

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

Scoping Comments in Response to
Notice of Intent to Prepare Supplemental Environmental Impact Statement
for the Yazoo Area Pump Project, 85 Fed. Reg. 21218 (April 16, 2020)

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Delivered by Hand and by Email to the Army Corps of Engineers: YazooBackwater@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 scoping comments in response to the Notice of Intent to Prepare Supplemental Environmental Impact Statement for the Yazoo Area Pump Project, dated April 16, 2020 (85 Fed. Reg. 21218).¹

The Conservation Organizations call on the U.S. Army Corps of Engineers (Corps) to abandon the Proposed Action, a falsely labeled “new project proposal” to build the Yazoo Pumps. That Proposed Action is prohibited by the 2008 Clean Water Act § 404(c) Final Determination and may not be—and should not be—constructed. The Corps should instead initiate a fundamentally new planning process to examine opportunities for providing meaningful, sustainable, and immediate benefits to the communities in the Yazoo Backwater Area while restoring this ecologically critical region.

General Comments

The Notice of Intent makes clear that the sole purpose of the supplemental environmental impact statement (SEIS) is to attempt to justify construction of the environmentally devastating Yazoo Backwater Pumps project—a project prohibited by the Yazoo Pumps 2008 Clean Water Act § 404(c) Final Determination.² The Corps’ attempt to build an already-vetoed project is as unprecedented as it is unacceptable. Tragically, this effort also dangles a false promise of hope to the people of the Yazoo Backwater Area by perpetuating a demonstrably untrue narrative that the Yazoo Pumps are designed to, and somehow magically will, protect communities from flooding.

As fully documented in the record that supports the 2008 Clean Water Act Final Determination, the Yazoo Pumps are an agricultural drainage project designed to allow increased agricultural production on marginal lands that have always flooded. More than 80% of the project’s benefits come from agricultural intensification that, at most, will benefit a handful of industrial sized farms that already receive massive farm subsidy payments.

The Yazoo Pumps are not designed to protect people, homes, or communities—and they will not do so. Indeed, a recent Corps analysis found that even under the best-case scenario, two-thirds of the Yazoo Backwater Area—347,000 acres during the flood of 2019—would still flood with the Yazoo Pumps in place. The Corps’ own new partial assessment of wetland impacts shows that, at the absolute minimum, the Yazoo Pumps will destroy tens of thousands of acres of wetlands that can store billions of gallons of floodwaters. In the process, the Pumps will discharge 6.2 million gallons of water per minute into the Yazoo River during flood events, significantly increasing flood risks for downstream communities.

Wetlands that will be drained and damaged by the Yazoo Pumps are “some of the richest wetland and aquatic resources in the nation,” and include “substantial tracts of highly productive bottomland hardwood forests.”³ These ecologically rich wetlands provide vital habitat in the heart of the Mississippi

¹ Some of the Conservation Organizations will also be submitting companion comments that supplement the information made in this letter and have joined additional, less technical comment letters.

² U.S. Environmental Protection Agency, Final Determination of The U.S. Environmental Protection Agency’s Assistant Administrator for Water Pursuant to Section 404(C) of the Clean Water Act Concerning the Proposed Yazoo Backwater Area Pumps Project, Issaquena County, Mississippi (August 31, 2008) (referred to hereafter as the “2008 Clean Water Act Final Determination”).

³ 2008 Clean Water Act Final Determination at i to iii.

River flyway, supporting more than 450 species of birds, fish and wildlife. Many thousands of acres of these 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 for people and wildlife. The wetlands that will be drained also “protect and improve water quality by removing and retaining pollutants, temporarily store surface water, maintain stream flows, and support aquatic food webs by processing and exporting significant amounts of organic carbon,”⁴ among many other benefits.

In 2008, the George W. Bush administration used its Clean Water Act authority to veto the Yazoo Pumps to prevent “unacceptable damage” to many tens of thousands of acres of these hemispherically significant wetlands. The veto was based on the Corps’ own determination that the project would drain at least 67,000 acres of wetlands; however, EPA and an independent hydrologic review found that the Pumps would likely damage up to 200,000 acres of ecologically significant wetlands—an area larger than all five boroughs of New York City.

Despite this longstanding veto, and restoration and protection of tens of thousands of additional acres of wetlands in the Yazoo Backwater Area since the veto was issued, the Notice of Intent explicitly rejects evaluation of any alternative other than the Proposed Action—a project that is virtually identical to the project vetoed in 2008 and that clearly falls under the explicit terms of the veto. The 2008 Clean Water Act Final Determination was upheld the U.S. District Court for the Northern District of Mississippi and the U.S. Court of Appeals for the Fifth Circuit.

The Corps’ refusal to examine other alternatives violates the National Environmental Policy Act (NEPA), several the Water Resources Development Act provisions, the Clean Water Act, and the Endangered Species Act. NEPA requires a rigorous exploration and objective evaluation of “all reasonable alternatives.”⁵ Several Water Resources Development Acts require the Corps to consider non-structural alternatives and practicable “natural infrastructure alternatives.”⁶ The Water Resources Development Act of 2007 also directs that all water resources projects are to reflect national priorities by “protecting and restoring the functions of natural systems.”⁷ The Clean Water Act 404(b)(1) Guidelines prohibit the Corps from approving a civils works project alternative unless the Corps demonstrates that the alternative is the least environmentally damaging practicable alternative,⁸ which can only be done by examining a full range of reasonable alternatives.

The Conservation Organizations urge the Corps to abandon its misguided efforts to build the destructive and dangerous Yazoo Pumps, and instead initiate a fundamentally new planning process to examine opportunities for providing meaningful, sustainable, and immediate flood risk reduction benefits to affected communities in the Yazoo Backwater Area while restoring this ecologically critical region—including the measures outlined in the proposed Resilience Alternative detailed in these scoping comments.

⁴ 2008 Clean Water Act Final Determination at i.

⁵ 40 C.F.R. § 1502.14.

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

⁷ 42 USC 1962–3.

⁸ 40 CFR 230.10(a). While the Corps does not technically issue itself a Clean Water Act 404 permit, it must satisfy the requirements of the 404(b)(1) Guidelines.

Detailed Comments

To comply with the National Environmental Policy Act (NEPA), the Clean Water Act, the Endangered Species Act, the National Water Resources Planning Policy, the civil works mitigation requirements, key planning provisions established by a number of Water Resources Development Acts, and the nation's other vital environmental laws, the Conservation Organizations call on the Corps to follow the recommendations set forth in these recommendations when preparing the SEIS.

A. The “Proposed Action” Should Be Abandoned Because it is Prohibited by the 2008 Clean Water Act 404(c) Final Determination and May Not Be Constructed

The Notice of Intent makes clear that the sole purpose of the supplemental environmental impact statement (SEIS) is to attempt to justify construction of the environmentally devastating Yazoo Backwater Pumps project—a project prohibited by the 2008 Clean Water Act Final Determination.

The 2008 Clean Water Act Final Determination was based on an extensive and detailed review and had overwhelming public support.⁹ The Final Determination concludes:

This Final Determination under section 404(c) of the CWA addresses unacceptable adverse effects on fishery areas and wildlife associated with construction and operation of the proposed Yazoo Backwater Area Pumps Project. The section 404(c) regulations define an unacceptable adverse effect as an impact on an aquatic ecosystem that is likely to result in significant degradation of municipal water supplies or significant loss of or damage to fisheries, shellfishing, or wildlife habitat or recreation areas (40 CFR 231.2(e)). Section 231.2(e) of the section 404(c) regulations states that the evaluation of the unacceptability of such impacts should consider relevant portions of the Section 404(b)(1) Guidelines. The relevant portions of the Section 404(b)(1) Guidelines in this case are their prohibition of any discharge that 1) would cause or contribute to significant degradation of the Nation's waters (40 CFR 230.10(c)) and 2) fails to adequately minimize and compensate for wetland and other aquatic resource losses (40 CFR 230.10(d)).

Based upon an independent evaluation by EPA Headquarters of the Recommended Determination and the administrative record submitted by the Regional Administrator and in full consideration of materials submitted by the project sponsor, the Corps and the Assistant Secretary of the Army for Civil Works, I have determined that the aquatic environment, which would be adversely impacted by the proposed project, contains significant fisheries and wildlife resources. According to the Corps, the Yazoo Backwater Area contains between 150,000 to 229,000 acres of wetlands, as well as an extensive network of streams, creeks, and other aquatic resources. Extensive information collected on the Yazoo Backwater Area demonstrates that it includes some of the richest wetland and aquatic resources in the Nation. These include a highly productive floodplain fishery, substantial tracts of highly productive bottomland hardwood

⁹ The 2008 Clean Water Act Final Determination garnered overwhelming support, including from: the Department of the Interior; 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.

forests that once dominated the LMRAV, and important migratory bird foraging grounds. These wetlands provide important habitat for an extensive variety of wetland dependent animal and plant species, including the federally protected Louisiana black bear and pondberry plant. In addition to serving as critical fish and wildlife habitat, project area wetlands also provide a suite of other important ecological functions. These wetlands protect and improve water quality by removing and retaining pollutants, temporarily store surface waters, maintain stream flows, and support aquatic food webs by processing and exporting significant amounts of organic carbon.

The administrative record developed in this case fully supports the conclusion that the construction and operation of the proposed project (i.e., Plan 5 of the FSEIS) and the two alternative proposals offered by the Corps in February 2008 (i.e., Plan 6 and Modified Plan 6), would dramatically alter the timing, and reduce the spatial extent, depth, frequency, and duration of time project area wetlands flood. These large-scale hydrologic alterations 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. Although not proposed to go forward, FSEIS Plans 3, 4, and 7, would also result in a dramatic alteration of the hydrologic regime in the Yazoo Backwater Area, significantly degrading the critical ecological functions provided by between approximately 28,400 and 118,400 acres of wetlands (see FSEIS Main Report, Table 17, page 1-20). In addition, EPA believes that the Corps has not adequately evaluated the degradation to critical ecological functions that the proposed project would have on 24,000 acres of wetlands outside the FSEIS wetland assessment area. EPA does not believe that impacts of this magnitude are consistent with the CWA. Further, these impacts must be viewed in the context of the significant cumulative losses across the 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.

EPA also finds that the Corps has not demonstrated that potential impacts of the Yazoo Backwater Area Project can be adequately mitigated to reduce the impacts to an acceptable level. Additionally, EPA finds that the environmental benefits suggested by the FSEIS to accrue from the project's nonstructural component have not been substantiated.

EPA also notes that the FWS, in its comments on the Proposed and Recommended Determinations, concurred with EPA Region IV's conclusion that the proposed project would result in extensive and unacceptable adverse effects on wildlife and fisheries. FWS also highlighted its concerns that the proposed project would significantly degrade the wildlife habitat provided by its four National Wildlife Refuges located within the Yazoo Backwater Area – reducing the capability of these refuges to achieve the purpose and intent for which they were congressionally established.

After evaluation of the Recommended Determination and the full administrative record, including public comments and the written documents and information provided by the project sponsor, the Corps and the Assistant Secretary of the Army for Civil Works subsequent to the Recommended Determination, I have determined that the discharge of dredged or fill material in connection with the construction of FSEIS Plans 3 through 7, and Modified Plan 6 would have an unacceptable adverse effect on fishery areas and wildlife. Based on these findings, the Final Determination prohibits, pursuant to section 404(c) of the CWA, the specification of the subject wetlands and other waters of the United States as described in the FSEIS as a disposal site for

the discharge of dredged or fill material for the purpose of construction of FSEIS Plans 3 through 7, and Modified Plan 6.

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. While this Final Determination prohibits the construction of FSEIS Plans 3 through 7, and Modified Plan 6, the data supporting this Final Determination indicates 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.¹⁰

According to the Notice of Intent:

The 2007 FSEIS evaluated a broad array of alternatives, including the No-Action alternative, nonstructural alternatives, structural alternatives, and combinations of structural and nonstructural alternatives. Reformulation will not be included in the Supplemental Environmental Impact Statement. The Supplemental Environmental Impact Statement will focus primarily on updating the 2007 FSEIS where necessary and incorporating the new, previously unavailable, scientific data to analyze the Proposed Action and compare it to the 2007 FSEIS.¹¹

Thus, the Notice of Intent plainly states that the SEIS will examine just a single alternative, which is referred to as the “Proposed Action.” The Proposed Action consists of the **same** 14,000 cubic foot per second pumping plant, running under the **same** operating plan, pumping water out of the **same** project area, and for the **same** purpose as the 2007 Final SEIS recommended plan—the exact project that was vetoed under Clean Water Act § 404(c) in 2008.¹² The Proposed Action also includes the **same** 55,000-acre voluntary reforestation component that was included in the vetoed plan. The only difference between the Proposed Action and the 2008 vetoed project is that the Proposed Action moves the physical location of the Yazoo Pumps by a few miles to the Deer Creek Site. **In short, the Proposed Action is the same project that was vetoed in 2008 and may not be constructed.**¹³ The SEIS should abandon consideration of the Proposed Action and any variation of the Yazoo Pumps.

The Conservation Organizations note that the potential “installation of well fields adjacent to the Mississippi River levee upstream of the backwater area” does not alter the fact that the Proposed Action is the same project that was vetoed in 2008, for at least the following reasons. First, the proposed well fields are fundamentally unrelated to the Yazoo Pumps. Based on the information provided in the Notice of Intent, these relief wells would be located in the far northwestern portion of the Yazoo Backwater Area and would be used to attempt to increase river flows during dry conditions. The Yazoo Pumps will be located on the southeastern edge of the Yazoo Backwater Area and, of course, are

¹⁰ 2008 Clean Water Act Final Determination at 72-73 (internal footnote omitted).

¹¹ 85 Fed. Reg. 21218, 21220 (April 16, 2020).

¹² The plan recommended by the 2007 Final EIS is typically referred to as Plan 5, which was explicitly vetoed in the 2008 Clean Water Act Final Determination.

¹³ Based on a partial analysis of wetland impacts provided by the Corps in response to a Freedom of Information Act request, it is also clear that the impacts of the Proposed Action will fall within the 28,400 to more than 67,000-acre range of vetoed wetland impacts. This partial Corps wetland analysis is discussed at length in Section D.2 of these comments.

designed to pump water out of the Yazoo Backwater Area during high water events. Second, the well fields referenced in the Notice of Intent could quickly and easily be constructed as a stand-alone project. There are already many similar types of well fields in the Yazoo Backwater Area (these “relief wells” are typically designed to prevent natural under-seepage from affecting the integrity of a levee). Third, the well fields are being proposed as an “environmental mitigation” measure for the Proposed Action. If the Proposed Action aggravates the already significant low flow conditions in the Yazoo Backwater Area, those impacts must be mitigated as a matter of law and such mitigation would not somehow transform the Proposed Action into a new project. The Conservation Organizations also note that the proposed well fields could themselves create adverse environmental impacts, and may not result in any meaningful augmentation of low flows.

B. The SEIS Must Establish a Proper Project Purpose

It is critical that the SEIS utilize a substantively and legally appropriate project purpose, which determines the universe of alternatives that must be evaluated.¹⁴ It is well-settled that all reasonable alternatives that accomplish the project purpose must be examined in an environmental impact statement (EIS), while alternatives that are not reasonably related to the project purpose do not have to be examined.¹⁵

An overly narrow project purpose can defeat the fundamental purpose of an EIS by eliminating consideration of highly reasonable, less environmentally damaging alternatives:

One obvious way for an agency to slip past the strictures of NEPA is to contrive a purpose so slender as to define competing “reasonable alternatives” out of consideration (and even out of existence). . . . If the agency constricts the definition of the project’s purpose and thereby excludes what truly are reasonable alternatives, the EIS cannot fulfill its role. Nor can the agency satisfy the Act. 42 U.S.C. § 4332(2)(E).¹⁶

A court “will reject an ‘unreasonably narrow’ definition of objectives that compels the selection of a particular alternative.”¹⁷ Agencies are also prohibited from so narrowly defining a project purpose that

¹⁴ *Citizens Against Burlington v. Busey*, 938 F.2d 190, 195 (D.C. Cir. 1991) (the project purpose and need “delimit[s] the universe of the action’s reasonable alternatives.”) *See also* *Wyoming v. U.S. Dep’t of Agric.*, 661 F.3d 1209, 1244 (10th Cir. 2011) (“how the agency defines the purpose of the proposed action sets the contours for its exploration of available alternatives.”).

¹⁵ *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810, 815-16 (9th Cir. 1987).

¹⁶ *Simmons v. United States Army Corps of Eng’rs*, 120 F.3d 664, 666 (7th Cir. 1997); *City of Carmel-by-the-Sea v. United States Dep’t of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997) (“an agency cannot define its objectives in unreasonably narrow terms”); *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 195-96 (D.C. Cir. 1991), cert. denied, 502 U.S. 994 (1991) (“an agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency’s power would accomplish the goals of the agency’s action”); *City of New York v. United States Dep’t of Transp.*, 715 F.2d 732, 743 (2d Cir. 1983), cert. denied, 456 U.S. 1005 (1984) (“an agency will not be permitted to narrow the objective of its action artificially and thereby circumvent the requirement that relevant alternatives be considered”).

¹⁷ *Theodore Roosevelt Conservation Partnership v. Salazar*, 661 F.3d 66, 73 (D.C. 2011).

it “forecloses a reasonable consideration of alternatives”¹⁸ or makes the final EIS “a foreordained formality.”¹⁹

The Notice of Intent clearly establishes an overly narrow project purpose. According to the Notice of Intent, the SEIS: “will analyze a new project proposal to build the pump project (the Proposed Action) in light of the new data” and the “Proposed Action is a new project proposal to complete the Yazoo Area Pump Project feature to alleviate the flood damage in the Yazoo Backwater Area.”²⁰

This project purpose is overly narrow because it forecloses a reasonable consideration of alternatives that do not focus solely on building the Proposed Action, and makes the final SEIS a foreordained formality.

The SEIS should adopt a fundamentally different project purpose that, as required by law, considers “the views of Congress, expressed, to the extent that an agency can determine them, in the agency’s statutory authorization to act, **as well as in other Congressional directives.**”²¹ Notably, Congress has established a multitude of directives that explicitly require and/or promote: (1) the protection and restoration of the nation’s waters and fish and wildlife resources; and (2) the use of natural infrastructure and nonstructural measures as a tool for achieving those goals.²² For example:

- (1) In 2018, Congress required the Corps to “consider the use of both traditional and natural infrastructure alternatives, alone or in conjunction with each other, if those alternatives are practicable” in flood and storm damage risk reduction studies. America’s Water Infrastructure Act of 2018 § 1149(c). Natural infrastructure alternatives include, but are by no means limited to, actions to protect and restore floodplain wetlands.
- (2) In 2016, Congress directed the Corps to “consider, as appropriate” natural and nature-based measures in flood and storm risk reduction and ecosystem restoration studies. 33 USC 2289a.

¹⁸ *Fuel Safe Washington v. Fed. Energy Regulatory Comm’n*, 389 F.3d 1313, 1324 (10th Cir. 2004) (quoting *Davis v. Mineta*, 302 F.3d 1104, 1119 (10th Cir. 2002); *Citizens’ Comm. To Save Our Canyons v. U.S. Forest Serv.*, 297 F.3d 1012, 1030 (10th Cir. 2002); *Simmons v. United States Army Corps of Eng’rs*, 120 F.3d 664, 666 (7th Cir. 1997); *City of New York v. United States Dep’t of Transp.*, 715 F.2d 732, 743 (2d Cir. 1983), cert. denied, 456 U.S. 1005 (1984) ((holding that “an agency may not narrow the objective of its action artificially and thereby circumvent the requirement that relevant alternatives be considered); *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991), cert. denied 502 U.S. 994 (1991).

¹⁹ *City of Bridgeton v. FAA*, 212 F.3d 448, 458 (8th Cir. 2000) (quoting *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991), cert. denied 502 U.S. 994 (1991); citing *Simmons v. U.S. Army Corps of Eng’rs*, 120 F.3d 664, 666 (7th Cir. 1997)).

²⁰ U.S. Army Corps of Engineers, Notice of Intent to Prepare Supplemental Environmental Impact Statement for the Yazoo Area Pump Project, 85 Fed. Reg. 21218, 21219 (April 16, 2020). By contrast, the 2007 SEIS utilized the following project purpose: “The primary purpose of the authorized Yazoo Backwater Project is to reduce flood damages to the study area.” U.S. Army Corps of Engineers, Final Supplement No. 1 To The 1982 Yazoo Area Pump Project Final Environmental Impact Statement (2007) at SEIS-15, paragraph 40. However, since the 2007 SEIS also determined that more than 80% of the alleged benefits from the Yazoo Pumps would come from increased agricultural production on drained lands, it is clear that the 2007 SEIS recommend an agricultural drainage project.

²¹ *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991) (emphasis added).

²² Post-project authorization directives, which include those outlined above, should be incorporated into the project purpose. According to Supplement I, “Project authority is the Flood Control Act of 1928, as amended, including, but not limited to, the Flood Control Acts of 1936, 1938, 1941, 1946, 1950, 1954, 1962, 1965, and 1968 and the Water Resources Development Act of 1986.” Supplement I, Project Report at 1.

- (3) In 2007, Congress directed that all water resources projects protect and restore the environment, including by protecting and restoring the functions of natural systems. 42 USC 1962–3.
- (4) In 1974, Congress directed the Corps to consider nonstructural alternatives when planning flood damage reduction projects. 33 USC 701b-11. Nonstructural alternatives avoid damage to natural systems, including floodplain wetlands.
- (5) In 1973, Congress passed the Endangered Species Act to conserve endangered and threatened species and “the ecosystems upon which endangered species and threatened species depend.” The Endangered Species Act also declares a Congressional policy “that Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species.” Endangered Species Act, 16 USC 1531.
- (6) In 1972, Congress passed the Clean Water Act “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” Clean Water Act § 101, 33 USC § 1251. The Clean Water Act also directed the development of the 404(b)(1) Guidelines which establish clear policies and procedures for protecting wetlands and other special aquatic sites.
- (7) In 1970, Congress directed the “Federal Government to use all practicable means” to “fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.” National Environmental Policy Act, 42 U.S.C. § 4331(b).
- (8) In 1958 Congress directed that “wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development” and that water resources development is to prevent loss and damage to fish and wildlife and improve the health of fish and wildlife resources. Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661, 662.
- (9) The 1941 Congressional authorization for the Yazoo Pumps explicitly designates lands “located below 90 feet, NGVD, in elevation to serve as a sump area for surface water storage”²³ and in 1959, the Corps determined that the authorized level of protection had been met.²⁴

To account for these many directives focused on protecting and restoring natural systems, including floodplain wetlands, and to ensure that the alternatives analysis does not inappropriately limit the analysis of alternatives, our organizations urge adoption of the following statement of project purpose:

The purpose of the proposed action is to reduce and avoid flood damages in the study area while protecting and restoring the ecological health of the study area and its wetlands.

²³ 2008 Clean Water Act Final Determination at 7-9.

²⁴ Id. (quoting Vicksburg District Corps, MR&T Comprehensive Review Report, Annex L, Yazoo Backwater Project Mississippi at 20 (November 1959)).

C. The SEIS Must Rigorously Explore and Objectively Evaluate All Reasonable Alternatives and Select an Alternative that Protects and Restores the Yazoo Backwater Area

The analysis of alternatives is the heart of the environmental review process, and the SEIS must rigorously and objectively evaluate all reasonable alternatives. The Conservation Organizations call on the Corps to rigorously and objectively evaluate the proposed Resilience Alternative discussed below and provided at Attachment A to these comments. The Conservation Organizations incorporate the detailed information provided in this Attachment A as thought as though fully set forth herein.

1. The SEIS Must Rigorously and Objectively Evaluate All Reasonable Alternatives

The SEIS must “[r]igorously explore and objectively evaluate all reasonable alternatives.”²⁵ This fundamental NEPA mandate clearly applies to supplemental environmental impact statements,²⁶ which means that “the existence of reasonable but unexamined alternatives” will render the SEIS “inadequate.”²⁷ An SEIS that examines just one alternative—as the Notice of Intent explicitly states will be done in this SEIS—would unquestionably violate NEPA.²⁸

The Water Resources Development Acts require the Corps to consider non-structural alternatives and practicable “natural infrastructure alternatives.”²⁹ The Water Resources Development Act of 2007 directs that all water resources projects are to reflect national priorities by “protecting and restoring the functions of natural systems.”³⁰

The Clean Water Act 404(b)(1) Guidelines prohibit the Corps from proceeding with a civil works project unless the Corps demonstrates that the project is the least environmentally damaging practicable alternative,³¹ which can only be done by examining a full range of reasonable alternatives. “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.”³²

²⁵ 40 C.F.R. § 1502.14.

²⁶ *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).

²⁷ *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).

²⁸ 85 Fed. Reg. 21218, 21220 (April 16, 2020).

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

³⁰ 42 USC 1962–3.

³¹ 40 CFR 230.10(a). While the Corps does not technically issue itself a Clean Water Act 404 permit, it must satisfy the requirements of the 404(b)(1) Guidelines.

³² 40 C.F.R. § 230.10(a).

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.”³³ Critically, the SEIS must also include “reasonable alternatives not within the jurisdiction of the lead agency.”³⁴ 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.³⁵

In developing and selecting alternatives, the SEIS 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 that were established by § 2036(a) of the Water Resources Development Act of 2007. These mitigation requirements must be satisfied, among other times, whenever the Corps will be recommending a project alternative in an EIS.³⁶ The alternative ultimately recommend by the SEIS must also obtain a Clean Water Act water quality certification from the State of Mississippi.

In short, the SEIS 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 SEIS must ultimately select an alternative that achieves these objectives while causing the least possible amount of harm to the environment.

³³ Forty Most asked Questions Concerning CEQ’s NEPA Regulations, 46 Fed. Reg. 18,026 (March 23, 1981).

³⁴ 40 CFR §1502.14(c).

³⁵ 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).

³⁶ 33 U.S.C. § 2283(d).

It is clear from the Notice of Intent, however, that the SEIS will not comply with these critical requirements. Instead, the SEIS will look at just one alternative—an alternative that will cause such significant and unacceptable harm that it was vetoed under the Clean Water Act in 2008.

According to the Notice of Intent:

The 2007 FSEIS evaluated a broad array of alternatives, including the No-Action alternative, nonstructural alternatives, structural alternatives, and combinations of structural and nonstructural alternatives. Reformulation will not be included in the Supplemental Environmental Impact Statement. The Supplemental Environmental Impact Statement will focus primarily on updating the 2007 FSEIS where necessary and incorporating the new, previously unavailable, scientific data to analyze the Proposed Action and compare it to the 2007 FSEIS.³⁷

If the SEIS in fact follows the highly restricted approach announced in the Notice of Intent, it will be in direct violation of NEPA, the Clean Water Act, and many other bedrock environmental laws.

2. The Recommended Resilience Alternative Will Quickly Provide Sustainable Benefits to the Yazoo Backwater Area While Restoring the Environment

The Conservation Organizations call on the Corps to fully examine the Resilience Alternative included in Attachment A to these comments, along with other natural, nature-based, and non-structural alternatives. The Resilience Alternative will avoid flood risks and reduce flood damages to impacted communities while protecting and restoring—instead of harming—this ecologically rich area. The Resilience Alternative unquestionably complies with the Clean Water Act 404(b)(1) Guidelines, the Endangered Species Act, and all other applicable environmental laws.

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 pre-disaster mitigation programs (which are being consolidated under the new Building Resilient Infrastructure and Communities “BRIC” program); and Federal Emergency Management Agency post-disaster recovery programs.³⁸

In evaluating the Resilience Alternative and developing and evaluating other reasonable alternatives, the SEIS must ensure: (i) a full understanding of the conditions on-the-ground, including the strong interest in enrolling lands in conservation easements, established conservation priorities, and the significant farm subsidy payments that already flow to farms in the Yazoo Backwater Area; (ii) a full and accurate

³⁷ 85 Fed. Reg. 21218, 21220 (April 16, 2020).

³⁸ Post-disaster recovery funds and programs are available for at least one year after a Presidential Emergency Declaration, and eligibility can be extended for an additional 180 days. These funds and programs may currently be available to the Yazoo Backwater Area pursuant to Federal Disaster Declaration 4429, which was most recently amended on September 20, 2019 (available at <https://www.fema.gov/disaster/4429/notices>).

assessment of environmental impacts (including the long-term impacts of climate change) and of economic costs and benefits; and (iii) full compliance with Federal environmental laws and planning requirements, all as highlighted throughout these comments.

The following factors provide clear and compelling evidence of the appropriateness of selecting, and the practicability of, the Resilience Alternative. These factors must be fully evaluated in the SEIS:

- (1) There has been—and continues to be—a strong interest in enrolling lands in the Wetland Reserve Easement program in the Yazoo Backwater Area, as demonstrated by NRCS data (see Figure 1, below).

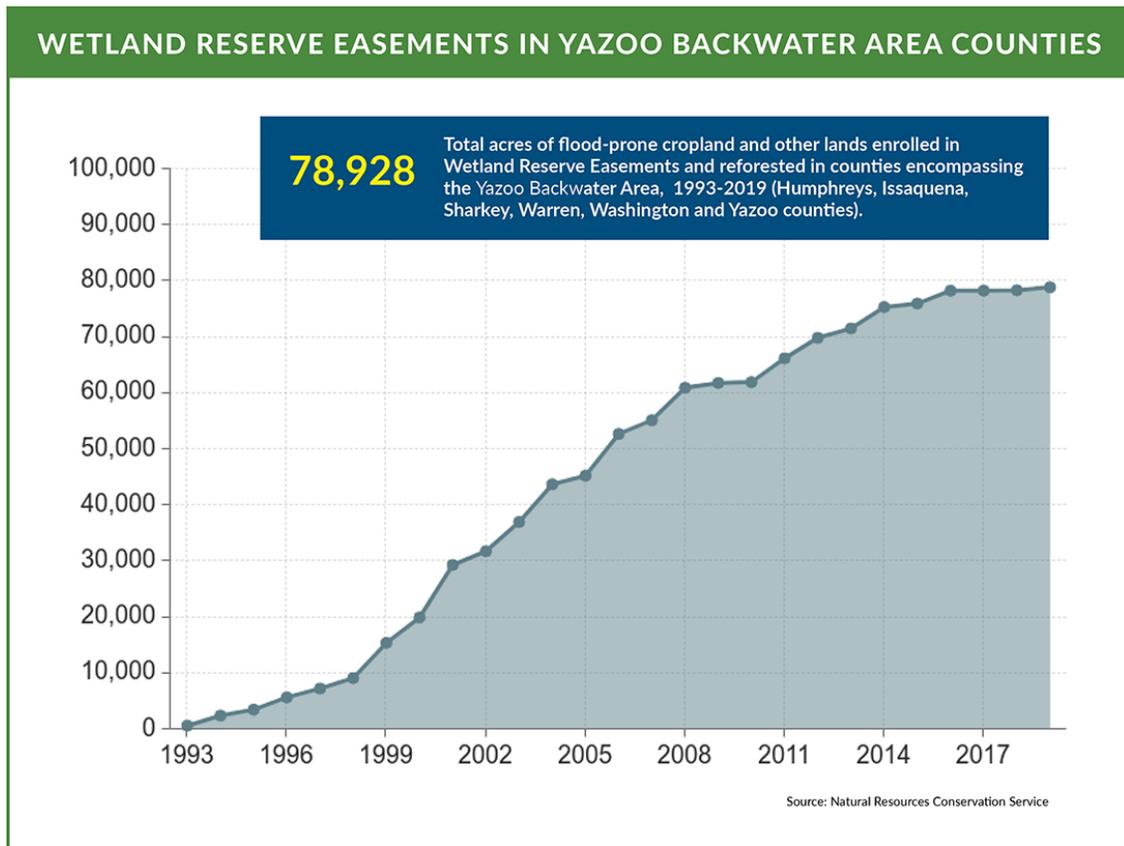


Figure 1, Wetland Reserve Easements in Yazoo Backwater Counties, 1993-2019 (Source: NRCS)

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The high demand for the Wetland Reserve Easement program can be seen throughout the Lower Mississippi Valley states, as demonstrated by NRCS data (see Figure 2, below). More than 1,000 separate Wetland Reserve Easement applications were pending in Arkansas, Louisiana, Kentucky, Mississippi, Missouri and Tennessee in FY2019. But just 98 were funded that year, enrolling 18,534 acres at a cost of \$71 million. This represents just 10% of lands that owners currently want to enroll and restore in the Lower Mississippi Valley states. Unfunded applications roll over from year to year, and efforts are underway to encourage Congress to increase funding to address the backlog in this program.

| Wetland Reserve Easements in the Lower Mississippi Valley States Pending Applications and Funded Easements for FY 2019 | | | | | | |
|---|--------------|----------------------|----------------|------------------|---------------------|----------------|
| State | Applications | Value | Acres | Easements Funded | Value | Acres Enrolled |
| Arkansas | 116 | \$91,548,905 | 28,639 | 20 | \$12,244,691 | 4,339 |
| Kentucky | 19 | \$22,691,157 | 4,388 | 13 | \$7,700,000 | 1,354 |
| Louisiana | 339 | \$194,540,500 | 62,333 | 31 | \$16,911,697 | 5,028 |
| Mississippi | 309 | \$175,134,388 | 60,172 | 18 | \$16,631,186 | 3,801 |
| Missouri | 182 | \$69,963,059 | 15,085 | 9 | \$12,833,949 | 2,364 |
| Tennessee | 47 | \$17,338,134 | 5,521 | 7 | \$5,174,571 | 1,648 |
| Total | 1,012 | \$571,216,143 | 176,138 | 98 | \$71,496,094 | 18,534 |

Figure 2, WRE Easement Requests Lower Mississippi Valley States (Source: NRCS)

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- (2) There is substantial interest in—and a significant need for—restoring forested and other wetlands in the project area, as evidenced by the 2020 Lower Mississippi Valley Joint Venture Conservation Priorities in the Yazoo Backwater Area (see Figure 3, below).³⁹ In the Fish and Wildlife Coordination Act Report prepared for the 2007 SEIS, the U.S. Fish and Wildlife Service stated that the Yazoo Backwater Area is the area with the “greatest potential” for meeting breeding bird habitat restoration and protection needs within the Mississippi Alluvial Valley.⁴⁰

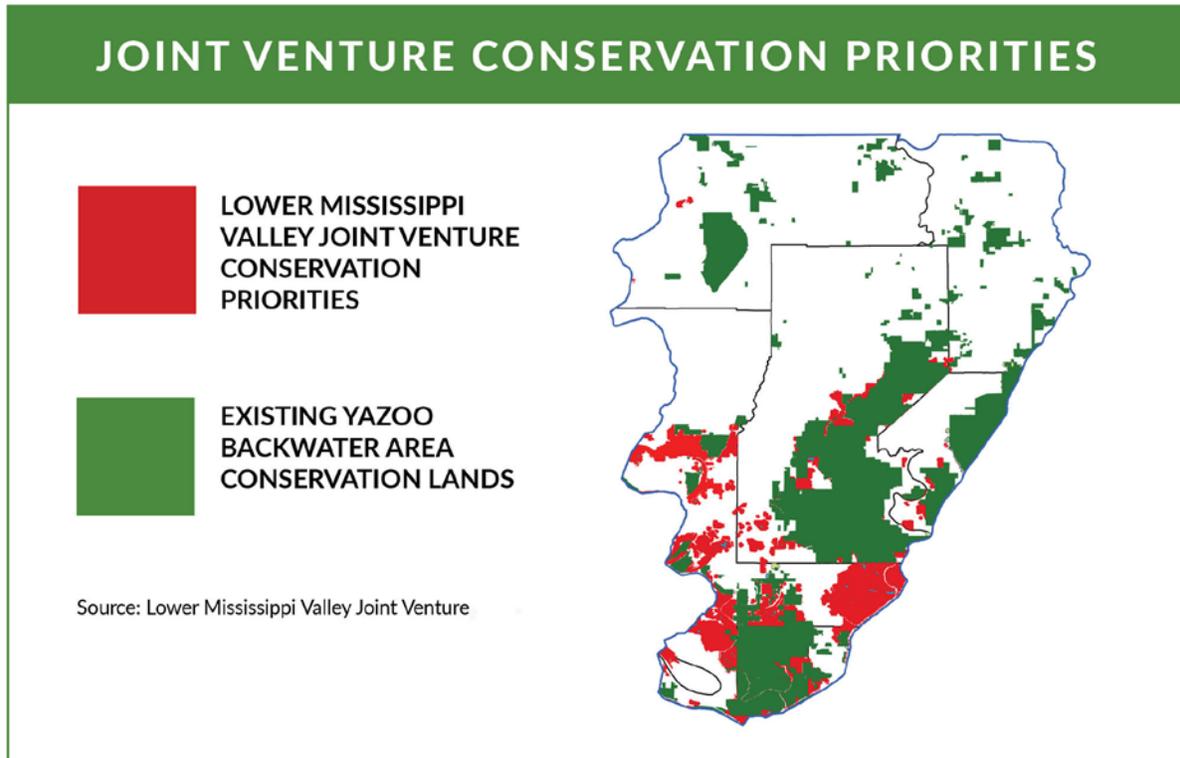


Figure 3, Lower Mississippi Valley Joint Venture 2020 Yazoo Backwater Area Conservation Priorities

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³⁹ Elliott, A.B.; Mini, A.E.; McKnight, S.K.; Twedt, D.J. Conservation–Protection of Forests for Wildlife in the Mississippi Alluvial Valley. *Forests* 2020, *11*, 75 (available at <https://www.mdpi.com/1999-4907/11/1/75>). A copy of this study is provided at Attachment E to these comments. The GIS data associated with this study can be accessed at <https://www.sciencebase.gov/catalog/item/5dd30670e4b069579762839c>.

⁴⁰ U.S. Fish and Wildlife Service, Fish and Wildlife Coordination Act Report (October 23, 2006), 2007 Final SEIS, Appendix 3 at 7.

(3) Reforestation of the wettest lands in the Yazoo Backwater Area is a conservation priority, and there are no limitations (*i.e.*, there are no county caps) on enrolling these lands in the Wetland Reserve Easement Program. Most of the 250,000 acres of conservation lands in the Yazoo Backwater Area have been established on the wettest soils. These wet soils, commonly known as 4W+ lands, are classified by USDA as “severely limited” for farming and are exempt from county caps on Wetland Reserve Easements. There are at least 46,000 acres of 4W+ lands in the Yazoo Backwater Area that are not in conservation, many of which are adjacent to existing conservation lands (see Figure 4, below). Reforestation of remaining unprotected 4W+ lands is a conservation priority. Investments to increase Wetland Reserve Easement Program enrollments would greatly improve the financial security of farmers who plant crops on marginal lands.

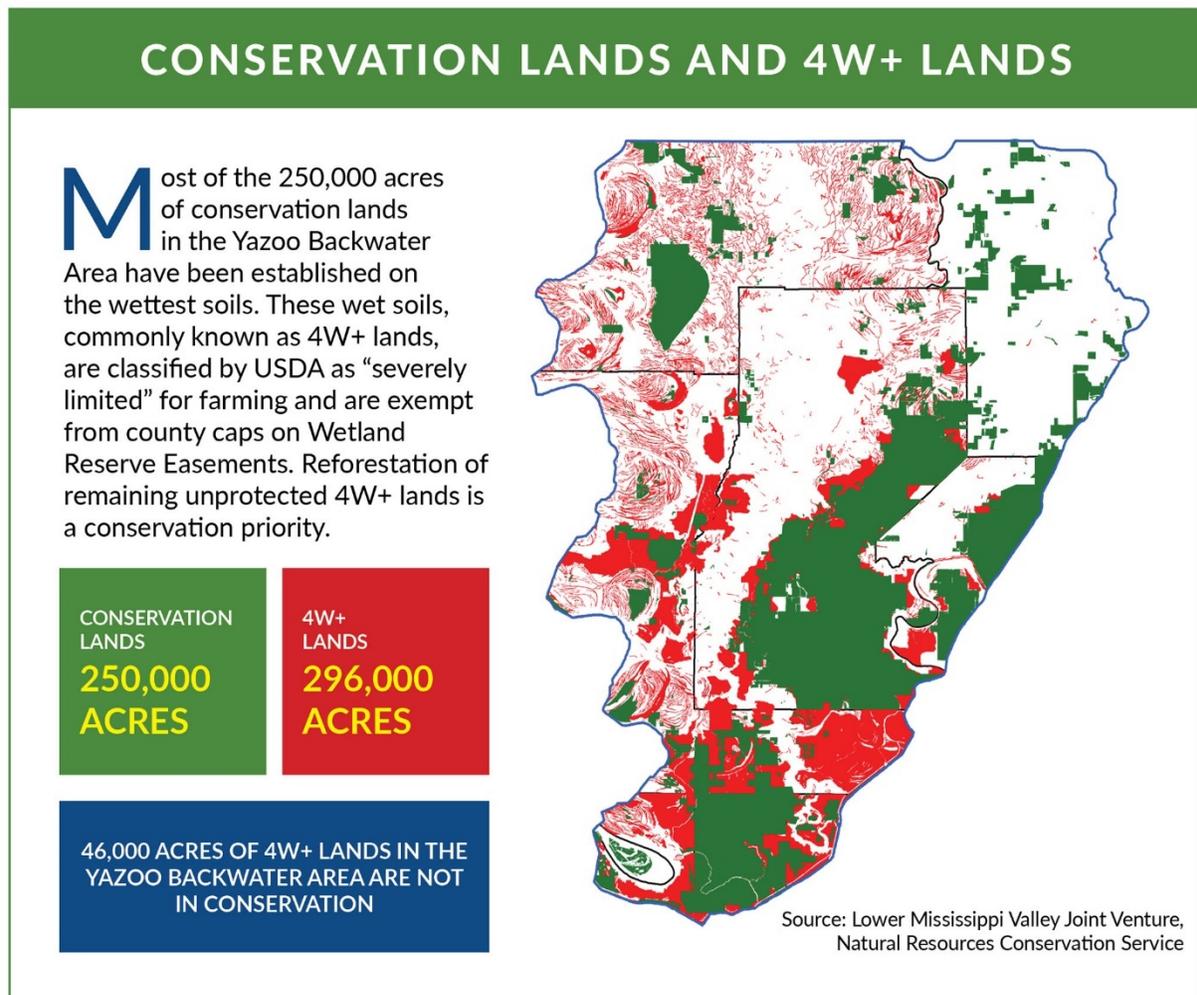


Figure 4, Conservation Lands and 4W+ Lands in the Yazoo Backwater Area

(4) Operation of the Yazoo Pumps would unquestionably damage both existing conservation lands, and lands that are a priority for future conservation efforts, including:

- 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.

Had the Yazoo Pumps been operating in 2019, vast acres of wetlands would have been drained—between 60,000 and 70,000 acres—even as 65% of flooded lands would have remained underwater (including 110,000 acres of cropland). The largest single tract of land that would have been drained is the 8,000-acre Lake George Wildlife Management Area, a Corps mitigation site for previously constructed water resources projects. See Figure 5, below.

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YAZOO BACKWATER AREA

LANDS DRAINED IF PUMPS HAD BEEN OPERATING IN 2019*

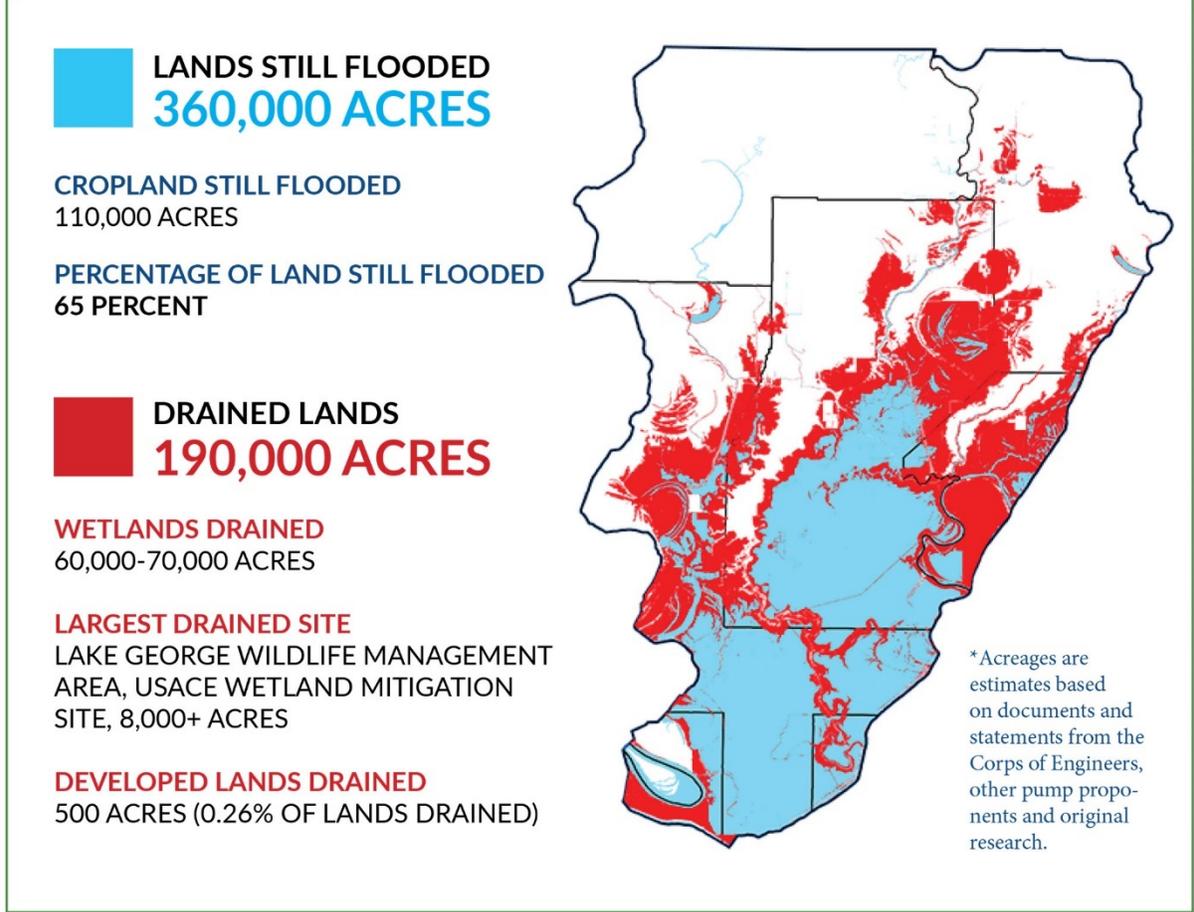


Figure 5, Yazoo Backwater Area, Lands Drained if Yazoo Pumps had been operating in 2019

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(5) Many farms in the Yazoo Backwater Area already receive substantial farm subsidy payments, calling into question the so-called “need” for having taxpayers spend what will likely be more than \$440 million to further subsidize agricultural production in this region. The 2007 SEIS concluded that more than 80% of project benefits would come from agricultural intensification.

According to USDA data compiled through the Environmental Working Group Farm Subsidy Database, farms in the 16 zip codes that fall within the Yazoo Backwater Area received the following subsidies between 1995 and 2019 (see Figures 6 and 7, below):

- Recipients received a total of **\$1.05 billion** in farm subsidy payments;
- The top 5 recipients received a total of **\$20.5 million, \$17.4 million, \$15.5 million, \$14.2 million, and \$10.7 million**, respectively;
- The top 5 recipients in each zip code received a total of **\$430.7 million—an average of \$215,000 for each of 80 recipients every year for 25 years**;
- 272 recipients received **more than \$1 million each—an average of \$40,000 a year for each recipient every year for 25 years**.

While the purchase of conservation easements provides important financial assistance to farmers, it does so without facilitating agricultural intensification and restores ecological services that provide important ecological services to the entire region, and beyond. The purchase of conservation easements also creates important cost avoidance benefits (see Section F.5, below).

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YAZOO BACKWATER AREA FARM SUBSIDIES*

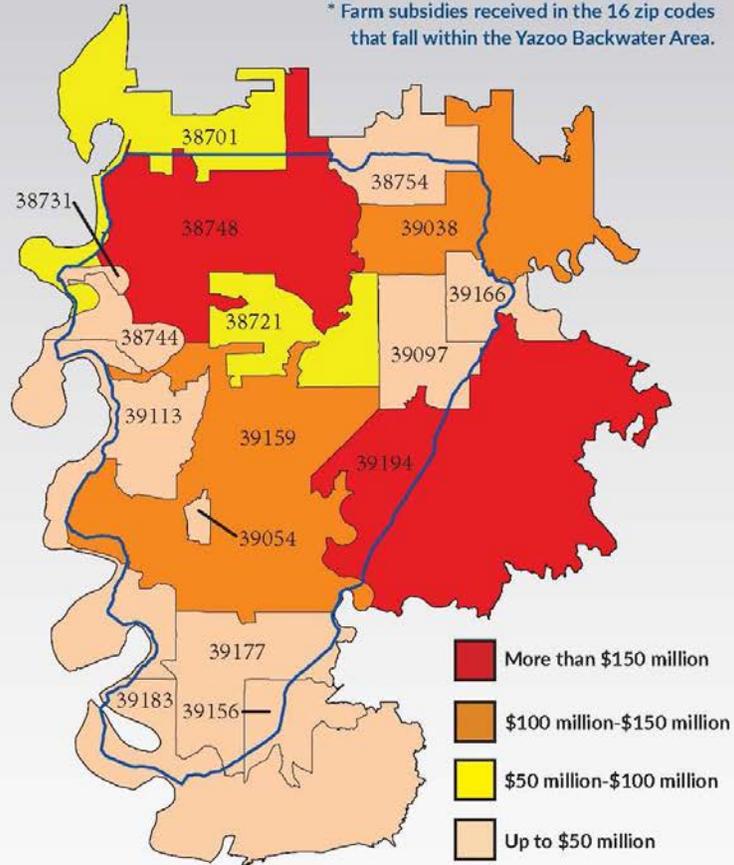
TOTAL SUBSIDIES*

**\$1.05
BILLION**

Subsidy payments include all taxpayer-funded farm subsidies received from 1995 to 2019. Subsidies were compiled for the 16 zip codes that fall within the Yazoo Backwater Area from the Environmental Working Group Farm Subsidy Database, which compiles USDA data. Some of the zip codes extend beyond the boundary of the backwater area (outlined in blue).

| ZIP CODE | SUBSIDIES |
|--------------|------------------------|
| 39194 | \$206,461,849 |
| 38748 | \$195,420,691 |
| 39159 | \$148,391,998 |
| 39038 | \$112,189,087 |
| 38721 | \$77,456,356 |
| 38701 | \$67,762,848 |
| 39097 | \$49,603,235 |
| 38744 | \$44,373,852 |
| 38754 | \$26,945,846 |
| 39054 | \$25,504,986 |
| 39183 | \$25,462,913 |
| 38731 | \$19,659,275 |
| 39177 | \$18,153,356 |
| 39166 | \$15,032,921 |
| 39156 | \$12,270,589 |
| 39113 | \$8,484,164 |
| TOTAL | \$1,053,173,966 |

* Farm subsidies received in the 16 zip codes that fall within the Yazoo Backwater Area.



Subsidies received include commodity payments, crop insurance, disaster payments and conservation payments. From 1995 to 2019, Mississippi farmers received a total of \$10.1 billion in farm subsidy payments, of which 90% were crop-related.



Nearly 60% of Mississippi farmers do not receive farm subsidies in any given year.

Figure 6, Yazoo Backwater Area Farm Subsidies 1995 to 2019

Farm Subsidy Payments Per Recipient in Yazoo Backwater Area Zip Codes, 1995-2019
Compiled from the Environmental Working Group Farm Subsidy Database

| ZIP CODE | TOTAL SUBSIDIES | TOTAL RECIPIENTS | TOP FIVE RECIPIENTS | TOP RECIPIENT | FARMS RECEIVING MORE THAN \$1 MILLION |
|---------------|------------------------|------------------|----------------------|----------------------|---------------------------------------|
| 38701 | \$67,762,848 | 576 | \$22,712,766 | \$7,194,098.06 | 19 |
| 38721 | \$77,456,356 | 247 | \$30,888,620 | \$9,036,034.68 | 21 |
| 38731 | \$19,659,275 | 43 | \$18,497,489 | \$6,232,323.25 | 6 |
| 38744 | \$44,373,852 | 151 | \$24,600,514 | \$8,041,347.43 | 14 |
| 38748 | \$195,420,691 | 494 | \$67,719,354 | \$20,474,822.20 | 41 |
| 38754 | \$26,945,846 | 182 | \$11,122,965 | \$3,068,592.91 | 9 |
| 39038 | \$112,189,087 | 561 | \$31,289,857 | \$10,709,713.62 | 32 |
| 39054 | \$25,504,986 | 87 | \$29,316,093 | \$8,428,658.15 | 5 |
| 39097 | \$49,603,235 | 144 | \$36,435,442 | \$15,490,694.85 | 10 |
| 39113 | \$8,484,164 | 68 | \$6,427,399 | \$3,947,952.38 | 2 |
| 39156 | \$12,270,589 | 84 | \$8,620,492 | \$3,442,211.37 | 2 |
| 39159 | \$148,391,998 | 474 | \$48,992,874 | \$14,235,037.72 | 38 |
| 39166 | \$15,032,921 | 74 | \$11,394,043 | \$8,095,796.40 | 2 |
| 39177 | \$18,153,356 | 54 | \$13,713,357 | \$6,600,398.14 | 5 |
| 39183 | \$25,462,913 | 301 | \$14,012,933 | \$4,019,405.06 | 8 |
| 39194 | \$206,461,849 | 1125 | \$54,923,294 | \$17,362,445.53 | 58 |
| TOTALS | \$1,053,173,966 | 4,665 | \$430,667,491 | \$146,379,532 | 272 |

Figure 7, Farm Subsidy Payments Per Recipient in Yazoo Backwater Area Zip Codes 1995-2019

As the Corps is aware, an 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.⁴¹ That review also determined that the Yazoo Pumps could not be economically justified even at what was then a \$207 million projected construction cost.⁴²

Even if increased production resulting from the Yazoo Pumps did increase profits for some large landowners in the project area, such increased production is unlikely to help other American farmers. Increased production causes overall prices to drop. For example, according

⁴¹ 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.

⁴² Id.

to a May 2020 article in Barron's, USDA has determined that corn and soybean prices are likely to fall this year due to excess production:

Facing a supply glut, the US Department of Agriculture projects the average farm price for corn will to drop to its lowest level in 14 years in the 2020-2021 growing season. Soybean prices also are expected to fall."⁴³

- (6) 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.⁴⁴ In addition, 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.

Moreover, 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.⁴⁵ This study is discussed at length in Section F.3 of these comments.

- (7) Since completion of the Yazoo Backwater Levee in 1978, flooding in the Yazoo Backwater Area has primarily been restricted to lower elevations (see Figure 8, below). Even as unprecedented flooding inundated communities along the Mississippi, Missouri, and Arkansas Rivers, in 2019, flooding in the Yazoo Backwater Area was predominately restricted to the 20-year floodplain, and just touched the 25-year floodplain elevation at its peak.⁴⁶ Between 1978 and 2018, water levels in the Yazoo Backwater Area **never** reached the 20-year floodplain and exceeded the 10-year floodplain just 2 times.⁴⁷ As a result, flood damage reduction solutions should focus on avoiding flood damages to homes and critical infrastructure located in these lower elevations.

⁴³ Chris Stein, AFP News, *'It's Kind Of Glum': US Farmers Worry As Crop Prices Dip*, Barron's, May 24, 2020 (available at <https://www.barrons.com/news/it-s-kind-of-glum-us-farmers-worry-as-crop-prices-dip-01590370505>).

⁴⁴ USDA National Agricultural Statistics Service, CropScape Cropland Data Layer.

⁴⁵ 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.

⁴⁶ Flood levels rose above the 25 year floodplain for just 8 days, reaching to just 0.23 inches above the 25 year floodplain elevation before receding. This year's flooding was the largest in the YBWA since completion of the Yazoo Backwater Levee in 1978. Between 1978 and 2018, water levels in the YBWA never reached the 20 year floodplain, and those levels exceeded the 10 year floodplain elevation just 2 times. By comparison, flooding in the YBWA reached 101.48 feet in 1973, which is well above the 100 year floodplain elevation. U.S. Army Corps of Engineers Rivergages Website (<http://rivergages.mvr.usace.army.mil>) (a compilation of this data is available from the National Wildlife Federation upon request).

⁴⁷ Floodplain elevation level source: USACE, Final EIS Yazoo Backwater Pumping Plant, Main Report at 90 (lower ponding area without project in place) Final Supplement No. 1 to the 1982 Yazoo Area Pump Project Final Environmental Impact Statement (2007), Main Report at 90, Table 13 (lower ponding area elevation base conditions); Steele Bayou Landside gage elevation source: USACE, RiverGages.com, <http://rivergages.mvr.usace.army.mil>.

**Yazoo Backwater Area Flood Elevations
Period of Record 1978 to 2019—Steele Bayou Landside Gage**

| | |
|---|----|
| Number of Years water reached and slightly exceeded the 25-year floodplain: | 1 |
| Number of Years water reached above 10-year and below 20-year floodplain: | 2 |
| Number of Years water reached above 5-year and below 10-year floodplain: | 5 |
| Number of Years water reached above 3-year and below 5-year floodplain: | 2 |
| Number of Years water reached above 2-year and below 3-year floodplain: | 5 |
| Number of Years water reached above 1-year and below 2-year floodplain: | 17 |
| Number of Years water did not reach the 1-year floodplain: | 11 |

| Year | Peak Elevation | Floodplain | Flood Rank |
|------|-----------------------|------------------------------|------------|
| 2019 | 98.23 May 23, 2019 | 0.23 inches above 25 year | 1 |
| 2018 | 95.33 | below 10 year | 7 |
| 2017 | 88.46 | below 2 year | 24 |
| 2016 | 91.98 | below 3 year | 13 |
| 2015 | 95.39 | below 10 year | 6 |
| 2014 | 95.59 | below 10 year | 4 |
| 2013 | 90.94 | below 2 year | 15 |
| 2012 | 85.37 | below 1 year | 32 |
| 2011 | 89.96 | below 2 year | 20 |
| 2010 | 95.5 | below 10 year | 5 |
| 2009 | 93.74 | below 5 year | 8 |
| 2008 | 92.18 | below 3 year | 11 |
| 2007 | 85.4 | below 1 year | 31 |
| 2006 | 80.1 | below 1 year | 39 |
| 2005 | 90 | below 2 year | 19-tied |
| 2004 | 84.7 | below 1 year | 35 |
| 2003 | 88.4 | below 2 year | 25 |
| 2002 | 90 | below 2 year | 19-tied |
| 2001 | 88.7 | below 2 year | 23 |
| 2000 | 77.4 | below 1 year | 40 |
| 1999 | 90.3 | below 2 year | 17 |
| 1998 | 88.3 | below 2 year | 26 |
| 1997 | 93.3 | below 5 year | 9 |
| 1996 | 88.1 | below 2 year | 27 |
| 1995 | 87.9 | below 2 year | 28 |
| 1994 | 90.9 | below 2 year | 16 |
| 1993 | 91.5 | below 3 year | 14 |
| 1992 | 82.3 | below 1 year | 36 |
| 1991 | 92.5 | below 3 year | 10 |
| 1990 | 89.6 | below 2 year | 22 |

| Year | Peak Elevation | Floodplain | Flood Rank |
|------|----------------|---------------|------------|
| 1989 | 89.7 | below 2 year | 21 |
| 1988 | 85.3 | below 1 year | 33 |
| 1987 | 84.9 | below 1 year | 34 |
| 1986 | 82.1 | below 1 year | 37 |
| 1985 | 87.1 | below 2 year | 29 |
| 1984 | 92 | below 3 year | 12 |
| 1983 | 95.8 | below 10 year | 3 |
| 1982 | 90.2 | below 2 year | 18 |
| 1981 | 80.4 | below 1 year | 38 |
| 1980 | 90 | below 2 year | 19-tied |
| 1979 | 96.5 | below 20 year | 2 |
| 1978 | 85.7 | below 1 year | 30 |

Figure 8, Yazoo Backwater Area Flood Elevation Levels 1978 to 2019, Steele Bayou Landside Gage (Source: USACE Data)

The Corps is currently engaged in multiple planning efforts focused on improving management of the Mississippi River to reduce or better manage flood levels in the Mississippi River.⁴⁸ If the measures developed through these studies are implemented, they would further reduce flood risks to the Yazoo Backwater Area by reducing the amount of time that the gates at the Steele Bayou Flood Control Structure would need to be closed. These planning efforts should be accelerated.

- (8) The proposed Yazoo Pumps plan and its 87-foot activation level (as indicated in the Notice of Intent) vastly exceeds the scope of the project’s Congressional authorization. As extensively documented in the 2008 Clean Water Act Final Determination, 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.”⁴⁹ 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. . . . 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

⁴⁸ While the Corps is of course aware of its ongoing planning processes, to our understanding they include an assessment of alternative management regimes for the Old River Control Structure, evaluating needs related to the Mississippi Rivers & Tributaries Project mainline levee system; and examining Mississippi River sediment diversions and other projects to restore Louisiana’s coastal wetlands.

⁴⁹ 2008 Clean Water Act Final Determination at 7-9.

high degree of protection for the foreseeable future without the necessity of pumping.⁵⁰

- (9) Even during the unprecedented 2019 flood, structural damages within the Yazoo Backwater counties were highly concentrated with **76% of all structural damage** and **85% of all structural monetary damages** occurring in Warren County, which includes the Eagle Lake community and extensive areas located outside of the boundaries of the Yazoo Backwater Area (see Figure 9, below). In 2019, relatively few structures were affected by flooding in Issaquena and Sharkey counties, the two counties located entirely within the Yazoo Backwater Area, according to Mississippi Emergency Management data. Within Issaquena and Sharkey counties a total of 53 homes and 19 mobile homes were affected. Of those, 27 homes had only minor or very minor damage. Data for other counties include large areas that would not be affected by the Pumps.

As discussed in Section F.4 of these comments, multiple factors contributed to the 2019 flooding at Eagle Lake, making it likely that the Eagle Lake community would have suffered flood damages even if the Yazoo Pumps had been operating in 2019. The targeted solutions proposed in the Resilience Alternative would provide reliable solutions to reduce flood damages for the Eagle Lake community.

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⁵⁰ Id. (quoting Vicksburg District Corps, MR&T Comprehensive Review Report, Annex L, Yazoo Backwater Project Mississippi at 20 (November 1959)).

YAZOO BACKWATER 2019 FLOOD DAMAGES*

During the prolonged 2019 flood, homes and businesses in the counties that make up the Yazoo Backwater Area sustained \$12.3 million in structural damage. This damage was concentrated in Warren County (including the Eagle Lake community). Warren County sustained 85% of the monetary damage. Flood mitigation, such as elevating structures, purchasing floodplain easements, and elevating flood-prone roads, is rarely practiced in the Yazoo Backwater Area.

WASHINGTON COUNTY
NO DAMAGES REPORTED

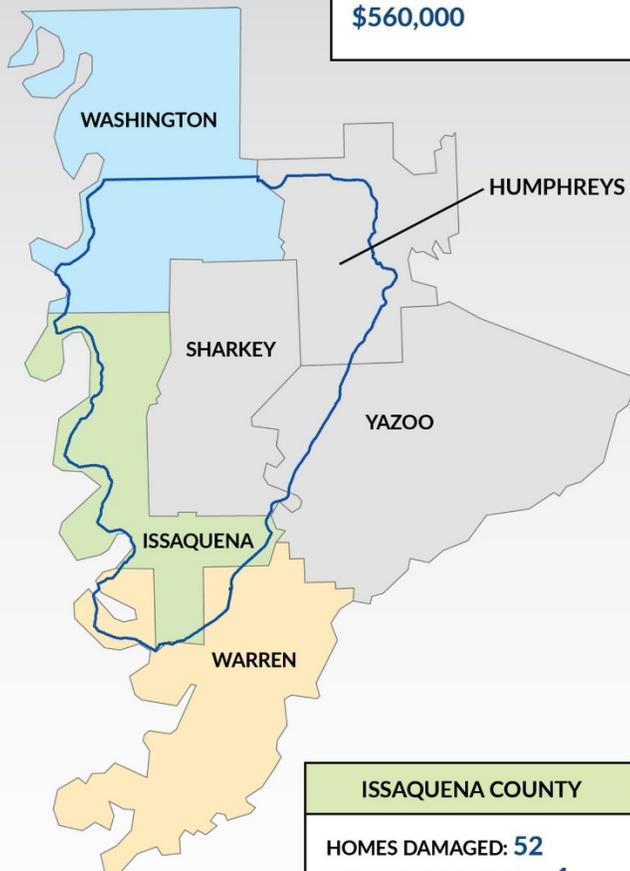
HUMPREYS, SHARKEY AND YAZOO COUNTIES
HOMES DAMAGED: **62**
BUSINESSES DAMAGED: **3**
TOTAL MONETARY DAMAGE: **\$560,000**

WARREN COUNTY

HOMES DAMAGED: **358**
BUSINESSES DAMAGED: **14**
TOTAL MONETARY DAMAGE: **\$10,442,000**

% OF ALL FLOOD DAMAGES OCCURRING IN WARREN COUNTY

| | |
|--|--|
|  76% All structures damaged |  85% All monetary damage |
|  76% Homes damaged |  85% Homes-monetary damage |
|  78% Businesses damaged |  82% Businesses-monetary damage |



ISSAQUENA COUNTY
HOMES DAMAGED: **52**
BUSINESSES DAMAGED: **1**
TOTAL MONETARY DAMAGE: **\$1,335,000**

*Estimated damages to homes and businesses in counties that fall within the Yazoo Backwater Area, as reported by the Mississippi Emergency Management Agency. It is unclear how much of the damage reported occurred outside the Yazoo Backwater Area (outlined in blue).

Figure 9, Yazoo Backwater Area 2019 Flood Damages Reported by Mississippi Emergency Management Agency

- (10) Ample evidence demonstrates that natural infrastructure (natural and nature-based solutions) and non-structural solutions can provide highly effective, and cost-effective flood damage reduction and flood avoidance benefits for communities. Indeed, the Reinsurance Association of America has concluded that: “One cannot overstate the value of preserving our natural systems for the protection of people and property from catastrophic events.”⁵¹

The value of wetlands for reducing flood risks has long been recognized by the Corps. For example, in a 1972 study evaluating options to reduce flooding along Charles River in Massachusetts, the Corps concluded:

Nature has already provided the least-cost solution to future flooding in the form of extensive [riverine] wetlands which moderate extreme highs and lows in streamflow. Rather than attempt to improve on this natural protection mechanism, it is both prudent and economical to leave the hydrologic regime established over millennia undisturbed.⁵²

A single acre of wetland can store 1.5 million gallons of floodwaters.⁵³ Just a 1 percent loss of a watershed’s wetlands can increase total flood volume by almost seven percent.⁵⁴ Wetlands prevented \$625 million in flood damages in the 12 coastal states affected by Hurricane Sandy, and reduced damages by 20 to 30 percent in the four states with the greatest wetland coverage.⁵⁵ Coastal wetlands reduced storm surge in some New Orleans neighborhoods by two to three feet during Hurricane Katrina, and levees with wetland buffers had a much greater chance of surviving Katrina’s fury than levees without wetland buffers.⁵⁶

A 2018 study shows that in the Gulf Coast regions of Texas, Louisiana, Mississippi, and Florida, nature-based solutions to reduce coastal flood risks are significantly more cost effective than structural solutions. A 2018 study shows that in this region, **the average benefit-cost ratio for nature-based solutions is 3.5 compared to 0.26 for levees/dikes.** Restoring wetlands could prevent \$18.2 billion of losses while costing just \$2 billion to carry out.⁵⁷

⁵¹ Restore America’s Estuaries, *Jobs & Dollars BIG RETURNS from coastal habitat restoration* (September 14, 2011) (http://www.estuaries.org/images/81103-RAE_17_FINAL_web.pdf).

⁵² American Rivers, *Unnatural Disasters, Natural Solutions: Lessons From The Flooding Of New Orleans* (2006) (quoting USACE, from Massachusetts Department of Fish and Game, *Functions of Riparian Areas for Flood Control*, http://www.mass.gov/dfwefe/river/pdf/riparian_factsheet_1.pdf).

⁵³ Environmental Protection Agency, “Wetlands: Protecting Life and Property from Flooding.” EPA 843-F-06-001. (2006) (factsheet).

⁵⁴ Demissie, M. and Abdul Khan. 1993. “Influence of Wetlands on Streamflow in Illinois.” Illinois State Water Survey, Contract Report 561, Champaign, IL, Table 7, pp. 44-45.

⁵⁵ Narayan, S., Beck, M.B., Wilson, P., et al., The Value of Coastal Wetlands for Flood Damage Reduction in the Northeastern USA. *Scientific Reports* 7, Article number 9463 (2017), doi:10.1038/s41598-017-09269-z (available at <https://www.nature.com/articles/s41598-017-09269-z>).

⁵⁶ Bob Marshall, *Studies abound on why the levees failed. But researchers point out that some levees held fast because wetlands worked as buffers during Katrina’s storm surge*, *New Orleans Times-Picayune* (March 23, 2006).

⁵⁷ Borja G. Reguero et al., “Comparing the Cost Effectiveness of Nature-Based and Coastal Adaptation: A Case Study from the Gulf Coast of the United States,” *PLoS ONE* 13, no. 4 (April 11, 2018),

Communities across the country are successfully using natural infrastructure and non-structural approaches to reduce flood risks. For example:

- In California, the Napa Valley Flood Control Project is using a community-developed “living river” plan to reduce flood damages along the flood-prone Napa River. This plan replaces the Corps’ originally-proposed floodwalls and levees with terraced marshes, wider wetland barriers, and restored riparian zones. The Project will restore more than 650 acres of high-value tidal wetlands of the San Francisco Bay Estuary while protecting 2,700 homes, 350 businesses, and over 50 public properties from 100-year flood levels, saving \$26 million annually in flood damage costs.⁵⁸ Though only partially complete, the project was credited for lowering flood levels by about 2 to 3 feet during the 2006 New Year’s Day flood.
- In Florida, the Corps is using wetland restoration in the Upper St. John’s River floodplain to provide important flood damage reduction benefits. The backbone of this project is restoration of 200,000 acres of floodplain which will hold more than 500,000 acre-feet of water—enough to cover 86 square miles with 10 feet of water—and will accommodate surface water runoff from a more than 2,000 square mile area. The Corps predicts that this \$200 million project will reduce flood damages by \$215 million during a 100-year flood event, and provide average annual benefits of \$14 million. This project was authorized by Congress in 1986 to reduce flood damages along the river.⁵⁹
- In Illinois, a 2014 study conducted for the Chicago Wilderness Green Infrastructure Vision, found that natural systems are the least costly and most efficient way to control flooding. Wetlands in the seven-county Chicago metropolitan area provide an average \$22,000 of benefits per acre each year in water flow regulation. This study also found that watersheds with 30 percent wetland or lake areas saw flood peaks that were 60 to 80 percent lower than watersheds without such coverage, and that preventing building in floodplain areas could save an average of \$900 per acre per year in flood damages.⁶⁰
- In Iowa, the purchase of 12,000 acres in easements along the 45-mile Iowa River corridor saved local communities an estimated \$7.6 million in flood damages as of 2009. The easement purchase effort began after the historic 1993 floods when river communities in east-central Iowa recognized the need for a more effective approach to reducing flood damages.

<https://doi.org/10.1371/journal.pone.0192132> (also finding that restoring oyster reefs could prevent \$9.7 billion in losses at a cost of \$1.3 billion; restoring barrier islands could prevent \$5.9 billion in losses at a cost of \$1.2 billion).

⁵⁸ Napa County California website at <https://www.countyofnapa.org/1096/Creating-Flood-Protection>.

⁵⁹ American Rivers, *Unnatural Disasters, Natural Solutions: Lessons From The Flooding Of New Orleans* (2006) (Upper St. Johns River case study).

⁶⁰ Will Allen, Ted Weber, and Jazmin Varela, *Green Infrastructure Vision: Version 2.3: Ecosystem Service Valuation*. (The Conservation Fund: 2014), 13-15, <https://datahub.cmap.illinois.gov/dataset/c303fd2e-beaf-4a75-a9ec-b27c6da49b69/resource/028c9b69-bb19-425e-bb92-3d33656bea4c/download/tcfcmappiv23ecosystemservicesfinalreport201412v2.pdf>.

- In Massachusetts, a 1972 Corps study showed that upstream wetlands were playing a critical role in reducing flooding in the middle and upper reaches of the Charles River by storing millions of gallons of water and preventing \$17 million each year in flood damages. This led the Corps to preserve 8,000 floodplain acres to ensure future flood storage, at a cost of just one-tenth of the structural project it had previously planned to build. This approach was sanctioned by Congress in 1974 when it authorized the Charles River Natural Valley Storage Area. These floodplain wetlands are credited with reducing major floods, including in 1979, 1982, and 2006. The Corps estimates that this project has prevented \$11.9 million in flood damages while providing recreational benefits valued at between \$3.2 and \$4.6 million.⁶¹
- In New York, restoration of wetlands and lands adjacent to 19 stream corridors in Staten Island “successfully removed the scourge of regular flooding from southeastern Staten Island, while saving the City \$300 million in costs of constructing storm water sewers.”⁶² Some 400 acres of freshwater wetland and riparian stream habitat has been restored along 11 miles of stream corridors that collectively drain about one third of Staten Island’s land area. A 2018 study commissioned by the City of New York found that using “hybrid infrastructure” that combines nature, nature-based, and gray infrastructure together could save Howard Beach, Queens \$225 million in damages in a 100-year storm while also generating important ecosystem services.⁶³
- In Oregon, the Portland Bureau of Environmental Services restored 63 acres of wetland and floodplain habitat, restored 15 miles of Johnson Creek, and move structures out of high-risk areas to reduce flood damages in the Johnson Creek neighborhood. In January 2012, when heavy rainfall caused Johnson Creek to rise two feet above its historic flood stage, the restored site held the floodwaters, keeping nearby homes dry and local businesses open. An ecosystem services valuation of the restored area found that the project would provide \$30 million in benefits (in 2004 dollars) over 100 years through avoided property and utility damages, avoided traffic delays, improved water and air quality, increased recreational opportunities, and healthy fish and wildlife habitat.⁶⁴
- In Texas, restoration of a 178-acre urban wetland—formerly an abandoned golf course—acted as a sponge to store 100 million gallons of water during Hurricane Harvey, protecting 150 homes in Houston’s Clear Lake community from serious flooding. This project will store up to a half billion gallons of water and protect 3,000 homes when completed in 2021.⁶⁵

⁶¹ American Rivers, *Unnatural Disasters, Natural Solutions: Lessons From The Flooding Of New Orleans* (2006) (Charles River Valley Natural Storage Area case study); and

<https://www.arcgis.com/apps/MapJournal/index.html?appid=0bf97d033a8642b18c2e8075d4b5ecfe>.

⁶² Cooper Union, Institute for Sustainable Design, *The Staten Island Bluebelt: A Study In Sustainable Water Management* (<http://cooper.edu/isd/news/waterwatch/statenisland>). These effort was started in 1990.

⁶³ The Nature Conservancy, *Urban Coastal Resilience: Valuing Nature’s Role*. (2015), <https://www.nature.org/content/dam/tnc/nature/en/documents/urban-coastal-resilience.pdf>.

⁶⁴ “Johnson Creek Restoration, Portland, Oregon,” *Naturally Resilient Communities*, accessed November 12, 2019, <http://nrcsolutions.org/johnson-creek-restoration-portland-oregon/>.

⁶⁵ Exploration Green, 2018, <https://www.explorationgreen.org/>.

- In Vermont, a vast network of floodplains and wetlands, including those protected by 23 conservation easements protecting 2,148 acres of wetland along Otter Creek, saved Middlebury \$1.8 million in flood damages during Tropical Storm Irene, and between \$126,000 and \$450,000 during each of 10 other flood events. Just 30 miles upstream, in an area without such floodplain and wetland protections, Tropical Storm Irene caused extensive flooding to the city of Rutland.

D. The SEIS Must Fully Analyze Direct, Indirect, and Cumulative Impacts

The SEIS 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.⁶⁶ 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.⁶⁷

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.⁶⁸ 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.⁶⁹

The cumulative impacts analysis ensures that the agency will not “treat the identified environmental concern in a vacuum.”⁷⁰ The cumulative impacts analysis must examine the cumulative effects of federal, state, and private projects and actions.⁷¹ The cumulative impacts analysis must also evaluate the cumulative impacts of climate change.⁷²

⁶⁶ 40 C.F.R. § 1502.16.

⁶⁷ 42 USC 1962–3(a).

⁶⁸ 40 C.F.R. § 1508.8.

⁶⁹ 40 C.F.R. § 1508.7.

⁷⁰ *Grand Canyon Trust v. FAA*, 290 F.3d 339, 346 (D.C. Cir. 2002).

⁷¹ 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).

⁷² *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.”).

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. 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.⁷³

The SEIS 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.⁷⁴ **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.”**⁷⁵

To properly analyze impacts from the Yazoo Pumps, it is also essential that the SEIS 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 SEIS must also fully analyze and account for all impacts related to building the Pumps and supporting infrastructure at the Deer Creek location. See Section D.5, below.

1. Impacts to Wetlands

As the 2008 Clean Water Act 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.”⁷⁶ 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.”⁷⁷

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

⁷³ Council on Environmental Quality, Considering Cumulative Effects Under the National Environmental Policy Act at 41 (January 1997).

⁷⁴ *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).

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

⁷⁶ 2008 Final Determination at i.

⁷⁷ William J. Mitsch and James G. Gosselink, *Wetlands* (5th ed.) (2015) at 112 (emphasis in original).

wetlands that often remove biotic and abiotic material, such as dissolved organic carbon, excessive salinity, toxins, and excess sediments and detritus.”⁷⁸

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.⁷⁹

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.”⁸⁰ The many significant ecological values of riverine wetlands are discussed at length in the 2008 Clean Water Act Final Determination (including the Technical Appendices) and in the comments on the 2007 SEIS submitted by the U.S. Department of the Interior, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, independent scientists, conservation community, and the public. These comments should be fully considered by the Corps in preparing this SEIS and should be included in the administrative record for this SEIS.

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).⁸¹ Riverine wetlands provide essential habitat for many species of fish and wildlife, including critical spawning habitat.⁸² Typically, at least 7 consecutive days of overbank flooding are required to trigger spawning.

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.”⁸³

⁷⁸ Id. at 111-112.

⁷⁹ Id. at 112 (emphasis added).

⁸⁰ Id. at 119.

⁸¹ 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).

⁸² See, e.g. 2008 Clean Water Act Final Determination, Technical Appendices.

⁸³ 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.

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.⁸⁴ 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.⁸⁵

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 Final Determination:⁸⁶

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.⁸⁷

The 2007 FSEIS also acknowledged that calculating **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.⁸⁸ The 2007 FSEIS did not explain why it did not rely on this confidence range.

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 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.**⁸⁹

Given the significant ecological value of the Yazoo Backwater Area wetlands—and the importance of adverse wetland impacts to fish and wildlife, water quality, flood damage reduction, and project costs

⁸⁴ 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 F 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.

⁸⁵ 2007 FSEIS Main Report at 141.

⁸⁶ 2008 Clean Water Act Final Determination at iii, 3, 45.

⁸⁷ 2008 Clean Water Act Final Determination at 45-47.

⁸⁸ 2007 FSEIS Main Report at 142.

⁸⁹ 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 G to these comments.

and benefits, among many other things—it is essential that the new SEIS properly account for the full suite of wetland impacts.

However, based on the Corps' draft Wetlands Analysis for the new SEIS (which was provided in response to a Freedom of Information Act request), the Corps is not carrying out the analyses required to properly account for the full suite of wetland impacts. Among many other failings, the draft Wetlands Analysis is only examining impacts to wetlands that receive ≥ 14 consecutive days of flooding—ignoring many other impacts to wetlands that among other things, will result in substantial harm to fish and wildlife. A copy of the draft Wetlands Analysis is provided at Attachment B to these comments.

The SEIS must provide at least the following information to ensure that the SEIS accurately addresses the geographic extent of wetland impacts in the project area:

- (1) The SEIS must provide the areal extent (number of acres) of wetlands in the 5-year floodplain without the project, and the areal extent of wetlands that will be in the 5-year floodplain with the project—*i.e.*, a full assessment of wetland acres that will no longer be in the 5-year floodplain with the project. It is also important that the Corps provide the GIS shapefile polygons for the 5-year floodplain with and without the project on the Yazoo Backwater Pumps website “**as quickly as practicable**” after they are generated, as required by law, so that the public can have prompt access to this critical planning data.⁹⁰

There is no scientific basis or rational justification for failing to evaluate impacts to wetlands located above the 2-year floodplain or to short-hydroperiod wetlands as the Corps had done in the draft Wetland Analysis and as the Corps did in 2007. To the contrary, the fundamental underpinnings of the science of wetland functions and values, ecological processes, ecosystem services, and fish and wildlife habitat requirements, make clear that impacts to these types of wetlands must in fact be assessed.

- (2) The SEIS must provide the areal extent (number of acres) of wetlands in the 2-year floodplain without the project, and the areal extent of wetlands that will be in the 2-year floodplain with the project—*i.e.*, a full assessment of wetland acres that will no longer be in the 2-year floodplain with the project. It is also important that the Corps provide the GIS shapefile polygons for the 2-year floodplain with and without the project on the Yazoo Backwater Pumps website “as quickly as practicable” after they are generated, as required by law, so that the public can have prompt access to this critical planning data.⁹¹
- (3) The SEIS must provide the areal extent (number of acres) of wetlands that receive equal to or greater than 14 consecutive days of flooding without the project, and the areal extent of wetlands that receive equal to or greater than 14 consecutive days of flooding

⁹⁰ 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 the Corps of Engineers.”)

⁹¹ *Id.*

with the project—*i.e.*, a full assessment of the wetland acres that will no longer receive equal to or greater than 14 consecutive days of flooding with the project. It is also important that the Corps provide the GIS shapefile polygons for these areas with and without the project on the Yazoo Backwater Pumps website “as quickly as practicable” after they are generated, as required by law, so that the public can have prompt access to this critical planning data.⁹²

- (4) The SEIS must provide the areal extent (number of acres) of wetlands that receive equal to or greater than 7 consecutive days of flooding without the project, and the areal extent of wetlands that receive equal to or greater than 7 consecutive days of flooding with the project—*i.e.*, a full assessment of the wetland acres that will no longer receive equal to or greater than 7 consecutive days of flooding with the project. It is also important that the Corps provide the GIS shapefile polygons for these areas with and without the project on the Yazoo Backwater Pumps website “as quickly as practicable” after they are generated, as required by law, so that the public can have prompt access to this critical planning data.⁹³ As noted above, there is no scientific basis or rational justification for failing to evaluate impacts to short-hydroperiod wetlands or to wetlands located above the 2-year floodplain as the Corps did in 2007 and as the Corps continues to do in the draft Wetlands Analysis.
- (5) The SEIS must provide detailed information on the changes that would result from construction and operation of the Yazoo Pumps to: the areal extent of inundation, depth of inundation, and duration of inundation of all wetlands that currently receive equal to or greater than 14 consecutive days of flooding.
- (6) The SEIS must provide detailed information on the changes that would result from construction and operation of the Yazoo Pumps to: the areal extent of inundation, depth of inundation, and duration of inundation of all wetlands that currently receive equal to or greater than 7 consecutive days of flooding.
- (7) The SEIS must provide detailed information on the direct and indirect impacts to wetlands, streams, and groundwater that will occur as a result of siting and operating the Pumps at the Deer Creek site. Among many other things, this must include an analysis of wetland impacts that would result from operating the Pumps when the Steele Bayou gates are open—which could occur since the structural limitations on operating that Pumps when the gates are open (*i.e.*, with the gates open, the flow of water through the Pumps would overwhelm the pump mechanism) may no longer apply at the Deer Creek location. See Section D.5 of these comments for additional information needs related to relocating the Yazoo Pumps to the Deer Creek site.
- (8) The SEIS must provide the underlying data and assumptions relied on by the Corps to establish: (i) floodplain elevations without the project; (ii) floodplain elevations with the project; and (iii) stage frequency curves with and without the project. This information is fundamental to assessing impacts and project costs and benefits, and should be fully available for public review and comment. It is also important that the Corps provide this

⁹² Id.

⁹³ Id.

information on the Yazoo Backwater Pumps website “as quickly as practicable” after it is generated, as required by law, so that the public can have prompt access to this critical planning data.⁹⁴

- (9) The SEIS must provide detailed information on all conservation and easement lands in the project area, and the wetlands on those lands that will be affected by the Yazoo Pumps, including:
- All federally-owned conservation lands (*e.g.*, National Wildlife Refuge lands, National Forest lands);
 - All state-owned conservation lands (*e.g.*, State Wildlife Management Areas and other state-owned lands);
 - All lands enrolled in the U.S Department of Agriculture Wetland Reserve Easement Program, Floodplain Easement Program, or Conservation Reserve Program;
 - All lands owned or managed by the Corps for mitigation or for other purposes, and all lands subject to Corps flood or flowage easements. The Conservation Organizations understand that the Corps owns permanent flood easements on at least 19,463 acres of land in the Yazoo Backwater Area and has purchased many thousands of acres of mitigation lands in the Yazoo Backwater Area for other water resources projects; and
 - All privately owned conservation lands.

No agricultural or other flood damage reduction benefits may 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. It is critical that the SEIS fully inform the public and decision-makers about the adverse impacts that the Yazoo Pumps would cause to the wetlands, streams, and other natural systems on lands and conservation easements that have been purchased, or are being managed, for conservation purposes using federal and state taxpayer dollars. See Section C.2 and Figures 3 and 4, above.

- (10) The SEIS must provide detailed information on all lands that fall under the following land use categories in the project area, and the adverse impacts to wetlands located on those lands as a result of the Yazoo Pumps, including: crop land, forest land, fallow land, and lands with soils identified as 4W+ soils under the USDA Land Classification system. Information on these land use categories is readily available from the U.S. Department of Agriculture (USDA) CropScape database⁹⁵ and other USDA sources. This information is essential for ensuring a meaningful evaluation of impacts, an effective evaluation of all reasonable alternatives as required by law, and proper evaluation of project costs and benefits.

The USDA Land Capability Classification system rates soils based on their degree of limitations for farming. Lands rated as Classes 4W to 8W, which are commonly referred

⁹⁴ Id.

⁹⁵ USDA CropScape database (<https://nassgeodata.gmu.edu/CropScape/>).

to as 4W+ soils, are the wettest soils and have “severe limitations” on farming, according to the USDA. In general, 4W+ lands are saturated or inundated from 50 to 100 percent of growing seasons. These lands were exempted from county caps on Wetland Reserve Easements by the 2014 Farm Bill, and reforestation of these lands is a conservation priority.

The USDA Land Capability Classification system provides the following definitions applicable to 4W+ soils:

- “Class 4 soils have very severe limitations that restrict the choice of plants or require very careful management, or both.”⁹⁶
- “Class 5 soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food and cover.”⁹⁷
- “Class 6 soils have severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover.”⁹⁸
- “Class 7 soils have very severe limitations that make them unsuited to cultivation and that restrict their use mainly to grazing, forestland, or wildlife.”⁹⁹
- “Class 8 soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife, or water supply or for esthetic purposes.”¹⁰⁰
- “Subclass w is made up of soils for which excess water is the dominant hazard or limitation affecting their use. Poor soil drainage, wetness, a high water table, and overflow are the factors that affect soils in this subclass.”¹⁰¹

USDA data shows 296,126 acres of 4W+ soils in the Yazoo Backwater Area. Most of the remaining unprotected 4W+ soils are adjacent to existing conservation lands, making them particularly important conservation priorities. See Section C.2 and Figure 4, above.

- (11) The SEIS must provide a detailed explanation of the models, underlying assumptions, and data inputs used to develop the new baseline wetland calculations in the draft Wetlands Analysis—this information is only vaguely touched upon in the draft Wetlands Analysis. The SEIS must also provide a detailed explanation regarding how the new baseline wetland calculations can be reconciled with: (i) the significantly larger area of 2-year floodplain baseline wetlands identified through the statistically valid field sample carried out in 2003 (the 2003 EMAP analysis); and (ii) the significant increases in

⁹⁶ USDA, Land Classification System

(http://www.ncrcd.org/files/4414/0968/3285/NRCS_Land_Capability_Classes.pdf and <https://www.ars.usda.gov/ARSUserFiles/np215/Food%20security%20talk%20inputs%20Lunch%203-15-11.pdf>; https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/?cid=nrcs143_014040).

⁹⁷ Id.

⁹⁸ Id.

⁹⁹ Id.

¹⁰⁰ Id.

¹⁰¹ Id.

conservation land acreage in the Yazoo Backwater Area since the 2007 SEIS, including tens of thousands of acres of additional lands enrolled in the Wetland Reserve Easement program, which includes restoration of wetland characteristics on enrolled lands.

- The 2007 SEIS concluded that there were 189,000 acres of wetlands in the \geq 14 day duration flood zone (the 2-year floodplain; the 2007 SEIS did not evaluate impacts above the 2-year floodplain and did not evaluate all wetland impacts in the 2-year floodplain, as discussed above).
- The 2003 EMAP analysis found 179,120 acres of baseline wetlands in the 2-year floodplain.¹⁰² The 2003 EMAP analysis is a statistically valid field sampling survey that used EPA's Environmental Monitoring and Assessment Program (EMAP) to ground-truth the baseline wetland acreage. The 2003 EMAP survey was conducted by the U.S. Environmental Protection Agency, the Corps, the U.S. Fish and Wildlife Service, and the Natural Resource Conservation Service.¹⁰³
- The draft Wetlands Analysis, on the other hand, concludes that only 69,465 acres of baseline wetlands exist in the 2-year floodplain (which it describes as the area within the \geq 14 day duration flood zone "potentially sustained by flood inputs").¹⁰⁴

The dramatic difference between the 2003 EMAP statistically valid field sampling survey and the new wetland baseline strongly suggest that the new wetland baseline acreage numbers are incorrect. The new wetland baseline also appears to be incompatible with the increase in Wetland Reserve Easements and other conservation lands in the Yazoo Backwater Area.

- (12) If the wetland baseline numbers in the draft Wetland Analysis are accurate, it means that between 109,655 and 120,015 acres of wetlands were lost in just the 2-year floodplain in the Yazoo Backwater Area since approximately 1978 (when the Yazoo Backwater Levee was completed), despite *increased* conservation of wetland acres over this same timeframe. According to the Corps' 2007 documentation (based on the FEAT analysis) and the 2003 EMAP ground-truthing analysis, these wetlands existed in the 2003-2007 timeframe. If these wetlands have in fact been lost, the SEIS must fully account for these highly significant losses, including in the cumulative impacts and alternatives analyses.
- (13) A detailed explanation of the models, underlying assumptions, data inputs, and rationales employed to impose the following limitations and reach the following conclusions in the draft Wetlands Analysis—this information is only vaguely touched upon in the draft Wetlands Analysis:

¹⁰² 2008 Clean Water Act Final Determination, Appendix 5 at Table 2.

¹⁰³ *Id.* at Appendix 5.

¹⁰⁴ Draft Wetland Analysis at 109.

- a. *“Potential wetland impacts consider hydrologic alternations to areas exhibiting flooding for ≥ 14 days.”*¹⁰⁵ As discussed above, there is no scientific justification for limiting consideration of wetland impacts to these areas. The SEIS should provide a detailed, quantified, and comprehensive explanation for imposing this highly significant limitation on the wetland impacts analysis.
- b. *“All HGM calculations utilized the mid-point of each flood duration range.”*¹⁰⁶ It is unclear why this mid-point was utilized. Since the length and level of inundation has significant implications for ecological services and outcomes, utilizing this midpoint could mask critical adverse impacts. *See also*, the points raised below regarding the many problems with the Corps’ HGM analysis.
- c. *“The analysis of direct impacts was not altered from the [2007 SEIS] due to the expectation that the physical footprint and associated impacts to wetlands remain consistent with previous estimates.”*¹⁰⁷ The calculation of functional values for the direct wetland impacts was also based on the 2007 SEIS project location.¹⁰⁸ These assessments of direct wetland impacts cannot be correct since the location of the Pumps has been changed. The SEIS must assess the direct impacts associated with the Deer Creek Site.

Critically, the many flaws in the 2007 HGM analysis should preclude its use, or any type of reliance on that analysis. The 2008 Clean Water Act Final Determination rejects the 2007 HGM analysis as fundamentally flawed:

EPA believes that certain modeling assumptions and factors used by the Corps in the application of these assessment 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. These concerns are summarized in Appendix 6.¹⁰⁹

The SEIS should correct the many failings that make the 2007 SEIS HGM analysis unreliable—including those identified in the 2008 Clean Water Act Final Determination, and use the improved HGM process to conduct a fundamentally new HGM analysis for the SEIS.

- d. *“This HGM analysis considers potential impacts to wetlands that experience ≥ 14 days of flood inundation. Recent onsite hydrologic monitoring results demonstrate that wetlands hydrology in the study area is predominantly driven by precipitation, with surface water flood inundation providing supplemental water sources in some*

¹⁰⁵ Draft Wetlands Analysis at 100.

¹⁰⁶ *Id.* at 100.

¹⁰⁷ *Id.* at 101

¹⁰⁸ *Id.* at 120.

¹⁰⁹ 2008 Clean Water Act Final Determination at 47. A full analysis of the problems with the Corps’ 2007 HGM analysis are provided in Appendix 6 of the 2008 Clean Water Act Final Determination. This Appendix, along with the entire 2008 Clean Water Act Final Determination, of course must be fully considered in the SEIS and included in the administrative record for the SEIS.

areas during some years (Berkowitz et al. 2019, see Section 4.8 of this report). As a result, the current analysis focuses on wetlands with the potential to be impacted from operation of the pumps (i.e., those supported by flooding). However, available data demonstrates that the wetlands within the project will continue to exhibit wetland hydrology based upon seasonal high water tables derived from precipitation inputs. Thus, conversion of wetlands to non-wetland habitats (i.e., uplands) is not anticipated outside of direct impacts related to the physical project footprint (38 acres).¹¹⁰ The Berkowitz study does not support these conclusions, as discussed in detail below; and the many other problems identified in this section strongly suggest that these conclusions are fundamentally incorrect.

- e. *“Notably, the three tiers of wetlands identified during the EMAP study do not reflect the wetlands within the study area subject to potential impacts from operation of the pumps. This is due to the fact that most wetlands within the region are sustained by local patterns of precipitation, with flooding providing supplemental sources of wetland hydrology in some areas (Figure 4.5.1-1). A recent publication (Berkowitz et al. 2019) identifies dominant sources of wetland hydrology in the region, reporting that >75% of wetland saturation events were induced by precipitation and that 87% of study wetlands would persist in the absence of flood water inputs (Figure 4.5.1-2).”¹¹¹ The Berkowitz study does not support these conclusions, as discussed in detail below; and the many other problems identified in this section strongly suggest that these conclusions are fundamentally incorrect.*
- f. *“The Holly Bluff Cut-off was completed in 1958, and the Backwater levee was completed in 1978. These flood control features reduced stages in the study area. The median ≥ 14 day flood duration elevation threshold was lowered approximately one to three feet as a result of implementing the flood control features, translating to a large aerial decrease in potential wetland areas when superimposed on the project landscape.”¹¹² If this is accurate, the SEIS must explain why the authorized level of flood protection (as set forth in the 1941 project authorization) has not already been achieved. The SEIS must also ensure that the new stage elevations are used consistently for all analyses in the SEIS, including for determining project benefits.*
- g. *“[A] total of 69,465 acres occurring below the ≥ 14 day flood duration elevation. This represents the potential wetland area that may be supported by flood inundation, and is the extent utilized throughout the subsequent analysis. These 69,465 acres occurs across several flood duration intervals ranging from 14 to > 35 days (Table 4.5.1-2).”¹¹³ See the discussion of baseline wetland impacts, above. The many other problems identified in this section also strongly suggest that these conclusions are fundamentally incorrect.*

¹¹⁰ Id. at 101.

¹¹¹ Id. at 102

¹¹² Id. at 109.

¹¹³ Id. at 109.

- h. *“The flood duration modeling data reports changes in the hydroperiod of potential wetland areas being examined. The majority (75 percent; 51,964 acres) of wetlands are not expected to change flood duration as a result of project implementation (Table 4.5.3-1). A subset of wetlands (24 percent; 16,841 acres) are estimated to display a decrease in flood duration, and a small number of (<0.1 percent; 661 acres) may experience an increase in flood duration.”*¹¹⁴ See the discussion of baseline wetland impacts, above. The many other problems identified in this section also strongly suggest that these conclusions are fundamentally incorrect.

- i. *“The majority (9,167 acres) of wetlands expected to display a decrease in flood duration will continue to experience ≥ 14 days of inundation from floodwaters, although the wetland functional capacity of those wetlands may be decreased. A portion of the wetlands (7,674 acres) estimated to experience a decrease in flood duration will no longer be subject to ≥ 14 days of flood inundation. However, available data suggests that this will not result in the conversion of wetlands to non-wetlands (i.e., loss of wetlands; except for the 38 acre physical project footprint) as precipitation-induced wetland hydrology has been shown to significantly exceed the period of flood inundation within the study area across all flood duration intervals (Berkowitz et al. 2019). The changes in flood duration will decrease wetland functional capacities, and those decreases are present for in the wetland functional assessment portion of this report (see below).”*¹¹⁵ The Berkowitz study does not support these conclusions, as discussed in detail below; and the many other problems identified in this section strongly suggest that these conclusions are fundamentally incorrect.

- j. The draft Wetlands Analysis states that the total acres of agricultural (crop) lands in the updated ≥ 14 day flood inundation zone totals 5,206 acres.¹¹⁶ The draft Wetland Analysis further concludes that only 997 acres of agricultural lands in that zone would be affected by the Yazoo Pumps.¹¹⁷ If the SEIS relies on these impact numbers, it must limit any assessment of agricultural benefits in this flood inundation zone to 997 acres, and explain how the Corps could carry out the promised reforestation component and required mitigation.

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¹¹⁴ Id. at 110.

¹¹⁵ Id. at 111.

¹¹⁶ Id at 109.

¹¹⁷ Id. at 121.

- k. *“The HGM assessment of wetland functions applied the same principles, equations, and parameter values utilized in the 2007 report, while updating the extent and distribution of wetlands based upon the best available data.”*¹¹⁸ It is inappropriate to rely on the 2007 HGM analysis. As the Environmental Protection Agency stated in the 2008 Clean Water Act Final Determination:

EPA believes that certain modeling assumptions and factors used by the Corps in the application of these assessment 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. These concerns are summarized in Appendix 6.¹¹⁹

- (14) The SEIS must provide a detailed assessment of: (i) the uncertainties associated with the model, data, and underlying assumptions used to develop its Wetland Analysis; and (ii) the implications of relying on a model that does not (or may not) accurately account for baseline wetlands or impacts to those wetlands.
- (15) The SEIS must provide documentation of the certification for models relied upon in the SEIS, including: (i) “the updated Digital Elevation Model (DEM) which uses a 10-meter resolution”¹²⁰; (ii) the “Flood Event Simulation Model (FESM)” which was used to model baseline conditions¹²¹; and (iii) any other models used in the SEIS. Corps guidance requires the use of certified models for project planning; a model this is not certified and that has not gone through peer review may not be used for the SEIS.

The Corps’ internal guidance clearly requires certification of the new model before it can be used for planning activities. The purpose of model certification is to ensure, among other things, that models used by the Corps are technically and theoretically sound, computationally accurate, transparent, and in compliance with Corps policy:

Use of certified or approved models for all planning activities is mandatory.

This policy is applicable to all planning models currently in use, models under development and new models. District commanders are responsible for delivering high quality, objective, defensible, and consistent planning products. Development of these products requires the appropriate use of tested and defensible models. National certification and approval of planning models results in significant efficiencies in the conduct of planning studies and enhances the capability to produce high quality products. The appropriate PCX will be responsible for implementing the model certification/approval process. The goal of certification/approval is to ensure that Corps planning products are theoretically sound, compliant with Corps policy, computationally accurate, based on reasonable assumptions regarding the availability of data, transparent, and described to address any limitations of the model or its use. The use of a

¹¹⁸ Id. at 121.

¹¹⁹ 2008 Clean Water Act Final Determination at 47. For a full analysis of the problems with the Corps’ 2007 HGM analysis see Appendix 6 of the 2008 Clean Water Act Final Determination.

¹²⁰ USACE Draft Wetland Analysis at 99, provided at Appendix B to these comments.

¹²¹ Id. at 100.

certified/approved model does not constitute technical review of the planning product. The selection and application of the model and the input data is still the responsibility of the users and is subject to Agency Technical Review and Independent External Peer Review (where applicable). Once a model is certified/approved, the PCXs will be responsible for assuring that model documentation and training on the use of the model are available (either from the PCX or the model developers), and for coordinating with model developers to assure the model reflects current procedures and policies. All certification/approval decisions will be in effect for a period specified by the Model Certification HQ Panel, not to exceed seven years.¹²²

Similarly, the use and application of the new model for individual projects is subject to the requirements of the Corps' peer review process.¹²³

- (16) The SEIS must ensure appropriate use of the Berkowitz study cited in the Notice of Intent and attached to and relied upon extensively in the draft Wetlands Analysis. The draft Wetlands Analysis draws improper conclusions from the Berkowitz study that taint the entire draft Wetlands Analysis. The Berkowitz study provides little, if any, information that is relevant or useful to the SEIS. It is critical that the SEIS not misuse or overstate the implications of the Berkowitz study.

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."¹²⁴ 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 duration and inundation patterns differed with dominant water source."¹²⁵

These findings do not support, and may not be used to support, any conclusions related to wetland impacts from the Proposed Action for at least the following critical reasons:

- a. As clearly documented in the Berkowitz study, the study is not based on a randomized, statistically valid sample of wetland locations in the project area.

¹²² EC 1105-2-412, Assuring Quality of Planning Models at paragraph 6 (emphasis added).

¹²³ See, e.g., EC 1105-2-408 and EC-1105-2-410.

¹²⁴ Berkowitz, J.F., D.R. Johnson, and J.J. Price, "Forested Wetland Hydrology in a Large Mississippi River Tributary System", *Wetlands Journal* (December 2019) (available at <https://link.springer.com/article/10.1007/s13157-019-01249-5>). While the April 16, 2020 Notice of Intent states that this study is also available on the Yazoo Pumps Backwater Pumps project website, it was not posted to that site as of June 7, 2020.

¹²⁵ Id. (emphasis added).

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.

- b. The Berkowitz study is based on an extremely limited monitoring record that by definition, cannot and does not provide the information needed to draw conclusions regarding the long-term and cumulative implications of the loss of overbank flooding that would occur with the Pumps in place.
- c. The Berkowitz study draws just one extremely limited conclusion that has no meaning in the context of the required NEPA or Clean Water Act reviews, and no meaning in the context of the ecological harm (including loss of ecological services) that would result from construction and operation of the Yazoo Pumps. The Berkowitz study simply concludes that “most wetlands” examined by the study would “persist” in the absence of flooding. Even if this conclusion was correct—which, given the severe limitations of the study, it almost certainly is not—it fails to provide any type of meaningful information.

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). Under that definition, a wetland that pre-Yazoo Pumps would experience inundation of more than a foot for more than 14 consecutive days during key spawning seasons could be deemed to “persist” post-Yazoo Pumps if it lacked any flood-induced inundation but still retained wetland soil characteristics. But under this scenario, the wetland would cease to provide any habitat for fish spawning or any nutrient cycling because wetlands cannot cycle nutrients if the water is not transported off the floodplain, among many other changes. Similarly, if the Yazoo Pumps prevented 20,000 acres of riverine wetlands from receiving at least 7 consecutive days of overbank flooding that would occur without the Pumps, spawning habitat would be completely lost on all of those 20,000 acres even though the wetlands could still persist.

In short, relying on a conclusion that some wetlands would “persist” as providing a rationale for constructing the Yazoo Pumps would constitute a willful refusal to account for the vitally important functions provided by riverine wetlands. Indeed, this is one of the key problems identified in the 2008 Clean Water Act Final Determination that warranted the 2008 veto. The Environmental Protection Agency 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).”¹²⁶ These changes constituted significant degradation in violation of the Clean Water, notwithstanding the fact that a subclass of wetlands still “persisted.”

- (17) The SEIS must ensure that the same criteria used to assess the geographic extent of wetland impacts (i.e., the new period of record and other data referred to in the Notice of Intent) is also used to assess the geographic extent of flood damage

¹²⁶ 2008 Clean Water Act Final Determination at 50.

reduction benefits. If, as claimed in the draft Wetlands Analysis, the 2007 period of record overestimated wetland impacts, the 2007 period of record would also have overestimated flood damage reduction benefits.

- (18) The SEIS must ensure a comprehensive examination of cumulative wetland losses, including by quantifying and fully accounting for: (i) the historic losses of bottomland hardwood wetlands and other wetlands in the project area and beyond; (ii) the impacts of the project area's massive agricultural withdrawals on the project area wetlands; (iii) the impacts of the severe depletion of groundwater levels in and near the project area on the area's wetlands; and (iv) the impacts of climate change on the project area wetlands. The cumulative impacts of the geographical extent of wetland losses also, of course, must be assessed in connection with the loss of and changes in wetland functions and the ecological impacts of those losses on fish and wildlife including migratory species, amphibians, and reptiles.

Once the SEIS properly assesses the extent of wetland impacts through the analyses discussed above, it must then assess the ecological implications—and significance of those implications—in light of a full understanding of the values provided by the Yazoo Backwater Area wetlands, the implications of the loss of ecological services provided by those wetlands, the full life-cycle needs of the many species that rely on these vital wetlands, and the critical importance of short hydroperiod wetlands for fish and wildlife, among other things.

Many of these factors are discussed in detail in the 2008 Clean Water Act Final Determination and the comments of the U.S. Department of the Interior, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, independent scientists, and conservation organizations on the 2008 Clean Water Act Final Determination and the 2007 SEIS. These materials should be carefully reviewed and fully accounted for in the SEIS, and should be included in the administrative record for the SEIS.

As confirmed in the 2008 Clean Water Act Final Determination, the Corps' 2007 HGM analysis process (which, as discussed above, the Corps continues to rely on) is fundamentally flawed and will not properly account for the ecological implications of the Yazoo Pumps-induced wetland losses:

EPA believes that certain modeling assumptions and factors used by the Corps in the application of these assessment 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. These concerns are summarized in Appendix 6.¹²⁷

As has been repeatedly highlighted by the Federal resource agencies, the area that would be drained by the Yazoo Pumps:

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

¹²⁷ 2008 Clean Water Act Final Determination at 47. A full analysis of the problems with the Corps' 2007 HGM analysis are provided in Appendix 6 of the 2008 Clean Water Act Final Determination. This Appendix, along with the entire 2008 Clean Water Act Final Determination, of course must be fully considered in the SEIS and included in the administrative record for the SEIS.

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.”¹²⁸ The Yazoo Pumps would cut off the hydrological cycle of backwater flooding that “is 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.¹²⁹

Forested wetlands have long been recognized as vitally important and as being “among the Nation’s most important wetlands.”¹³⁰ 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.”¹³¹

Notably, in its comments on the 2007 FSEIS, the Department of the Interior 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.”¹³² As noted above, many fish species require at least 7 consecutive days of overbank flooding to trigger spawning so that spawning habitat will be completely lost on those wetlands that no longer flood in this manner as a result of the Pumps.

The assessment of the ecological implications of the adverse impacts to wetlands must also account for the full suite of impacts to wetland plants, including the region’s vitally important bottomland hardwood wetland species. As noted above, even small changes in wetland hydrology can cause “massive changes in species composition and richness and in ecosystem productivity.”¹³³

The assessment of the ecological implications of the adverse impacts to wetlands must also account for the full suite of ecological services provided by the area’s wetlands. For example, losses to forested and other wetlands resulting from the Yazoo Pumps could, among many other adverse 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.”¹³⁴

¹²⁸ U.S. Fish and Wildlife Service, Fish and Wildlife Coordination Act Report (October 23, 2006), 2007 Final SEIS, Appendix 3 at 1.

¹²⁹ *Id.* at 11.

¹³⁰ Report to Congress, Secretary of the Interior, Impact of Federal Programs on Wetlands, 1988, Volume I at 39.

¹³¹ *Id.*

¹³² U.S. Department of the Interior Comments on the 2007 FSEIS at 7, 9.

¹³³ William J. Mitsch and James G. Gosselink, *Wetlands* (5th ed.) (2015) at 112.

¹³⁴ Acreman, M.; Holden, J. 2013. How wetlands affect floods. *Wetlands*, 33 (5). 773-786. 10.1007/s13157-013-0473-2.

- 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.”¹³⁵
- Further deplete the already significantly depleted groundwater in the Yazoo Backwater Area and the entire Mississippi Delta and further exacerbate the already significant low stream flows in the Yazoo Backwater Area by eliminating large swaths of wetlands that contribute to groundwater recharge and the protection and restoration of stream flow.

Many of these impacts and implications are discussed in more detail below and throughout these comments.

2. Impacts to Streams

The SEIS must evaluate the impacts of constructing and operating the Yazoo Pumps on the rivers, streams, and bayous within the Yazoo Backwater Area. As discussed in Section D.5 of these comments, the SEIS also must evaluate the impacts of the Yazoo Pumps on the Yazoo River. The 2007 SEIS did not analyze any of these impacts.

It is beyond question that draining vast areas of wetlands will adversely affect the streams in the Yazoo Backwater Area. Intensifying agricultural production in the Yazoo Backwater Area, which is the fundamental purpose of the Yazoo Pumps use (and accounts for more than 80% of project benefits) will result in increased cultivation, additional fertilizer and pesticide use, and potential land clearing that will all have an adverse effect on the area’s streams.

Stream impacts that must be evaluated include:

- (1) Changes to water temperature;
- (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 D.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.

¹³⁵ 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>.

Impacts to stream resources must be separately evaluated and mitigated, as a matter of law. The SEIS cannot simply ignore the impacts to the project area’s vast array of streams.

3. Impacts to Conservation Lands

The SEIS must fully 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.

As noted above, 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.

For example, had the Yazoo Pumps been operating in 2019, vast acres of wetlands would have been drained—between 60,000 and 70,000 acres—even as 65% of flooded lands would have remained underwater (including 110,000 acres of cropland). The largest single tract of land that would have been drained is the 8,000-acre Lake George Wildlife Management Area, which as noted above is a Corps mitigation site for previously constructed water resources projects. See Figure 5, above.

Collectively, these conservation lands cover 250,000 acres in the Yazoo Backwater Area. See Figures 3 and 4, above. The following are the estimated acres in each category of conservation lands 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 to fully assessing adverse impacts to these conservation lands, it is critical that no agricultural or other flood damage reduction benefits 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. It is critical that the SEIS fully inform the public and decision-makers about the adverse impacts that the Yazoo Pumps would cause to the wetlands, streams, and other natural systems on lands and conservation easements that have been purchased, or are being managed, for conservation purposes using federal and state taxpayer dollars.

4. Impacts on Downstream Flooding

The SEIS must carefully assess the impacts of operating the Yazoo Pumps on: increasing flood heights in the Yazoo River; increasing flood risks to homes, businesses, and communities located along or near the Yazoo River; increasing the risk of overtopping or otherwise undermining the integrity of the Yazoo Backwater Levee; and increasing flood heights in the Mississippi River.

A document entitled *Impacts of Yazoo Backwater Pump to Downstream Stages, 22 November 2019*,¹³⁶ which was prepared by the Corps, concludes that operating the Pumps in 2019 would have increased flood levels in the Yazoo River (on the riverside of the Steele Bayou Gates) by 0.3 feet. However, because the study has a margin of error of 0.5 feet, the **Corps' study actually shows that flood levels in the Yazoo River could have increased by 0.3 feet to 0.8 feet in 2019 had the Yazoo Pumps been in operation.**¹³⁷ This Corps study also concludes that operating the Pumps in 2019 would have increased flood levels at the mouth of the Yazoo River by 0.2 feet. However, **because of the study's margin of error, the increase in flood levels at the mouth of the Yazoo River could be as high as 0.7 feet.**

Based on this Corps analysis, had the Yazoo Pumps been operating in 2019, they would have overtopped the Yazoo Backwater Levee, which according to the Corps had just 0.3 feet of remaining freeboard during the 2019 flood, as demonstrated in this slide from a Mississippi Valley Division presentation on the 2019 Mississippi River flood. See Figure 10, below.

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¹³⁶ This document is posted on the Delta Council website at <https://www.deltacouncil.org/corpsimpactstudy.html> (last visited June 8, 2020).

¹³⁷ USACE, *Impacts of Yazoo Backwater Pump to Downstream Stages, 22 November 2019* at 1 (Model tolerance for the MR&T flowline assessment HEC-RAS model is approximately plus or minus 0.5 ft.)



Figure 10, Yazoo Backwater Levee Remaining Freeboard 2019 Flood (0.3ft) (Source: USACE Mississippi Valley Division Presentation on 2019 Mississippi River Flood, Joey Windham, Chief Watershed Division)

The portion of the Yazoo Backwater Levee that could be directly impacted by the Yazoo Pumps (that portion located south of Belzoni, MS) consists of “approximately 28 miles of earthen embankment.” This portion of the Yazoo Backwater Levee (which is not accredited by the Federal Emergency Management Agency) has a moderate risk with **overtopping with breach the primary risk driver**, according to the National Levee Database.¹³⁸ Moderate risk is defined as follows: “Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in moderate risk.”¹³⁹

As reported by the Mississippi Business Journal in 2012, this section of the Yazoo Backwater Levee must be “raised slightly more than 1.5 feet, according to Ken Parrish, Army Corps of Engineers’ senior project manager for the mainline Mississippi River levee.”¹⁴⁰ The article also states that “Federal officials say the recent flooding showed the 27-mile long flood protection berm must be raised more than a foot-and-a-half to provide its intended protection. The levee must have three to five feet of “free board,” according to the U.S. Army Corps of Engineers. This is the water-free mark from the highest level of a 100-year-flood to the top of the levee. The spring flood led to a recalculation of the 100-year flood mark and the beginning of the de-certification fears.”¹⁴¹

The Corps recommends supporting “**risk reduction actions as a priority**” for levees at moderate risk:

¹³⁸ National Levee Database at <https://levees.sec.usace.army.mil/#/levees/system/5905000041/summary> (visited June 8, 2020) (emphasis added).

¹³⁹ USACE, EC 1165-2-218, APPENDIX D Levee Safety Action Classification (LSAC) Table, <https://www.mvn.usace.army.mil/Portals/56/docs/PAO/LSACs/LSAC%20Table.pdf> (visited June 8, 2020).

¹⁴⁰ Ted Carter, Army Corps of Engineers: Backwater levees must be raised or face de-certification, Mississippi Business Journal, May 17, 2012 (available at <https://msbusiness.com/2012/05/army-corps-of-engineers-backwater-levees-must-be-raised-or-face-de-certification/>).

¹⁴¹ Id.

Based on risk drivers, implement interim risk reduction measures as appropriate. Verify risk information is current and implement routine monitoring program; assure O&M is up to date; communicate risk characteristics to the community in a timely manner; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and, recommend purchase of flood insurance. **Support risk reduction actions as a priority.**¹⁴²

Operation of the Yazoo Pumps would increase—not reduce—risks to the integrity of the Yazoo Backwater Levee by increasing flood heights in the Yazoo River and by pumping water into the Yazoo River at high velocity. Increased flood heights in the Yazoo River would also affect Vicksburg communities and business located along the Yazoo River. Because of the new Deer Creek location, increased flood heights in the Yazoo River caused by the Yazoo Pumps would also create a significant risk of inundating the International Paper wastewater treatment ponds and releasing significant amounts of toxic wastewater into the Yazoo River. See Section D.5 and Figure 11, below.

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¹⁴² USACE, EC 1165-2-218, APPENDIX D Levee Safety Action Classification (LSAC) Table, <https://www.mvn.usace.army.mil/Portals/56/docs/PAO/LSACs/LSAC%20Table.pdf> (visited June 8, 2020).Id.

5. Impacts of Siting the Yazoo Pumps at the Deer Creek Location

The SEIS must fully evaluate the impacts associated with moving the location of the Pumps to the Deer Creek Location (see Figure 11, below).

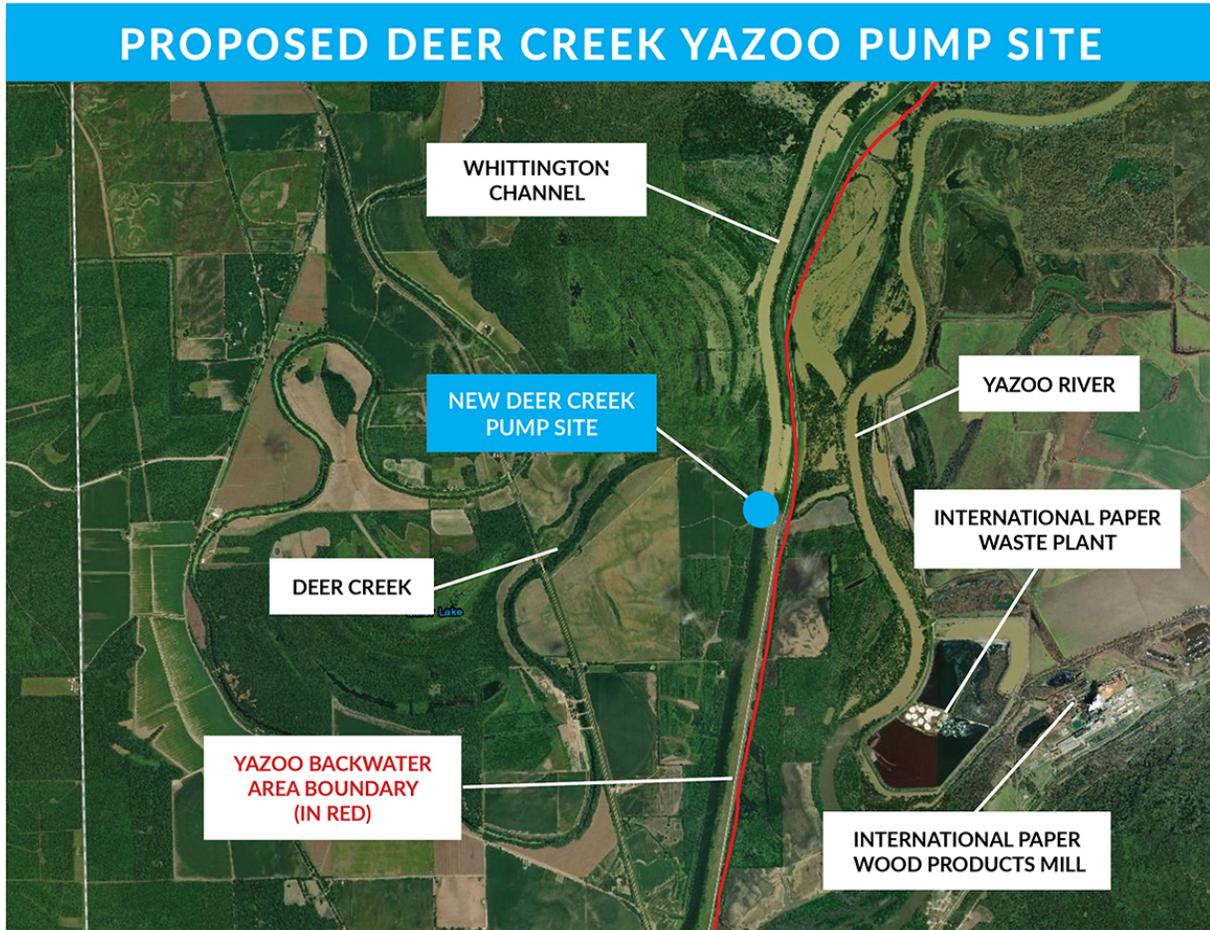


Figure 11, Proposed Deer Creek Yazoo Pumps Site Location (Source: Google Maps)

The new location raises the specter of numerous additional significant impacts that were never considered in the 2007 SEIS. To ensure a proper evaluation of these impacts, the SEIS must assess and quantify at least the following:

- (1) The SEIS must examine the impacts associated with channel clearing, channel enlargement, channel stabilization, and any other actions needed to ensure that Deer Creek will be able to support the pressure and flow associated with operating the Yazoo Pumps.
- (2) The SEIS must examine the impacts resulting from constructing the inlet and outlet channels and other required infrastructure at the Deer Creek location.
- (3) The SEIS must examine the impacts of constructing and operating the Yazoo Pumps at the Deer Creek location on the stability and integrity of the Yazoo Backwater Levee.

- (4) The SEIS must provide a detailed operating plan for the Yazoo Pumps at the Deer Creek location, and examine the impacts of the project in light of the inherent flexibility of Corps operating plans. For example, the operating plan presented in the 2007 SEIS states that the Pumps can be turned on whenever water levels are “predicted” to reach 87 feet, which could allow initiation of pumping when water levels are already extremely low. Notably, the public has no way of tracking the exact time or elevations when pumping is initiated.

Moreover, any pumping regime adopted by the Corps can, and certainly will, change. The Corps has the authority to make changes to the operating regime, and the pressure to do so will be significant. The Corps has a long history of changing operations in a way that harms the environment and public safety. For example, over time, the Corps has changed the operating plan for the New Madrid Floodway (which provides a natural area for the Mississippi River to spread out onto its historic floodplain) by raising the activation level from 58 feet to 60 feet and finally to 61.72 feet in 2011 (see Figure 12, below).

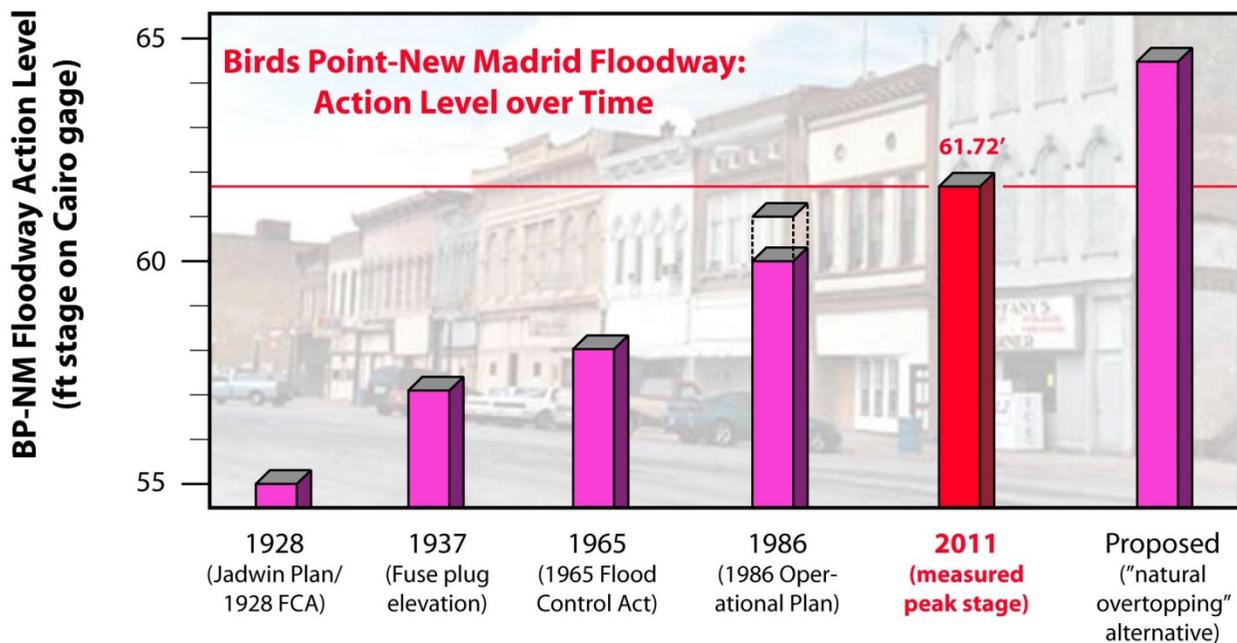


Figure 12, Example of Fundamental Operating Plan Changes—New Madrid Floodway (Courtesy of Nicholas Pinter, Ph.D., Southern Illinois University)

The New Madrid Floodway operational changes have happened “officially” and unofficially. A 1986 Operating Plan “officially” changed the activation level to trigger use of the floodway when water levels were predicted to reach 61 feet.¹⁴³ However, during the flood of 2011, the Corps did not follow that operating plan, but instead waited to activate the floodway until the river reached 61.72 feet at Cairo, far above either the authorized activation level or the 1986 activation level. The delay in activating the floodway resulted in extensive

¹⁴³ Camillo, Charles A., "Divine Providence: The 2011 Flood in the Mississippi River and Tributaries Project" (2012). *US Army Corps of Engineers, Omaha District*. Paper 142 at 57, available at <http://digitalcommons.unl.edu/usarmyceomaha/142> (visited on December 18, 2016).

flooding. More than 200 structures flooded in Olive Branch, Illinois. Almost 240 homes were flooded in the City of Metropolis Illinois and dozens of businesses were either closed or greatly affected by high water. Lost revenue, flood fighting and clean-up costs from the 2011 flood cost Metropolis almost \$1.4 million.¹⁴⁴ The entire city of Cairo Illinois was put under a mandatory evacuation order. Residents were forced to leave their homes and find alternative places to stay, often at significant personal expense. Cairo could have been completely destroyed by any further delay. Once the floodway was used, water levels at Cairo dropped 1 foot in just 6 hours, and 2.7 feet in just 48 hours.

- (5) The SEIS must examine whether locating the Yazoo Pumps at the Deer Creek location will allow (and thus, likely lead to) operating the Yazoo Pumps when the Steele Bayou gates are open. If this is the case, the adverse impacts to wetland from the Yazoo Pumps could be significantly greater since pumping could happen much more frequently. Locating the Yazoo Pumps at Steele Bayou creates a fundamental structural limitation on pumping operations. According to the 2007 SEIS, if the Pumps are located at Steele Bayou they cannot be operated when the Steele Bayou gates are open because the large flow of water would through the open gates would overwhelm the pump mechanism.
- (6) The SEIS must examine whether operating the Yazoo Pumps at the Deer Creek location will cause additional or more intense harm to the Deer Creek watershed due to the much smaller drainage area of that watershed. According to Corps documents, Deer Creek drains just 200 square miles. By contrast, Steele Bayou drains 752 square miles, the Big Sunflower River drains 2,832 square miles, and the Little Sunflower drains 309 square miles.
- (7) The SEIS must examine whether operating the Yazoo Pumps at the Deer Creek location will cause additional or more intense harm to Delta National Forest (which is managed as a bottomland hardwood wetland ecosystem) and other nearby conservation lands. Moving the Pumps to the Deer Creek location places the Pumps much closer to Delta National Forest and other conservation lands than the Steele Bayou location.
- (8) The SEIS must examine whether discharging the Yazoo Pumps into the Yazoo River at the Deer Creek location will cause additional, more intense, or different harm to the Yazoo River and its floodplain. Of particular note, the Deer Creek location is just upstream of an International Paper Plant and the plant's industrial wastewater treatment facility and ponds which are directly adjacent to the Yazoo River (see Section D.5 and Figure 11, above). Discharging water into the Yazoo River at this location creates a significant risk of inundating the wastewater treatment ponds and releasing significant amounts of toxic wastewater into the Yazoo River.
- (9) The SEIS must examine the impacts of construction and operation of any power generation facilities at the site, and the impacts to air quality from operations, including any increase in compounds that will contribute to climate change.
- (10) As discussed in detail in Section F.2 of these comments, the SEIS must examine whether locating the Yazoo Pumps at the Deer Creek location results in the loss of the non-federal cost share waiver implemented in 1997.

¹⁴⁴ July 26, 2016 Letter to President Obama from Billy McDaniel, Mayor of the City of Metropolis Illinois.

6. Impacts to Water Quality

The SEIS must demonstrate that the Yazoo Pumps will not cause or contribute to violations of state water quality standards, as required by the Clean Water Act.

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.¹⁴⁵ This prohibition is especially relevant as the Yazoo Backwater Area already suffers from degraded water quality due to pollutants such as sediment, pesticides, and excessive nutrients. As a result, the area includes an extensive list of section 303(d) impaired waters, some of which are subject to strict Total Maximum Daily Loads (TMDL). A list of these TMDLs are provided at Attachment C to these comments. Furthermore, Mississippi's anti-degradation standards protects all of the natural streams and wetlands in the area.¹⁴⁶

The Yazoo Pumps would, however, exacerbate pollution levels in this area, leading to exceedances of state water quality standards. Among other impacts, the proposed project would (1) increase sediment and pesticide levels in Deer Creek, (2) degrade or destroy thousands of acres of wetlands that play a crucial role in protecting water quality, and (3) increase agricultural production and the use of fertilizers and pesticides. The net result could trigger exceedances of state water quality standards, precluding the Corps' ability to comply with Clean Water Act section 404, unless the Corps proves there is "sufficient information" to conclude otherwise.¹⁴⁷ The Corps must therefore prepare an SEIS that comprehensively analyze the impacts of the project on water quality, including the significant new information regarding water quality in the area.¹⁴⁸

(1) Water Quality Standards in the Yazoo Backwater Area

The Yazoo Backwater Area contains a network of streams and channels that ultimately connect through the Yazoo River to the Mississippi River near Vicksburg. Most stream flow in the Yazoo River originates in the uplands along the eastern flank of the basin and is carried to the Yazoo River via the Coldwater, Yokona, Tallahatchie, and Yalobusha Rivers, and several smaller streams. Interior drainage is provided by numerous small streams that discharge to Deer Creek, the Big Sunflower River, or Bogue Phalia, all of which flow to the lower Yazoo River.

The Yazoo Backwater Area is an incredibly productive fishery, as highlighted by the U.S. Fish and Wildlife Service:

The Yazoo system is an incredibly productive fishery for catfishes (flathead, blue and channel cats) and catostomids (primarily buffalofishes – a principal group exploited by subsistence and artisanal fishers). Blue sucker stocks are also fairly strong and dynamic (this is a fish that is not

¹⁴⁵ 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").

¹⁴⁶ 11 Code Miss. R. Pt. 6, R. 2.1.

¹⁴⁷ See 40 C.F.R. § 230.12(a)(3)(iv).

¹⁴⁸ See 40 C.F.R. § 1502.9(c)(1) (requiring agencies to evaluate and disclose environmental consequences of "new circumstances or information" that are significant and which have not been previously the subject of an original EIS).

doing well in other parts of its range, but holding its own in the Yazoo system).¹⁴⁹

The Service documented dozens of additional backwater fish that depend upon the Yazoo Backwater Area's river floodplains and ecosystems.¹⁵⁰

As such, Mississippi classifies all of the natural streams and waters in the Yazoo Backwater Area as "Fish and Wildlife" waters, ensuring their protection under the state's anti-degradation policy.¹⁵¹ Fish and Wildlife waters "are intended for fishing and for propagation of fish, aquatic life, and wildlife. Waters that meet the Fish and Wildlife Criteria shall also be suitable for secondary contact recreation. Secondary contact recreation is defined as incidental contact with the water during activities such as wading, fishing, and boating, that are not likely to result in full body immersion."¹⁵² Mississippi's anti-degradation policy states that "[i]n no event . . . may degradation of water quality interfere with or become injurious to existing instream water uses."¹⁵³

The Yazoo Backwater Area, however, suffers from degraded water quality due to the impacts of agricultural past practices prevalent in the Mississippi Delta. In 2005, the state reported that overall water quality was lower in this area than anywhere else in the state, as evidenced by a region-wide advisory regarding fish consumption, and numerous consumption bans in some area waters because of high pesticide levels. EPA also documented the extensive list of 303(d)-impaired water bodies in the Area in 2007 due to pollutants such as sediment, pesticides, and excessive nutrients.¹⁵⁴ As a result, numerous waterbodies are subject to TMDLs with little or no margin for additional pollution. See Attachment C.

The Corps acknowledged in the 2007 SEIS its obligation to analyze the TMDL and Section 303(d) list waters "because Mississippi's most recent edition of its water quality criteria states that these waters shall not be further impaired for any designated use."¹⁵⁵ Since then, the Mississippi Department of Environmental Quality (MDEQ) has completed numerous additional TMDLs for streams and rivers in the Yazoo Backwater Area, 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)

¹⁴⁹ U.S. Fish and Wildlife Service, Fish and Wildlife Resources Associated with the Yazoo Backwater Area Certain Life History Aspects, Ecological Relationships, and Effects Anticipated as a Result of Reduced Flooding (June 11, 2018), at 15.

¹⁵⁰ Id. at 18, Table 2.

¹⁵¹ See <https://www.mdeq.ms.gov/wp-content/uploads/2007/10/yzmap&tablewqsadptaug07.pdf> (Map depicting Yazoo River Basin Water Quality Standards)

¹⁵² 11 Code Miss. R. Pt. 6, R. 2.3.

¹⁵³ 11 Code Miss. R. Pt. 6, R. 2.1.

¹⁵⁴ See 2008 Clean Water Act Final Determination, Appendix 7.

¹⁵⁵ 2007 EIS, Appx. 16 ¶1235.

- 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, triggering the Corps' obligation to prepare an SEIS and evaluates whether the proposed project complies with state water quality standards, including these newly issued TMDLs.¹⁵⁶

(2) The Proposed Project Will Increase Sediment and Pesticide Levels in Deer Creek

The Yazoo Backwater Area suffers from elevated levels of legacy pesticides, including DDT and Toxaphene. As documented by MDEQ, these contaminants have year-round impacts on aquatic species and public health, requiring closure of fishing in the Yazoo backwater Area, including the Yazoo National Wildlife Refuge.¹⁵⁷ MDEQ has also issued fish consumption advisories due to the elevated concentrations of these pesticides in fish tissue.¹⁵⁸ To prevent any further impairment of the watershed or existing uses, MDEQ imposed a TMDL for these pesticides in 2005, which contains no margin for safety due to the severity of these pollutants.¹⁵⁹

The proposed construction of the Yazoo Pumps in Deer Creek would mobilize legacy pesticides in the soil, potentially violating the TMDL and causing impermissible degradation of waterbodies. As shown by the Corps' soil samples, Deer Creek contains DDT, DDD, DDE, and Dieldrin at levels that exceed the threshold effect and probable effect levels imposed by EPA to protect public health.¹⁶⁰ Deer Creek also contains levels of arsenic, copper, lead, mercury, nickel and zinc that exceed EPA's threshold effect levels.¹⁶¹ The proposed project would periodically remove sediment in Deer Creek, releasing these pollutants, violating the TMDL (which contains no allowance for increased levels in pollutants), and impairing the ability of the creek to support "Fish and Wildlife" uses.

Yet, the Corps has never analyzed the impacts of these construction activities on state water quality standards, despite the obligation to do so under NEPA and the 404(b)(1) Guidelines.¹⁶² In the 2007 SEIS, the Corps focused solely on construction activities at the Steele Bayou gates, claiming there were no contaminated soils in the area.¹⁶³ That assertion does not apply to the newly proposed location at Deer Creek, as demonstrated by the Corps' own soil data. The Corps must therefore prepare an SEIS to

¹⁵⁶ See 40 C.F.R. § 1502.9(c)(1).

¹⁵⁷ See MDEQ, Yazoo River Basin Legacy Pesticide TMDL (Nov. 2005), at 14.

¹⁵⁸ *Id.*

¹⁵⁹ *Id.* at 17.

¹⁶⁰ 2007 EIS Appx. 16 at Table 16-5a.

¹⁶¹ *Id.* at Table 16-6.

¹⁶² See 40 C.F.R. § 230.10(b).

¹⁶³ See 2007 EIS Appx. 16 ¶230.

evaluate these water quality impacts and demonstrate that the proposed project will not cause or contribute exceedances of state water quality standards.

(3) The Proposed Project Will Destroy Wetlands, Impairing Water Quality Throughout the Yazoo Backwater Area

Wetlands perform a series of critical functions that reduce the excessive levels of pollutants in the Yazoo Backwater Area. As documented by EPA,

wetlands permanently remove or temporarily immobilize elements and compounds that are imported to the wetland from various sources, but primarily via the flood cycle. Elements include macronutrients essential to plant growth (e.g., nitrogen, phosphorus, and potassium) as well as heavy metals (zinc, chromium, etc.) that can be toxic at high concentrations. Compounds include pesticides and other imported materials. The primary benefit of this function is that the removal and sequestration of elements and compounds by wetlands reduces the load of nutrients, heavy metals, pesticides, and other pollutants in rivers and streams.¹⁶⁴

Despite this critical pollutant-filtering role, the 2007 FSEIS arbitrarily and inappropriately excluded 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”).¹⁶⁵ 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 Final Determination:

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.¹⁶⁶

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.¹⁶⁷

Due to this gross underestimate of wetlands impacts, the Corps failed to recognize that the destruction and degradation of these wetlands would contribute to violations of state water quality standards, as documented by EPA. The 2008 Clean Water Act Final Determination states:

¹⁶⁴ EPA Veto at 30.

¹⁶⁵ FSEIS Main Report at 141.

¹⁶⁶ EPA Veto at 45.

¹⁶⁷ FSEIS Main Report at 142.

In the 24,000 acres of wetlands occurring in the 2-year floodplain that were not evaluated in the FSEIS, the pollutant removal functions would be lost completely since flooding would be reduced to a point (i.e., 10 year return) where floodwaters no longer access the wetlands on a regular basis. Without regular input of the elements and compounds by floods, these normally riverine wetlands would convert to flat wetlands and would no longer perform this particular function. 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)).¹⁶⁸

The Corps has an obligation to prepare an SEIS to evaluate these significant impacts, which it entirely overlooked in 2007, and ensure the project does not violate state water quality standards, as predicted by EPA.

(4) The Proposed Project Will Increase Agricultural Production and Associated Pollution

By draining the Yazoo backwater Area, the Yazoo Pumps would convert normally riverine wetlands into flat wetlands free from periodic flooding. This conversion would eliminate the pollutant filtering capacity of these lands, all while encouraging agricultural production and the associated use of pesticides. The net result would be unavoidable degradation of water quality, as made clear by Dr. R. Eugene Turner, one of the nation's preeminent wetland scientists. In his comments on EPA's veto, he clearly explained the consequences for water quality:

When drained there will be substantial changes to the soils which will encourage agricultural development and this development will use fertilizers. The fertilizers will leak from the system sooner or later. Water quality compromises are, therefore, unavoidable. Several studies, for example, have demonstrated a positive linear relationships between soil P and P in runoff (Sharpley 1995; Pote et al. 1996; Davis et al. 2005).

The net result is a loss in nutrient uptake/transformation, and an increase in the nutrient loading from agricultural uses of fertilizer and the 'mining' of nutrients stored in vegetation and soils (Turner and Rabalais 2003).¹⁶⁹

The Corps must analyze whether the "net result" of the Pumps—the loss of wetland capacity coupled with increased agricultural production—would impermissibly degrade waterways in the backwater area or exceeded TMDLs. 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.¹⁷⁰ Though the TMDL only set limits for point-sources, it acknowledged the need to assess whether these

¹⁶⁸ EPA Veto at 52.

¹⁶⁹ Comments of Dr. R. Eugene Turner submitted to the EPA docket on the Yazoo Pumps veto on April 23, 2008. Full citations to the studies referred to in this quotation are included in Dr. Turner's comments.

¹⁷⁰ See TMDL Total Nitrogen and Total Phosphorus For Selected Large Rivers in the Delta (June 2008), at 4 (available at https://www.mdeg.ms.gov/wp-content/uploads/TMDLs/Yazoo/Delta_Large_Rivers_FINAL_Nutrients_TMDL_35411.pdf).

standards were sufficient, given nutrient loadings from the non-point sources, including agricultural cropland.¹⁷¹ Given the impairment of waterways due to nutrients, the Corps must demonstrate the proposed project will not cause exceedances of existing TMDLs or otherwise degrade water quality and impair existing uses.

The Corps also has an obligation to analyze impacts of increased nutrient loadings on downstream waters, including the Gulf of Mexico.¹⁷² Each summer, an extensive area of hypoxia forms in the Gulf of Mexico as a result of high nutrients in the Mississippi and Atchafalaya Rivers. The Yazoo River basin is a significant cause of the problem due to its proximity to the Gulf and intensive agricultural operations.¹⁷³ The proposed project would exacerbate this problem, requiring a thorough SEIS to ensure that the Yazoo backwater Area pollution problems are not causing water quality violations downstream.

7. Impacts to Groundwater

The SEIS must fully evaluate the impacts of the project on groundwater, and the cascading impact to the Yazoo Backwater Area's rich natural resources. Irrigation in the Mississippi Delta, including the Yazoo Backwater Area, has caused some of the most severe groundwater declines in the United States and highly damaging low-flow conditions in many Delta streams.

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.¹⁷⁴

¹⁷¹ *Id.* at 22.

¹⁷² See *Riverside Irrigation District v. Andrews*, 758 F.2d 508, 511–12 (10th Cir. 1985) (requiring Corps to analyze the secondary effects of a proposed project on downstream waters).

¹⁷³ In 1996, the Yazoo River Basin alone contributed at least 5.7% of phosphorous loads, 2.7% of nitrogen loads, and 1% of the nitrogen load in the Gulf. See Coupe, R.H., Concentrations and Loads of Nitrogen and Phosphorous in the Yazoo River, Northwestern Mississippi, 1996-97 (available at); see also F. Douglas Shields Jr., et al., Nitrogen and Phosphorous Levels in the Yazoo River Basin, Mississippi, *Ecology* (2009) (available at <https://naldc.nal.usda.gov/download/44722/PDF>).

¹⁷⁴ 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 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->

Recent studies demonstrate the significant value of wetlands to groundwater recharge in the Yazoo Backwater Area,¹⁷⁵ strongly suggesting that wetland losses caused by the Yazoo Pumps will exacerbate the area's already significant groundwater declines. The likelihood of increased irrigation to facilitate the Yazoo Pumps-induced agricultural intensification, will cause 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).

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. Impacts to Fish and Wildlife, Including Listed Species

The SEIS must examine the direct, indirect, and cumulative impacts of the Yazoo Pumps and alternatives on the full array of species that rely on the Yazoo Backwater Area, including fish, waterfowl, birds, mammals, reptiles, amphibians, and mussels. Close attention must be paid to at-risk species, including species listed under the Endangered Species Act, and the SEIS must comply with the consultation and other requirements of the Endangered Species Act.

The ecologically rich wetlands in the Yazoo Backwater Area provide vital habitat to an astounding array of more than 450 species of birds, fish and wildlife. Located in the heart of the Mississippi River flyway, the Yazoo Backwater Area is vitally important to migratory species. Sixty percent of all North American birds and 40% of North America's waterfowl migrate through the Mississippi River flyway.

The Yazoo Backwater Area is also home to a number of at-risk species and species of special concern, including species designed as threatened or endangered under the Federal Endangered Species Act after the 2007 SEIS was completed. The impacts to all at-risk and species of concern must be fully evaluated in the SEIS. As noted above, the SEIS also must comply with the consultation and other requirements of the Endangered Species Act.

It is beyond dispute that a loss of wetlands and natural flood pulses in the Yazoo Backwater Area will cause adverse impacts to wildlife. For example:

[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>).

¹⁷⁵ 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). 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). A copy of Journal of Hydrology study is provided at Attachment D to these comments.

“Disruption of lateral connectivity and the flood pulse can affect both aquatic and non-aquatic organisms, as well as nutrient processing, and other floodplain functions (Cobb et al. 1993, Lytle and Poff 2006 and references therein). For example, productivity of songbirds and waterfowl can be affected because of the influence of the flood pulse on predators and food availability (Heitmeyer 2006, Hoover 2006, Cooper et al. 2009, Hoover 2009). Furthermore, channelization and dams can alter the timing, depth, duration, and frequency of floods and disrupt synchronized linkages between the flood pulse and life history processes of organisms (Richter et al. 1997, Bunn and Arthington 2002, Heitmeyer 2006, Hupp et al. 2009).

* * *

Floodplain forests historically provided a variety of habitats for breeding amphibians, secretive marsh birds, and wintering and breeding waterfowl. Furthermore, the diversity of hydroperiods resulted in abundant aquatic invertebrate populations and high seed production by moist-soil plants. These food and structural resources are critical for fulfilling wintering, breeding, and migrating waterfowl and shorebird needs; however, they have been lost over broad expanses of the landscape as a result of widespread drainage. Such resources are not restored through simple planting of trees.”¹⁷⁶

Thus, to properly assess impacts to fish and wildlife, the SEIS must first properly assess the direct, indirect, and cumulative impacts of the Yazoo Pumps and alternatives to the wetlands, streams, conservation lands, overbank flooding, and water quality and quantity in the Yazoo Backwater Area, as discussed throughout these comments. Once baseline habitat losses and their ecological implications are determined, the implications of those changes must be assessed for the wildlife species that rely on the affected habitats.

The 2008 Clean Water Act Final Determination (including its Technical Appendices) provide detailed information on the many species that rely on the Yazoo Backwater Area, discuss vital habitat needs for those species, and highlight the harm that the Yazoo Pumps would cause to those species. These documents should form the foundation of the SEIS assessment of fish and wildlife impacts.

The impacts to fish and wildlife must be assessed in light of an understanding of current population levels, existing stressors, and full life cycle needs of the species that utilize the project area. Lifecycle needs include such things as: fish spawning (including the timing, amount, and depth of overbank flooding needed to trigger spawning), fish rearing, fish refugia; breeding, rearing, resting, and feeding for all species; and for migratory species the availability of food and stopover habitat throughout their migratory cycles. The SEIS must also account for any harm that might be caused by species being drawn into the Pump mechanism. Critically, the SEIS also must assess the cumulative impacts of climate change on fish and wildlife, as discussed below.

As discussed in Section D.1 of these comments, the Corps’ HGM process is fundamentally flawed and will not provide a valid assessment of fish and wildlife impacts. The Corps’ typical reliance on such things as annual, seasonal, and daily averages to account for impacts is also flawed, and cannot provide the information needed to conduct a valid assessment of impacts. For example, an assessment of the

¹⁷⁶ Sammy L. King, et, al, The Ecology, Restoration, And Management Of Southeastern Floodplain Ecosystems: A Synthesis, Wetlands, Vol. 29, No. 2, June 2009, pp. 624–634.

“average annual days” of flooding or “average annual duck use days” cannot provide the information needed to determine whether access to wetlands or food supplies will be available at the right time of year and for the right amount of time to support the lifecycle needs of fish and wildlife.

The vast majority of wildlife species in the South Delta are well-adapted to living and thriving in floodplain environments, and rely on wetlands sustained by flooding for critical phases of their life cycles (including ducks, migratory songbirds, wading birds, raptors, snakes, frogs, salamanders, alligators to name a few). The tens of thousands of acres of damage to these vital wetlands caused by the Yazoo Pumps—and the elimination of spawning habitat caused by loss or reduction of overbank flooding—will not be offset by limited reductions in flood elevations during rare large-scale flood events.¹⁷⁷

9. Cumulative Impacts

The cumulative impacts analysis is a critical component of NEPA review. It ensures that the reviewing agency will not “treat the identified environmental concern in a vacuum.”¹⁷⁸ Cumulative impacts are defined as:

“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.”¹⁷⁹

In evaluating cumulative impacts:

“The analyst’s primary goal is to determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative effects of other past, present, and future actions. Much of the environment has been greatly modified by human activities, and most resources, ecosystems, and human communities are in the process of change as a result of cumulative effects. **The analyst must determine the realistic potential for the resource to sustain itself in the future and whether the proposed action will affect this potential; therefore, the baseline condition of the resource of concern should include a description of how conditions have changed over time and how they are likely to change in the future without the proposed action.** The potential for a resource, ecosystem, and human community to sustain its structure and function depends on its resistance to stress and its ability

¹⁷⁷ Moreover, even during the prolonged 2019 floods, many factors unrelated to flooding played a role in wildlife impacts. For example, while significant numbers of White-tailed deer perished in 2019, a large number of those deer were deliberately culled—645 deer were killed in the Yazoo Backwater Area counties during the 2019 flood under depredation permits issued by the Mississippi Department of Wildlife, Fisheries, and Parks. Many deer in the Yazoo Backwater Area also had the ability to flee to higher ground but did not, according to William McKinley, Mississippi’s deer program coordinator. Many factors likely aggravated the impacts of the 2019 flood on the White-tailed deer in the Yazoo Backwater Area, including the extensive flood-control works and widespread conversion of habitat to agriculture that eliminated vital habitat, reduced the resiliency of the deer population, and created artificial barriers to wildlife movement. The Resilience Alternative proposed in these comments would protect and restore contiguous habitat corridors that could be used by deer to migrate out of the area during large-scale floods.

¹⁷⁸ *Grand Canyon Trust v. FAA*, 290 F.3d 339, 346 (D.C. Cir. 2002).

¹⁷⁹ 40 C.F.R. § 1508.7.

to recover (i.e., its resilience). Determining whether the condition of the resource is within the range of natural variability or is vulnerable to rapid degradation is frequently problematic. Ideally, the analyst can identify a threshold beyond which change in the resource condition is detrimental. More often, the analyst must review the history of that resource and evaluate whether past degradation may place it near such a threshold. For example, the loss of 50% of historical wetlands within a watershed may indicate that further losses would significantly affect the capacity of the watershed to withstand floods. **It is often the case that when a large proportion of a resource is lost, the system nears collapse as the surviving portion is pressed into service to perform more functions.**¹⁸⁰

A meaningful assessment of cumulative impacts must identify:

“(1) the area in which effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions – past, present, and proposed, and reasonably foreseeable – that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate.”¹⁸¹

In conducting the cumulative impacts assessment, it is not enough to simply catalog past, present, and reasonably foreseeable future actions. An EIS instead must determine the specific impacts on the system of those actions and determine whether those impacts combined with the proposed action would significantly affect the ecological health and functioning of the area impacted by the project.

As recognized by the 2008 Clean Water Act Final Determination, the adverse impacts of 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.¹⁸²

The significant loss of vital bottomland forested and other wetlands throughout the Mississippi Delta and the Mississippi River Alluvial Valley must be fully evaluated in the cumulative impact analysis, along with the significant losses of wildlife throughout these regions, among other things. A recent article in *Science Magazine* reported on the staggering loss of **three billion** north American birds since 1970:

North America's birds are disappearing from the skies at a rate that's shocking even to ornithologists. Since the 1970s, the continent has lost 3 billion birds, nearly 30% of the total, and even common birds such as sparrows and blackbirds are in decline, U.S. and Canadian researchers report this week online in *Science*. "It's staggering," says first author Ken Rosenberg, a conservation scientist at the Cornell University Laboratory of Ornithology. The

¹⁸⁰ Council on Environmental Quality, *Considering Cumulative Effects Under the National Environmental Policy Act* (January 1997) at 41 (emphasis added).

¹⁸¹ TOMAC, *Taxpayers of Michigan Against Casinos v. Norton*, 435 F.3d 852 (D.C. Cir. 2006) (quoting *Grand Canyon Trust*, 290 F.3d at 345); *Fritiofson v. Alexander*, 772 F.2d 1225, 1245 (5th Cir. 1985) (holding this level of detail necessary even at the less detailed review stage of an Environmental Assessment).

¹⁸² 2008 Clean Water Act Final Determination at iii.

findings raise fears that some familiar species could go the way of the passenger pigeon, a species once so abundant that its extinction in the early 1900s seemed unthinkable.

The results, from the most comprehensive inventory ever done of North American birds, point to ecosystems in disarray because of habitat loss and other factors that have yet to be pinned down, researchers say.¹⁸³

The SEIS also must analyze the impacts of climate change in the cumulative impacts analysis. Indeed, analyzing the impacts of climate change is “precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.”¹⁸⁴

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.¹⁸⁵ The impacts of climate change are particularly significant for migratory species. As recognized by the United Nations Environment Program and the Convention on the Conservation of Migratory Species of Wild Animals, migratory wildlife is particularly vulnerable to the impacts of climate change:

“As a group, migratory wildlife appears to be particularly vulnerable to the impacts of Climate Change because it uses multiple habitats and sites and use a wide range of resources at different points of their migratory cycle. They are also subject to a wide range of physical conditions and often rely on predictable weather patterns, such as winds and ocean currents, which might change under the influence of Climate Change. Finally, they face a wide range of biological influences, such as predators, competitors and diseases that could be affected by Climate Change. While some of this is also true for more sedentary species, migrants have the potential to be affected by Climate Change not only on their breeding and non-breeding grounds but also while on migration.”

“Apart from such direct impacts, factors that affect the migratory journey itself may affect other parts of a species’ life cycle. Changes in the timing of migration may affect breeding or hibernation, for example if a species has to take longer than normal on migration, due to changes in conditions *en route*, then it may arrive late, obtain poorer quality breeding resources (such as territory) and be less productive as a result. If migration consumes more resources than normal, then individuals may have fewer resources to put into breeding”

* * *

¹⁸³ 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>).

¹⁸⁴ *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.”)

¹⁸⁵ 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/>.

“Key factors that are likely to affect all species, regardless of migratory tendency, are changes in prey distributions and changes or loss of habitat. Changes in prey may occur in terms of their distributions or in timing. The latter may occur through differential changes in developmental rates and can lead to a mismatch in timing between predators and prey (“phenological disjunction”). Changes in habitat quality (leading ultimately to habitat loss) may be important for migratory species that need a coherent network of sites to facilitate their migratory journeys. Habitat quality is especially important on staging or stop-over sites, as individuals need to consume large amounts of resource rapidly to continue their onward journey. Such high quality sites may [be] crucial to allow migrants to cross large ecological barriers, such as oceans or deserts.”¹⁸⁶

Migratory birds are at particular risk from climate change. Migratory birds are affected by changes in water regime, mismatches with food supply, sea level rise, and habitat shifts, changes in prey range, and increased storm frequency.¹⁸⁷

The SEIS should also carefully assess the cumulative impact on the loss of Yazoo Backwater Area wetlands to 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.¹⁸⁸ 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.¹⁸⁹ 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.¹⁹⁰ 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.¹⁹¹ In 2004, scientists 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.¹⁹²

¹⁸⁶ UNEP/CMS Secretariat, Bonn, Germany, *Migratory Species and Climate Change: Impacts of a Changing Environment on Wild Animals* (2006) at 40-41 (available at http://www.cms.int/publications/pdf/CMS_CimateChange.pdf).

¹⁸⁷ *Id.* at 42-43.

¹⁸⁸ 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.

¹⁸⁹ 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.

¹⁹⁰ 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.)

¹⁹¹ 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).

¹⁹² 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).

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.”¹⁹³

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.¹⁹⁴
- 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.¹⁹⁵ One recent study suggests that climate change has allowed the spread of a disease known as chytridiomycosis 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.¹⁹⁶ About two-thirds of the 110 known harlequin frog species are believed to have

¹⁹³ 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).

¹⁹⁴ 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.

¹⁹⁵ 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.

¹⁹⁶ Pounds, J.A., M.P.L. Fogden, J.H. Campbell. 2006. Biological response to climate change on a tropical mountain. *Nature* 398, 611-615.

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.¹⁹⁷

- Climate change may also affect amphibian breeding patterns.¹⁹⁸ 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.¹⁹⁹
- Increases in UV-B radiation in the northern hemisphere due to ozone depletion is also having an adverse impact on amphibians.²⁰⁰ One study suggests that ultraviolet-B (UV-B) radiation adversely affects the hatching success of amphibian larvae.²⁰¹ 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.²⁰² UV-B also can have detrimental effects on embryo growth.

The cumulative impacts of climate change must be fully addressed and accounted for in the SEIS.

10. Environmental Justice

The SEIS must assess whether the Yazoo Pumps would cause disproportionate impacts to low income communities and communities of color. Executive Order 12898 requires that each Federal agency achieve environmental justice by identifying and addressing disproportionately high adverse human health or environmental effects of federal activities on minority and low-income populations.

Particular concerns that should be addressed in this assessment include:

- Exposing such communities to increased flood risks, including by discharging the Yazoo

¹⁹⁷ Carey, C., and M. A. Alexander. 2003. Climate change and amphibian declines: is there a link? *Diversity and Distributions* 9:111-121.

¹⁹⁸ Carey, C., and M. A. Alexander. 2003. Climate change and amphibian declines: is there a link? *Diversity and Distributions* 9:111-121.

¹⁹⁹ 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.

²⁰⁰ 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.

²⁰¹ 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.

²⁰² 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.

Pumps into what will be an already flooded Yazoo River, and eliminating tens of thousands of acres of wetlands that provide natural flood protection;

- Adversely affecting subsidence hunting and fishing, including through extensive loss of vital waterfowl and fisheries habitat (including fisheries spawning and rearing habitat);
- Increased exposure to pesticides, fertilizers, and other agricultural chemicals due to project-induced agricultural intensification, including through increased contamination in area streams;
- The potential for exposure to toxic materials, including through the release or re-suspension of contaminated sediments during construction and operation activities, and the potential for releasing significant amounts of toxic wastewater into the Yazoo River through inundating industrial-sized wastewater treatment ponds during operation of the Pumps;
- Significant noise and air pollution from construction and operation activities; and
- The cumulative impacts of any such activities.

E. The SEIS Must Demonstrate Compliance with the 404(b)(1) Guidelines

The Clean Water Act 404(b)(1) Guidelines 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.”²⁰³ 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.”²⁰⁴

Under the 404(b)(1) Guidelines, the proposed Yazoo Pumps project is prohibited if the proposed discharge (and operation of the Yazoo Pumps) meet any of the following criteria:

- (1) The proposed discharge “will cause or contribute to significant degradation of the waters of the United States.” 40 C.F.R. § 230.10(c).
- (2) The proposed discharge will violate applicable toxic effluent standards or prohibition under Clean Water Act § 307 and cause or contribute to violations of state water quality standards. 40 C.F.R. § 230.10(b).
- (3) The proposed discharge will result in a likelihood of the destruction or adverse modification of formally designated critical habitat. 40 C.F.R. § 230.10(b).
- (4) The Corps has not clearly demonstrated that there is no “practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem.” 40 C.F.R. § 230.10(a).

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

²⁰⁴ 40 C.F.R. § 230.10(d).

- (5) The Corps has not taken “appropriate and practicable” steps to minimize potential adverse impacts on the aquatic ecosystem. 40 C.F.R. § 230.10(d).

The SEIS must carry out the analyses highlighted throughout these comments to determine whether the recommended alternative can proceed under the 404(b)(1) Guidelines. As noted above, the SEIS cannot demonstrate compliance if it looks at only one alternative. The Corps also may not rely on the 2007 SEIS to argue that the Yazoo Pumps are the least environmentally damaging alternative, including for the obvious reason that the Pumps are the same project recommended in the 2007 SEIS—a project determined to be so damaging that it was vetoed under Clean Water Act § 404(c).

F. The SEIS Must Fundamentally Reexamine the Project’s Economic Costs and Benefits

The SEIS must fundamentally reexamine the project’s economic costs and benefits. This reexamination is 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 SEIS economic assessment.

The SEIS must also ensure that the same criteria used to assess the geographic extent of wetland impacts (i.e., the new period of record and other data referred to in the Notice of Intent) is also used to assess the geographic extent of flood damage reduction benefits. If, as claimed in the draft Wetlands Analysis, the 2007 period of record overestimated wetland impacts, the 2007 period of record would also have overestimated flood damage reduction benefits.

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

The SEIS 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 require significant additional construction than would be required at Steele Bayou, and the costs of the newly proposed well fields, among many other things.²⁰⁵

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

²⁰⁵ 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 2007 SEIS estimated operations and maintenance costs at \$2.1 million each year.

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.”

2. Non-Federal Cost Share

As noted in Section D.5 of these comments, the SEIS 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. 33 USC 2213(e). For purposes of this provision, “physical construction shall be considered to be initiated on the date of the award of a construction contract.” 33 USC 2213(e).

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.” 33 USC 2213 (e)(1). 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 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.²⁰⁶ 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.

²⁰⁶ This slide was obtained through a Freedom of Information Act request.

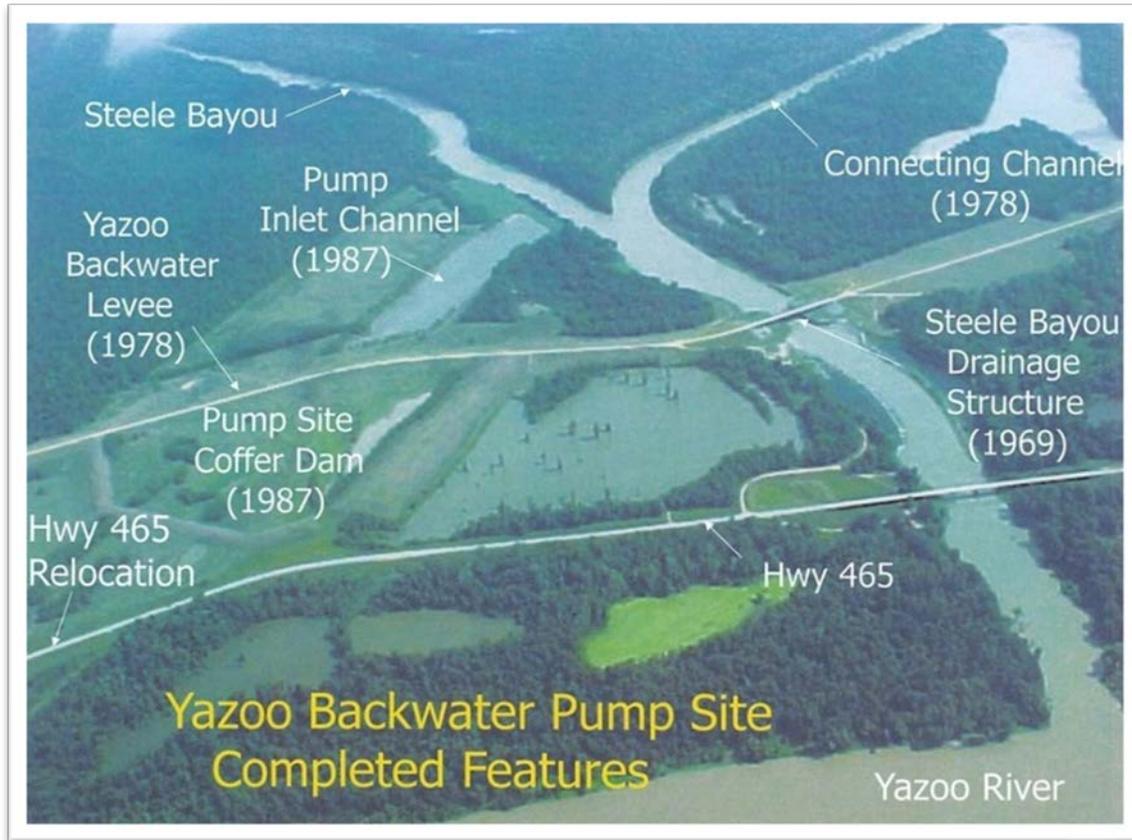


Figure 13, Completed Construction at Steele Bayou Location from USACE Presentation to EPA, Yazoo Backwater Project Brief Region IV 15 May 2019

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).

3. 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 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.²⁰⁷

²⁰⁷ 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

The SEIS must make sure that these flaws are not repeated in the new economic analysis. To this end, it is essential that the current SEIS 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. See Sections C.2 and D.3., above. 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 Action.
- (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.²⁰⁸

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.**”²⁰⁹ The study also found that **cotton yield was positively correlated with maximum area flooded during the same year**, noting that this was 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.²¹⁰

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

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.

²⁰⁸ 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.

²⁰⁹ Id.(emphasis added).

²¹⁰ Id.

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.”²¹¹ 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.²¹²

- (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.²¹³ 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. See Section C.2, above.

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. See Section C.2. and Figures 6 and 7, above. As the Corps is aware, an 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.²¹⁴ That review also determined that

²¹¹ Id.

²¹² Id.

²¹³ USDA National Agricultural Statistics Service, CropScape Cropland Data Layer.

²¹⁴ 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

the Yazoo Pumps could not be economically justified even at what was then a \$207 million projected construction cost.²¹⁵

- (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 SEIS noted that there were only 192 farms in the project area with an average size of 2,913 acres.²¹⁶ The 2007 SEIS 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 below the 90-foot elevation since the Yazoo Pumps authorization does not authorize pumping below the 90-foot elevation.

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

In assessing flood damage reduction benefits to homes, businesses, and other structures, the SEIS should utilize an up-to-date inventory of all structures and roads in the Yazoo Backwater Area that provides precise elevation data. The SEIS 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. See Section C.2. and Figures 5, 8, and 9, above.

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.

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

- Flood damage reduction benefits – automobiles. The 2007 SEIS claims that the average household in the project area has two automobiles valued at \$15,000 per car. The Corps

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.

²¹⁵ Id.

²¹⁶ 2017 FSEIS Main Report at 24.

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 SEIS 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. FSEIS, Appendix 7 at 77. 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.

5. 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 are highlighted in Section C.2., above. These benefits 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 at Attachment H to the Comments. An Earth Economics report *The Value of Restoring the Mississippi River Delta* is provided at Attachment I to these Comments. The Conservation Organizations will supply additional ecosystem services valuation studies upon request. In addition to fully accounting for the ecosystem service values, the SEIS should also account for benefits associated with avoiding flood-fighting costs, the additional cost avoidance 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.²¹⁷

G. The SEIS Must Fully Analyze Mitigation and Include a Detailed Mitigation Plan

As documented in the 2008 Clean Water Act Final Determination, the mitigation plan established by the 2007 SEIS was woefully inadequate and could not compensate for the significant adverse impacts of the Yazoo Pumps.

The SEIS must develop a fundamentally new mitigation plan that complies with the requirements highlighted below. Critically, the first step in developing that plan is to accurately assess the full scope of adverse impacts to wetlands, streams, fish and wildlife, and other critical resources. The SEIS must also address how the promised mitigation can be achieved on lands that will be drained by the Yazoo Pumps. There is ample evidence that the Yazoo Pumps would, at a minimum, significantly undermine the effectiveness of mitigation measures by draining the very lands targeted for mitigation.²¹⁸

To comply with NEPA, the SEIS must analyze mitigation measures with “sufficient detail to ensure that environmental consequences have been fairly evaluated.”²¹⁹ To comply with the Water Resources Development Acts, the SEIS must meet the mitigation requirements established by 33 U.S.C. § 2283(d), including the requirement to develop a detailed mitigation plan.

NEPA requires that the SEIS discuss mitigation measures “in sufficient detail to ensure that environmental consequences have been fairly evaluated.”²²⁰ A “perfunctory description” of the mitigating measures is not sufficient.²²¹ 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

²¹⁷ 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>).

²¹⁸ See *Env'tl. Def. v. U.S. Army Corps of Eng'rs*, 515 F. Supp. 2d 69, 81 (D.D.C. 2007) (“The agency 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.”).

²¹⁹ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989).

²²⁰ *Id.*

²²¹ *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1380 (9th Cir.1998).

the adverse effects. An adverse effect than 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.²²²

The SEIS 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 impacts can be avoided. A mitigation discussion without at least *some* evaluation of effectiveness is useless in making that determination.”²²³

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.”²²⁴

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, (Clewell 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. Clewell 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.”²²⁵

²²² Id.

²²³ South Fork Band Council v. Dept. of Interior, 588 F.3d 718, 727 (9th Cir. 2009) (internal citations omitted).

²²⁴ Wyoming Outdoor Council v. U.S. Army Corps of Eng’rs, 351 F. Supp. 2d 1232, 1252 (D. Wyo. 2005).

²²⁵ National Research Council, Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy (1992) at 311-12.

Absent a meaningful discussion of the effectiveness of the proposed mitigation, the SEIS 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.”²²⁶

Provisions established through a number of Water Resources Development Acts require the Corps to mitigate the adverse impacts of the project.²²⁷ The Corps is required to mitigate 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.” 33 U.S.C. § 2283(d)(1). To ensure that this happens, the Corps is prohibited from selecting a “project alternative in any report” unless that report includes a “specific plan to mitigate fish and wildlife losses.” *Id.* Accordingly, the draft SEIS must include a specific mitigation plan.

Corps mitigation plans must ensure that “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.” 33 U.S.C. § 2283(d)(1). Mitigation plans “shall include, at a minimum:”

- (1) 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) 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. 33 U.S.C. § 2283(d).

Corps mitigation plans must also comply with “the mitigation standards and policies established pursuant to the regulatory programs” administered by the Corps. 33 U.S.C. § 2283(d).

Corps mitigation must be monitored until the monitoring demonstrates that the ecological success criteria established in the mitigation plan have been met. The Corps is also required to consult yearly on each project with the appropriate Federal agencies and the states on the status of the mitigation efforts. The consultation must address the status of ecological success on the date of the consultation, the

²²⁶ 40 C.F.R. § 1502.14.

²²⁷ The Water Resources Development Act of 2007 requires the Corps to implement mitigation, and comply with mitigation planning requirements, for any project for which the Corps “select[s] a project alternative in any report.” 33 U.S.C. § 2283(d). Thus, mitigation will be required for the Project as a matter of law upon issuance of the final SEIS, and mitigation is required as a matter of law for components of the Regulating Works Project that are proceeding under environmental assessments.

likelihood that the ecological success criteria will be met, the projected timeline for achieving that success, and any recommendations for improving the likelihood of success. 33 U.S.C. § 2283(d).

In addition, mitigation lands for Corps civil works projects must be purchased before any construction begins. 33 U.S.C. § 2283(a). 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.” *Id.*

H. The SEIS Must Undergo Independent External Peer Review

The SEIS must be reviewed under the Independent External Peer Review (IEPR) process established by the Water Resources Development Act of 2007. 33 USC 2343. We strongly urge the Corps to immediately initiate the IEPR process and contract with the National Academies to carry out the IEPR for the SEIS.

The SEIS 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. 33 USC 2343(a). 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 environmental costs or benefits of the project.” 33 USC 2343 (a)(4).

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. 33 USC 2343(b) and 2343(d). 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. 33 USC 2343(c).

Conclusion

That Yazoo Pumps are prohibited by the 2008 Clean Water Act Final Determination and may not be—and should not be—constructed. The Conservation Organizations urge the Corps to abandon its misguided efforts to build the destructive and dangerous Yazoo Pumps, and instead initiate a fundamentally new planning process to examine opportunities for providing meaningful, sustainable, and immediate flood risk reduction benefits to impacted communities in the Yazoo Backwater Area while restoring this ecologically critical region—including the measures outlined in the proposed Resilience Alternative detailed in these scoping comments.

Please contact Jill Mastrototaro with Audubon Mississippi (Jill.Mastrototaro@audubon.org, 504-481-3659) or Olivia Dorothy with American Rivers (odorothy@americanrivers.org, 217-390-3658) if you have any questions or would like additional information.

Respectfully submitted,



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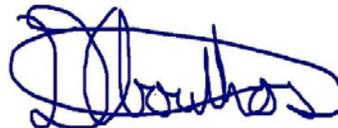
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Attachment A

Conservation Organizations Scoping Comments in Response to
Notice of Intent to Prepare Supplemental Environmental Impact Statement
for the Yazoo Area Pump Project, 85 Fed. Reg. 21218 (April 16, 2020)

A Resilience Alternative for the Yazoo Backwater Area

This document provides information on natural infrastructure and non-structural measures to reduce flood risks and increase community resilience in the Yazoo Backwater Area (YBWA) of Mississippi. Large-scale implementation of these measures can be achieved through the strategic use of federal programs that are currently funded, accepting proposals, and available to assist communities in the YBWA.

Flooding in the YBWA is primarily restricted to the lowest lying areas. From 1978 to 2018, water levels in the YBWA reached the 10-year floodplain elevation just 2 times, and never reached the 20-year floodplain elevation.¹ During the unprecedented flooding in 2019, water levels in the YBWA were primarily restricted to the 20-year floodplain, rising less than a quarter of an inch into the 25-year floodplain for 8 days before receding.

Wetlands in the YBWA play an essential role in minimizing flood damages, providing vital habitat to hundreds of species of fish and wildlife, and supporting wildlife-related recreation. Recognizing these many benefits, the George W. Bush Administration acted to protect 67,000 acres of the YBWA's ecologically significant natural wetland infrastructure by issuing a Clean Water Act 404(c) Final Determination for the Yazoo Backwater Pumping Plant.² This 2008 action paved the way for the long-term protection of an additional 53,300 acres of YBWA wetlands through conservation easements and other voluntary mechanisms. These protected wetlands safeguard YBWA communities by storing tens of billions of gallons of floodwaters.

The following sections recommends areas where investment in natural infrastructure and non-structural measures would provide important flood risk reduction benefits and and increase resilience in the YBWA. It also provides information on federal programs that implement those measures.

Federal Programs Available to Reduce Flood Risks and Increase Resilience in the Yazoo Backwater Area

Numerous federal programs are currently funded, accepting proposals, and available to advance the large-scale use of natural infrastructure and non-structural measures to reduce flood risks and increase resilience in the YBWA. These programs, and targets for their use, are outlined below. Successful deployment of these programs will require robust engagement with YBWA communities and collection of the data and information outlined in Section II.

¹ This period of record follows completion of the Yazoo Backwater Area Levee in 1978. By comparison, flooding in the YBWA reached 101.48 feet in 1973, which is well above the 100 year floodplain elevation. [U.S. Army Corps of Engineers Rivergages Website](#).

² While the 2019 flooding has prompted a renewed push for the Yazoo Pumps, preliminary Corps of Engineers' data shows that at least 68% of lands flooded in 2019 would have remained flooded if the Yazoo Pumps had been built and able to operate.

| Reducing Flood Risks and Improving Resilience in the Yazoo Backwater Area Federal Programs Currently Funded and Accepting Proposals | | | | |
|--|------------|--------------------|----------------------|--------------------------------|
| Federal Program | Structures | Agricultural Lands | Community Facilities | Roads, Bridges Utility Systems |
| Wetland Reserve Easements (WRE) USDA | | ✓ | | |
| Floodplain Easement Program USDA | ✓ | ✓ | | |
| Hazard Mitigation Grant Program (HMGP) FEMA – Post-Disaster Recovery | ✓ | | ✓ | ✓ |
| Community Facilities Grant Program USDA – Post-Disaster Recovery | ✓ | | ✓ | |
| Pre-Disaster Mitigation Program (PDM) FEMA – Pre-Disaster Mitigation | ✓ | | ✓* | ✓ |
| Flood Mitigation Assistance (FMA) FEMA – Pre-Disaster Mitigation | ✓ | | ✓* | ✓ |

*With some limitations. Additional programs, including the FEMA Community Development Block Grants-Disaster Recovery Program, could become available through supplemental appropriations.

Effective implementation of these programs would add to the region’s rich natural resource base and create more resilient communities. These benefits could be amplified by an innovative marketing campaign to drive wildlife and cultural heritage-associated tourism to the YBWA developed in collaboration with the [Mississippi Delta National Heritage Area](#), the [Delta Blues Trail](#), the [Delta National Forest](#), and the [Theodore Roosevelt National Wildlife Refuge Complex](#). The Delta Interpretive Center, which will be housed in the newly constructed Theodore Roosevelt Wildlife Refuge Visitor Center, could be a centerpiece of this effort.³ Funding for such a campaign could be sought through the [Mississippi Delta National Heritage Area Grant Program](#).⁴

Diversifying the economy of the YBWA in this manner would assist in arresting and reversing the region’s economic decline. In 2011, state residents and nonresidents spent \$2.63 billion on wildlife recreation in Mississippi. Of that total, \$650 million was spent on trip-related expenditures, \$1.7 billion

³ The Theodore Roosevelt Wildlife Refuge Visitor Center is “[one of the most significant investments in tourism infrastructure](#)” in the Delta.

⁴ The Mississippi Delta National Heritage Area, which includes all the YBWA counties, was established by Section 8008 of the Omnibus Federal Land Management Act of 2009, [Pub. L. 111–11](#) (16 USC 461 note) to preserve and promote the landscape, culture and history of the Mississippi Delta. Section 8008 authorizes appropriations of up to one million dollars a year through 2024, and establishes a management authority and a local coordinating entity to assist local governments, regional planning organizations, and nonprofit organizations in developing recreational and educational opportunities in the Heritage Area and increasing public awareness of, and appreciation for, natural, historic, scenic, and cultural resources of the Heritage Area.

was spent on equipment, and \$268 million was spent on licenses, leases, and other items. [U.S. Fish and Wildlife Service, 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Table 47.](#) The demand for wildlife-related recreation is increasing nationwide, and directing more of this demand to the YBWA could produce significant economic benefits.

1. Wetland Reserve and Floodplain Easement Programs (USDA)

Target: Enroll at least **70,000 acres** of Yazoo Backwater Area lands in the Wetland Reserve Easement and Floodplain Easement Programs managed by the U.S. Department of Agriculture. Wetland reserve easements should target marginal croplands (those with 4W+ soils) adjacent to existing conservation lands, and marginal croplands inundated during the 2019 floods. Floodplain easements should target those same lands and/or frequently flooded residential properties, particularly “severe repetitive loss” and “repetitive loss” properties as defined by the Federal Emergency Management Agency.

Responsible Federal Agency and Partners: U.S. Department of Agriculture (Natural Resources Conservation Service) working with local landowners, homeowners, and non-governmental organizations.

Funding: Both programs are currently funded and accepting proposals for enrollment.

Benefits: Natural infrastructure is highly effective at reducing flood and storm risks for communities. Extensive public benefits include significantly reducing flood risks and emergency response costs, creating safer and healthier communities, and restoring vital floodplain habitat. A single acre of wetland can store 1.5 million gallons of floodwater. Wetlands purify water supplies, reduce nutrient loading into streams and rivers, and recharge groundwater supplies. Wetlands provide vital wildlife habitat, and restoring bottomland hardwood wetlands in the YBWA is a priority for achieving the forest bird population goals for the Lower Mississippi Valley Joint Venture. Protecting and restoring floodplain wetlands can significantly lower federal flood insurance rates for communities participating in the National Flood Insurance Program Community Rating System. Restoring enrolled lands creates jobs and economic outputs. Enrolling cropped wetlands in WRE reduces the costs of commodity, federal crop insurance, and noninsured crop disaster assistance programs. Landowners receive direct payments for enrolling their lands.

Wetland Reserve Easement Program (WRE):

- Cropped and forested lands can be enrolled in WRE. Enrolled lands are taken out of agricultural production and restored to wetlands.
- Enrollment provides direct payments to landowners, currently up to \$3,100 per acre. USDA also pays to restore the enrolled lands. Landowners can make additional profits by selling or leasing the land for hunting, fishing, or other uses compatible with maintaining the restoration. Landowners may also be eligible for a tax deduction.
- 4W+ lands are classified by USDA as “severely limited” for agriculture because they are saturated at least 50% or more of the growing season. Because of these limitations, the 2014 Farm Bill exempted 4W+ lands from WRE enrollment caps. 4W+ lands also do not count towards county-wide WRE caps.
- **More than 296,000 acres** in the YBWA are classified by USDA as 4W+ lands, and as a result could be enrolled in WRE. In 2019, **62,042 acres** of 4W+ lands were inundated in Issaquena, Sharkey, and Warren counties. Most 4W+ lands in the YBWA **adjoin existing conservation lands**.

- Detailed GIS-based information on 4W+ soils and conservation lands in the YBWA is provided in the Conservation Organization Scoping Comments.
- The WRE program is extremely popular in Mississippi. At least 186,000 acres have been enrolled in the WRE program in Mississippi (in both the Wetlands Reserve Program and WRE programs which are now combined), and there is strong interest in enrolling more acres into the program.

Floodplain Easements:

- Both cropland and residential properties may be enrolled in the USDA Floodplain Easement program. Cropped lands are taken out of agricultural production and restored. Structures located within the area of a floodplain easement are demolished and removed, or relocated outside of the affected floodplain, and the lands are then restored.
- Enrollment provides direct payments to landowners, currently up to \$3,100 per acre. USDA pays to restore the enrolled lands. USDA also pays the costs of demolishing and removing, or relocating structures out of the affected floodplain. Landowners can make additional profits by selling or leasing the land for hunting, fishing, or other uses compatible with maintaining the restoration. Landowners may also be eligible for a tax deduction.
- A significant amount of funding is currently available for the purchase of floodplain easements in Mississippi (and numerous other states).

Additional Information:

- **Easement Payment Schedule:** In Mississippi, payments for enrolling lands in the WRE and Floodplain Easement Programs are the same. Easement purchase prices on forested land are slightly less than on cropland. The payment schedule is established by USDA on a yearly basis and may fluctuate slightly from year to year.
- **Agency Capacity:** Enrolling 70,000 acres of easements would be facilitated by adding staff capacity within the USDA Natural Resources Conservation Service to assess and process easement proposals.
- **Jobs and Economic Activity:** Restoration work associated with easement enrollment would create jobs. In Mississippi, the Fish and Wildlife Service Partners for Wildlife Program created 29.7 jobs for each million dollars spent on restoration, and \$1.63 of economic activity for each dollar spent on restoration in FY2011. U.S. Fish and Wildlife Service, [*The Contribution of Partners for Fish and Wildlife Program and Coastal Program Restoration Projects to Local U.S. Economies*](#) (September 2013) at 18.
- **Groundwater Recharge:** Restoring enrolled lands would provide critically important groundwater recharge benefits to the YBWA. Irrigation in the Mississippi Delta, including the YBWA, has caused some of the most severe groundwater declines in the United States and highly damaging low-flow conditions in many Delta streams. Recent studies demonstrate the significant value of wetlands to groundwater recharge in the YBWA. 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); 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).

- **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.
- **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).
- **Ad Valorem Tax Offsets:** To offset potential losses of ad valorem taxes that could result from placing YBWA county cropland under easements, landowners (or through enactment of legislation, USDA) could make a one-time payment to the county as easements are enrolled equal to a very small percentage of the cost of the easement. The county could then place the funds in trust and draw upon the interest of the trust to offset losses in ad valorem taxes.

2. Pre-Disaster Mitigation Programs (FEMA)

Target: Significantly expand pre-disaster mitigation planning and protection in the YBWA to reduce the risk of damage from future high water events and increase community resilience, and provide free Flood Risk Management Workshops in the YBWA for interested parties.

Responsible Federal Agency and Partners: Federal Emergency Management Agency working with the State of Mississippi, local governments, and non-governmental organizations.

Funding: FEMA’s Pre-Disaster Mitigation Grant Program and Flood Mitigation Assistance Programs are currently funded and accepting proposals. FEMA will provide free Certified Floodplain Management training upon request.

Benefits: Significant public benefits through creation of safer communities by improving resiliency, eliminating impacts of future flood events, and providing long-term solutions to flooding problems. Effective pre-disaster mitigation reduces loss of life and property damage from future floods, minimizes flood disaster disruptions, and allows more rapid recovery when flooding does occur. On average, \$1 spent on hazard mitigation through a federally funded mitigation grant saves \$6 in future disaster costs. Federal grants provide \$7 in benefits for each \$1 invested in riverine flood mitigation.

FEMA Pre-Disaster Mitigation Grant Program:

- The [Pre-Disaster Mitigation \(PDM\) program](#) provides funding to states, tribes, and local governments to reduce overall risk to the population and structures from future hazard events while also reducing reliance on federal funding to recover from future disasters. [The PDM program typically covers up to 75% of eligible activity costs, but small and impoverished communities may be eligible for coverage of up to 90% of eligible costs.](#)
- Following this current funding cycle, the PDM program will transition into the Building Resilient Infrastructure and Communities (BRIC) program established by the Disaster Recovery Reform Act of 2018. The BRIC program will be funded through a 6% equivalency set-aside of all disaster expenditures from the Disaster Relief Fund. This should significantly increase the amount of funding available for pre-disaster mitigation efforts.
- FEMA has \$250 million available for distribution under the PDM program for FY19. The [deadline](#) for submitting requests under this cycle is January 31, 2020.

FEMA Flood Mitigation Assistance Program:

- The [Flood Mitigation Assistance \(FMA\) Program](#) provides funding to states, tribes, and local governments to reduce or eliminate the risk of repetitive flood damage to buildings and structures insured under the National Flood Insurance Program. [FMA funding may cover up to 100% of costs to address severe repetitive loss properties and up to 90% of costs to address repetitive loss properties.](#) Other activities will be funded up to 75%.
- FEMA has \$70 million available for distribution under the FMA program for FY19. The [deadline](#) for submitting applications under the current cycle is January 31, 2020.

Free Certified Floodplain Management Training:

- FEMA can provide free Flood Risk Management Workshops and Certified Floodplain Manager (CFM) Exams to equip participants with important information on reducing flood risks and career skills. The CFM program seeks to reduce flood risk for people and encourage flood resilient development through multi-benefit floodplain management. The CFM program seeks to reduce flood risk for people and encourage flood resilient development through multi-benefit floodplain management. [Trainings include information on the National Flood Insurance Program, including its history, standards, regulations and administration; floodplain mapping; flood hazard mitigation; and floodplain management for environmental benefits.](#) FEMA could also provide additional relevant trainings in the YBWA through its [Integrated Emergency Management Course](#).
- The NGO community could work with foundations and others to obtain scholarship funding to defray out-of-pocket costs for attendees, including travel expenses, lost wages, and daycare.
- The state, local governments, or others could request that FEMA provide free Flood Risk Management Workshops at locations in the YBWA.

3. Post-Disaster Recovery Programs (FEMA, USDA, HUD)

Target: Prioritize disaster recovery funds to voluntary buy-outs and elevations of “severe repetitive loss” and “repetitive loss” properties in the YBWA, and improve essential community infrastructure. Key targets include the **198** severe repetitive loss properties in Issaquena and Sharkey counties (150 in Issaquena, 48 in Sharkey), and any of the **1,191** severe repetitive loss properties located in the YBWA

portions of Warren, Washington, and Humphreys counties (total severe repetitive loss properties are 833 in Warren, 314 in Washington, 44 in Humphreys).

Responsible Federal Agencies and Partners: Federal Emergency Management Agency, U.S. Department of Agriculture, U.S. Department of Housing and Urban Development (depending on program used), working with the State of Mississippi, local governments, property owners, and residents.

Funding: The FEMA Hazard Mitigation Grant Program is currently funded and may be accepting applications for the YBWA. The USDA Community Facilities Grant Program is currently funded and accepting applications. Supplemental appropriations targeted to the YBWA would be required to take advantage of the HUD Community Development Block Grants – Disaster Recovery program.

Benefits: Significant public benefits, including reducing flood risks and emergency response costs, creating safer and healthier communities, and restoring vital floodplain habitat. Increasing the resilience of roads and other community infrastructure improves community well-being and supports economic development. Homeowners are compensated for moving out of harm's way or elevating homes and other structures to avoid future flood damages.

FEMA Hazard Mitigation Grant Program (HMGP):

- The HMGP provides grants to state and local governments in areas covered by a Presidential disaster declaration. These grants can be used to purchase flood-damaged properties from willing sellers at pre-flood values and preserve the land as open space, or to elevate structures.
- The YBWA is eligible for HMGP grants through the April 23, 2019 [Federal Disaster Declaration 4429](#), which made FEMA's HMGP available to the entire state of Mississippi. This Disaster Declaration was most recently amended on September 20, 2019. FEMA accepts HMGP applications for **one year** after a federal disaster declaration with the possibility of up to a 180-day extension at the state's request.
- Any structure in the 100-year floodplain (*i.e.*, a Special Flood Hazard Area) [valued at up to \\$276,000 automatically qualifies for a FEMA-funded buy-out, and any structure in a Special Hazard Area valued at up to \\$175,000 automatically qualifies for a FEMA-funded elevation](#). Other structures may also qualify if a benefit-cost analysis shows that a buy-out or elevation would be cost-effective.
- FEMA has funded **638 buy-outs in Mississippi, including 105 in Warren County**, since the 1980s.

USDA Community Facilities Grant Program:

- The USDA [Community Facilities Grant Program](#) provides grants to rural communities with up to 20,000 residents in areas covered by a Presidential disaster declaration. Funding under this grant program can be used to advance more than 100 types of projects, including the purchase, construction, or improvement of essential community facilities. Essential community facilities include such things as health care facilities, town halls, courthouses, community centers, fairgrounds, police and fire departments, libraries, museums, and food banks.
- USDA recently [announced the availability of \\$150 million to fund grants under this program](#).

HUD Community Development Block Grants – Disaster Recovery (CDBG-DR):

- CDBG-DR grants supplement FEMA disaster recovery funds to help cities, counties, and states recover from Presidentially-declared disasters, especially in low-income communities. Activities funded through these flexible grants must meet one of three national objectives: benefit low-

and-moderate-income persons; aid in the prevention or elimination of slums or blight; or meet other community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community where other financial resources are not available to meet such needs.

- Mississippi is currently finishing up [two CDBG-DR grants for Hurricane Katrina recovery \(\\$5.06 billion and \\$423 million\)](#) and a [third CDBG-DR grant for recovery from the storms of 2008 \(\\$11.7 million\)](#), and appears to have some unspent monies remaining.
- The Bipartisan Budget Act of 2018 [approved \\$12 billion in funding for a new Community Development Block Grant disaster fund focused on helping CDBG-DR grant recipients “carry out strategic and high-impact activities to mitigate disaster risks and reduce future losses”](#) including among many other things, supporting data-informed investments in high-impact mitigation projects, building state and local government capacity for comprehensively analyzing disaster risks, and supporting the adoption of policies that minimize future disaster costs. While Mississippi has not received an allocation under this fund to date, a second round of allocations will be taking place and future appropriations are likely.
- CDBG-DR grants require supplemental appropriations to HUD. Advocating for CDBG-DR funding for the YBWA could result in a significant source of additional funding to assist in recovery.

Additional Information:

- **Disaster Declaration:** The April 23, 2019 [Federal Disaster Declaration 4429](#) made FEMA’s HMGP applicable to the entire state of Mississippi. Multiple amendments were made to that declaration, with the last amendment issued on September 20, 2019. [The Mississippi Emergency Management Agency has clarified that the declaration covers the 2019 YBWA flood.](#)
- **Severe Repetitive Flood Loss Properties:** “Severe repetitive loss properties” are properties covered by the National Flood Insurance Program that have flooded repeatedly and are priorities for elevation or removal. These structures, which are mostly homes, have been the subject of four or more damage claims of more than \$5,000 each, or two or more claims in which the insured structure sustained cumulative damage exceeding its fair market value. FEMA can provide the precise number of severe repetitive loss properties within the YBWA.
- **Repetitive Flood Loss Properties:** “Repetitive loss properties” are properties covered by the National Flood Insurance Program that have flood-related damage on two occasions where the cost of the repair equaled or exceeded 25% of the market value of the structure at the time of each such flood event; and the second incidence of flood-related damage increased the cost of flood-insurance compliance coverage. FEMA can provide the precise number of repetitive loss properties within the YBWA.
- **Typical Timeline for FEMA Buy-Outs:** Approximately 70% of FEMA buy-out projects are approved within two years of the associated disaster. More than half of all buyout projects have taken more than 5 years to closeout. [NRDC, *Going Under: Long Wait Times for Post-Flood Buyouts Leave Homeowners Underwater* \(September 2019\).](#)
- **History of FEMA Buy-Outs:** Since the 1980s, FEMA has funded 638 buy-outs in Mississippi, including 105 in Warren County. In all, FEMA has funded the buy-out of more than 43,360 properties through 3,839 “projects” in 49 states. Of these properties, 96% suffered from river flooding or intense rains, while 4% suffered from coastal flooding. The HMGP has funded 96%

of all FEMA buy-outs. Buy-outs disproportionately occur in white communities rather than communities of color, according to a 2019 NPR investigation. For example, after the 2008 floods in Iowa, “households in high social vulnerability areas were less likely to obtain full financial compensation” from federally funded buyout programs and waited longer to receive acquisition funds. [NRDC, *Going Under: Long Wait Times for Post-Flood Buyouts Leave Homeowners Underwater* \(September 2019\)](#) at 10, 8, 6.