates the mandatory mitigation requirements established by 33 U.S.C. § 2283 and the Clean Water Act, including the requirement to develop a detailed mitigation plan. The DSEIS also violates NEPA's requirement to analyze mitigation measures with "sufficient detail to ensure that environmental consequences have been fairly evaluated."⁴³⁵

Notably, the DSEIS repeats many of the same mitigation errors documented by EPA in the 2008 veto, including the wholesale failure to identify specific mitigation sites, provide a detailed mitigation plan, or ensure an adequate amount of compensatory mitigation. The DSEIS also fails to address how the promised mitigation can be achieved on lands that will themselves be adversely affected by the Yazoo Pumps.⁴³⁶

the Corps of Engineers.").

⁴²⁹ The Corps did not provide any alternatives analysis, as required by the law. The Corps did not include any information on the costs or benefits of the Yazoo Pumps, despite its obligation to do so. The Corps did not provide the required Endangered Species Act assessments or Fish and Wildlife Coordination Act report, both of which would have provided valuable insight from the nation's fish and wildlife experts. The Corps does not include a report—or account for the findings of—an Independent External Peer Review panel. The Corps did not even provide a complete analysis of the proposed pumps significant, unacceptable impacts on the region's rich array of wetlands, streams, aquatic resources, and wildlife.

⁴³⁰ See Letter from Stuart Gillespie to Col. Hilliard, Re: Data Request Pursuant to 33 U.S.C. § 2342—Yazoo Area Pump Project Draft SEIS 2 (Oct. 26, 2020).

⁴³¹ See Letter from David R. Dryer to Stuart Gillespie, Re: Data Request by Earthjustice—Yazoo Area Pump Project Draft SEIS 2 (Oct. 30, 2020).

⁴³² Letter from Stuart Gillespie to FOIA Officer, Re: Freedom of Information Request—Yazoo Area Pump Project Draft SEIS 2 (Nov. 2, 2020); see also Letter from Stuart Gillespie to Col. Hilliard, Re: Data Request Pursuant to 33 U.S.C. § 2342—Yazoo Area Pump Project Draft SEIS 2 (Nov. 2, 2020).

⁴³³ Letter from Stuart Gillespie to Col. Hilliard, Re: Request for Extension of Public Comment Period—Yazoo Area Pump Project Draft SEIS 2 (Nov. 19, 2020), at 2.

⁴³⁴ *Id.*

⁴³⁵ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989).

⁴³⁶ The Conservation Organizations also note that each page of the Mitigation Appendix released for public comment includes a "DRAFT" watermark. As a result, the public has no way of knowing whether this Mitigation Appendix is in fact the one that the Corps intended to release for public comment.

The DSEIS must ensure mitigation for all losses to fish and wildlife created by a project unless the Secretary determines that the adverse impacts to fish and wildlife would be “negligible.”⁴³⁷ In carrying out this mitigation, “impacts to bottomland hardwood forests are mitigated in-kind and harm to other habitat types are mitigated to not less than in-kind conditions, to the extent possible.”⁴³⁸ The DSEIS must include a “specific plan to mitigate fish and wildlife losses” and the Corps is prohibited from selecting a “project alternative in any report” unless that report includes the required specific mitigation plan.⁴³⁹

The DSEIS must also comply with “the mitigation standards and policies established pursuant to the regulatory programs” administered by the Corps.⁴⁴⁰ To meet these standards, the mitigation must compensate for the aquatic resource functions that will be lost to the project; “must be commensurate with the amount and type of impact” caused by the project; and must satisfy many other critical requirements.⁴⁴¹

Mitigation lands for the Proposed Plan must be purchased before any construction begins.⁴⁴² Any physical construction required for purposes of mitigation should also be undertaken prior to project construction but must, at the latest, be undertaken “concurrently with the physical construction of such project.”⁴⁴³ Corps mitigation must be monitored until the monitoring demonstrates that the ecological success criteria established in the mitigation plan have been met.⁴⁴⁴

NEPA requires that the DSEIS discuss mitigation measures “in sufficient detail to ensure that environmental consequences have been fairly evaluated.”⁴⁴⁵ A “perfunctory description” of the mitigating measures is not sufficient.⁴⁴⁶ As the Supreme Court has noted, this is because:

omission of a reasonably complete discussion of possible mitigation measures would undermine the ‘action-forcing’ function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects. An adverse effect that can be fully remedied by, for example, an inconsequential public expenditure is certainly not as serious as a similar effect that can only be modestly ameliorated through the commitment of vast public and private resources.⁴⁴⁷

The DSEIS also must discuss the effectiveness of the proposed mitigation:

“An essential component of a reasonably complete mitigation discussion is an assessment of whether the proposed mitigation measures can be effective. The Supreme Court has required a mitigation discussion precisely for the purpose of evaluating whether anticipated environmental

⁴³⁷ 33 U.S.C. § 2283(d)(1).

⁴³⁸ 33 U.S.C. § 2283(d)(1).

⁴³⁹ 33 U.S.C. § 2283(d)(1).

⁴⁴⁰ 33 U.S.C. § 2283(d).

⁴⁴¹ 33 C.F.R. § 332.3(a).

⁴⁴² 33 U.S.C. § 2283(a).

⁴⁴³ 33 U.S.C. § 2283(a).

⁴⁴⁴ 33 U.S.C. § 2283(d).

⁴⁴⁵ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989).

⁴⁴⁶ *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1380 (9th Cir.1998).

⁴⁴⁷ *Id.*

impacts can be avoided. A mitigation discussion without at least *some* evaluation of effectiveness is useless in making that determination.”⁴⁴⁸

This should include a discussion of how the mitigation will effectively address temporal losses (i.e., it takes many years to restore a fully functioning, mature wetland and many decades to restore a fully functioning mature bottomland hardwood wetland forest), and how mitigation for wetland losses can be effectively carried out in areas drained by the Yazoo Pumps. A bald assertion that mitigation will be successful is not sufficient. The effectiveness must instead be supported by “substantial evidence in the record.”⁴⁴⁹

A discussion of the effectiveness is particularly critical because, despite progress in this area, wetland and stream mitigation often fails or does not fully replace lost ecological values. For example, the National Research Council has concluded:

“Attempts to restore forested wetlands of the Southeast (e.g., bottomland hardwoods and cypress swamps) have encountered difficulties related to the time required to replace mature trees, the lack of material to transplant, the lack of knowledge of how and when to carry out seeding or transplantation, (Clewley and Lea, 1989) and altered hydrology (drainage for conversion to agriculture) of the wetland area. Natural forested wetlands may support hundreds of plant species, many of which thrive in the understory (91 percent of 409 species in one riverine forest were understory species). Old-growth forests are dominated by trees that gradually achieve a dominant role in the canopy and that are self-sustaining through their ability to reproduce in their own shade. It is not clear that such climax species can be successfully established in open sites, or whether their introduction must await development of seral (intermediate successional stage) plant communities. Clewley and Lea (1989) noted the need for intensive site preparation to reduce competition between weeds and transplanted tree seedlings. Their review was the first to mention insect herbivory and fire as potential problems. In many cases, restoration of suitable hydrologic conditions will be necessary. The short time period within which forest restoration attempts have been monitored precludes an evaluation of their functional equivalency with natural reference systems.”⁴⁵⁰

Absent a meaningful discussion of the effectiveness of the proposed mitigation, the DSEIS will not have taken the mandated “hard look” at the environmental impacts of the proposed action and alternatives to the action, and will fail to provide “a clear basis for choice among options by the decisionmaker.”⁴⁵¹

⁴⁴⁸ South Fork Band Council v. Dept. of Interior, 588 F.3d 718, 727 (9th Cir. 2009) (internal citations omitted).

⁴⁴⁹ Wyoming Outdoor Council v. U.S. Army Corps of Eng’rs, 351 F. Supp. 2d 1232, 1252 (D. Wyo. 2005).

⁴⁵⁰ National Research Council, Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy (1992) at 311-12.

⁴⁵¹ 40 C.F.R. § 1502.14.

1. The DSEIS Does Not Accurately Assess Mitigation Needs

As discussed throughout these comments, the DSEIS does not properly evaluate the adverse impacts of the Yazoo Pumps on the project area's hemispherically significant wetlands; does not evaluate adverse impacts to the many streams in the project area; does not evaluate the impacts of massive reductions in flood stages in the project area; and does not properly evaluate adverse impacts to the fish and wildlife resources that rely on those vital systems, among many other failings. The DSEIS "cannot reliably conclude that the selected project has minimized adverse impacts on aquatic ecosystems to the extent practicable when its habitat mitigation calculations are infected with an underestimate of the floodplain habitat impacted."⁴⁵² As a result, the DSEIS does not propose adequate amounts of compensatory mitigation to offset the project's significant and unacceptable impacts.

The Conservation Organizations also note that the 2007 Yazoo Pumps EIS included 4,367 acres of mitigation for previously constructed projects in the Yazoo Pumps project area—3,848 acres of mitigation for the previously constructed Yazoo Area and Satartia Area Backwater Levee Projects and 519 acres of mitigation for past work at the Steele Bayou pump station site—in addition to the 10,662 acres of mitigation that the Corps said was required to compensate for the direct and indirect impacts of the proposed Yazoo Pumps in 2007.⁴⁵³ The 2020 DSEIS makes no reference to addressing (or having completed) the needed mitigation for these previously constructed projects. It is critical that these adverse impacts be fully mitigated through mitigation that properly accounts for the temporal habitat losses that occurred between the time of construction and any future mitigation.

2. The Mitigation Proposed in the DSEIS Will Not Offset the Significant Adverse Impacts that Are Identified in the DSEIS

The DSEIS proposes two mitigation components that will not offset even the severe underestimate of 38,744 acres of wetlands impacts identified in the DSEIS, let alone offset the full suite of significant adverse impacts caused by the Proposed Plan.

The first component of the proposed mitigation consists of 2,405 acres of reforestation of unidentified flooded lands, which the DSEIS claims will replace the significant wetland functions lost to the Proposed Plan. The second out-of-kind component consists of the installation of 34 groundwater wells far outside of the project area that will operate "during the low water season" in a counter-productive attempt to offset flood-related hypoxia problems that are not created by the Yazoo Pumps. DSEIS at 26.

a. The Proposed Reforestation at Unidentified Locations Will Not Offset the Significant Adverse Impacts of the Proposed Plan

At the most foundational level, it is clear that the conceptual mitigation plan in the DSEIS is inadequate to offset the "unavoidable adverse impacts to wetlands, terrestrial, aquatic, and waterfowl resources."⁴⁵⁴ As detailed in Section F.1 of these comments, the DSEIS arbitrarily constrains its analysis to exclude impacts to thousands of acres of wetlands that flood for less than 14 days or are located above the 2-year floodplain. As a result, the DSEIS proposes no mitigation measures to offset the Proposed Plan's impacts on these critical resources. This is a glaring omission. For example, as

⁴⁵² *Envtl. Def.*, 515 F. Supp. 2d at 83.

⁴⁵³ Yazoo Backwater Area Reformulation Main Report, October 2007 at 138-140.

⁴⁵⁴ DSEIS at 21.

explained by EPA, short hydroperiod wetlands provide critical fish spawning habitat, which “is the controlling resource for this project (i.e., the resource which suffers the greatest loss and requires the greatest amount of compensatory mitigation).”⁴⁵⁵

The DSEIS then compounds this threshold error by deriving the amount of needed mitigation through a fundamentally flawed functional assessment that obscures the loss of critical wetland functions, aquatic resources, and waterfowl habitat, as documented by EPA and detailed in Section F.1 of these comments.⁴⁵⁶ Based on this flawed analysis, the DSEIS concludes that:

Indirect impacts to wetlands are associated with changes in flood duration levels under the Proposed Plan; these impacts will result in a loss of 11,054 AAFcUs. The impacts, both direct and indirect cumulatively, require establishment of 2,405 acres of reforested compensatory mitigation lands.

* * *

Based on these calculations it was determined that the acquisition of 2,405 acres of frequently flooded agricultural lands in fee title and subsequent reforestation of these lands would be pursued to offset any unavoidable losses to wetlands, terrestrial, wildlife, waterfowl, and a portion of the aquatics resources.⁴⁵⁷

As discussed in Section F.1 of these comments, the functional assessment that forms the basis of the mitigation proposal was decisively rejected by EPA in the 2008 veto precisely because it did not—and could not—properly account for the ecological implications of the Yazoo Pumps-induced wetland losses. This functional assessment dramatically understates the functions and values lost in the severe underestimate of 38,744 acres of wetland impacts acknowledged in the DSEIS. As a result, the proposed mitigation that is based on replacing these lost functions will not even offset the actual functional losses for the severely understated acreage impacts acknowledged in the DSEIS.

The DSEIS exacerbates these critical errors by failing to identify specific mitigation sites, in direct violation of 33 U.S.C. § 2283 and the 404(b)(1) Guidelines. As set forth at 40 C.F.R. § 230.93(d), the Corps needs to identify mitigation sites so that it can determine whether the sites are “ecologically suitable for providing the desired aquatic resource function.”⁴⁵⁸ The Corps must then evaluate the sites’ characteristics—such as hydrology, soils, and habitat connectivity⁴⁵⁹—so that it can ensure the proposed mitigation will successfully replace “the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project.”⁴⁶⁰

EPA underscored the importance of identifying mitigation sites in its veto, explaining that site-specific information is essential to the comparison of pre-project conditions and post-project conditions “on both the impact site and the proposed compensatory mitigation site.”⁴⁶¹ Due to the Corps’ failure to

⁴⁵⁵ Clean Water Act 404(c) Final Determination at 56 (emphasis added).

⁴⁵⁶ See Clean Water Act 404(c) Final Determination Appx. 8 at 4.

⁴⁵⁷ DSEIS at 73 and 80.

⁴⁵⁸ 40 C.F.R. § 230.93(d)(1).

⁴⁵⁹ *Id.* § 230.93(d)(1)(i)-(vi).

⁴⁶⁰ *Id.* § 293.93(f)(2).

⁴⁶¹ Clean Water Act 404(c) Final Determination Appx. 8 at 2.

provide that information, “it is not possible to determine that the potential adverse environmental impacts of a project would be successfully minimized and compensated for to avoid significantly degrading the Nation’s waters.”⁴⁶² Accordingly, EPA rejected the Corps’ unidentified reforestation measures in the veto. Yet, the Corps simply repeats this very same flaw in the DSEIS, rendering its analysis arbitrary, capricious, and contrary to the 404(b)(1) Guidelines once again.⁴⁶³

Specific mitigation sites must be identified because mitigation can only be credited towards increases in functional values beyond the baseline condition at the mitigation site. According to the DSEIS, lands targeted for restoration will have hydric soils and may be frequently flooded, which means that they will have baseline wetland functional values that cannot be counted towards the mitigation benefits. Without identifying specific mitigation sites, it simply is not possible to determine how many acres of mitigation are required to replace the functions lost to the Proposed Plan. Specific mitigation sites also must be identified to comply with both the statutory and regulatory mitigation planning requirements discussed below.

As a result, the DSEIS fundamentally fails to ensure that the unidentified reforestation is “sufficient to replace lost aquatic resource functions.”⁴⁶⁴ To the contrary, the DSEIS demonstrates that the proposed reforestation is in fact not sufficient to replace these vital functions for at least the following reasons.

First, as explained by EPA in the veto and as acknowledged by the Corps’ own HGM Approach, wetlands in the Yazoo Backwater Area perform at least eight distinct functions.⁴⁶⁵ For example, during backwater flooding, riverine wetlands export organic carbon to downstream aquatic systems—a “critical function” for aquatic food webs.⁴⁶⁶ Riverine wetlands also detain precipitation—a distinct function that operates “independent of the influence of flooding” and helps prevent erosion and reduce peak runoff.⁴⁶⁷ Each of the eight wetland functions perform unique roles in maintaining the integrity of the Yazoo Backwater Area’s aquatic ecosystem.⁴⁶⁸ Accordingly, as explained by EPA in the Veto, “appropriate compensatory mitigation would be that which restores at least the baseline level of all functions.”⁴⁶⁹

The DSEIS, however, fails to ensure that the proposed mitigation will restore the baseline levels of all functions because it improperly conflates the unique wetland functions to obscure the significant losses of individual functions. In the DSEIS, the Corps calculates the Proposed Plan’s impacts on each wetland function, but then combines these distinct losses into a single, composite number: 11,498 AAFcUs.⁴⁷⁰

⁴⁶² Clean Water Act 404(c) Final Determination at 61.

⁴⁶³ See *All. to Save the Mattaponi v. U.S. Army Corps of Engineers*, 606 F. Supp. 2d 121, 133 (D.D.C. 2009) (“In addition, the Corps does not address comments that without more site-specific information it is impossible to determine whether the Mitigation Plan will replace functional values to the point where the Project does not cause or contribute to significant degradation.”).

⁴⁶⁴ 40 C.F.R. § 293.93(f)(2).

⁴⁶⁵ Clean Water Act 404(c) Final Determination at 28; Smith and Klimas (2002) at 47.

⁴⁶⁶ Clean Water Act 404(c) Final Determination at 29-30; *see also* Smith and Klimas at 56 (“This function is defined as the capacity of the wetland to export dissolved and particulate organic carbon, which may be vitally important to downstream aquatic systems.”).

⁴⁶⁷ Smith and Klimas (2002) at 52.

⁴⁶⁸ *Id.* at 47-67 (detailing each distinct wetland function).

⁴⁶⁹ Clean Water Act 404(c) Final Determination Appx. 8 at 2. This requirement is particularly important in light of the National Research Council’s finding that “wetland area and particularly wetland functions were not being replaced by compensatory mitigation projects.” Clean Water Act 404(c) Final Determination Appx 8 at 5.

⁴⁷⁰ DSEIS F-5 (Wetlands) at Table 80; The term “AAFCUs” stands for “Average Annual Functional Capacity Units.”

The DSEIS then asserts that it can offset that composite number with 2,405 acres of reforestation.⁴⁷¹ But this generic analysis obscures a glaring mismatch between the Proposed Plan's impacts on certain wetland functions and the proposed reforestation, which does not mitigate those lost functions.

As shown by the Corps' own data and confirmed by EPA in the veto, the Yazoo Pumps significantly degrade three hydrologically-driven wetland functions: Export Organic Carbon, Physical Removal of Elements and Compounds, and Biological Removal of Elements and Compounds.⁴⁷² But the proposed reforestation provides almost no compensation for these lost functions⁴⁷³—a clear discrepancy that exposes the flaws in the DSEIS analysis and the inadequacies in the proposed mitigation.⁴⁷⁴ See Section F.1 of these comments for additional information.

In fact, data provided in the DSEIS exposes the shortcomings in the proposed reforestation. According to the data, 2,405 acres of reforestation would generate 813 functional units of organic carbon export.⁴⁷⁵ The Proposed Plan, however, would eliminate 3,588 functional units of organic carbon export.⁴⁷⁶ To offset the loss of this critical function, the DSEIS would have to provide at least 10,641 acres of reforestation, over four times the amount proposed in the DSEIS.⁴⁷⁷

Second, the DSEIS relies on an internally inconsistent analysis to avoid its obligation to offset the Proposed Plan's significant impacts on fish spawning and rearing habitat.⁴⁷⁸ The DSEIS states that the Proposed Plan would eliminate 2,838 and 3,232 average annual habitat units (AAHUs) for spawning and rearing, respectively.⁴⁷⁹ The DSEIS then estimates that the reforestation of one acre of agricultural land would generate 0.71 AAHUs, assuming "full functional value" for that restored habitat.⁴⁸⁰ Accordingly, the DSEIS concludes that 4,553 acres of reforestation are required to "fully mitigate" the Proposed Plan's impacts to rearing habitat (which are significantly underestimated).⁴⁸¹

The DSEIS attempts to escape that obligation, however, through an "internally inconsistent" and self-serving analysis, which "used discounted habitat quantity values for habitat loss, but not for habitat

Id. at 2.

⁴⁷¹ *Id.* at 35.

⁴⁷² Tables 70-79 document the severe declines in export organic carbon, physical removal of elements and compounds, and biological removal of elements and compounds due to the loss of backwater flooding. DSEIS F-5 (Wetlands) at Tables 70-79; *see also* Clean Water Act 404(c) Final Determination Appx. 8 at 4 ("the functions of Organic Carbon Export, Biological Removal of Elements and Compounds, and Physical Removal of Elements and Compounds show a significant impact as a result of the project").

⁴⁷³ *See id.* at Table 80. The mitigation is almost exclusively limited to compensating for the detain floodwater, detain precipitation, cycle nutrients, and the maintain plant communities functions.

⁴⁷⁴ *See* *Env'tl. Def. v. U.S. Army Corps of Engineers*, 515 F. Supp. 2d 69, 84 (D.D.C. 2007) (rejecting Corps' attempt to "reduce habitat types to fungible 'habitat units'" and thereby overlook critical distinctions).

⁴⁷⁵ *Id.*

⁴⁷⁶ *See id.* Tables 70-79.

⁴⁷⁷ That estimate still fails to account for the thousands of acres of wetland impacts that Corps never considered, let alone attempted to mitigate.

⁴⁷⁸ *See* *Gulf Power Co. v. F.E.R.C.*, 983 F.2d 1095, 1101 (D.C. Cir. 1993) ("[W]hen an agency takes inconsistent positions ... it must explain its reasoning.").

⁴⁷⁹ DSEIS Appx. F-8 (Aquatic Resources) at 4

⁴⁸⁰ *Id.*

⁴⁸¹ *Id.* The DSEIS bases this number on the quantity of lost rearing habitat, which is greater than lost spawning habitat.

mitigation.”⁴⁸² The DSEIS deeply discounts the Proposed Plan’s impacts on wetlands by claiming that hypoxia had degraded all aquatic resource habitat by sixty percent. As a result, the DSEIS claims the Proposed Plan will impact only 1,703 and 1,939 habitat units for spawning and rearing, respectively.⁴⁸³ To calculate the requisite mitigation, the Corps does not apply an equivalent discount to the proposed reforestation, which would also be impacted by hypoxia under its theory. Instead, the DSEIS uses the same 0.71 figure discussed above, which represents the “AAHUs gained per acre without hypoxia.”⁴⁸⁴ This inconsistency skewed the analysis, leading the DSEIS to claim that it would only need 2,732 acres of reforestation to offset impacts, not the 4,533 acres it initially identified.⁴⁸⁵

A consistent analysis, however, reveals the severe shortfalls in the DSEIS mitigation. If the DSEIS had consistently accounted for the effects of hypoxia on both habitat lost and habitat mitigated, the acreage of reforestation required to mitigate the impacts of the project would have remained constant at 4,553 acres—the amount initially identified in the DSEIS. This is so because the effects of hypoxia apply to both sides of the equation (i.e., hypoxia reduces the value of the lost habitat as well as the value of the reforestation habitat). The DSEIS fails to apply this basic mathematical principle, and thus fails to propose sufficient mitigation to offset the Proposed Plan’s significant impacts on aquatic resources, in violation of 33 U.S.C. §2283 and the 404(b)(1) Guidelines.⁴⁸⁶

Third, the DSEIS fails to account for the risks associated with the proposed compensatory mitigation, and thereby overlooks a critical aspect of the problem. The 404(b)(1) Guidelines require the Corps to calculate the appropriate compensatory mitigation amount by taking into consideration such relevant factors as the method of compensation, the likelihood of success, differences between lost functions at the impact site and mitigation site, and the difficulty of restoring aquatic resources, to name a few.⁴⁸⁷ The Corps fails to do so. It ignores EPA’s insistence (as documented in the veto) on assigning a higher risk factor for mitigation sites that would be degraded by the Yazoo Pumps, and are thus twice as likely to fail.⁴⁸⁸ The DSEIS does not assign any risk factors for the unidentified mitigation sites either, despite the inherent risks of attempting to recreate wetland habitat without site-specific plans.⁴⁸⁹ Indeed, the Corps does not discuss compensation ratios anywhere in the DSEIS, and thereby entirely fails to consider a relevant factor under the 404(b)(1) Guidelines.

Each of these problems are then compounded by the wholesale failure of the DSEIS to include the mandatory specific and detailed mitigation plan, as discussed in detail below.

⁴⁸² *Envtl. Def. v. U.S. Army Corps of Engineers*, 515 F. Supp. 2d at 79.

⁴⁸³ *Id.* The Corps duplicated this same inconsistent analysis for spawning habitat. *Id.* As such, the errors identified here for rearing habitat apply equally to spawning habitat, underscoring the magnitude of the Corps’ error.

⁴⁸⁴ DSEIS, Appendix F-8 (Aquatic Resources) at Table 3.

⁴⁸⁵ *Id.*

⁴⁸⁶ See *Envtl. Def.*, 515 F. Supp. 2d at 83 (“The finding of full mitigation in spite of this omission was arbitrary and capricious.”).

⁴⁸⁷ See 40 C.F.R. § 230.93(f)(2).

⁴⁸⁸ *Id.* at 7 (using a risk factor of 2 “due to the high risk involved and the lack of functional lift achieved in areas of reduced flooding.”).

⁴⁸⁹ Clean Water Act 404(c) Final Determination Appx. 8 at 5; see *also* NRC report.

b. The Proposed Groundwater Wells Are Counter-Productive and Fail to Satisfy the Strict Requirements for Out-of-Kind Mitigation.

As noted above, the DSEIS also proposes installing 34 groundwater wells far outside of the project area that will operate “during the low water season.” DSEIS at 26. The purpose of these wells is to offset flood-related hypoxia—a problem that is not created by the Yazoo Pumps. According to the DSEIS:

The supplemental low flow groundwater wells will improve environmental flows in 9,321 acres of streams, directly benefiting fish, mussels, and other ecological attributes of the Yazoo Study Area. Monitoring studies have documented extensive hypoxia in the Yazoo Study Area during flood inundation, questioning the value of reforestation to fully address aquatic impacts. Therefore, the alternative mitigation method of the installation of supplemental low flow groundwater wells will address a range of other habitat impairment in the Big Sunflower-Steele Bayou drainage negatively impacting the overall fish communities and aquatic habitat through environmental flow establishment during the low water season. Re-establishing perennial flows with supplemental low flow groundwater wells is anticipated to offset high mortality of larvae and juvenile fish in the spring from hypoxia and improve survival of juveniles and adults during autumn. This approach address the overall aquatic community during all life stages and improves a total of 9,321 acres of streams by improved environmental flows.

DSEIS at 26 (emphasis added). The DSEIS also states that the wells “will only be operated during periods of low flow (generally during the fall), and will not contribute to water levels during backwater flood events.” DSEIS at 25. Because the groundwater wells are not offsetting an adverse impact created by the Yazoo Pumps, they will not mitigate for unavoidable losses to aquatic resources resulting from the Proposed Plan. See DSEIS at 21.

As importantly, the DSEIS provides no information to support a finding that these groundwater wells would not simply deplete the already severely-depleted aquifer underlying the Mississippi Alluvial Plain. The DSEIS also provides no information to suggest that any water that is pumped into stream segments far north of the project area through the groundwater wells will actually reach or benefit the streams within the Yazoo Pumps project area to the extent claimed. Since the groundwater wells will be installed “in areas primarily utilized for agricultural production” some or all of the added water could easily (and legally) be diverted for irrigation, to supplement water supplies in catfish or other farm ponds, or for other purposes.⁴⁹⁰ Notably, as discussed below, the groundwater wells could themselves cause significant adverse impacts.

The Corps' regulations set a high bar for out-of-kind mitigation because it does not, by definition, replace the same structural and functional resources impacted by a project.⁴⁹¹ The Corps must demonstrate, based on a “watershed approach,” that out-of-kind mitigation will best serve the needs of

⁴⁹⁰ Producers in the Yazoo backwater area are already “increasing surface water usage in agricultural irrigation” due to concerns about the severe overdraft of the aquifer. See Gao (2019) at 2. This substitution is also cheaper as “irrigation with surface water resources can greatly reduce pumping cost.” *Id.* There is thus a significant risk that producers would divert any supplemental flows created by the groundwater wells to irrigate their crops, thereby depriving downstream reaches of any environmental benefit.

⁴⁹¹ 40 C.F.R. § 293.92 (“*Out-of-kind* means a resource of a different structural and functional type from the impacted resource.”).

the watershed.⁴⁹² To that end, the Corps must consider available “watershed plans” to assess the viability of the out-of-kind mitigation.⁴⁹³ The Corps must also demonstrate that the out-of-kind mitigation measures satisfy the other requirements of the 404(b)(1) Guidelines, as outlined above. The DSEIS, however, simply disregards these substantive requirements. As a result, it relies on a counter-productive proposal to install 34 groundwater wells that has already been rejected due to its unacceptable impacts. The DSEIS also relies on pure conjecture to claim mitigation credits that are unrealistic, if not entirely illusory.

As a threshold matter, the DSEIS ignores an available watershed plan that rejected an analogous groundwater well proposal due to the unacceptable adverse impacts on the watershed. In 1998, the U.S. Department of Agriculture (USDA) developed the Mississippi Delta Comprehensive Multipurpose Water Resource Plan to evaluate various proposal to restore baseflows in the Sunflower River watershed.⁴⁹⁴ A copy of this plan is provided at Attachment K to these comments. The Comprehensive Plan documents the adverse effects of excessive agricultural pumping, which has severely depleted the Mississippi River Alluvial Aquifer and created an underground cone of depression that captures baseflows in rivers and streams throughout the Yazoo River Basin.⁴⁹⁵ As a result, baseflows flows along the Sunflower River have declined precipitously over the past 70 years, leading to low flow conditions.⁴⁹⁶ Accordingly, USDA and a coalition of local partners carefully studied various proposals to augment the declining baseflows in the Sunflower River watershed.⁴⁹⁷

The Comprehensive Plan decisively rejected a proposal to supplement surface flows in the Big Sunflower River with groundwater wells located more than one-mile away from the Mississippi River levee. As explained in the Plan, additional groundwater pumping would further deplete the aquifer and capture even more baseflows from streams and rivers.⁴⁹⁸ This counter-productive result is particularly acute for wells located more than one mile away from the Mississippi River. As the Comprehensive Plan found:

Well fields located within approximately one mile of the Mississippi River levee are recharged directly by the Mississippi River and should not cause declines in the Alluvial Aquifer. Work done by MSDEQ indicates that the river does not directly influence wells at distances greater than about 1 mile from the levee.⁴⁹⁹

⁴⁹² *Id.* § 293.93(e)(2).

⁴⁹³ *Id.* at § 293.93(c)(1) (“Where a watershed plan is available, the district engineer will determine whether the plan is appropriate for use in the watershed approach for compensatory mitigation.”).

⁴⁹⁴ USDA, Natural Resource Conservation Service, Mississippi Delta Comprehensive Multipurpose Water Resource Plan [hereinafter Comprehensive Plan, provided as Attachment K], Exec. Summary; *see also id.* Chapter 3. By definition, the USDA’s Comprehensive Plan constitutes a watershed plan within the meaning of the 404(b)(1) Guidelines. *See* 40 C.F.R. § 293.92 (“*Watershed plan* means a plan developed by federal, tribal, state, and/or local government agencies or appropriate non-governmental organizations, in consultation with relevant stakeholders, for the specific goal of aquatic resource restoration, establishment, enhancement, and preservation.”).

⁴⁹⁵ Comprehensive Plan, Intro; *see also* Paul M. Barlow, Streamflow Depletion by Wells—Understanding and Managing the Effects of Groundwater Pumping on Streamflow, U.S. Geologic Survey Circular 1376 (2012) [hereinafter Barlow 2012]. A copy of Barlow 2012 is provided at Attachment L to these comments.

⁴⁹⁶ DSEIS Appx. K at 2-3; DSEIS Appx. F-8 (Aquatic Resources) at 13; DSEIS Appx. I (Water Quality) at 51.

⁴⁹⁷ Comprehensive Report, Intro.

⁴⁹⁸ Comprehensive Report Chapter 2, at 7; *see also* Barlow (2012).

⁴⁹⁹ Comprehensive Report Chapter 2, at 7.

Accordingly, the USDA decisively ruled out any additional groundwater wells more than a mile away from the levee, explaining that “[t]he potential Alluvial Aquifer drawdown that would occur with using wells too far from the River could make this an unacceptable option.”⁵⁰⁰

The Corps entirely failed to consider this watershed plan, and thus overlooked the unacceptable adverse impacts of the proposed groundwater wells. Instead, in one conclusory and counterfactual sentence, the Corps asserts that “the wells are within 30,000 feet of the Mississippi River and have access to its abundant water supply.”⁵⁰¹ This unsupported statement is directly contradicted by the USDA’s Comprehensive Plan, which found that the River “does not directly influence wells at a distance greater than about 1 mile from the levee.” As the Corps is aware, there are 5280 feet in a mile which means the DSEIS is proposing locating groundwater wells up to 5.7 miles away from the River in areas where they would further drawdown the aquifer.

Monitoring data also contradicts the Corps’ fact-free assumption that the proposed groundwater wells would not deplete the aquifer. For example, the Corps proposes to locate a series of groundwater wells northeast of Beluah, Mississippi along Labayan and Lane Bayou.⁵⁰² A USGS groundwater monitoring well near these sites shows a consistent downward trend in groundwater levels,⁵⁰³ proving that agricultural pumping is the major influence in this area that far exceeds the River’s influence. Accordingly, additional pumping would worsen the overdraft problem and further deplete baseflows—an unacceptable impact, as explained by the USDA’s Comprehensive Plan.⁵⁰⁴ The same is true for the proposed groundwater wells at Browns, Straights, and Lower Stokes Bayou,⁵⁰⁵ all of which are near a USGS monitoring well showing significant declines in groundwater levels.⁵⁰⁶ The Corps, however, entirely failed to “examine the relevant data and articulate a satisfactory explanation for its action,” rendering its mitigation analysis arbitrary and capricious.⁵⁰⁷

As a result of this error, the DSEIS also overlooked the authority of the Mississippi Department of Environmental Quality (MDEQ) to shut down the groundwater wells due to their adverse impacts on the alluvial aquifer. In the DSEIS, the Corps acknowledges that it would obtain necessary permits from MDEQ before constructing the groundwater wells.⁵⁰⁸ But the DSEIS fails to recognize MDEQ’s authority to prohibit any groundwater pumping at these sites during low-flow conditions—precisely when the Corps would operate the wells.⁵⁰⁹ If MDEQ prohibited pumping, the proposed groundwater wells would

⁵⁰⁰ Comprehensive Report Chapter 3 at 21.

⁵⁰¹ DEIS Appx. K at 4; *see also* DSEIS Appx. F-8 (Aquatic Resources) at 16 (explaining that the groundwater wells would be “primarily along Highway 1 near Clarksdale (Coahoma County) south to Arcola (Washington County)”); *see also* DSEIS Appx I (Water Quality) at Figs. 4-3, 4-4, and 4-5.

⁵⁰² *See* DSEIS Appx. K at Fig 4-1.

⁵⁰³ USGS Groundwater Watch, Field Groundwater Level Measurements for Site Numbers 334957090564301 - 011F0020 BOLIVAR & 334106090590902 - 011N0002 BOLIVAR, provided as Attachment M at 1-2.

⁵⁰⁴ *See* Barlow 2012.

⁵⁰⁵ *See* DEIS Appx. K at Fig 4-1.

⁵⁰⁶ USGS Groundwater Watch at 3-4, provided at Attachment M to these comments.

⁵⁰⁷ *See* Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983).

⁵⁰⁸ DSEIS at 25.

⁵⁰⁹ *See* Report Chapter 3 at 17 (“a MS DEQ defined minimum flow for the interior Delta rivers and streams . . . could result in the State of Mississippi prohibiting all groundwater withdrawals from the Aquifer to allow these groundwater levels to rise sufficiently to restore baseflows.”).

provide none of the supplemental flows claimed in the DSEIS, rendering this mitigation measure entirely illusory.⁵¹⁰

The DSEIS also relies on a series of unrealistic assumptions to overinflate the benefits of the groundwater wells. According to the DSEIS, the groundwater wells would discharge up to 5 cfs of water into headwater streams during very dry conditions.⁵¹¹ As such, there is a significant risk that some or all of these “supplemental” flows would be lost due to transmission—one of “the major paths of water loss of surface water” in the Big Sunflower River basin.⁵¹² This is a particularly acute problem given that the targeted headwater streams are dry, isolated from the lower reaches due to zero flow conditions, and thus would soak up the supplemental flows.⁵¹³ Yet, the Corps did not account for any transmission losses in its mitigation analysis and instead assumed the supplemental flows would reconnect 654 miles of streams.⁵¹⁴ This unsupported and unrealistic assumption highlights the flaws in the Corps’ analysis.⁵¹⁵

In addition, the DSEIS disregards the fact that the Yazoo Pumps would exacerbate low-flow conditions in the Yazoo Backwater Area and thereby undercut any benefits provided by the groundwater wells. As explained by EPA, the Yazoo Pumps would reduce the ability of floodwaters to recharge the aquifer to levels that would sustain baseflows.⁵¹⁶ By interfering with this recharge process, the pumps would, in turn, “reduce the amount of water that returns to area streams as baseflow.”⁵¹⁷ That decline in baseflows would counteract any “supplemental” flows created by the groundwater wells, thereby reducing or eliminating the purported mitigation credits claimed by the Corps. The DSEIS, however, fails to account for this serious problem. As a result, the Corps has no basis for concluding the proposed mitigation measures provide the requisite benefits to mitigate the significant, unacceptable impacts of the Proposed Plan.⁵¹⁸

Furthermore, the DSEIS undermines the purported mitigation measures by inexplicably modifying the operating plan for the Steel Bayou Flood Control Structure to eliminate benefits for aquatic habitat. In 2007, the Corps proposed to increase water levels at the Steel Bayou Flood Control Structure during low

⁵¹⁰ The Corps also fails to explain why its proposed groundwater wells would succeed when other “augmentation efforts has been hampered since the inception minimizing the full potential of the project on the basin.” DSEIS Appx. I (Water Quality) at 52. In fact, the Yazoo Mississippi Delta Joint Water Management District implemented a 50 cfs flow-augmentation project, but has provided almost no increases in minimum flows along the Big Sunflower River over the past 5 years. *Id.* (Fig. 4-2).

⁵¹¹ DSEIS at 79.

⁵¹² Fei Gao, *Simulating Potential Weekly Stream and Pond Water Available for Irrigation in the Big Sunflower River Watershed of the Mississippi Delta*, Water: June 2019, at 2 [hereinafter Gao (2019)], provided as Attachment N. See also Olufemi Abimbola, *Influence of Watershed Characteristics on Streambed Hydraulic Conductivity Across Multiple Stream Orders*, Scientific Reports (2020), provided as Attachment O. As explained in Gao 2019, Stream transmission is equivalent to the effective hydraulic conductivity of the channel alluvium multiplied by the flow travel time, the wetted perimeter (m), and the channel length (km). Gao (2019) at 5.

⁵¹³ DSEIS at Appx. F-8 (Aquatic Resources) at 15.

⁵¹⁴ See, e.g., DSEIS Appx. F-8 (Aquatic Resources) at 17 (calculating increased flows at Merigold without any deduction for losses due to transmission); see also *id.* at Table 14.

⁵¹⁵ See *W. Virginia v. E.P.A.*, 362 F.3d 861, 867 (D.C. Cir. 2004) (Agency’s “failure to explain why it made that choice was error, particularly in the face of contrary real-world data.”).

⁵¹⁶ Clean Water Act 404(c) Final Determination at 51.

⁵¹⁷ *Id.*

⁵¹⁸ See *Env’t Def.*, 515 F. Supp. at 83 (“The finding of full mitigation in spite of this omission was arbitrary and capricious.”).

flow conditions so as to create additional aquatic habitat.⁵¹⁹ The DSEIS, however, reverses course and proposes to eliminate this component of the 2007 plan. As a result, the Proposed Plan further reduces aquatic habitat—another perverse result that counteracts any benefits of the proposed groundwater wells. This unexplained reversal was arbitrary and capricious.⁵²⁰ It also plainly violates the 404(b)(1) Guidelines, which require the Corps to take *all* appropriate and practicable steps to minimize and compensate for the project’s adverse impacts on the aquatic ecosystem.⁵²¹ Instead of a comprehensive approach, the Corps has taken inconsistent approaches that are at cross-purposes with its obligation to minimize and compensate for the significant, unacceptable adverse impacts of the project.

The Corps also relies on an inconsistent and irrational analysis to arbitrarily overstate the benefits of the groundwater wells. First, the DSEIS claims that groundwater wells would provide supplemental flows that increase “minimum water depth” and “re-connect large areas of backwaters otherwise isolated during non-flowing conditions.”⁵²² During these low flow events, the wetted width of the Big Sunflower River narrows down to a minimum of 23 feet.⁵²³ Instead of using that minimum width to calculate the purported benefit to aquatic habitat during minimum flows, however, the DSEIS uses the far larger mean width of 167 feet, even though it does not coincide with the purportedly problematic non-flowing events. As a result of this mismatch, the DSEIS overinflates the purported benefits by a factor of almost 8.⁵²⁴

Second, the DSEIS uses an irrational formula to claim habitat benefits that simply do not exist in the real world. For example, the DSEIS calculates the increase in aquatic habitat by multiplying the purported increase in wetted acres due to the groundwater wells by 0.46—the average aquatic habitat value for *reforested lands*.⁵²⁵ But the groundwater wells will increase stream flows in headwater streams that are located alongside agricultural fields in the upper reaches of the Yazoo basin.⁵²⁶ The habitat value of these agricultural lands is far less (0.2) than the amount used by the Corps in its analysis.⁵²⁷ This mismatch also renders the results arbitrary and capricious.⁵²⁸

Third, the DSEIS fails to demonstrate that the proposed groundwater wells would have a “greater likelihood” of offsetting the pumps’ significant adverse impacts to fish and spawning habitat, as compared to on-site reforestation.⁵²⁹ As explained above, the Proposed Plan would eliminate thousands of acres of short hydroperiod wetlands that are critical to fish spawning and rearing. Instead of replacing that unacceptable loss of critical wetlands, however, the DSEIS attempts to focus on a

⁵¹⁹ 2007 Final SEIS Appx. 11 (Aquatics) at 16.

⁵²⁰ See *Fox Television*, 556 U.S. at 516 (An agency must give “a reasoned explanation ... for disregarding facts and circumstances that underlay or were engendered by the prior policy.”).

⁵²¹ 40 C.F.R. § 230.10(d).

⁵²² DSEIS at Appx. F-8 (Aquatic Resources) at 15.

⁵²³ *Id.* at 14 (Table 13).

⁵²⁴ *Id.*

⁵²⁵ See DSEIS Appx. F-8 (Aquatics) at Table 14 (multiplying “Acres” by “With Flow AAHU (0.46)”); 2007 SEIS Appx. 10 at 16 (“an Average Annual Habitat Unit (AAHU) gained per acre of reforested land was determined for spawning (0.46) and rearing (0.46)”).

⁵²⁶ See, e.g., DSEIS Appx. I (Water Quality) at Figure 4-4 and 4-5 (depicting headwater tributaries alongside cleared agricultural lands).

⁵²⁷ SEIS Appx. 11 (Aquatics) at 36.

⁵²⁸ See *Appalachian Power Co. v. E.P.A.*, 249 F.3d 1032, 1053 (D.C. Cir. 2001) (analytical assumptions must have a “rational relationship” to the real world).

⁵²⁹ 40 C.F.R. 230.93(b)(6).

different problem regarding hypoxia in the backwater area. But addressing that problem requires the same solution. As explained in the DSEIS, hypoxia occurs at different gradients in the water column. Fish thus depend on unobstructed access to backwater habitat—such as reforested short hydroperiod wetlands—to “escape from hypoxic waters.”⁵³⁰ The Corps should be creating even more wetland habitat through reforestation, not less as it illogically proposes in the DSEIS.

Finally, the DSEIS fails to demonstrate that increasing low flows in the fall would offset the losses of spawning habitat in the Spring. At best, the DSEIS vaguely asserts that increasing flows “may” offset hypoxia in the spring.⁵³¹ The mitigation is thus admittedly uncertain to provide the purported environmental benefit—a risk that must be factored into the calculation of mitigation credits but was not.⁵³² Furthermore, the Corps provides no performance standards, monitoring requirements, or adaptive management measures for the groundwater wells to ensure any mitigation benefits or avoid adverse consequences.⁵³³

3. The DSEIS Does Not Include the Required Detailed Mitigation Plan

The DSEIS does not include a legally adequate mitigation plan. To the contrary, the DSEIS provides nothing more than a conceptual framework upon which a future mitigation plan may, or may not, be based.

Mitigation plans for water resources projects constructed by the Corps—including the mitigation plan for the Proposed Plan—must include:

- (1) A detailed description of the type, amount, and characteristics of the habitat being restored, a description of the physical actions to be taken to carry out the restoration, and the functions and values that will be achieved;
- (2) A detailed description of the ecological success criteria, based on replacement of lost functions and values, that will be evaluated and used to determine mitigation success;
- (3) A description of the lands and interest in lands to be acquired for mitigation, and the basis for determining that those lands will be available;
- (4) A mitigation monitoring plan that includes the cost and duration of monitoring, and identifies the entities responsible for monitoring if it is practicable to do so (if the responsible entity is not identified in the monitoring plan it must be identified in the project partnership agreement that is required for all Corps projects). Corps mitigation must be monitored until the monitoring demonstrates that the ecological success criteria established in the mitigation plan have been met; and
- (5) A contingency plan for taking corrective action in cases where monitoring shows that mitigation is not achieving ecological success as defined in the plan.⁵³⁴

Mitigation plans for water resources projects constructed by the Corps—including the mitigation plan for the Proposed Plan—must also comply with the Clean Water Act mitigation requirements, which

⁵³⁰ DSEIS APPX. F-8 (Aquatic Resources) at 8.

⁵³¹ DSEIS Appx. F-8 (Aquatics) at 18.

⁵³² 40 C.F.R. § 230.93(f)(2).

⁵³³ See 40 C.F.R. 230.93(f)(7), (8), (12).

⁵³⁴ 33 U.S.C. § 2283(d).

require that a mitigation plan contain a level of detail “commensurate with the scale and scope of the impacts”⁵³⁵ and include, among other things:

- (1) “A description of the factors considered during the site selection process. This should include consideration of watershed needs, onsite alternatives where applicable, and the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the compensatory mitigation project site.”⁵³⁶
- (2) “A description of the ecological characteristics of the proposed compensatory mitigation project site This may include descriptions of historic and existing plant communities, historic and existing hydrology, soil conditions, a map showing the locations of the impact and mitigation site(s) or the geographic coordinates for those site(s), and other site characteristics appropriate to the type of resource proposed as compensation. The baseline information should also include a delineation of waters of the United States on the proposed compensatory mitigation project site.”⁵³⁷
- (3) “Detailed written specifications and work descriptions for the compensatory mitigation project, including, but not limited to, the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water, including connections to existing waters and uplands; methods for establishing the desired plant community; plans to control invasive plant species; the proposed grading plan, including elevations and slopes of the substrate; soil management; and erosion control measures.”⁵³⁸
- (4) “A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.”⁵³⁹
- (5) “Ecologically-based standards that will be used to determine whether the compensatory mitigation project is achieving its objectives.”⁵⁴⁰ These performance standards must be objective and verifiable and based on the best available science that can be measured or assessed in a practicable manner.⁵⁴¹
- (6) “A description of parameters to be monitored in order to determine if the compensatory mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting on monitoring results to the district engineer must be included.”⁵⁴² The mitigation plan must provide for a monitoring period that is sufficient to demonstrate that the compensatory mitigation project has met performance standards, but not less than five years. A longer monitoring period must be required for aquatic resources with slow development rates (e.g., forested wetlands).⁵⁴³
- (7) “A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.”⁵⁴⁴

⁵³⁵ 33 C.F.R. 332.4(c).

⁵³⁶ 33 C.F.R. § 332.4(c)(3).

⁵³⁷ 33 C.F.R. § 332.4(c)(5).

⁵³⁸ 33 C.F.R. § 332.4(c)(7).

⁵³⁹ 33 C.F.R. § 332.4(c)(8).

⁵⁴⁰ 33 C.F.R. § 332.4(c)(9).

⁵⁴¹ 33 C.F.R. § 332.5(a) and (b).

⁵⁴² 33 C.F.R. § 332.4(c)(10).

⁵⁴³ 33 C.F.R. § 332.6.

⁵⁴⁴ 33 C.F.R. § 332.4(c)(11).

- (8) “A management strategy to address unforeseen changes in site conditions or other components of the compensatory mitigation project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success.”⁵⁴⁵
- (9) “A description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project will be successfully completed, in accordance with its performance standards.”⁵⁴⁶
- (10) A clear statement of the compensatory mitigation requirements, including special conditions that “must be enforceable.” Among other things, the “special conditions must clearly indicate the party or parties responsible for the implementation, performance, and longterm management of the compensatory mitigation project.”⁵⁴⁷
- (11) “The real estate instrument, management plan, or other mechanism providing long-term protection of the compensatory mitigation site must, to the extent appropriate and practicable, prohibit incompatible uses (e.g., clear cutting or mineral extraction) that might otherwise jeopardize the objectives of the compensatory mitigation project.”⁵⁴⁸

However, in direct violation of 33 U.S.C. 2283 and the Clean Water Act, the DSEIS provides none of this information but instead merely provides a conceptual mitigation plan that may, or may not, be implemented. For example:

- The DSEIS does not identify specific mitigation sites. To the contrary, it states explicitly that “site-specific mitigation tracts have not been identified” and that “decisions on the implementation of mitigation measures” and “a site-specific, detailed mitigation plan” will not be made until those sites are selected.⁵⁴⁹ This wait-and-see approach to mitigation is expressly prohibited because it is destined to fail.⁵⁵⁰
- The DSEIS does not include the mandatory details regarding the type, amount, and characteristics of the habitat being restored, a description of the physical actions to be taken to carry out the restoration, the specific functions and values that will be achieved, or the detailed ecological success criteria that will apply to those sites. To the contrary, the DSEIS clearly states that such information will not be developed until mitigation lands are actually acquired.⁵⁵¹
- The DSEIS does not address the deficiencies in its monitoring requirements documented by EPA in the veto. The veto faults the Corps for relying on “visual inspections” to monitor the

⁵⁴⁵ 33 C.F.R. § 332.4(c)(12).

⁵⁴⁶ 33 C.F.R. § 332.4(c)(13).

⁵⁴⁷ 33 C.F.R. § 332.3(k) and (l).

⁵⁴⁸ 33 C.F.R. § 332.7(a).

⁵⁴⁹ DSEIS, Appendix J (Mitigation) at 1.

⁵⁵⁰ 40 C.F.R. 230.93.

⁵⁵¹ DSEIS, Appendix J (Mitigation) at 7. Simply stating that the mitigation will be counted as successful if it replaces the lost habitat units identified in the DSEIS, as the DSEIS has done in the conceptual mitigation plan, does not constitute an ecological performance standard as it does nothing to do ensure the adequacy of the mitigation. Moreover, as discussed throughout these comments, the DSEIS assessment of lost functions is fatally flawed and even full replacement of these identified functional values would not offset the significant and unacceptable adverse impacts of the project.

proposed reforestation, explaining that such a superficial approach was “one of many weaknesses in the mitigation plan, which make it impossible to conclude that impacts will be reduced permanently below the threshold of significant degradation.”⁵⁵² Yet, the DSEIS still commits only to “visually inspecting” vegetation in the mitigation plan—the same inadequate approach rejected by EPA.⁵⁵³ In fact, the Corps makes a concerted effort to avoid any additional monitoring obligations, a tactic that simply underscores its failure to consider EPA’s advice or comply with the 404(b)(1) Guidelines.⁵⁵⁴

- The DSEIS does not provide the mandatory basis for determining that the specific mitigation sites will be available. Instead, the DSEIS simply asserts without any evidence that it is anticipated that the Corps will be able to obtain certain types of land for mitigation.⁵⁵⁵ The DSEIS acknowledges that it has not made any inquires to landowners regarding their willingness to sell lands to the Corps for mitigation. To the contrary, the DSEIS states that landowners will not be queried regarding their interest in selling lands to the Corps for mitigation until a project decision is made.⁵⁵⁶
- The DSEIS acknowledges that it does not include the required contingency plan. Instead the DSEIS states that one will be developed if required.⁵⁵⁷

I. The DSEIS Has Not Undergone the Required Independent External Peer Review

The DSEIS must be reviewed under the Independent External Peer Review (IEPR) process established by the Water Resources Development Act of 2007,⁵⁵⁸ and that required IEPR should already be very close to completion. However, the Conservation Organizations can find no reference to an IEPR being planned or carried out for the DSEIS. We strongly urge the Corps to immediately initiate the IEPR process and contract with the National Academies to carry out the IEPR for the DSEIS.

The DSEIS clearly triggers mandatory IEPR under this provision as it evaluates a civil works project that will cost well over \$200 million and that is unquestionably highly controversial.⁵⁵⁹ The project clearly satisfies both of the IEPR controversy triggers as: “there is a significant public dispute as to the size, nature, or effects of the project” and “there is a significant public dispute as to the economic or

⁵⁵² Clean Water Act 404(c) Final Determination at 62.

⁵⁵³ DSEIS Appx. J (Mitigation) at 14.

⁵⁵⁴ For example, the Corps avoids hydrology monitoring and merely suggests that it “could” do so. DSEIS Appx. J (Mitigation) at 14. This is a transparent attempt to avoid the 404(b)(1) Guidelines.

⁵⁵⁵ DSEIS, Appendix J (Mitigation) at 5, 6 (according to the mitigation plan, “it is anticipated that agriculture land in the batture and lands subjected to frequent backwater flooding would have a high likelihood of acquisition”; “it is anticipated that land subjected to frequent flooding would have a high likelihood of acquisition”; and “it was estimated that 70 percent of” lands at or below the post-project 14-day consecutive inundation zone “could be acquired for compensatory mitigation”).

⁵⁵⁶ DSEIS, Appendix J (Mitigation) at 7.

⁵⁵⁷ DSEIS, Appendix J (Mitigation) at 5 (“In the event that mitigation lands cannot be identified and acquired in the following mitigation zones, a contingency plan would be established and submitted to the inter-agency team for review and comment.”).

⁵⁵⁸ 33 USC 2343.

⁵⁵⁹ 33 USC 2343(a). The Yazoo Pumps was projected to cost well over the \$200 million mandatory trigger for IEPR in 2007; inflation alone will have greatly increased the project’s cost.

environmental costs or benefits of the project.”⁵⁶⁰ The controversy and significant public disputes surrounding the environmental costs of the Proposed Plan are documented throughout these comments.

As the Corps is well aware, “in all cases” the IEPR review must be carried out concurrently with the project study and must be completed “not more than 60 days after the last day of the public comment period for the draft project study,” unless the Chief of Engineers determines that more time is necessary.⁵⁶¹ The Corps provides IEPR plans online, and is required by law to provide the public with information on the timing of the IEPR, the entity that has the contract for the IEPR review, and the names and qualifications of the IEPR panel members.⁵⁶²

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⁵⁶⁰ 33 USC 2343 (a)(4).
⁵⁶¹ 33 USC 2343(b) and 2343(d).
⁵⁶² 33 USC 2343(c).

Conclusion

The Conservation Organizations staunchly oppose the Proposed Plan which is clearly prohibited by the 2008 Clean Water Act § 404(c) Final Determination and the Clean Water Act 404(b)(1) Guidelines. The Conservation Organizations urge the Corps to abandon the Proposed Plan and the deeply flawed DSEIS, and instead focus on opportunities for providing meaningful, sustainable, and immediate benefits to the communities in the Yazoo Backwater Area while restoring this ecologically critical region.

Please contact Olivia Dorothy with American Rivers (odorothy@americanrivers.org, 217-390-3658) or Jill Mastrototaro with Audubon Mississippi (Jill.Mastrototaro@audubon.org, 504-481-3659) if you have any questions or would like additional information.

Respectfully submitted,



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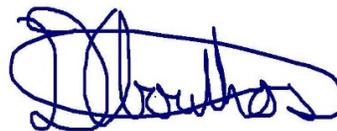
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