United States Department of the Interior

FISH AND WILDLIFE SERVICE
Jackson Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213

October 23, 2006

Colonel Anthony C. Vesay
District Engineer
U.S. Army Corps of Engineers
4155 Clay Street
Vicksburg, Mississippi 39183-3435

Dear Colonel Vesay:

Enclosed is the U.S. Fish and Wildlife Service (Service) final Fish and Wildlife Coordination Act (FWCA) Report on the Corps of Engineers' Yazoo Basin Reformulation Study, Mississippi. Our document was prepared in accordance with the FWCA (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and fulfills the requirements of Section 2(b) of the FWCA. The report was coordinated with the Mississippi Department of Wildlife, Fisheries and Parks, and any written comments they provide to the Service will be forwarded to your agency.

As you are aware, the Yazoo Backwater Area (YBWA) Project has a long history dating back to its authorization by the Flood Control Act of 1941. The Corps has selected a 14,000 cfs pumping plant as the solution to the flooding and natural resource degradation problems of the Yazoo Backwater Area. The pump start elevation of your Recommended Plan is 87 feet, NGVD, which is the one year floodplain elevation. Your agency has defined as a nonstructural feature of the selected plan, the reforestation of up to 55,600 acres of cleared lands protected by perpetual easements and purchased from willing sellers in the one and two year floodplain.

As discussed with staff from your agency, the Service does not support the Corps' Recommended Plan. Numerous inaccurate assumptions including the extent of wetlands that your agency analyzed for impacts; the questionable success of the goal to reforest 55,600 acres; and the Corps' determination that there will be no changes in land use for the next 50 years formed the basis of our position on the selected plan.

The Service has recommended a plan that would balance natural floodplain values and sustained economic development for the backwater area. The plan would restore the low lying, marginal agricultural lands below 91 feet, NGVD, the two year floodplain, by offering perpetual easements on existing forested wetlands and cleared wetlands, and specifically designating lands below 91 feet as a nonstructural flood damage reduction

zone. Our plan also recommends partially restoring historic backwater flows, and protecting the built up areas of Cary, Rolling Fork, and Anguilla with ring levees.

As stated in the November 3, 2000, U.S. Department of the Interior review comments of your draft Supplemental Environmental Impact Statement (SEIS) and Corps Report on the YBWA Project, the Service may refer this project to the Council on Environmental Quality (CEQ) if the proposal in the draft SEIS, or a similar plan, is selected for inclusion in the final SEIS.

We appreciate the opportunity to provide our final FWCA Report on the YBWA Project.

Sincerely,

Ray Aycock

Ray Aycock
Field Supervisor

cc: Mississippi Department of Wildlife, Fisheries and Parks, Jackson, MS
U.S. Fish and Wildlife Service, Atlanta, GA

FISH AND WILDLIFE COORDINATION ACT REPORT

YAZOO BACKWATER AREA, MISSISSIPPI REFORMULATION STUDY

U.S. FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
JACKSON, MISSISSIPPI

Submitted to

Vicksburg District
U.S. Army Corps of Engineers
Vicksburg, Mississippi

October 2006

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EXECUTIVE SUMMARY

The Yazoo Backwater Area (YBWA) contains some of the richest natural resources in the nation including a highly productive floodplain fishery, one of only a few remaining examples of the bottomland hardwood forest ecosystem which once dominated the Lower Mississippi Alluvial Valley, and is one of only four remaining backwater ecosystems with a hydrological connection with the Mississippi River. The federal listed endangered pondberry (*Lindera melissifolia*) and the threatened Louisiana black bear (*Ursus americanus luteolus*) are currently present in the YBWA, and the area is a prime location for the reintroduction of additional bears. The area supports hemispherically significant populations of resident and migratory land birds and waterfowl. The public land base includes in excess of 123,000 acres of bottomland hardwood forest and open lands encompassing National Wildlife Refuges (NWRs), State Wildlife Management Areas (WMAs), and Delta National Forest (NF) as well as nearly 184,000 acres of privately owned forest land. Due to the historical presence of over 100,000 acres of marginal farm lands, a restoration (reforestation) trend is underway, through the Wetland and Conservation Reserve Programs (WRP and CRP). As of 2005 (most current data available), 36,800 acres are enrolled in WRP and 23,500 acres are in CRP.

In September 2000, the U.S. Army Corps of Engineers (Corps) released the draft Supplemental EIS and Reformulation Report of nearly 2000 pages recommending construction of what has long been one of the Nation's most controversial water resource development projects -- the Yazoo Pumps. Despite periods of close coordination between our agencies on this project, the Corps released their report without completing coordination associated with the Fish and Wildlife Coordination Act (FWCA) and consultation pursuant to the Endangered Species Act. As a result, the public was asked to review the Corps' report without benefit of the Service's analyses as required by those two key pieces of environmental legislation. Thus, the U.S. Fish and Wildlife Service (Service) developed a document in both web-based and hard copy formats to convey the Service's analysis, position, and recommendations to the interested public. The entirety of the draft document, including the related background materials, was officially transmitted to the Corps on November 9, 2000, in partial fulfillment of the requirements of Section 2(b) of the FWCA, although it did not constitute the final report of the Secretary of the Interior required by Section 2(b) of the FWCA for the reasons stated in Sec 3.10 (D) of the Service's Policy and Guidance on Fulfillment of Fish and Wildlife Coordination Act Responsibilities in the Corps of Engineers Water Resource Development Program. The reasons were inadequate data available to determine impacts to fish and wildlife resources in order to make specific recommendations that should be taken to conserve those resources.

For several decades, controversy has surrounded water resource planning in the Yazoo Backwater Area, and no alternative yet recommended has gained sufficient public support to be implemented. In the past, federal flood control and drainage policies have accounted for nearly one of every two acres of wetlands lost in the Mississippi Delta since 1935. As to the present, our concern is that the Corps has selected a traditional pumping plant, similar to that first proposed in 1941. The plan does not contain measures such as a nonstructural flood damage reduction zone, which would preserve and restore the environmental values of the two year floodplain and raise the elevation that flood damages occur. The Service continues to be concerned that a full range of alternatives was never given indepth consideration. We believe that the Corps' Recommended Plan emphasizes agricultural drainage to the detriment of fish and wildlife resources and is inconsistent with current national policies regarding the development and wise use of our floodplains.

The Service does not support the Corps' Recommended Plan, which is, with some minor

differences, the same as that proposed when the draft SEIS was released in September 2000: a 14,000 cfs pumping plant with a start elevation of 87 feet National Geodetic Vertical Datum (NGVD), the one year flood elevation. We believe this pumping plan would perpetuate and intensify agriculture in low lying lands within the two year floodplain (elevation 91 feet NGVD) and adversely impact fish and wildlife resources and natural floodplain values. In addition, the Recommended Plan underestimates impacts to wetlands and fish and wildlife resources, as the Corps' analysis only includes jurisdictional wetlands. Based on this analysis, the Recommended Plan would reduce the frequency and duration of flooding on 26,300 acres of jurisdictional wetlands including 5,800 acres of public forested wetlands on NWRs, Delta NF, and State WMAs. Furthermore, 3,300 acres of wetlands on WRP wetlands would lose jurisdictional status and 2,600 acres of CRP wetlands would lose jurisdictional status. The Service also believes that the selected plan would negatively impact the reforestation trend of marginal agricultural lands currently underway in the YBWA, and would likely result in the eventual clearing of currently existing, forested wetlands for marginal agriculture.

The Service planning goal for Mississippi's Lower Delta is the advancement of a water resource development project that balances sustainable floodplain development and floodplain restoration. We believe that the YBWA project should include:

- a full assessment of wetland and fish and wildlife impacts associated with the loss of non-jurisdictional wetlands;
- full mitigation for all adverse project impacts, to be completed prior to project operations;
- a spacially explicit and designated nonstructural flood damage reduction zone within the two year floodplain;
- provisions to protect existing forested wetlands within the two year floodplain, and to continue the ongoing reforestation of low lying, cleared agricultural lands

As always, we continue to stand ready to work with the Corps and the other stakeholders to design a project for the Yazoo Backwater Area that meets the needs and addresses the concerns of the people of Mississippi and the Nation, while also protecting the nation's valuable fish and wildlife resources.

STUDY PURPOSE, SCOPE, AND AUTHORITY

This report presents the position and recommendations of the Service, regarding the Corps' Yazoo Backwater Reformulation Study. The Corps has selected a Pumping Plant as the solution to flooding problems in the backwater area. The recommended pump's project would become a feature of the Yazoo Backwater Area Project, which is an authorized portion of the overall Mississippi River and Tributaries (MR&T) Project. Flood protection for the entire Yazoo Backwater Area was authorized by the Flood Control Act of 1941, as amended by the Acts of 1944, and 1965, and the Water Resources Development Act of 1986.

The Backwater Reformulation Study is in partial response to a directive from the Office of Management and Budget (OMB) contained in the Fiscal Year 1991 Budget Passback. The guidance states in part: " However, in response to the request for review and redesign of the project by the Governor of Mississippi, a reformulation report shall be prepared to identify, display, and evaluate alternative plans for:

1) Greater levels of flood protection for urban areas;
2) Reduced levels of agricultural intensification; and
3) Reduced adverse impacts to the environment."

The OMB guidance also stated that the methodology of the report shall include full consideration of predominantly nonstructural and nontraditional measures.

The Corps is also conducting the current post-authorization reformulation study in response to the 1996 Water Resources Development Act (WRDA). This act included specific authorization for both the continuation of planning to reevaluate the feasibility of implementing the Yazoo Backwater Area Pumping Plant, and the removal of previously enacted Federal requirements for local cost-sharing in planning and implementing that project.

Project Planning Post WRDA 1996

The history of water and related land resource development planning in the Yazoo River Basin (YRB) has been somewhat contentious, primarily because the resulting structural projects have been built essentially to meet the single purposes of flood control or drainage. The current planning effort has involved an even more extensive, though no less controversial, degree of interchange between the various parties involved. The Corps initiated facilitated meetings to receive public input on the formulation of alternatives during the early stages of the current planning iteration. That process did not, however, result in broad-based public support for any of the alternatives that were developed. During February 1999, the Local Project Sponsor initiated an intensive effort to develop consensus among the increasing number of interested parties on a mutually acceptable alternative. Several consensus group meetings were held, and while that process was largely unsuccessful, participants agreed that nonstructural measures should be included as a stated project purpose, and that the Corps should seek approval to use non-traditional benefit categories in the benefit/cost analysis.

During the time period from the release of the draft Yazoo Backwater Reformulation Study Report and SEIS in September 2000, until June 2002, the Service made numerous verbal and written requests to the Vicksburg District for a resumption of coordination that might result in progress towards the selection of an acceptable alternative. To each of the Service's requests, the Corps chose either a negative response or no response. On June 11, 2002, an additional verbal request was made for a resumption of coordination, to no avail. On June 12, 2002, the Corps offered to provide information on a "non-structural" alternative. In addition, the Corps stated that this alternative would be included in the Final Supplemental EIS, but would not influence their selection of a Recommended Plan. Subsequently, the Corps provided two pages of information on a non-structural alternative. However, the Service found the usefulness of the data to be limited due to the small quantity of information provided.

Since we provided our draft FWCA report in November 2002, Service/Corps coordination has been limited. For the next two and one-half years, the Corps and EPA entered a deliberative process concerning the extent of Clean Water Act jurisdictional wetlands in the YBWA. Other than participating in the wetland verification field work, the Service was not included in the wetland deliberations. On July 21, 2005, the Corps requested our attendance at a meeting to discuss six draft Environmental Appendices that had been provided to the Service and other resource agencies. During the meeting, EPA also briefed attendees on "EMAP-An Estimate of Wetland Extent in the Lower Yazoo Basin." Review and comments from the resource agencies on the appendices were requested by the Corps. The Service provided comments to the Corps on October 11, 2005 (Appendix B).

Beginning in March 2006, meetings and coordination with the Corps and the local sponsor, the Board of Mississippi Levee Commissioners, became frequent. The Service was requested to

complete consultation on the Louisiana black bear and pondberry and to provide our final FWCA report. Data necessary to complete our consultations and report was subsequently provided in a piece meal fashion. More important than not receiving data in a timely manner, the Service was never involved, in our view, in any serious discussions with the Corps regarding the impact assessments to fish and wildlife resources or the development of project alternatives.

As stated in the Corps' draft 2000 report, the primary purpose of the proposed pumping plant study is to review the uncompleted features of the authorized Backwater Project to determine if features are economically feasible, environmentally sustainable, and is the best plan for meeting the area's current and future water resource needs.

The primary purpose of the Service report is to document our position and recommendations to achieve "equal consideration" of fish and wildlife resources with the authorized project purpose of flood damage reduction, as mandated by the Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). "Equal consideration" means that the project which is ultimately implemented must ensure that natural floodplain values, essential to maintaining and improving the significant fish and wildlife resources of the lower YBWA, are conserved, protected, and restored. Our position and recommendations have been developed on the basis of biological, hydrological, and spatial surveys and analyses of the study area, the Corps' Recommended Plan, and various other alternatives, including the no-action plan.

The Service report provides specific recommendations for arriving at an acceptable plan that incorporates a combination of separable structural and nonstructural features. Such a plan would be designed to achieve economic and environmental sustainability in the YBWA; therefore, its implementation would require the adoption of "new directions" in floodplain management as a matter of project purpose, policy, and result. The report concludes with a summary of our findings and the Service's official position in support of implementing such a plan.

This report fulfills the requirements of Section 2(b) of the FWCA, and supersedes the position of the Department and the Service that was previously established in our June 11, 1982, FWCA report on the Yazoo Backwater Area - Yazoo Area Pump Study. As required by the FWCA, this report should therefore be fully integrated and addressed in the Corps' reformulation report for that project. Because the FWCA also requires that the Service fully coordinate its findings and position with the Mississippi Department of Fish, Wildlife and Parks, that agency (also a participant in the consensus-building process) was provided the opportunity to review this report and their comments will be included and addressed in our report (Appendix A).

DESCRIPTION OF THE STUDY AREA

The project area is just north of Vicksburg, Mississippi, and includes all or part of Humphreys, Issaquena, Sharkey, Warren, Washington, and Yazoo Counties (Figure 1). The area encompasses approximately 926,000 acres and is bounded on the west by the left descending bank of the Mississippi River Mainline Levee, the Yazoo Basin escarpment on the east, and the Yazoo River to the south (Figure 2). The area receives water from Deer Creek, Steele Bayou, Big Sunflower River, and the Little Sunflower River. Backwater effects extend into Steele Bayou and Little Sunflower River sub-basins, which are two distinct hydraulic reaches. Historically inundated by backwaters of the Mississippi and Yazoo Rivers, completion of the Yazoo Backwater Levee in 1978 isolated the YBWA from direct backwater flooding. Inundation of that area now results from the accumulation of interior drainage waters impounded by the backwater and mainstem levees when Mississippi and Yazoo River stages preclude gravity drainage via the Steele Bayou and Little Sunflower River control structures. The proposed

pumping plant would evacuate (i.e., force drain) impounded water during those periods, thereby reducing interior flood-related damages.

EXISTING FISH AND WILDLIFE RESOURCES

Although the project-area wetlands support a tremendous variety of fish and wildlife, including white-tailed deer, Eastern wild turkey, mink, river otter, bobcat, rabbit, squirrel, and a multitude of reptiles and amphibians, most of those resources fall within the trust purview of the State. The following subsection, by contrast, is intended to explicitly identify and substantiate the significance of the Federal-trust fish and wildlife resources within the YBWA that will be affected by project implementation. In their broadest sense, Federal-trust fish and wildlife resources (i.e., those subject to Federal or international laws or treaties) of the YBWA include publically owned National Wildlife Refuges and Delta NF, migratory birds, interjurisdictional fishes, endangered and threatened species, and the backwater floodplain habitats on which they depend.

In the 1800s, the YBWA wetlands supported resident wildlife such as black bear, wolves, and cougars, that are classified as imperiled or extirpated today. Those wetlands also provided wintering habitat for millions of migratory birds, and the clear lakes, rivers, streams, and bayous teemed with fishes, shellfishes, and other aquatic organisms. In 1821, James Audubon wrote that the Yazoo River was "...a beautiful stream of transparent water covered by thousands of geese and ducks and filled with fish." In the 1920s, President Theodore Roosevelt hunted black bear from a camp on the Sunflower River. Although he was not successful on that hunt, history records that the toy teddy bear was created as a direct result of that outing. The Lower Mississippi Alluvial Valley Ecosystem (LMAV) in general, and the YRB and YBWA (Figure 2) in particular, once constituted one of the most productive ecosystems for fish and wildlife in North America. While those resource values in the LMAV have been severely degraded since settlement (Figure 3), the YBWA remains critically important to the conservation of fish and wildlife.

Migratory Birds

There is little question that the YBWA floodplain wetlands provide migratory bird habitat of hemispheric significance, particularly for waterfowl, shorebirds, colonial-nesting waterbirds and wading birds, and neotropical species. Because absolute data are lacking, it is not possible to detail the exact size of the populations those wetlands support as a measure of their significance. Nevertheless, several major migratory bird initiatives substantiate the importance of project-area wetlands to migratory birds.

The North American Waterfowl Management Plan (NAWMP) identifies the LMAV ecosystem as internationally significant wintering habitat for mid-continental waterfowl populations. As an integral component of the Mississippi Alluvial Valley (MAV), it follows that the project-area floodplain wetlands are equally important to meeting the habitat and population goals of the NAWMP.

The quality of YBWA habitats for wintering waterfowl depends on their availability. Waterfowl foraging habitats, regardless of food value, are of little use to wintering waterfowl unless they are available (i.e., shallowly flooded). Thus, periods of above normal rainfall increase available foraging habitat by up to 900 percent in Mississippi (Reinecke et al. 1988). Based on data from the Mississippi portion of the delta, mallard body weights were higher during the wet winter of 1982-83 than those observed during the dry winter of 1980-1981 (Delnicke and Reinecke 1986).

The physical condition of waterfowl arriving on their breeding grounds has a significant impact on their breeding success and survival (Bellrose 1980, Reinecke et al. 1989). Poor feeding conditions are positively correlated with low winter precipitation (Heitmeyer and Fredrickson 1981, Kaminski and Gluesing 1987, Raveling and Heitmeyer 1989) and could potentially reduce recruitment in waterfowl (Dubovsky and Kaminski 1994).

The increased availability of wintering habitats also affects the distribution of wintering waterfowl; proportionately more birds winter in the MAV during periods of above normal rainfall and cold winters (Nichols et al. 1983, Reinecke et al.1987). Managed habitats within the YBWA employ structural measures to control surface water and manipulate vegetation, and are typically located on public lands and a few exclusive private hunting clubs. Managed habitats of the YBWA provide core wintering habitat during years when rainfall is below normal. In years of normal or above normal precipitation, however, un-managed habitats provide important wintering waterfowl habitat.

While wetland management efforts have historically focused primarily on waterfowl, the 1990s saw increased public concern for shorebirds and other non-game waterbirds. Because more than 500,000 shorebirds migrate through the MAV annually, wetland development and management objectives have been expanded to include them (Helmers 1992). For example, the YBWA is encompassed within the Lower Mississippi Valley/West Gulf Coastal Plain Shorebird Management Plan (Elliott and McKnight 2000), which was prepared as part of the Lower Mississippi Alluvial Valley Migratory Bird Initiative, (Loesch et al. 1980). This includes both regional and state-by-state estimates of habitat needed to sustain shorebird migrations, as well as estimates of the research and funding that would be needed to adequately address MAV shorebird conservation.

Successful long-distance migrants, shorebirds require highly productive stopover sites where they can efficiently forage to replenish fat reserves. They typically require exposed mudflat habitats that are shallowly flooded (<10 cm) with an abundance of invertebrates. Within the YBWA, such habitats are provided by impounded water on farmed wetlands and moist soil units, as well as the wetted edge in open lands as seasonal floodwaters recede. Most species of shorebirds avoid wooded wetlands, although they may occasionally use suitable openings in them. Suitable stopover habitat, particularly during the late summer and fall may, therefore, be a limiting factor for shorebird populations that migrate through the Mississippi Alluvial Valley (Helmers 1992). The original habitat objective in the Lower MS Valley/West Gulf Coastal Plain Shorebird Plan was 1,500 acres for the Delta of Mississippi. Since then, Dr. David Krementz (USGS Arkansas Coop Unit) has completed research and determined that shorebird habitat needs in the Mississippi Delta will have to be doubled to approximately 3,000 acres.

In contrast to shorebirds, colonial-nesting waterbirds and wading birds are highly dependent upon forested and scrub-shrub wetlands for nesting and feeding habitat. Flooded forested wetlands contain abundant populations of forage fish and provide productive feeding habitats for wading and waterbirds. Nesting in the overstory of forested wetlands, particularly semi-permanently flooded wetlands and swamps, offers seclusion from predators, and minimal disturbance for raising young.

Neotropical migratory birds breed in Canada and the United States, and winter in Mexico, the Caribbean, Central America, and South America. Approximately 250 species of birds that breed in North America are neotropical migrants (Bonney et al., 1995). Like waterfowl, shorebirds, and wading birds, neotropical migrants also require stopover habitats along their migration routes in which to feed and rest for long flights, often over open water. The presence of suitable

habitats along migration routes is therefore crucial to the survival and reproduction of these birds. Bottomland hardwood forests in the MAV are used extensively by these migrants during the nesting and migration seasons (Twedt, et al. 2001; Wilson, et al. 2000; Wilson and Twedt, 2002; Woodrey, et al.).

Deforestation and fragmentation of bottomland hardwood forest (BLHF) in the LMAV and in the YBWA (Figure 3) coupled with associated changes in the remaining vegetational community structure, have caused a reduction in bird populations, particularly neotropical migrants. These songbirds that migrate long distances, such as warblers, vireos, tanagers, and flycatchers, constitute up to 90 percent of the breeding avifauna of extensive tracts of eastern deciduous forests, but these species are scarce or absent in small isolated woodlots. Fragmentation results in small patches of woods, unsuitable for forest interior species, which provide more habitat for predators of bird nests. Small patches of woods are ideal habitat for brown headed cowbirds that parasitize songbird nests. Analysis of Breeding Bird Survey (BBS) data for the period from 1966 to 1990 reveals that the Mississippi Alluvial Plain is one of five major physiographic areas in which notable declines have occurred (Pashley and Barrow 1992). Seventy-seven percent of the species that breed in bottomland hardwoods are undergoing population declines, including interior forest species such as the prothonotary warbler, and early and mid-successional growth forest species, such as the orchard oriole and yellow-breasted chat.

Partners in Flight (PIF), an international program of Federal and state conservation agencies, private organizations, and corporate participants, has set population goals for breeding birds in the MAV, based on species and habitat priorities. Eighteen of the 21 species with a species priority score of 24 or more nest in BLHF (Table 1), resulting in its selection as the highest priority habitat type in the Nation for achieving and sustaining those breeding bird population goals. More than 35,000 remaining forest patches in the MAV (greater than 2.5 acres) were identified using 1992 thematic mapper images. With that information, 10 habitat protection/ restoration target areas were identified in Mississippi, including four patches of between10,000 and 20,000 acres, five patches of between 20,000 and 100,000 acres, and one patch of >100,000 acres. The greatest potential for meeting these breeding bird habitat restoration and protection needs lies within the YBWA sumps, because of the relatively numerous, but disjunct, BLHF habitat patches that could potentially be connected via reforestation to restore larger contiguous blocks of habitat. Large contiguous blocks of BLHF are crucial for achieving and sustaining interior forest bird populations and diversity.

Table 1. Top priority list of 18 breeding birds found in bottomland hardwoods in Mississippi

Bachman's Warbler	(Vermivora bachmanii)
Ivory-billed Woodpecker	(Campephilus principalis)
Swainson's Warbler	(Limnothlypis swainsonii)
Prothonotary Warbler	(Protonotaria citrea)
Mississippi Kite	(Ictinia mississippiensis)
Yellow-billed Cuckoo	(Coccyzus americanus)
Cerulean Warbler	(Dendroica cerulea)
Orchard Oriole	(Icterus spurius)
American Swallow-tailed Kite	(Elanoides forficatus)
White-eyed Vireo	(Vireo griseus)
Hooded Warbler	(Wilsonia citrina)
Painted Bunting	(Passerina ciris)
Wood Thrush	(Hylocichla mustelina)

Northern Parula	(Parula americana)
Eastern Wood-Pewee	(Contopus virens)
Acadian Flycatcher	(Empidonax virescens)
Great Crested Flycatcher	(Myiarchus crinitus)
Redheaded Woodpecker	(Melanerpeas eruthrocephalus)

Source: (Partners in Flight Bird Conservation Plan for the Mississippi Alluvial Valley, September 1999)

The Important Bird Areas (IBA) program is the focal point for the National Audubon Society's bird conservation work. BirdLife International initiated the IBA concept in the 1980s, and now IBAs are active in nearly 170 countries, with over 7,500 sites identified. As the U.S. partner of BirdLife, Audubon, working with the Mississippi Museum of Natural Science, the Mississippi Ornithological Society, and the Service has identified 35 IBAs in Mississippi. Criteria for IBAs include: must support endangered, threatened, or vulnerable species, of a unique or threatened natural community; where birds concentrate in significant numbers; and support exceptional numbers or diversity of migratory landbirds. IBAs in the project area include Delta National Forest, Panther Swamp and Yazoo NWRs, Mahannah WMA, and Tara Wildlife, Inc., a private holding dedicated to wildlife conservation.

Backwater Fisheries and Aquatic Habitats

The YBWA supports a diverse ichthyofauna characteristic of Mississippi Delta fish assemblages taxonomically dominated by minnows and sunfishes. Most species are considered indicative and tolerant of degraded water quality and habitat (Jester et al. 1992). Principal game and commercial fish species inhabiting the study area aquatic habitats include white crappie, bluegill, largemouth bass, channel catfish, blue catfish, flathead catfish, smallmouth buffalo, common carp, freshwater drum, and several gar species. Other fishes that are locally abundant in the YBWA include mosquito fish, orange-spotted sunfish, gizzard shad, ghost shiner, blacktail shiner, threadfin shad, green sunfish, and warmouth. Field collections for the Fishery Appendix for the YBW project documented 57 species of fish.

Permanent open-water habitats in the project area include natural streams, oxbow lakes, sloughs, ponds, and ditches. Riparian vegetation along those habitats provides shade needed to sustain aquatic life by maintaining moderate water temperatures during the hot summer months. Aquatic habitats in the YBWA are highly variable in terms of size, current velocity, water clarity, depth, and amount of vegetative cover and woody debris. That diversity of habitat, in turn, supports diverse fish fauna. Ephemeral ponds are also an important aquatic habitat in the YBWA because they support breeding reptiles, amphibians, and certain fish species.

Overall, the YBWA provides fair quality fishery habitat. High sediment deposition rates and turbidity levels, repeated channel modification, and agricultural pollution have caused an overall decline in aquatic habitat quality. On June 26, 2001, Mississippi's Department of Environmental Quality (MDEQ) issued a fish consumption advisory for large portions of the Mississippi Delta's waters due to high residual levels of DDT and Toxaphene. The MDEQ advisory recommended "consumption of no more than two meals per month of buffalo, carp and gar and to not eat more than two meals per month of catfish larger than 22 inches." The advisory (still in effect) covers all water bodies east of the Mississippi River levee and west of the loess bluffs.

Although the oxbow lakes have been adversely impacted by agricultural runoff and siltation, they continue to support good-quality fisheries, particularly those subject to backwater flooding by the

Mississippi River. Sport fishing pressure on oxbow lakes varies from moderate to heavy with white crappie comprising the bulk of the catch. With the exception of the Mississippi River, sport fishing pressure on the study-area rivers and streams varies from nonexistent to moderate. During the spring and fall, certain reaches of the rivers and streams receive heavy commercial fishing pressure.

In floodplain ecosystems such as the YBWA (Figure 4), flooding not only enhances fish production, but also plays a key role in maintaining genetic and species diversity (Bayley 1995, Sparks 1995). Fishes use the floodplains for spawning, feeding, and refuge habitat (Welcomme 1979, 1985, Sparks et al. 1990). During flood periods, fishes gain access to inundated forests where they feed on terrestrial arthropods, fruits, seeds, flowers, and leaves (Ye 1996). Welcomme (1976, 1985, 1986), Goulding (1980), and Sparks et al. (1990) indicate that fish production in floodplain rivers is strongly influenced by the timing, height, and duration of flooding. In the lower Mississippi River and its tributaries, positive relationships between fish abundance and the acreage of bottomland hardwood forests susceptible to flooding have been documented (Risotto and Turner 1985). Bayley (1995) found that multi-species fish biomass was significantly greater in rivers with flood pulses and floodplains than in impoundments with stable water levels.

Characteristics of riparian vegetation coupled with the dynamics of overbank flooding ultimately determine potential productivity for fisheries in floodplain river ecosystems through input of allochthonous (detrital) materials as well as nutrients from terrestrial origin (Junk et al. 1989). Processing of detritus in conjunction with allochthonous production is stimulated by flooding and becomes the principal energetic foundation supporting fish populations (Bayley 1989, 1995, Sparks 1995). Flooding also introduces large woody debris which provides important instream attachment substrates for invertebrates (Benke et al. 1985), as well as habitat for fishes (Gorman and Karr 1978 and Benke et al. 1985). Instream structure is an important contributing factor to the overall productivity of rivers and streams. Benke et al. (1984) determined that although snags represent a relatively small habitat surface they support 60 percent of the total invertebrate biomass and 16 percent of the production for a lowland river. Fifty percent of the major fish species obtain at least 60 percent of their prey biomass from snags. Angermeir and Karr (1984) found that fishes and benthic invertebrates were usually more abundant on the side of a stream that had woody debris than on the side devoid of debris, and larger fishes avoided stream reaches without debris.

The backwater areas of the lower Mississippi River ecosystem, although degraded, remain the "ecological engines" that are responsible for the outstanding productivity of the aquatic ecosystem. The proposed project poses further degradation to the aquatic ecosystem because its authorized purpose is to further reduce backwater hydrology to reduce flood damages primarily during March, April, and May which are the peak fish spawning and rearing months.

Threatened and Endangered Species

The study area backwater ecosystem supports relict flora and fauna that are relatively unchanged since they arose in the Mesozoic and Pleistocene and successfully adapted to living in the alluvial floodplain (e.g., water tupelo, paddlefish, pallid sturgeon, bowfin, and alligator gar). Others, equally well-adapted to that system, have not survived modern land-use related habitat changes (e.g., ivory billed woodpecker, red wolf, eastern cougar), and have been extirpated.

Several species that occur within the YBWA are currently listed as threatened or endangered in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

They include pondberry (*Lindera melissifolia*), an endangered plant; the pallid sturgeon (*Scaphirhynchus albus*) an endangered fish, and the threatened Louisiana black bear (*Ursus americanus luteolus*). One mussel species, the pyramid pigtoe (*Pleurobema pyramidatum*), has been discovered in the Big Sunflower River, and is on the State of Mississippi's endangered species list. There is only one record of a pallid sturgeon in the project area, and the Service determined that no further evaluation of the sturgeon was required.

Section 7 of the Endangered Species Act requires the Corps to initiate endangered species consultation for any proposed water resources project that "may adversely affect" any listed species. They prepared a Biological Assessment (Appendix 14: Endangered and Threatened Species Biological Assessment of the Draft Yazoo Backwater Area, Mississippi Reformulation Report, September 2000) of potential project effects on the listed pondberry and Louisiana black bear. The Corps determined that their selected alternative would not likely adversely affect any listed species including pondberry. The Service evaluated the Corps' determination and the adequacy of their substantiating analyses. Based on that review, the Service determined that the Corps' selected plan "may adversely affect" the endangered pondberry and requested in our October 16, 2000, letter that the Corps initiate formal consultation on that species under the Act. Subsequent verbal and written requests that formal consultation should be initiated were declined by the Corps. However, in a December 5, 2005, letter the Corps requested that the Service begin formal consultation relative to potential project impacts to pondberry. On January 27, 2006, the Service accepted the Corps' request to initiate formal consultation, and the Service is currently preparing our biological opinion.

Based on new information, the Service also wrote the Corps on October 26, 2004, and suggested the reinitiation of consultation concerning the possible effects of the YBWA project on the Louisiana black bear. MDWFP had recorded increased sightings of the bear in the project area. On January 24, 2005, the Corps stated that they were in the process of revising the environmental appendices for the Pumps project and the issues we raised in our October 2004, letter would be addressed in the revised appendices. On December 5, 2005, the Corps provided a revised threatened and endangered Appendix 14 for our review. On August 10, 2006, the Service provided a summary review and informal consultation letter to the Corps stating that the Corps' Recommended Plan for the YBP would not adversely affect the Louisiana black bear.

Backwater Ecosystems of the Mississippi River

Biologically and institutionally, the floodplain and wetland habitats of the project area are Nationally significant in their own right. These are not merely overflow habitats, they are unique precisely because they occur in a backwater area; one of only four in the LMAV ecosystem. Those areas would be significant for their floodwater storage capacity alone; however, the extent of backwater flooding within the Red River Backwater Area of Louisiana, the Arkansas/White Backwater area in Arkansas, the St. Francis River Backwater area of northeastern Arkansas and southeastern Missouri, and the YBWA, has been deliberately limited by levees. Flood duration has also been purposefully reduced by pumping plants within all of those areas except the YBWA. These hydrological perturbations have resulted in an increased frequency and duration of flooding within the remaining un-leveed portions of those backwater areas, as well as on the batture lands located outside the levee-protected areas.

As a direct result of those hydrological changes, the exceptional fish and wildlife habitat values once provided by the four backwater floodplain/wetland complexes have been substantially degraded. While some of those losses can be attributed to the historical lack of understanding and support for the fish and wildlife habitat and related functional values of intact backwater

areas, studies have increasingly clarified the ecological importance of those systems to the overall well-being of the encompassing ecosystem. In 1995, Gore and Shields noted that the stability and functioning of large river ecosystems depends on maintaining the integrity of both their watershed and floodplains.

The YBWA floodplain wetland and aquatic habitats are vital to the conservation of the nationally significant fish and wildlife resources discussed above. For example, the Black Bear Conservation Committee, an innovative coalition between industry, academia, and State and Federal agencies has identified a population goal for the threatened Louisiana black bear of 25-30 female bears with cubs in Mississippi. Appropriate conservation and management measures within the YBWA will be a key aspect in meeting that goal. The black bear was once distributed throughout Mississippi, however, because of excessive harvest and habitat loss, black bear populations have been severely reduced. Currently, the Louisiana black bear's range in Mississippi occurs primarily in the Mississippi portion of the Lower Mississippi Alluvial Valley (LMAV) in the bottomland hardwood and floodplain forests along the Mississippi River and also in the southern part of the state (Figure 5). A few females with young have been documented in the YBWA floodplain and several males are currently being radio-tracked by MDWFP in the area (B.Young, pers. Comm.). Although the bear is capable of surviving under a range of habitat types, some necessary habitat requirements include hard mast, soft mast, escape cover, denning sites, forested corridors, and limited human access. The Service has outlined objectives and strategies for plantings and landscape design to specifically enhance habitat for the federally threatened Louisiana black bear (Appendix C), especially in designated black bear habitat restoration priority zones. There are eight primary zones in the project area necessary for bear corridors between existing beat habitat, and approximately two thirds of the YBWA is a secondary priority zone (Figure 5). If a YBW project is implemented, we recommend that any reforestation efforts follow these guidelines.

Likewise, the hydrological cycle of backwater flooding is critically important to maintenance of project-area wetland and aquatic habitat values, including fisheries production. In addition to making the diverse YBWA habitats accessible to the fish and wildlife, the backwater flood cycle is also the essential linkage that transfers energy and organisms between the YBWA and the rest of the lower MAV ecosystem.

Remaining BLHF habitats are extremely important components in the life cycle of many wildlife species (Glasgow and Noble 1971). While those values were described for Federal-trust fish and wildlife previously, they are also vitally important to other resident wildlife species. Squirrels reach their highest densities in the ideal habitat provided by mature mast trees. Furbearers, such as mink, raccoon, opossum, beaver, bobcat, skunk, fox, and river otter, are locally abundant in the bottomland hardwoods and riparian areas of the YBWA. Narrow strips of BLHF along channels, canals, and ditches provide highly important travel and dispersal corridors for black bear, coyotes, rabbits, raccoons, opossums, and other fauna. White-tailed deer reach some of their highest known densities in this diverse, productive habitat, which also supports a variety of non-game species.

NATIONAL WILDLIFE REFUGES, NATIONAL FORESTS, STATE WILDLIFE MANAGEMENT AREAS, AND OTHER FEDERAL INVESTMENTS

In addition to their biological significance, the remaining BLHF wetlands and aquatic habitats (including their essential ecological elements and functional values) of the YBWA support intensive public use. Lands within the direct trusteeship of the Department of the Interior that are in the project area include 29,451 acres within Holt Collier, Panther Swamp, and Yazoo

National Wildlife Refuges. These refuges were established for their nationally significant values to migratory waterfowl and the public's enjoyment of those values. There are also 4,314 acres of FmHA lands which the Service owns in fee title. In addition, there are approximately 61,800 acres within the U.S. Forest Service's Delta National Forest, the only bottomland hardwood National Forest in the United States. The Corps of Engineers owns and leases to MDWFP, 8,383 acres in their Lake George Wildlife Wetland Restoration Project. The MDWFP also manages the 12,675-acre Mahannah Wildlife Management Area (WMA), and the 5,675-acre Twin Oaks WMA (Figure 6).

By 2005, the National Resource Conservation Service's (NRCS) Wetland Reserve Program (WRP) had enrolled and restored 36,780 acres of bottomland hardwood wetlands in the YBWA. Approximately 23,540 acres had been enrolled in the NRCS's Conservation Reserve Program (CRP), which is a 15-year easement to restore forested wetlands.

FUTURE WITHOUT PROJECT CONDITIONS

Despite their habitat and related functional values, BLHF wetlands and aquatic habitats have been substantially reduced in quality and quantity. In the 1950s, there was a major expansion of agriculture into poorly drained, frequently flooded portions of the MAV. Federal flood control projects claimed as benefits the conversion of over five million acres of forested wetlands to cropland. The period from 1950 through the 1970s, for example, saw the conversion of approximately 3.5 million acres of wooded wetlands to other land uses in the lower MAV ecosystem, and both the effect and the magnitude of similar changes that occurred within the YBWA were no less dramatic. In the six county area that includes the YBWA, over 300,000 acres of forested wetlands were cleared during the period between 1957 and 1977 (MacDonald et al. 1979). In fact, habitat changes of such magnitude would normally be expected to take place over a geologic time frame, rather than a few decades.

The Corps has projected no change in the future without project land use conditions. Aware of the reforestation trend in the lower Delta during the 1990s, the Service provided our projection of future without project land use analysis of the YBWA to the Corps in our September 1999, Planning Aid Report (PAR). At the time of our report, restoration was underway on approximately 23,000 acres in WRP alone within the YBWA.

Our PAR concluded that there is a gradual and long-term movement away from agriculture to forest-based land uses within the poorly drained, frequently flooded portions of the Yazoo Backwater Area. The Service projected that approximately 43,400 acres of cleared agricultural lands would be restored under future without-project conditions. Over eighty percent of the restoration was projected to occur within the two year frequency event. Again, Corps' land use data reveals that from 1999 to 2005, there has been an increase of approximately 20,000 acres of forest land in the YBWA within the two year floodplain The Service's conclusion that reforestation would continue in the project area appears accurate.

It appears that the Service's 1999 report was conservative in its projection of 43,400 acres of reforestation, and we believe the realignment of land use will continue into the future, absent major hydrologic and hydraulic intervention. According to data obtained from the Corps, as of 2005, there were 36,780 enrolled in WRP and 23,540 acres in CRP. While future farm prices may trigger a return to farming high-risk areas, we believe it will not likely produce any immediate, large-scale wetland conversion, as was the case during the 1950s-1970s. The Service believes the socio-political and economic forces currently in place will tend to deter rapid conversion of wetlands to agriculture. As an example in support of our belief, the hunting and

recreational values of forested wetlands alone have steadily increased over the past several years.

SERVICE PLANNING GOAL

The Service planning goal for the Yazoo BWA Reformulation Study is the implementation of a Federal water resource development project that will support ecologically and economically sustainable development. The project would continue the ongoing realignment of land use with land capability; and, in terms of policy, purpose, and result, reflect "new directions" in the MR&T approach to floodplain management, wetland conservation, and air and water quality improvement.

Our concerns cannot be met by continuing to live with the future without-project condition. Rather, this goal embodies the Service's desire and expectation that a project will be implemented which reflects a fundamental change in the historic direction of flood control within the YBWA. An economically and environmentally sustainable landscape will not otherwise be achievable. Not coincidentally, attainment of this goal would have far-reaching benefits in terms of conserving the nationally significant fish and wildlife resources of the project area.

To achieve this planning goal, the Service has formulated three planning objectives and several corresponding evaluation criteria upon which our evaluation and assessment of the Corps' Recommended Plan are based.

SERVICE PLANNING OBJECTIVES

Objective 1: Continue the Ongoing Realignment of Land Use and Land Capability to Address the Imbalance Between Agricultural Development and Wetland Conservation in the YBWA.

The focus of this planning objective is the restoration of a sustainable balance between agricultural development and wetland conservation within the YBWA. That imbalance is widely acknowledged as the product of the last major agricultural expansion (the "soybean boom" of the late 1950s through the 1970s) and its linkage to the implementation of major flood control and drainage projects. A comparison of 1950s forest cover and 1990s forest cover in relation to the soil drainage characteristics of the YBWA indicates that agricultural expansion during that period primarily occurred in poorly drained, frequently flooded areas. Thus, any plan designed to meet this objective will require specific measures to restore frequently flooded, poorly drained agricultural lands to forested wetlands. Four evaluation criteria have been identified to measure the extent to which such alternatives fulfill this objective.

Evaluation Criterion 1A: Existing Wetlands are Protected

To meet this criterion, an alternative must specifically preclude further agricultural conversion of wetlands, either by securing non-development easements, or by ensuring that project-related hydrologic alterations do not reduce the extent of wetlands.

Evaluation Criterion 1B: Further Intensification of Agriculture in Wetlands Is Avoided

There are over 95,000 acres of agricultural land within the area affected by the two year frequency flood. Alternatives that meet Criterion 1B will avoid hydrologic modifications that have the purpose or effect of sustaining, intensifying, or expanding this encroachment.

Evaluation Criterion 1C: Cleared Wetlands Are Restored to a Level That Exceeds That Projected

to Occur Without the Project.

There are approximately 95,600 acres of marginal agricultural land that currently exist in the YBWA, which could potentially be eligible for restoration and/or reforestation through a myriad of Service, EPA, USDA, or carbon sequestration-driven partnership programs. In 1999, the Service PAR projected that an additional 43,400 acres of restoration of wetlands would occur over the 50-year, future without-project period of analysis. According to current Corps' data, that projection is conservative since, as of 2005, there were 36,780 acres enrolled in WRP and 23,540 acres in CRP; and 20,000 acres in the two year floodplain were reforested between 1999 and 2005. The Service expects this reforestation trend to continue. If an alternative is to meet this criterion, it must contain explicit, viable measures that will result in a net gain in restored wetlands over the acres of reforestation that will occur without the project.

Evaluation Criteria 1D: A Transition from Agriculture to Forest Occurs within the two year Floodplain.

This criterion speaks to the question of balance between agricultural expansion and the conservation of nationally significant wetlands. More directly, it speaks to the question of economic and environmental sustainability within the YBWA. The two year floodplain floods on average once every other year. These frequently flooded wetlands are the lowest portion of the natural sump and still retain some natural environmental values. This area of the floodplain is high risk and marginal for agriculture and is naturally suited for fish, wildlife, and other wetland values. Within the YBWA, an alternative that meets this criterion must foster a transition from agriculture to forest within the two year floodplain.

Objective 2: Achieve "New Directions" in Floodplain Management for the MR&T Project.

As early as 1965, the National Academy of Science initiated, at the request of the U.S. Department of Agriculture, a nation-wide evaluation of the relationship between agricultural land use and the conservation of wildlife and other natural resources. With strong implications for sustainability in terms of land capability, the resulting 1970 report concluded, in part:

"We regard the 'total' development of river systems as a misbegotten concept stemming from early assumptions that economic expansion must out gain population–now a patently erroneous premise. A much restructured, artificial hydrology will result in the mass decimation of wildlife and natural areas, will foreclose future management options by bringing about irreversible changes, and will create problems of unpredictable magnitude through siltation and eutrophication. Most overflow lands can be used most securely and economically within the limits of their natural flood dynamics..."

The Service believes the Corps has both the authority and responsibility to achieve within the Yazoo Backwater Area "new directions" in floodplain management – changes of the sort called for in a 1999 report of the National Academy of Sciences entitled "New Directions in Water Resources Planning for the Army Corps of Engineers". Accordingly, the Service has developed two criteria for evaluating the extent to which alternatives respond to Planning Objective 2.

Evaluation Criterion 2A: A Specific Nonstructural Flood Damage Reduction Zone (NSFDRZ) is Dedicated

A specifically designated nonstructural flood damage alternative to agricultural drainage has never been formulated as part of an MR&T project. The area proposed for reducing agricultural

damages nonstructurally must be specifically and hydrologically defined. Such a nonstructural feature should be designated and dedicated as a matter of project policy and purpose. This criterion is not concerned with the size of a NSFDRZ; but rather, its viability -- its ability to nonstructurally raise, within a hydrologically defined area, the elevation at which damages begin to occur.

Evaluation Criterion 2B: Impacts of the Project Design Flood (PDF) on Environmental and Economic Sustainability are Lessened

Evaluation criterion 2B addresses the extent to which an alternative would reduce the catastrophic damages associated with the occurrence of the Project Design Flood (PDF). To maintain the integrity of the mainline levees, the Yazoo Backwater Levee is designed to overtop in the event of the PDF, at which time over three-quarters of a million acres in the YBWA would be inundated. Although the crest elevation of the backwater levee is acknowledgment that such an event will likely occur, there is no evidence that this realization has entered into subsequent decisions regarding development of the backwater areas.

In this sense, we conclude that the ability of the communities within the YBWA to recover from the catastrophic impacts of the PDF would be increased by alternatives that move the YBWA toward development that is more sustainable in an environmental as well as economic sense. It is the view of the Service that any alternative meeting this criterion should promote a transition from agriculture to forest within the two year event, and ideally provide PDF protection to the built up areas of Cary, Rolling Fork, and Anguilla.

Objective 3: Restore Natural Floodplain Values and Functions.

This planning objective focuses on maintaining and restoring the wetland hydrology associated with a backwater system of the Mississippi River, maintaining the integrity of flood storage basins, and protecting and restoring flood-compatible land uses. In short, it addresses the maintenance and restoration of the ecological functions, values, and processes that define a backwater ecosystem, regardless of our ability to place an economic value on such functions and processes.

As one of the Mississippi River's four major backwater systems, the floodplain forests of the YBWA have been denuded, degraded and fragmented. Its floodplain fisheries have been isolated from the direct hydrological influence of the Mississippi River. Its waterways have been degraded by excessive sediment, nutrients, and agricultural chemicals; and they have been physically re-shaped, re-sized, and re-directed to serve as drainage systems. Yet the YBWA remains an area of national ecological significance. Despite that degradation and recognizing that the objective is not a return to a pristine state, it is entirely possible to restore a measure of ecological sustainability to the YBWA. The Service has established three criteria to evaluate the responsiveness of alternatives to this objective.

Evaluation Criterion 3A: Backwater Floodplain Hydrology is Restored

The backwater flood pulse is the primary factor defining the ecological attributes of the YBWA It not only "fuels" the processes essential to fish and wildlife productivity within the YBWA, it provides the biochemical link to the larger LMV ecosystem. The focus of this criterion is not on maintaining the indirect connection that currently exists, but rather, it is on restoring, to some degree, the historic hydrologic connection by changing the operation of existing and proposed structural features. The Service proposes changes in the operation of the Steele Bayou Control

Structure that would reestablish a direct connection between the YBWA and the Mississippi River up to the elevation of the one year event, 87 feet, or 91 feet, the two year event. During plan formulation, the Corps analyzed the hydrologic effects of allowing free exchange between the Mississippi River and the YBWA up to 87 feet. Their detailed analysis concluded that, in concert with a pump operating at either 87 or 91 feet, this restoration feature would have no significant adverse impacts upon flood control above 91 feet. However, the Corps' Reformulation Report and Draft SEIS did not acknowledge or disclose the results of that evaluation or any subsequent assessment of its environmental benefits.

Any alternative meeting this criterion would include changes in the operation of the Steele Bayou Control Structure that would reestablish a direct connection between the YBWA and the Mississippi River up to the elevation of the one year event, 87 feet, or 91 feet, the two year event.

Evaluation Criterion 3B: Flood-compatible Land Uses are Protected and Restored

Any plan that seeks a balanced approach to flood damage reduction will of necessity restore flood compatible land uses over much of the poorly drained, frequently flooded portions of the YBWA. Currently, there are 95,600 acres of agricultural lands within the environmentally sensitive two year floodplain. Promoting flood compatible, wetland land uses on those 95,600 acres of cleared wetlands and preserving existing forested wetlands is central to achieving a balance between agricultural intensification and wetland conservation.

Evaluation Criterion 3C: The Carbon Storage and Nutrient Assimilation Functions of the Floodplain Ecosystem are Increased over that Level Expected to Occur Without the Project.

The principal focus of this criterion is the potential impact that project alternatives would have on the specific backwater floodplain functions of nutrient assimilation and carbon sequestration, both of which play an essential role in the maintenance of air and water quality. Floodplain wetlands have a tremendous capacity to assimilate the excessive nutrients that are known to cause eutrophication in freshwater and which are acknowledged to be the primary cause of the approximately 7,000-square mile hypoxic zone that appears each summer in the Gulf of Mexico. Similarly, forested wetlands are unparalleled in their capability to take up the carbon-rich gases that are the primary cause of global warming, sequestering significant quantities of elemental carbon while replenishing the atmosphere with oxygen.

DESCRIPTION OF EVALUATION METHODS

Wetlands

As described in the Corps' Wetland Appendix, the Corps in collaboration with EPA and the Army's Engineer Research and Development Center (ERDC) in Vicksburg, Mississippi, delineated the areal extent and functional values of wetlands in the project area. The extent of wetlands was determined with an offsite methodology utilizing a combination of remote-sensing and Geographic Information System (GIS) techniques. The wetland definition used by the Corps is "those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adopted for a life in saturated soil conditions." The Corps further defined the conditions for the hydrology of wetlands as "an area may have wetland hydrology if it is inundated or saturated to the surface for at least 5 percent of the growing season in most years."

The computed growing season was the period March 1- November 27 (270 days x 5 percent =

13.5 days rounded to 14 days. The Corps then developed the five percent wetland elevation data for the wetland delineation from six recording gage locations throughout the project area. Although not described in detail here, the Corps used the Flood Event Simulation Model (FESM) to determine pre- and post project wetland acreage. The FESM model is an Arc-View extension developed to show the areal extent of flooding using stage data.

In order to test the FESM model, EPA utilized their Environmental Monitoring and Assessment Program (EMAP) to produce a statistically significant estimate of the project area wetland acreage and compare that acreage to the amount estimated by the Corps' FEAT model. EMAP estimates that the areal extent of wetlands in the YBWA is 212,284 acres. The FESM estimate is 189,600 acres of wetlands.

The FESM method is dependent on the period of record stage data, the surface elevation model of the basin, and estimates wetlands that are maintained by out-of-bank flooding. FESM can provide the areal extent of wetlands under base and with-project conditions. It does not estimate the extent of wetlands that capture precipitation of floodwaters above the five percent duration elevation. EMAP is based on a field determination at more than 157 randomly selected sites in the YBWA in 2003. The method's strength is that it is based on field inspection, but it cannot provide a map of pre- and post project wetland areas.

Wetland Functions

The Hydrogeomorphic (HGM) Methodology was utilized by ERDC to assess the direct and indirect project impacts to wetland functions and the mitigation of wetland functions. Project area wetlands were divided into five subgroups based on annual duration of flooding- 2.5, 5, 7.5, 10, and 12.5 percent. In order to further evaluate wetland functions and losses, wetlands were also subdivided into six land use categories such as mature forest, early aged forest, and agriculture. The HGM method evaluates the impacts to wetlands for several wetland functions. HGM determines the values of the functions as Functional Capacity Units (FCU). The functions impacted by changes in the duration of flooding and evaluated for the YBWP were export organic carbon, provide habitat for fish and wildlife, physical removal of elements and compounds, and biological removal of elements and compounds.

The HGM analysis only evaluated wetlands and project impacts within the two year floodplain. The detain floodwater, detain precipitation, cycle nutrients, and maintain plant communities are HGM wetland functions that were not evaluated, because the duration of flooding is not a variable in these function models.

Wildlife

Terrestrial wildlife habitat and project impacts were evaluated and quantified by ERDC with the Service's Habitat Evaluation Procedures (HEP). Six evaluation species were used to represent the habitat requirements of wildlife inhabiting the forested portions of the study area:

Barred owl	(*Strix varia*)	gray squirrel	(*Sciurus carolinensis*)
Carolina chickadee	(*Parus carolinensis*)	wood duck	(*Aix sponsa*)
Pileated woodpecker	(*Dryocopus pileatus*)	mink	(*Mustela vison*)

The quality of habitat for each species was determined by measuring specific habitat variables (e.g., canopy cover, tree height, size and abundance of snags) on sample plots and entering these data into Habitat Suitability Index (HSI) models for each species. HSI scores can range from 0

(unsuitable habitat) to 1.0 (optimal habitat). The HSI value is then multiplied by the number of acres available to an evaluation species, to calculate the baseline habitat units (HUs). One HU is equal to one acre of optimal habitat. For example, an HSI of 0.80 x 100 acres = 80 HUs. Baseline (pre-project) HSI values indicated above average habitat quality for most evaluation species. The low value for mink, 0.11-0.12, applies only to areas of potential mink habitat which is defined as forest land that is flooded at least 25% of the year (cumulative duration). The lands that met this parameter barely exceeded the 25% minimum specified in the model for mink.

HUs available to each species are estimated for each of several target years over the life of the project (50 years). Estimates of future habitat conditions are made for the without project condition and for each with project alternative. Impacts or benefits to each species are then determined by calculating the difference in average annual habitat units (AAHUs) between with project and without project alternatives. When the proposed reforestation is left out of the calculations, the only changes in habitat availability were due to the clearing of 38 acres of existing mature forest, except Plan 2B, and increasing minimum water levels to 70-73 feet NGVD at the Steele Bayou structure actually benefit the water dependent species- wood duck and mink.

Fisheries

The HEP analysis was also used by ERDC to determine impacts to floodplain spawning habitat, since reproduction of most wetland fish species is closely related to the timing, extent, and duration of flooding, and annual variations in periodic flooding of rivers affects reproductive success and year-class strength. The following species were selected based on reproductive strategy (i.e. release of floating eggs, deposit adhesive eggs over sand, gravel, or vegetation) as well as generalist species that tolerate a wide range of habitat conditions.

Threadfin shad	(*Dorosoma pretenense*)	Channel catfish	(*Ictalurus punctatus*)
Blacktail shiner	(*Cyprinella venusta*)	Flathead catfish	(*Pylodictis olivaris*)
Ghost shiner	(*Notropis buchanani*)	White crappie	(*Pomoxis annularis*)
Speckled chub	(*Macrhybopsis aestivalis*)	Freshwater drum	(*Aplodinotus grunniens*)
Smallmouth buffalo	(*Ictibus bubalus*)		

All the evaluation species can be potentially impacted from reduced floodplain inundation and loss of forested wetland areas. Most of these species live in main channel environments as adults, but move laterally onto the floodplain during spring and early summer to spawn or rear as larvae.

HSI scores for each evaluation species indicated a similar trend of increasing habitat value from cleared to forested lands. Studies have confirmed that fishes in delta habitats prefer bottomland hardwood wetlands during seasonal inundation, and that larvae are more abundant in structurally complex habitats and permanent waterbodies. Agricultural lands afforded minimal protection from predators and consequently had low spawning and rearing values for all evaluation fish species. Fallow fields had higher value for species, such as smallmouth buffalo, that spawn over herbaceous cover typical of fallow fields.

As discussed above in the Wildlife Evaluation Section, HSI scores are multiplied by acres of habitat available to equal habitat units (HUs). HUs are annualized over the life of the project to obtain average annual habitat units (AAHUs). There was a net increase in AAHUs of spawning habitat for the nonstructural plans, since those plans involve large scale reforestation and no pumps. As expected, structural plans result in a decrease in spawning and rearing AAHUs. The

HEP analysis did not evaluate the entrainment and impingement impacts to fish resulting from operating a pumping plant.

Waterfowl

The YBP would have direct and indirect impacts on waterfowl that winter in the project area because of changes in the duration and extent of backwater flooding. The methodology used by ERDC to predict potential project impacts was developed by our agency and is based on using food as an index of wintering waterfowl carrying capacity, which is expressed as the number of duck-use-days (DUDs) per acre. Information needed to estimate DUDs include land use and crop type, extent, duration, and depth of flooding, amount of winter food present by crop type, energy of food types, and energy requirements of waterfowl.

Without reforestation, most alternatives result in an increase in DUDs, since the Steele Bayou structure minimum water level elevation would be raised to 70 to 73 feet during the winter months. This would provide a slight increase in flooded winter crop fields. All reforestation alternatives result in a substantial decrease in DUDs, since waterfowl foraging values are less on forest lands than croplands. The Corps will provide pipe structures to create up to five percent of all reforestation easements for winter waterfowl foraging. With the five percent foraging values credited on all proposed reforestation acreage, there would be substantial increases in DUDs for each reforestation alternative. The Service believes it is unrealistic for the Corps to assume that all reforestation participants will dedicate five percent of their easement lands to waterfowl foraging.

ALTERNATIVE PLANS

In the Corps' draft 2000 Yazoo Backwater Reformulation Report, 35 plans were evaluated and grouped into three separate categories-nonstructural, structural, and combination, as defined by the Corps. The vast majority of the 35 plans were structural alternatives (14-17,500 cfs pumping plants). Since release of the 2000 draft report, the Corps included three additional nonstructural plans in the final array; 2A, 2B, and 2C. Again, as defined by the Corps, the final array of alternatives include four nonstructural plans, one structural plan, four structural/nonstructural combination alternatives, and a no action plan (Table 2).

Table 2 was provided by the Corps. Commonalities of the final array of alternatives include:1). perpetual reforestation easements are from willing sellers only; and 2). all reforestation acreages are goals, as the intent is to acquire easements on up to the total acreage stated.

Table 2. SUMMARY COMPARASION OF FINAL ARRAY FEATURES (a)

Alternative	Measure		
	Nonstructural	Structural	Operational
Plan 1- No action	Not applicable	Not applicable	Not applicable
Plan 2	124,400(b) acres of agricultural lands reforested some above 91feet; Conservation easements on 191,600 acres of	Not applicable	Maintain water elevations between 70 and 73 feet, NGVD, during low-water periods

	agricultural lands between 91 and 100.3 feet NGVD. No intensification or Development would be allowed under the easement.		
Plan 2A	81,400(b) acres of agricultural lands reforested at and below 91 feet; Flood proofing 1487 structures in the 100-year flood plain; Implementing an income assurance program that would be established for 234,600 acres of cropland above 88.5 feet NGVD	Not applicable	Not applicable
Plan 2B	26,400(b) acres of agricultural lands reforested below 91 feet NGVD and outside the ring-leveed areas	Ring levees would be used to protect some structures	Not applicable
Plan 2C	114,400(b) acres of cropland some above 91 feet would be reforested; Implementing an income assurance program on 201,600 acres of cropland which is all remaining cropland in the 100-year floodplain; Relocation of 1,487 structures damaged by a 100-year flood event.	Not applicable	Not applicable
Plan 3	Not applicable	14,000-cfs pump,80 –foot, NGVD pumping elevation	85-foot, NGVD, pumping elevation during waterfowl

			season; Maintain water elevations between 70 and 73 feet during low-water periods.
Plan 4	37,200(b) acres of agricultural lands reforested at and below 91 feet, NGVD	14,000-cfs pump, 85-foot, NGVD, pumping elevation	Maintain water elevations between 70 and 73 feet during low-water periods
Plan 5-Recommended Plan	55,600(b) acres of agricultural lands reforested at and below 91 feet, NGVD	14,000-cfs pump,87- foot NGVD pumping elevation	Maintain water elevations between 70 and 73 feet, NGVD during low-water periods
Plan 6	81,400(b)acres of agricultural lands reforested at and below 91 feet, NGVD	14,000-cfs pump,88.5 feet NGVD pumping elevation	Maintain water elevations between 70 and 73 feet, NGVD during low-water periods; reintroduce Mississippi River water to 87 feet.
Plan 7	124,400(b) acres of agricultural lands reforested some above 91 feet NGVD	14,000-cfs pump,91-foot NGVD pumping elevation	Maintain water elevations between 70 and 73 feet during low-water periods; Reintroduce Mississippi River water to 87 feet, NGVD

(a) For plans that involve reforestation, the Corps has the following policies concerning the perpetual easements they acquire: "No more than 10 percent of a property could be in conservation measures. Conservation measures are practices implemented and maintained solely for wildlife management purposes. Conservation measures include, but are not necessarily limited to, (1) water management impoundments for waterfowl, wading birds, or other wildlife purposes; (2) food plots; (3) permanent openings maintained in early successional stages; (4) access trails, roads, and firebreaks; or (5) facilities and buildings necessary for property management (constructed above the 100-year flood plain elevation). Landowners would be responsible for the cost of implementing and maintaining conservation practices. Landowners also would be responsible for maintaining ditches used for agricultural operations on remaining portions of their properties or for agricultural operations on other properties dependent on those ditches."

(b) Blocking Out. The symbol "(b)" indicates a blocked acreage in the plan descriptions. Acreages are rounded to the nearest 100 acres. The reforestation and conservation easement acquisition limits for the YBP were established based on the one year flood frequency stage elevations. However, based upon sound real estate practices and guidance as found in USACE real estate regulations, blocking out will be utilized to address such items as access, the extent of severance damages, and avoidance of an

uneconomic remainder. The blocking out will result in the acquisition of some lands outside the one year flood event. The Vicksburg District Real Estate Division has vast experience in the acquisition of lands based upon elevation and typically uses a blocking factor of 30 percent. This figure was utilized for calculating the acreage to be acquired for the reforestation conservation easement in connection with the Yazoo Backwater Reformulation Study.

ANALYSIS OF ALTERNATIVES

Plan 1- This is the no action alternative. Agriculture in low lying, marginal wetlands below elevation 91 feet, the two year floodplain, would continue. Flood damages to agriculture in marginal areas and urban areas would continue. The Corps has projected that there will be no changes in land use over the 50 year period with out a project. However, with no project, the Service projects that the current reforestation trend in the YBWA will continue. The Service prepared a Planning Aid Report (PAR) in September 1999, which analyzed historical and current land use trends and estimated that approximately 43,400 acres of cleared agricultural lands would be reforested over the next 50 years. We estimated that over 80 percent of the reforestation would occur within the two year floodplain. According to current Corps' data, that projection is conservative since as of 2005, there were 36,780 acres enrolled in WRP and 23,540 acres in CRP; and 20,000 acres in the two year floodplain were reforested between 1999 and 2005. We still believe this reforestation trend will continue depending (in part) on future government programs and partnerships. For example, Mississippi is a pilot State for the Healthy Forest Restoration Program.

Plan 5- The Corps' Recommended Plan consists of a 14,000 cfs pumping plant with a year round start elevation of 87 feet, which is the one year flood elevation. Agricultural production in low lying, cleared lands within the two year floodplain would continue. The Corps has included reforestation of up to 55,600 acres of cleared lands within the one and two year floodplains, a measure which they have defined as a nonstructural component of the project. Reforestation would be through perpetual easements from willing sellers only. Approximately 43,000 acres of cleared lands are potentially available below 87 feet, so the remaining acreage needed to reach the goal of 55,600 acres would be acquired between 87 and 91 feet (the two year floodplain). The operation of the existing Steele Bayou structure would be changed to maintain water elevations from between 70 and 73 feet instead of the current 68 to 70 feet, during low-water periods. This would slightly increase winter foraging habitat for waterfowl.

The Corps has also determined that 15,029 acres of reforestation is required prior to initiation of pumping operations in order for the Recommended Plan to achieve no net loss of environmental values. That minimum threshold consists of 10,603 acres for fish spawning impacts (fish spawning compensation produces net gains for wildlife and wetland losses), compensation for direct and past pump site construction 578 acres, and 3,848 acres compensation for past construction of the Yazoo backwater levee. The Service believes that impacts to wetlands flooded less than 14 consecutive days should also be analyzed and compensated prior to pump operation.

Plan 5 would adversely effect 26,300 acres of jurisdictional wetlands (wetlands that are flooded 14 consecutive days during the growing season) of which approximately 14,700 acres are forested and 11,600 are cleared wetlands. Approximately 5,800 acres of these jurisdictional wetlands are public forested lands on NWRs, Delta NF, and State WMAs. NWRs and State WMAs were established for forested wetland species and migratory waterfowl, and the reduction in the extent and duration of flooding adversely impacts those species and the management objectives of these public areas. In fact, State WMAs such as Twin Oaks and Lake George are mitigation lands acquired by the Corps for adverse impacts to bottomland hardwood wetlands.

Not only would fewer acres of wetlands adversely affect the habitat available to waterfowl and other water dependent species, over a long period of time the composition of vegetative species would be altered. The shift to plant species that prefer drier conditions are of less nutritional value to waterfowl, a Service and refuge trust responsibility.

Approximately 3,300 acres of WRP easement lands and 2,600 acres of CRP lands would also no longer be jurisdictional wetlands. Reductions in flooding could adversely affect the ability of these existing federal conservation lands to meet the purposes for which they were established, and would reduce flooding on farmed wetlands not enrolled in WRP and CRP. By altering the hydrology on farmed wetlands, the flooding eligibility points used in ranking the wetlands for potential enrollment in WRP and CRP are lowered, adversely affecting the possibility of these lands being accepted in these NRCS conservation programs.

Shorter hydro period wetlands, wetlands flooded less than 14 days (five days, eight days, 10 days) were not considered by the Corps as adverse project impacts. The Service has maintained that shorter hydro period wetlands (i.e three, four, and five year floodplain) are as important, if not biologically more valuable, than jurisdictional wetlands. A quote from the Yazoo Basin Regional Guidebook for applying the hydrogeomorphic approach states that "One of the primary criteria used to identify regional wetland subclasses in the Yazoo Basin is flood return interval. A 5-year or less flood return interval is regarded as sufficient to support major functions that involve periodic connection to stream systems." (Smith and Klimas 2002) If the wetlands in the YBW area that flood for periods of less than 14 days were evaluated in the HGM, additional wetland losses greater than 14,151 FCUs would result, and necessitate compensation acreage greater than 3,784 acres for compensation of FCUs lost with implementation of the Recommended Plan.

Table 3, provided by the Corps, summarizes the environmental gains and losses of all the final array of alternatives considered on fish, wildlife, waterfowl, and wetland functional values. The impacts are significantly underestimated since wetlands that flood less than 14 consecutive days were not considered. Further, the Corps did not acknowledge the current reforestation trend in the project area. The Service's analysis, contained in our 1999 PAR, projected that 43,400 acres would be reforested in the future without the project. The Corps maintains that the proposed reforestation of 55,600 acres of cleared lands would more than offset the environmental losses of Plan 5. However, the proposed perpetual easements are from willing sellers and the reforestation measure is a goal, not an acreage that is guaranteed to occur.

Furthermore, since only 43,000 cleared acres are available within the one year floodplain, 12,600 acres of reforestation would be above the pump start elevation in the two year floodplain and would be subject to flooding reductions. Flooding reductions would lessen the fish, wildlife, and other wetland values the reforestation feature was supposed to provide.

Finally, a large pumping plant will likely induce the clearing of additional currently existing forested wetlands at some point in the future. Based on these questionable assumptions, the environmental losses and gains of the Recommended Plan are unreliable.

TABLE 3
ENVIRONMENTAL GAINS AND LOSSES

Plan	Terrestrial (AAHU)		Wetland (FCU)		Waterfowl (DUD)		Aquatic Spawning (AAHU)		Aquatic Rearing (AAHU)	
	Structural Effect a/	Nonstructural Effect b/	Structural Effect	Nonstructural Effect	Structural Effect	Nonstructural Effect c/	Structural Effect	Nonstructural Effect	Structural Effect	Nonstructural Effect
1	0	0	0	0	0	0	0	0	0	0
2	0	174,658	0	418,291	195,476	2,589,646	0	16,684	1,322	26,870
2A	0	114,286	0	273,704	0	1,665,155	0	10,917	0	17,582
2B	-4,014	37,066	-49,138	88,769	-673,365	381,566	-6,891	3,541	-32,772	5,702
2C	0	160,618	0	384,666	0	2,491,805	0	15,343	0	24,710
3	-113	0	-43,590	0	-19,651	0	-7,818	0	-14,693	0
4	126	52,229	-27,822	125,084	39,866	449,541	-4,076	4,989	-8,855	8,035
5	126	78,062	-14,151	186,953	75,807	901,599	-1,607	7,457	-4,809	12,010
6	248	114,286	-9,373	273,704	258,960	1,495,262	-28	10,917	-940	17,582
7	248	174,658	-4,139	418,291	279,425	2,567,092	1,326	16,684	1,373	26,870

a/ Hydrologic and construction effects.
b/ Reforestation effects.
c/ Reforestation and waterfowl foraging area effects.

Reforestation for Plan 5 is perpetual easements from willing sellers. However, the 15,029 acres of compensation lands determined by the Corps for the Recommended Plan to achieve no net loss of environmental values may have to be acquired in fee title. The Corps has determined that the 15,029 acres needed to achieve no net loss must be acquired prior to operation of the pumps. The Service recommends that shorter hydro-period wetlands are analyzed and mitigated prior to pump operation as well.

The Service recommends that any lands acquired for mitigation of the project be purchased on an environmental priority basis. Cleared areas that reduce the fragmentation of existing bottomland hardwood forests and/or provide corridors for the black bear (Figure 5), neotropical songbirds, and other wildlife should be the top priority. In holdings and lands adjacent to NWRs, State WMAs, and Delta NF should also be a mitigation priority.

To summarize the major shortcomings of the Corps' Recommended Plan:

1.) No wetlands flooded for less than 14 consecutive days are considered or mitigated.
2.) No existing wetlands are protected.
3.) No wetlands cleared in the future are considered, protected, or mitigated.
4.) Reforestation is a goal of up to 55,600 acres with no assurances of completion.
5.) The duration and frequency of wetland flooding above the one year floodplain is reduced and agriculture in wetlands within the two year event is perpetuated.

Plan 2- This is a nonstructural plan involving perpetual easements from willing sellers on all cleared lands, up to 95,600 acres (124,400 with blocking factor) within the two year floodplain, 91 feet. Flowage easements would also be acquired on all 191,600 acres of agricultural lands from willing sellers within the 100 year floodplain, elevation 100.3 feet. No agricultural intensification or other development would be allowed under the easement.

This plan would certainly restore a majority of the natural floodplain values within the two year floodplain. For example, in Table 3 there is an increase of 418,291 wetland FCUs for Plan 2 compared to the loss of 43,590 FCUs for structural Plan 3. The easements are from willing sellers and would be well received based on the popularity of restoration programs. Since pumps are not constructed, there are no adverse impacts to wetland flooding, and there would be no incentive to clear forested wetlands for cropland. Flood damage reduction on a significant amount of agricultural lands in the two year floodplain would be achieved. Flooding of urban areas is not addressed.

Plan 2A- This nonstructural alternative would involve easements on up to 62,600 acres (81,400 acres with blocking) of cleared lands below 88.5 feet, which are the five percent duration wetlands (flooded 14 consecutive days). There would be an income assurance program established for 234,600 acres of cropland above 88.5 feet. The 1,487 structures in the 100-year floodplain would be flood proofed.

This plan would restore natural floodplain values within the five percent duration, reduce some agricultural flood damages, and address urban flood damages. Since restoration of cleared wetlands is at and below 88.5 feet, the plan does not have the environmental gains (increase of 273,704 FCUs) of Plan 2 (+418,291 FCUs), which would restore wetlands up to 91 feet, the two year floodplain. Flooding of structures in the 100-year floodplain is addressed.

Plan 2B- This alternative has a structural component of 14 ring levees to provide 100-year flood protection to numerous structures. Reforestation easements up to 20,300 acres (26,400 with blocking) of cleared lands that would remain outside of the ring levees and below the two year

floodplain elevation of 91 feet, NGVD.

By providing levee protection to most of the structures in the YBWA, the plan significantly addresses urban flood protection. Since there are 14 ring levees that would occupy a majority of the project area (only 20,300 acres of cleared lands are not encompassed by levees), the environmental losses of Plan 2B are significant (-49,138 wetland FCUs).

Plan 2C- This is a nonstructural plan involving voluntary reforestation of 88,000 acres of cleared lands in the two year floodplain, and the implementation of an income assurance program on all remaining cropland, 201,600 acres, in the 100-year floodplain. This alternative also involves the relocation of all 1,487 structures damaged by the 100-year flood event. Plan 2C is based on the February 7, 2000, Shabman and Zepp Report An Approach for Evaluating Nonstructural Actions with Application to the Yazoo River (Mississippi) Backwater Area.

This plan has no structural impacts and would significantly restore natural floodplain values (+384,666 wetland FCUs) and addresses flood damage reduction on agricultural lands in the two year floodplain. Plan 2C also eliminates all 100-year floodplain urban flood damages.

According to the "Shabman" Report, Plan 2C would have positive net economic development (NED) benefits from installation of the nonstructural measures ($20 million). Included in the benefits are carbon sequestration ($9.8 million) and nutrient load reduction ($32.2 million). Without these benefit categories, NED is negative. The Shabman Report also stated that "... agricultural flood control benefits for a pump project appear insufficient to justify costs."

Plan 3- This is a structural plan with a pump start elevation at 80 feet, which is the elevation that flood damages begin in the YBP area. Between November 1 and February 28, the pump start elevation would be raised to 85 feet to provide more water during the winter waterfowl season. During low-water periods, the Steele Bayou structure would be operated at 70 to 73 feet.

Plan 3 would result in significant reductions of wetland flooding (-43,590 wetland FCUs) and corresponding adverse environmental effects (-19,651 waterfowl DUDs, -7,818 aquatic spawning and -14,693 aquatic rearing AAHUs), and by reducing agricultural damages with a pump start elevation of 80 feet, intensify agriculture in low lying wetland areas. To some extent, urban flooding would also be reduced.

Plan 4- This plan includes a nonstructural component, as defined by the Corps, of easements and reforestation on 28,600 acres (37,200 acres with blocking) of cleared lands below 85 feet, and a 14,000 cfs pump with a year round elevation of 85 feet. During low-water periods, the Steele Bayou structure would be operated at 70 to 73 feet.

This is the National Economic Development Plan (NED). This alternative has the greatest excess benefits over costs. With a pump start elevation two feet below the one year flood event, significant reductions in flooding would result in wetland drainage (-27,822 FCUs), further intensification of agriculture in low lying areas, adverse environmental effects, and some reduction in urban flooding. Because of the Corps' assumption that the reforestation goal will be completely fulfilled, there would be net gains for terrestrial AAHUs, wetland FCUs, DUDs, and aquatic AAHUs (Table 3).

Plan 6- This structural plan has a 14,000 cfs pump start elevation of 88.5 feet, which is1.5 feet higher than the Recommended Plan start elevation of 87 feet, the one year floodplain. The extent of jurisdictional wetlands, 14 days of consecutive flooding during the growing season, is

elevation 88.5 feet. Plan 6 includes the acquisition of easements on up to 62,600 acres (81,400 acres with blocking up to 91 feet) of cleared lands below 88.5 feet. In addition to operating the Steele Bayou structure between 70 and 73 feet during low water periods, the structure would be operated to allow the reintroduction of Mississippi River flows up to 87 feet (the one year flood event).

This alternative essentially avoids impacts to jurisdictional wetlands with the 88.5-foot pump start elevation. The frequency and duration of shorter hydro period wetlands are still adversely affected. The reintroduction of backwater flows would partially restore historical wetland functions and fish and wildlife resource values. Again, due to the Corps' assumption that the reforestation goal will be completely fulfilled, Plan 6 would result in net environmental gains for resources.

Plan 7- This structural plan has the highest pump start elevation at 91 feet, the two year floodplain. The Corps defines as a nonstructural component, the acquisition of easements on 95,700 acres (124,400 acres with blocking) of cleared lands from willing sellers within the two year floodplain (91 feet) is included. This alternative also would include preservation of 81,800 acres of forested lands through conservation easements from willing sellers within the two year floodplain. Again, the Steele Bayou structure would be operated between 70 and 73 during low water periods, and like Plan 6, backwater flows would be reintroduced to the project area up to a maximum of 87 feet.

From a structural approach, this plan has the least pumping plant effects (-4,139 FCUs) and significant reforestation benefits with an increase in FCUs of up to 418,291. Plan 7 has large gains in terrestrial and aquatic AAHUs and DUDs (Table 3), based on Corps assumptions. Flooding of shorter hydro period wetlands would still be adversely affected. Backwater flows would partially restore wetland functions. A significant forested wetland floodplain would be preserved, since the pump start elevation is set at the two year event and conservation easements on existing wetlands below that elevation (91 feet) would be quite popular. Partial restoration of backwater flows vital to riverine fish and wildlife species in the project area would also be a project feature.

The reforestation feature of Plan 7 is not a nonstructural flood control measure. A nonstructural flood damage reduction zone must be specifically designated within the two year floodplain to meet the criteria of nonstructural flood control. With a designated zone, no flood control is provided and farming activities and structural development are undertaken at personal risk. Without that designated zone, there is no effective reduction of flood damages. Although some landowners will opt for conservation easements, those continuing with structural development or agricultural practices in the two year floodplain will continue to seek flood damage relief and financial assistance.

PROCEDURAL, POLICY, AND TECHNICAL ISSUES

Issue 1: Response to OMB Reformulation Directives

In FY 1991, the Office of Management and Budget (OMB) provided to the Corps the following guidance for conducting the overall Yazoo Basin Reformulation Study. The OMB Guidance was largely in response to the 1989 Report of the Governor's Advisory Committee on the Yazoo Basin Projects.

"Yazoo Basin Study (MS): The mark includes the requested funding for a restudy of the

Yazoo Basin Project. However, in response to the request for review and redesign of the project by the Governor of Mississippi, a reformulation report shall be prepared to identify, display, and evaluate alternative plans for 1) greater levels of flood protection for urban areas; 2) reduced levels of agricultural intensification; and 3) reduced adverse impacts of the environment. The scope of the reformulation should encompass alternative reservoir operations, and flood damage reduction alternatives for the Yazoo Backwater Area in addition to the Yazoo Backwater Pumping Plant. Methodology of the report shall be in accordance with the Principles and Guidelines including full consideration of predominately nonstructural and nontraditional measures. Compliance with the Fish and Wildlife Coordination Act and the National Environmental Policy Act shall be integrated with the preparation of the reformulation report. The reformulation report should be transmitted to OMB by the fourth quarter of FY 1991.

Consistent with existing Army guidance, no new contracts should be awarded until the reformulation report is approved by OMB."

The Service views this guidance as a clear charge to the Corps that resolving the long-standing controversy over Yazoo Basin projects, to include the Yazoo Backwater Area Project (the pumps), will require a comprehensive, innovative, and non-traditional approach to water resource development. The Service believes that the Corps' Reformulation Report and Recommended Plan reflect neither the letter nor the intent of OMB's guidance, having fallen short in the five areas indicated below:

a). Full Consideration of Nonstructural/Non-traditional Measures

As discussed earlier, it is the Service's view that the project feature put forth by the Corps as "nonstructural" flood control does not actually meet the test of being called nonstructural flood control. The proposal to reforest lands from willing sellers is a mitigation/enhancement feature.

On the question of evaluation, the Service -- in letters of March 22, 1999, and December 15, 1999, and in formal presentations to the local sponsor and the Mississippi Valley Division Engineer (on March 30 and June 6, 1999, respectively) -- presented an alternative that would designate and dedicate a spatially explicit, non-structural flood damage reduction zone (NSFDRZ); and called for a policy level linkage between the Corps' Recommended Plan and the flood damage-reduction programs of the Federal Emergency Management Agency (FEMA) and the national crop insurance program. The Corps' Recommended Plan does not include a NSFDRZ.

b). Reducing Adverse Impacts to the Environment

The Corps points to two aspects of their Recommended Plan in drawing the conclusion that the project has favorable environmental benefits: 1) a higher pumping elevation than that proposed for the National Economic Development (NED) plan (87' vs. 85' NGVD); and 2) the proposed "reestablishment of forest on 55,600 acres of open land below the pump elevation."

Changing the pumping elevation from 85 to 87 feet does not constitute an environmental feature, is inaccurate, and reflects the MR&T Project's long-standing focus on flood control rather than flood damage reduction. A pump start elevation of 87 feet would still reduce flooding on all wetlands above the one year floodplain. Such thinking presumes that there are no natural, beneficial floodplain values associated with flooding, and prejudices an objective assessment of nonstructural alternatives.

As to the reestablishment of forest on 55,600 acres of cleared lands below the 87-foot pump elevation, this is feature that is a goal of up to that total acreage. The reforestation is from willing sellers and the probability of attaining this goal is low. Further, since there are only 43,000 acres of cleared wetlands below 87 feet, over 12,000 acres would be cleared lands subject to reduced flooding, since they are above the pump start elevation of 87 feet. Finally, at some point in the future, the lack of Clean Water Act jurisdiction on over 8,300 acres of private forested wetlands and the presence of a pumping plant, will likely induce the clearing of additional existing forested wetlands, both jurisdictional and shorter hydro-period wetlands.

c). Emphasizing Urban Protection and De-emphasizing Agricultural Intensification

In that none of the communities in the YBWA are large enough to meet the definition of "urban areas," the Corps' draft Reformulation Report described and analyzed them as "built-up" areas. Because the currently Recommended Plan continues the 70-year MR&T approach to structural drainage, its implementation can be expected to effectively increase agricultural intensification within the YBWA, while simultaneously increasing and intensifying the flood damages associated with the Project Design Flood.

One of the plans in the final suite of alternatives would provide protection for urban/built-up areas. Plan 2B would consist of 14 ring levees to provide 100-year flood protection to a majority of the structures in the YBWA, which is a significant expansion of the Service's recommendation for levees around three towns. Understandably, the cost of Plan 2B is prohibitive. In the formulation of the currently Recommended Plan, no additional protection was considered for the communities of Cary, Rolling Fork or Anguilla. The Recommended Plan remains a $211 million structural response to largely agricultural flood damages. The Corps has determined that approximately 80 percent of total project benefits accrue to agricultural and 13 percent to the structural category.

The Service concludes that the Corps' Recommended Plan does not adequately address the OMB Directive that presumed that urban flood damages would be dealt with directly and not as an indirect consequence of further agricultural drainage. Save for the differences in pumping capacity and the elevation at which forced drainage would begin, the current plan differs only slightly from those advanced over the past several decades. The focus remains one of agricultural drainage with flood damage reduction for urban areas occurring as an incidental by-product. Additionally, the landowner driven trend of restoring economically and ecologically sustainable uses below the two year event can be expected to end.

d). Compliance with the Fish and Wildlife Coordination Act

The primary mandate for the Service's participation in the YBWA Reformulation Study is the Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). The overriding purpose of this legislation is to "provide that wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs ..." It has both procedural and substantive requirements that provide a legal and procedural framework for reconciling what may otherwise be conflicts between water resource development and the maintenance and restoration of fish and wildlife resources. In a procedural sense, it requires consultation and coordination between the Corps and the Service on all aspects of water resource development. In a substantive sense, it requires that fish and wildlife conservation be treated as a co-equal project purpose along with flood control, navigation, etc. It should be noted that the primary responsibility for compliance rests with the Corps through their

mandate to consult and consider.

The administrative procedures developed over the FWCA's 48-year history require consultation, coordination, and equal consideration in all phases of the planning, construction, and operation of projects such as the Yazoo Pumps. Those requirements apply to each of the six basic steps of the Federal water project planning process detailed in "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" (P&G; WRC, 1983). The six steps are comprised of specification of water and related land resources problems and opportunities; inventory, forecast, and analysis of the water and related land resources conditions within the planning area relevant to the identified problems and opportunities; formulation of alternative plans; evaluation of the effects of the alternative plans; comparison of alternative plans; and selection of a recommended plan.

As to the last steps of plan formulation and selection, our letter of May 26, 2000, indicated to the Corps that when consultation, coordination, and consideration were needed the most, they were occurring the least. Coordination essentially ended in February 2000, which effectively brought consultation, coordination, and consideration to an untimely close, just as the Corps independently and unilaterally moved from plan formulation to the remaining three steps of the planning process. During the ensuing seven-month lapse in FWCA coordination, the Corps unilaterally conducted the critical steps of evaluating the final array of alternatives, comparing their effects and assessing trade-offs, and selecting a recommended plan; all in the absence of any further coordination with the Service. During that same period, the Corps uncharacteristically did not respond to our written request for the information needed to complete our analyses and develop a draft FWCA report. Those substantive failures led to the procedural failure of not including our draft FWCA report in the Corps' draft Reformulation Report of 2000, as is normal and customary under our administrative coordination procedures.

Coordination and communication have been difficult since 2000, as well, including a two year plus period from November 2002, following submission of our draft FWCA Report, until July 2005, when there was essentially no coordination or communication about the project. In July 2005, the Service and other resources agencies were requested to review six draft environmental appendices for the YBWA Project (Our review comments are in Appendix B). Frequent meetings with the local sponsor and the Corps have occurred since March 2006, however, data necessary for the completion of our final FWCA Report has been provided only sporadically, and is not sufficient to fully evaluate fish and wildlife impacts associated with the final array of alternatives.

e). Compliance with Service Mitigation Policy[1]

Our mitigation policy specifies five criteria that must be met by a project in order to gain Service support. Those criteria are:

> "(1) The project or proposal is ecologically sound."
>
> We believe the Corps' Recommended Plan is ecologically unsound because it adversely impacts the spatial extent and duration of flooding on nationally significant wetlands (both jurisdictional and shorter hydro-period) that support valuable fish and wildlife

1 U.S. Fish and Wildlife Service Mitigation Policy, Federal Register, Vol.46 No.15, January 23, 1981

resources, perpetuates and expands farming of low-lying, marginal farmland, and essentially ends the ongoing reforestation of cleared wetlands in the lower Yazoo Basin.

"(2) The least environmentally damaging reasonable alternative is selected."

The Recommended Plan is one of the most environmentally damaging alternatives of 35 proposals that were initially developed during the consensus-building process. Reasonable alternatives involving nonstructural, flood damage reduction features have been rejected without being thoroughly evaluated.

"(3) Every reasonable effort is made to avoid or minimize damage or loss of fish and wildlife resources and uses."

The Corps has expended considerable effort justifying their Recommended Plan for a pumping plant with a start elevation at the one year frequency event, and little effort avoiding or minimizing adverse impacts to fish and wildlife resources already diminished by previous flood control projects and associated agriculture intensification.

"(4) All important recommended means and measures have been adopted with guaranteed implementation to satisfactorily compensate for unavoidable damage or loss consistent with the appropriate mitigation goal."

The Corps' selected plan does not contain any Service recommendations to satisfactorily compensate for unavoidable losses. However, the overriding issue is that the Corps' Recommended Plan is totally contrary to the Service's goal for a balance between economic and environmental sustainability in the YBWA. Any alternative should promote a transition from agriculture to forest within the two-year event, and provide Project Design Flood protection to the built up areas of Cary, Rolling Fork, and Anguilla. The Corps' plan does not.

"(5) For wetlands and shallow water habitats, the proposed activity is clearly water dependent and there is a demonstrated public need."

The clear intent of the OMB directive was that the Yazoo Basin was to be the focus of a comprehensive and non-traditional review. Yet, the Corps' plan for the YBWA provides for the traditional approach of wetland drainage and agricultural intensification of wetlands, which is clearly non-water dependent, and does not provide for the demonstrated public need for Project Design Flood protection of Cary, Rolling Fork, and Anguilla.

The Service Mitigation Policy also provides explicit guidance regarding formulation of the Service position regarding a given project:

"The Service may recommend the 'no project' alternative for those projects or other proposals that do not meet all of the above criteria and where there is likely to be a significant fish and wildlife resource loss."

In accordance with the above provisions, and for the stated reasons, the Service recommends further evaluation of the Corps' Recommended Plan for the YBWA.

f). Compliance with the National Environmental Policy Act (NEPA)

The official comments of the Department of the Interior (Appendix D) dated November 3, 2000, regarding the Corps' draft SEIS stated that the document was inadequate and did not comply with the spirit and intent of the National Environmental Policy Act of the Implementing Regulations promulgated by the Council on Environmental Quality (CEQ). These concerns still exist, and the Service has determined that the mitigation requirements of NEPA are not met by the Corps' Recommended Plan.

The Corps is only evaluating project impacts to Clean Water Act jurisdictional wetlands. Shorter hydro-period wetlands of significant biological value are not analyzed or mitigated. NEPA requires the evaluation of all impacts to the environment, not just wetlands flooded for 14 consecutive days during the growing season. Previous court cases have ruled that only evaluating jurisdictional wetlands, as opposed to all wetlands in the project area, is not in compliance with NEPA.

Furthermore, the Corps has incorrectly projected no future without project changes in land use. This questionable assumption further under-estimates the amount of mitigation required to fully off-set adverse impacts. In 1999, the Service PAR projected that over the next 50 years, 43,400 acres would be reforested in the entire project area. According to Corps' data, as of 2005, there were 36,780 acres enrolled in WRP and 23,540 acres in CRP; and 20,000 acres in the two year floodplain were reforested between 1999 and 2005. It is apparent to the Service that we were conservative in 1999, and this reforestation trend is set to exceed our original projection. Not only is the Corps assuming that all perpetual easements from willing sellers will be acquired, they are counting as mitigation, a portion of cleared lands that would be reforested in the future without a project.

Issue 2: Incomplete and Inaccurate Characterization of Baseline and Future Without-Project Conditions

The Corps' description of baseline conditions regularly omits reference to the extensive restoration of wetlands that has occurred since 1985 on the poorly drained, frequently flooded portions of the YBWA. The highly successful and locally popular conservation programs administered by the U.S. Department of Agriculture have received strong support from Mississippi's Congressional delegation and landowner interest remains high. Landowner intentions to enroll continue to exceed available funding. By 2005, there were 36,780 acres enrolled in the Wetland Reserve Program (WRP) and 23,540 acres enrolled in the Conservation Reserve Program (CRP). The significance is accentuated by the Corps' insistence that baseline conditions will remain static over the 50-year without-project future (FWOP).

If the Corps' baseline conditions are inaccurate in the face of existing data; their FWOP projection is questionable in light of existing trends. Much of the Corps' analysis is based on the assumption that there will be no change in future land use in the absence of a project. The Corps' projection of "no change" is essentially one of static equilibrium -- a steady-state is presumed to have been achieved, and that state is assumed to persist unchanged for the next half century. The Corps bases their conclusion on the fact that WRP and CRP enrollment is approaching its cap in Sharkey and Issaquena counties. Moreover, they use the same argument to dismiss the Service's projections of continued wetland restoration. The Service offers the following two points regarding the Corps' conclusion.

The Corps' projection of no change over the next half century hinges on an administrative aspect of two programs that are less than 15 years old, and that are subject to formal legislative change at five-year intervals. There is clearly interest and support for the economically viable alternative

that these programs offer to continued farming of poorly drained, frequently flooded land.

As to the second point, the Service's projections of future wetland restoration were not predicated on a continuation of WRP or CRP. Rather, our projections presume that the economic and social pressures that are behind the ongoing realignment of land use with land capability would find outlets irrespective of the administrative constraints of current programs. On this point, the Corps has misinterpreted and misapplied the projections made by the Service in our September 1999 Planning Aid Report. Based on the Corps' 2005 land use data, as of 2005, there were 36,780 acres enrolled in WRP and 23,540 acres in CRP; and 20,000 acres in the two year floodplain were reforested between 1999 and 2005.

The Corps' YBWA Reformulation Report does not take into account the tremendous restoration potential of carbon sequestration activities in the YBWA even though approximately 95,000 acres of marginal agricultural land with an extremely high restoration potential currently exists in the area, and carbon sequestration-driven reforestation projects are quickly becoming an important restoration tool throughout the LMAV.

As of August 2006, approximately 73,821 acres primarily on National Wildlife Refuge lands (90 percent within the LMAV) have been reforested as part of a carbon sequestration agreement between Utility Companies and the Service that was signed in 2000. This cooperative agreement essentially met the entire reforestation needs of National Wildlife Refuges in the Service's Southeast Region. Additional carbon sequestration cooperative ventures between energy/utility corporations and the Service include: 640 acres purchased and reforested by Texaco as an addition to Tensas National Wildlife Refuge and 11,000 acres purchased by American Electric Power as the Bushly Bayou addition to Catahoula National Wildlife Refuge.

In our view, by inaccurately assessing the future without the project reforestation trend, questionable mitigation and environmental gains are being attributed to the Recommended Plan. A significant portion of credit given to the Corps' reforestation feature would have occurred with out implementation of the project.

Issue 3: Environmental Problems and Concerns

A clear and concise characterization of environmental problems and concerns is essential to a responsive planning process. However, the Corps' characterization has been overly general and simplistic. Problems are characterized simply as the loss and degradation of habitat, and the attendant effects upon recreational opportunities. While those are very real problems, such a characterization does not acknowledge the breadth and depth of the environmental concerns that underlie the current controversy.

The first step followed by federal agencies in formulating water resource projects is "Problem identification". It provides the foundation for all that follows -- the formulation, assessment, and evaluation of alternative courses of action. The longstanding controversy surrounding this project has its roots in a simple dichotomy regarding the nature of the problem: the Corps has traditionally seen the problem as flooding and its impediment to agriculture, and has responded accordingly. On the other hand, the Service sees a more complex problem -- one that can be characterized most simply as a lack of balance between agricultural expansion and the conservation (and, in some measure, the restoration) of the Nation's largest and most environmentally rich floodplain ecosystem.

Issue 4: Cumulative Impacts of Mississippi River & Tributary Projects on Wetland Loss in the

Lower Mississippi Valley

The role of federal flood control/drainage programs in the clearing and drainage of the LMV's forested wetlands for agriculture has long been acknowledged. However, the pattern, the relationship, and the impacts thereof are ignored in the Corps' Reformulation Report in favor of a recounting of mitigation associated with Yazoo Basin projects. As to the underlying relationship, the reader is referred to a 1986 report prepared by the Service on "The Relationship of Federal Flood Control and Drainage to the Agricultural Development of Wetlands in the Lower Mississippi Valley. A Case History: The Yazoo Basin, Mississippi."

The record indicates that there is a long-standing and repetitive failure on the part of the Corps to acknowledge and consider, in any comprehensive or cumulative sense, the impacts of their program on the region's forested wetlands. This failure in particular is borne out by the USDA's comments on the Corps' only "comprehensive" review report, a report that itself is over 40 years old. USDA's concerns emanated from the Corps' counting as benefits the project-induced clearing of over 5.2 million acres of forested wetlands. Practically all of the Corps' projects contained within that report lacked economic justification in the absence of project-induced wetland conversion. It is of particular concern to the Service that the Corps' Reformulation Report ignores the 1988 conclusions and documentation of the Secretary of Interior that nearly one of every two acres of the wetlands lost in the LMV since 1935 are attributable to the MR&T Project. As indicated in the Service's March 17, 2000, letter, those impacts have been instrumental in moving the development of land and water resources in the LMV beyond the point of economic and environmental sustainability.

CONCLUSIONS

The Service has consistently supported the national policy of balancing economic development with environmental protection. However, there is no balance when the selected plan poses the clear threat of significant adverse environmental impacts and is selected over less damaging alternatives simply on the basis of costs and benefits that exclude the functions and values provided by healthy backwater ecosystems. The Service recommended specifically designating the high risk, two year floodplain area as a nonstructural flood damage reduction zone and reestablishing the forest. With that designated zone, the wettest portion of the natural backwater sump would be restored and the flood damage elevation would be raised to 91 feet.

The Service's analysis has identified substantial deficiencies in the Corps' Reformulation Report regarding the National Environmental Policy Act and the Fish and Wildlife Coordination Act.

The Recommended Plan would:

1. Reduce flooding of cleared and forested wetlands resulting in significant adverse effects, and perpetuating agricultural production in marginal areas lying below the two year flood event.

2. Reduce flooding and adversely impact an unspecified acreage of wetlands flooded less than 14 consecutive days. These wetlands provide important functions and fish and wildlife values, and those adverse impacts are not mitigated.

3. Reduce flooding and adversely impact jurisdictional wetlands on 5,800 acres of public trust lands-Service NWRs, Delta NF, and State WMAs, and on 3,300 acres of WRP and 2,600 acres of CRP conservation lands.

4. Reduce flooding and adversely impact an unquantified acreage of shorter hydro-period wetlands on NWRs, Delta NF, and WMAs, and on additional WRP and CRP conservation lands.

5. Utilize a reforestation feature with a goal of 55,600 acres that is based on perpetual easements from willing sellers that will likely not be fulfilled.

The plan recommended by the Corps of Engineers does not reflect an orderly, balanced, and environmentally sensitive approach to the water and related land resource problems and opportunities of the Yazoo Backwater Area. It does not achieve the Service's planning goals and objectives, and more importantly, does not reflect the equal consideration for fish and wildlife resources as required by the FWCA. Because of the significant impacts to the long-term viability of fish and wildlife resources in the project area, and the lack of coordination afforded the Service to ensure equal consideration for fish and wildlife resources as required by FWCA, and the availability of less damaging alternatives, the Service may refer the Recommended Plan to the President's Council on Environmental Quality.

RECOMMENDATIONS

As stated earlier, the Service's goal for the YBWA Reformulation Study is the implementation of a project that will support ecologically and economically sustainable development. The Service's desire and expectation is that a project will be implemented; one that reflects a fundamental change in the historic direction of flood control within the YBWA. To achieve this goal, such a project must continue the ongoing realignment of land use and land capability to restore a sustainable balance between agricultural development and wetland conservation within the YBWA. It must realize a new direction in water and land resource development, and must restore and maintain natural floodplain values and functions in the YBWA.

As such, the U.S. Fish and Wildlife Service would support a combined structural/nonstructural response to the flood damages associated with the Yazoo Backwater Area that contains the following elements and features:

1. Adverse impacts to jurisdictional and shorter hydro-period wetlands and associated fish and wildlife values are fully assessed and fully mitigated prior to project operations.

2. The restoration of natural floodplain values through nonstructural flood control is incorporated as an authorized National Ecosystem Restoration (NER) project purpose.

3. A separable, spatially explicit Nonstructural Flood Damage Reduction Zone (NSFDRZ) that encompasses the two year frequency event is implemented as an NER project purpose.

4. Perpetual conservation easements are offered on the 95,600 acres of cleared wetlands and on the 81,800 acres of forested wetlands in the two year floodplain.

5. Historic backwater flows from the Mississippi River are reintroduced up to the 87-foot elevation.

6. Construction of localized levees and pumps as necessary to provide Project Design Flood protection for the Cary/Rolling Fork/Anguilla area. In making this recommendation, the

Service acknowledges that such features are likely to lack economic justification solely on the basis of flood damages prevented. However, we believe such features should prove fully justifiable as economic restoration features and as features designed to ensure that these communities are able to sustain themselves in the face of the otherwise catastrophic impacts of the Project Design Flood.

We believe that a project incorporating these components would provide the balance needed to ensure economic and ecological sustainability, and provides the equal consideration for fish and wildlife resources required by the FWCA.

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COE Yazoo Backwater Reformulation Project

Counties, Cities, Roads

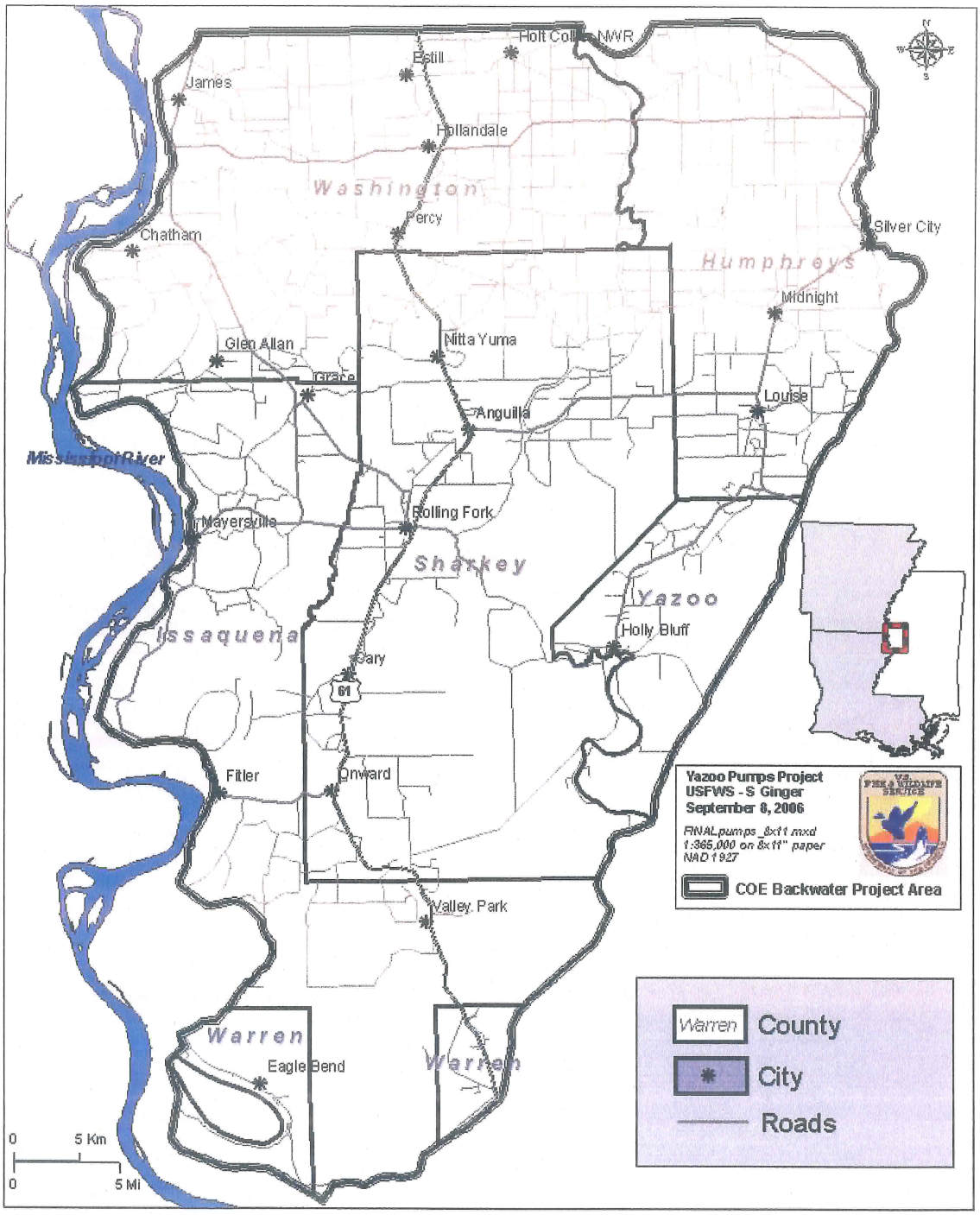

Figure 1. Project Area

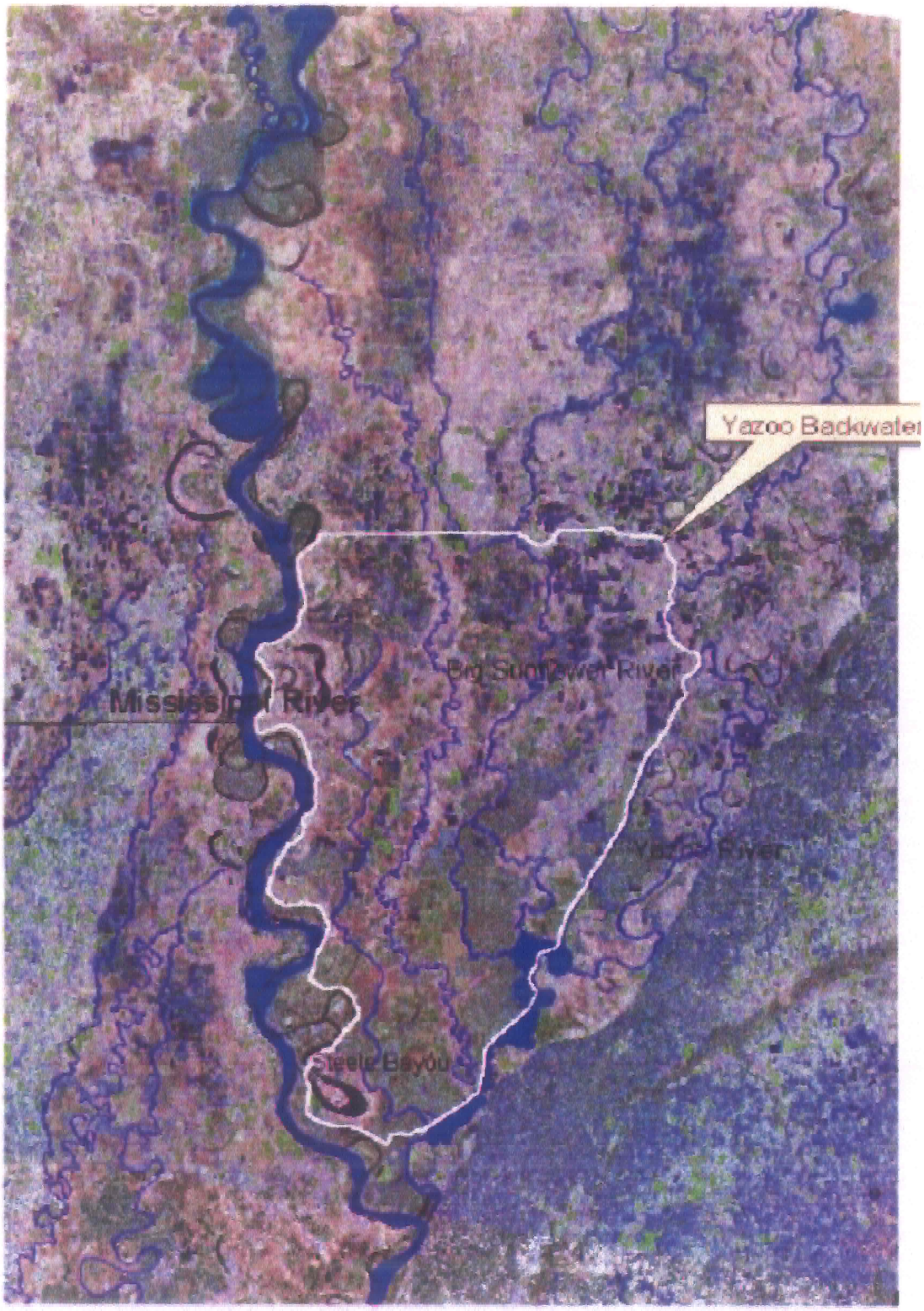

Figure 2. Yazoo Backwater Area

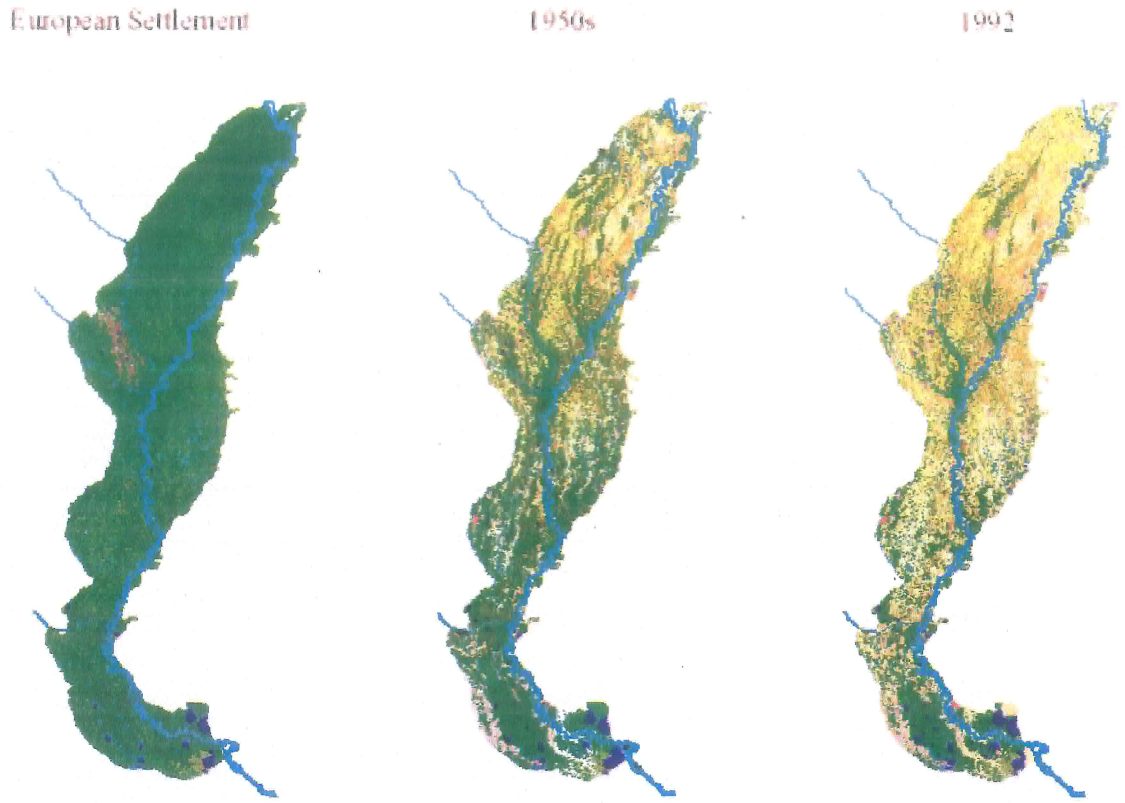

Figure 3. Forest Conversion

100 year flood event

two year flood event

Figure 4

COE Yazoo Backwater Reformulation Project

USFWS Black Bear Habitat Conservation Priority Areas and Bear Data

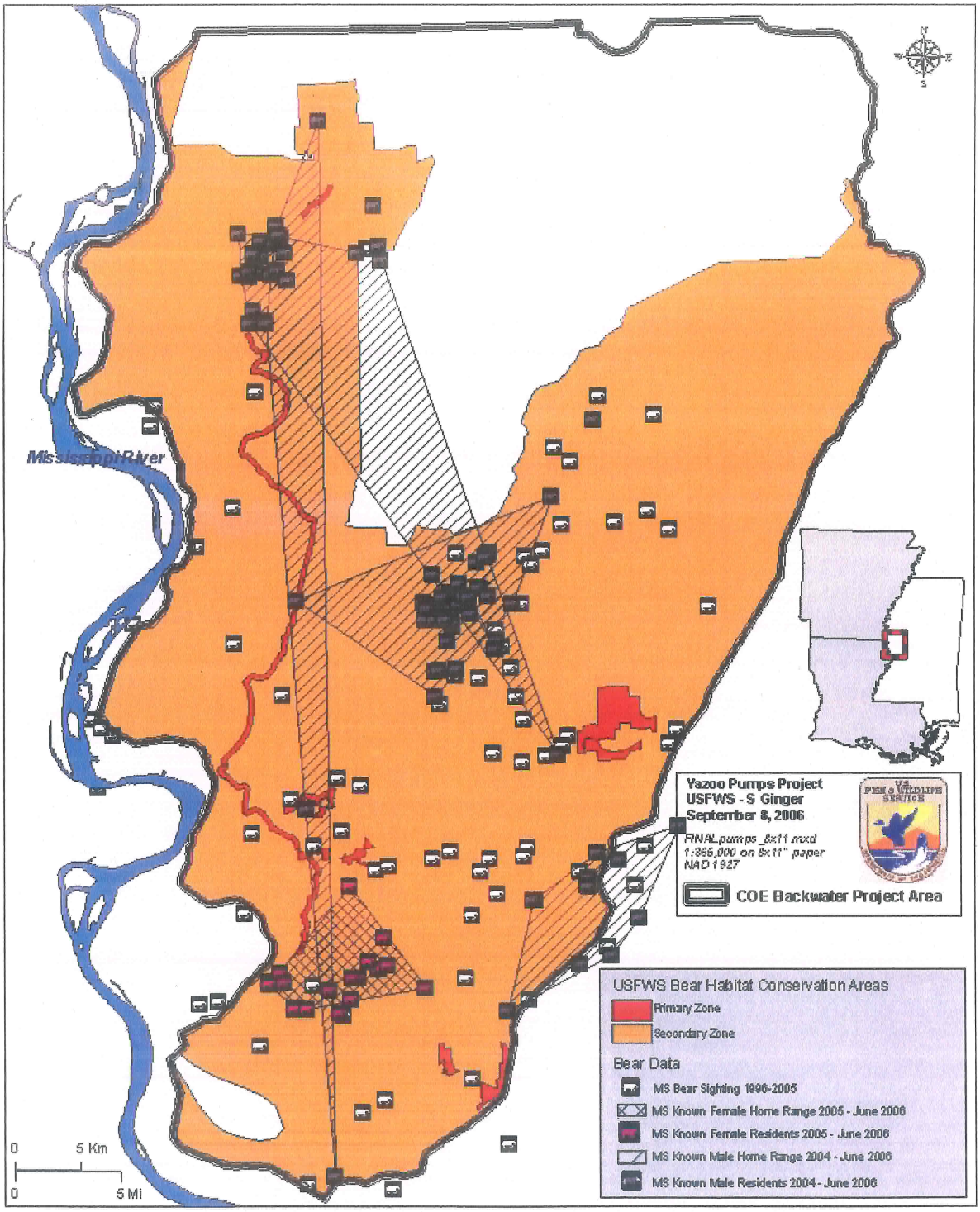

Figure 5

COE Yazoo Backwater Reformulation Project

Public Land and Private Conservation Easements

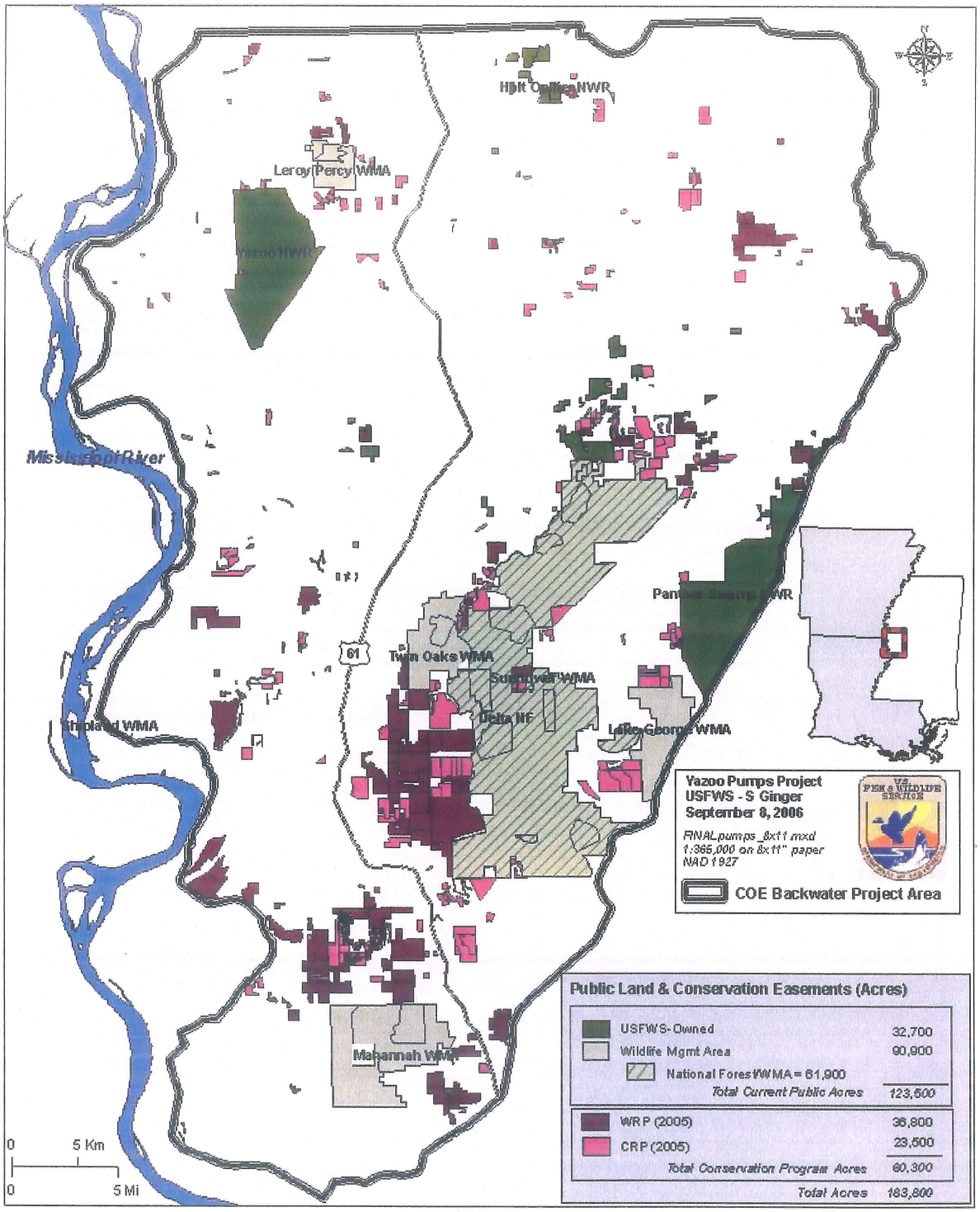

Figure 6

APPENDIX A

MISSISSIPPI DEPARTMENT OF WILDLIFE, FISHERIES AND PARKS COMMENTS

APPENDIX B
SERVICE REVIEW COMMENTS ON SIX CORPS OF ENGINEER DRAFT ENVIRONMENTAL APPENDICES

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mississippi Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213

October 11, 2005

Mr. Douglas J. Kamien
Deputy for Programs and
Project Management
U.S. Army Corps of Engineers
4155 Clay Street
Vicksburg, Mississippi 39183-3435

Dear Mr. Kamien:

This is in response your letter of July 21, 2005, which requested our attendance at a meeting of resource agencies on July 29, to discuss the Yazoo Backwater Area (YBWA) Reformulation Project. Biologists from the Fish and Wildlife Service (Service) and other resource agencies attended the meeting and were briefed on seven draft environmental appendices for the Reformulation Project prepared by the Vicksburg District. The Environmental Protection Agency (EPA) briefed meeting attendees on "EMAP-An Estimate of Wetland Extent in the Lower Yazoo Basin."

Review and comments from the resources agencies on the appendices were requested by August 30, 2005. Due to the volume and complexity of the data, our letter of August 1, requested a 90-day review period for submission of our comments. Your letter of September 7, 2005, granted an additional 30 days (September 30) for review. Subsequently, two additional question and answer meetings on the appendices were held at the Vicksburg District office. As a result of Hurricane Katrina, the deadline for agency comments was extended to October 7, 2005.

For the past two years, the Service has requested involvement in the Corps/EPA reassessment of the extent of Section 404 jurisdictional wetlands in the YBWA. Service biologists participated in the field wetland inspections in the summer of 2003, and from that point forward, despite numerous written and verbal requests, were excluded from all wetland reassessment coordination conducted by the Corps and EPA. July 29, 2005, was the first time in over two years that we were afforded an opportunity to be involved in your Wetland Appendix, EPA's EMAP document, or the six other environmental appendices, and this opportunity was only to view your finished product. Therefore, we are unable to provide you the thorough types of comments that would have otherwise been constructive and beneficial toward compiling a scientifically sound document.

Our review is only of the appendices, as the main report has not been provided to us. These comments are submitted in accordance with the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e) but do not constitute our final report in accordance with Section 2(b) of the Act.

General Comments

All appendices are based on the recommended plan, the main feature of which is a 14,000 cubic feet/second (cfs) pumping plant which is intended to reduce flooding on 26,263 acres of jurisdictional wetlands. The selected plan could include reforestation of up to 62,500 acres of cleared land within the one year floodplain.

The following comments are applicable to all the appendices.

Only jurisdictional wetlands under the Clean Water Act are considered.

There is no consideration of project impacts to wetlands that are not jurisdictional pursuant to the Clean Water Act. Ponded wetlands supported by rainfall, saturated wetlands supported by groundwater, wetlands with short hydroperiods (< 5% of the growing season), and isolated wetlands are neither estimated nor evaluated. Furthermore, the National Environmental Policy Act (NEPA) requires a full analysis of all potential impacts to fish and wildlife dependent resources, not only Corps-jurisdictional wetlands. This discrepancy is carried through all the appendices and grossly underestimates the extent of adverse project impacts on this watershed and ecosystem. Furthermore, this gross underestimate of wetland impacts has resulted in inadequate and inappropriate mitigation options proposed for the project.

It is assumed that future land use in the project area will remain constant with or without the YBWA Project.

It is unrealistic to assume that future land use in the project area will remain constant with or without the Yazoo Backwater Area (YBWA) project. As stated in a Natural Resource Conservation Service letter dated June 23, 2005, to the Mississippi River Levee Board concerning farm programs in the Mississippi Delta, "Each year we enroll an additional 8 to 9,000 acres in the Wetland Reserve Program and plant that acreage in hardwood seedlings." Many of these enrollment acres are in the YBWA Project counties. With the project, this trend of reforestation of low-lying, cleared agricultural land is likely to be reversed when landowners, believing that the project will eliminate flooding, will clear forested wetlands. History has shown that flood control projects of this type throughout the Mississippi have routinely stimulated land clearing and agricultural intensification of marginally suitable lands. We believe future land use, with or with out YBWA Project, will not remain static and those changes must be considered in the project evaluation.

Mitigation for project impacts is based exclusively on obtaining voluntary conservation easements on up to 62,500 acres of cleared land within the one year floodplain for reforestation.

The premise upon which the evaluation of impacts and subsequent mitigation are based is that voluntary conservation easements on up to 62,500 acres of cleared land within the one year floodplain will be obtained and those lands will be reforested. There is considerable uncertainty as to the location of these cleared lands, the contiguousness of these lands, and the frequency and duration of flooding on them. Furthermore, planting trees on agricultural land does not necessarily result in the restoration of an area to a functioning wetland. Past trends indicate that if the pumps are installed, a false sense of complete flood control would prevail, farming would intensify, and the likelihood of obtaining this magnitude of cleared land from willing sellers would become infeasible. This potential reality is further influenced by WRP caps in several south Delta counties.

We have the following specific comments concerning each appendix:

Wetlands Appendix

Hydrologically, the basin has been overwhelmingly influenced by the Corps' Mississippi River and Tributaries Project, the largest flood control project in the world. It has fundamentally changed the way the remaining Yazoo Basin wetlands receive and cycle water. The Yazoo headwaters have been significantly altered by detention reservoirs on headwater streams, a system of levees, and channel modifications. The relationship of hydrological alterations in the basin should be brought into perspective relative to the historic declines in wetland functions and values and how the project may compound this negative trend.

We recommend the cumulative impact section of this Appendix be expanded. Cumulative impact analysis should discuss past, present, and foreseeable future impacts on specific basin functions and attributes. Historic changes in basin hydrology (disconnection of Mississippi river floodplain and loss of riverine class wetlands), conversion to agriculture, loss of old growth forest, increases in fragmentation, should all be reviewed from the perspective of specific attributes (e.g., wildlife habitat).

According to Smith and Klimas (2002), from an estimated original area of 9 to 10 million hectares, Mississippi Alluvial Valley forests were reduced by about 50 percent by 1937, and currently less than 25 percent of the original area remains forested. Much of the remaining forest is highly fragmented. Within the Yazoo Basin, only about 10 percent of the original forest area remains. It is generally understood that reduction and fragmentation of forest habitat, coupled with changes in the remaining habitat, resulted in the loss or severe declines of the ivory-billed woodpecker, Bachman's warbler, and large range species like the red wolf, black bear, and Florida panther. These types of cumulative impact losses are not addressed in your cumulative impact analysis.

There is too much emphasis throughout the document on long hydroperiod jurisdictional wetlands. Although jurisdictional wetlands may be important to Section 404 (b) (1) analyses, **total project impacts**, not just "jurisdictional" wetlands need to be accounted for and analyzed. Determination of a lack of jurisdiction is not an appropriate metric for limiting impact analysis for a Federal project. Using this metric unduly limits analysis of impacts on short hydroperiod wetlands. From an ecosystem perspective, wetlands supported

by short hydroperiods are as important, if not more important, than longer hydroperiod wetlands for certain wildlife species. Habitat values in the Yazoo Delta are boosted by the mosaic of long and short hydroperiod wetlands and uplands.

The analysis neglects wetlands that are saturated to the surface during the growing season. The project area receives, on average, 52 inches of rainfall per year, yet rainfall and ponding were not considered. These rainwater-fed wetland types are a critical component of the mosaic of habitats in the basin and are likely to be affected by the project. The elimination of the analysis of impacts to isolated wetlands is not justified.

The Corps' analysis of wetlands that are affected by the project is limited to the Riverine Backwater regional subclass. We recommend the Corps analyze the influence of the project (reduced backflooding) on groundwater which may in turn affect hydroperiod in other wetland subclasses (e.g. depressions). According to the Yazoo Regional Hydrogeomorphic Methodology (HGM) Guidebook (Smith and Klimas 2002), "(G)roundwater also is a significant component of the hydrology of the Yazoo Basin." The relationship between impacts to wetlands and effects on amount and quality of groundwater in the project area should be investigated.

Specific Comments

Page 10-3, Para. 6. It is stated that in order to be classified as a wetland, a plant community must have hydrophytic vegetation. It should be pointed out that an area with the appropriate hydroperiod could also be classified as a wetland if tillage was curtailed and natural vegetation was allowed to regrow (farmed wetlands).

Page 10-6, Para. 13. In this paragraph it is stated that areas are wetlands if they also meet hydrophytic vegetation and hydric soils requirements. Earlier in the appendix, it is stated that only hydrology will be used to determine wetland extent. This contradiction should be corrected.

Page 10-9, Para. 21. First it says that the Mississippi River is the sole source of water that maintains wetlands in the basin. Then it says that, since the area receives 52 inches of precipitation annually, the assumption of the river as sole source is likely false, and that precipitation likely sustains many of the basin's wetlands. Finally, this paragraph says that, however, it is too difficult to determine which wetlands are sustained by backwater flooding and which by precipitation. These contradictory statements lead to confusion and make the validity of the extent of wetlands described in the appendix questionable. Clarification regarding the relationship of the various hydrologic sources would be beneficial.

Page 10-12, Para. 26. There is a discussion of the development of a runoff model to estimate stage data for the period prior to the Steele Bayou and Little Sunflower structures. No error estimates on the stage data are provided. The potential range of maximum and minimum error for stage estimates is important particularly because of the flat Yazoo Basin topography.

Page 10-12, Para. 26. "...using observed rainfall data...". Earlier in the document it states that using precipitation data was too difficult. Clarification on what observed rainfall data is and how it was used should be included.

Page 10-14. Para. 30. "Observed data at these two gages were limited, and the stage data from these two gages were critical to the overall analysis of the project." Again, the validity of the delineation of wetlands sounds weak with the statement that data were limited, yet they were critical to the analysis. The statement should be clarified.

Page 10-24, Para. 42. According to your Flood Event Assessment Tool (FEAT) model, it is noted that "the quality of the model output is dependent mainly on the quality and accuracy of the elevation data." It is then stated that the elevation data were derived from the USGS 1:24000 Digital Elevation Model, but no estimates are given as to the accuracy of these figures or the contour interval delineated by the model. The contour interval delineated (two foot, five foot, or ten foot) and estimated accuracy of the delineation has a direct bearing on the accuracy and precision of derived estimates. The smaller the contour interval the more precise the ultimate areal estimates will be. In the project area, even minor differences in delineation accuracy and contour intervals considered could result in drastically different acreages of wetland estimates. More details regarding the DEM and its limitations should be included.

Page 10-38, Para. 66. The Flood Event Assessment Tool (FEAT) model was used to calculate the 5% duration elevation (Tier 2), which was then verified by delineating wetlands on the ground. According to the ground truth exercise, in Tier 2 wetlands, 34.6% (18 of 52 points) were misclassified as nonwetland when they should have been classified as wetland. If the 34.6% is added to the estimated acreage of wetlands to be impacted by this project (which is 189,600 acres), the total would be 289,908 acres. The remainder of the document attempts to discount the accuracy of the field verification and build up the accuracy of the hydrologic models and interpreted results. Field verification or ground truth acquisition is typically a key component of model calibration. Therefore the apparent disconnect between what was observed on the ground and the model outputs should be explained.

Page 10-59, Para. 96. The cumulative impacts of the YBWA and Big Sunflower Projects on wetland resources of the combined project area are explained by referring the reader to Plates 10-53 and 10-54. The paragraph goes on to state that the Big Sunflower project will reduce jurisdictional wetlands by 9,200 acres and the combined projects will reduce jurisdictional wetlands by 35,508 acres. The estimate of combined impacts of the two projects is difficult to comprehend. Additional explanation would assist in understanding the cumulative impacts.

Page 10-60, Para. 97. It is stated that the "Swamp Buster" Act prevents farmers from converting forested wetlands to row crops. This is a misstatement. "Swamp Buster" does not prevent such conversions, but by denying subsidies for such conversions, it serves as a strong inducement to not convert. Despite arguments to the contrary, if jurisdiction is removed from wetlands as a result of the project, these wetlands would be more vulnerable

to clearing and conversion. Moreover, if after project completion, NRCS also considers these areas non-jurisdictional, any protection that "Swamp Buster" does offer from conversion would be eliminated.

Impacts to Wetland Functions Appendix (HGM Analysis)

While the mechanics of the HGM exercise appear fairly sound, questionable assumptions which we identified earlier may have lead to erroneous conclusions. See our general comments on the appendices.

According to the document, project induced changes would consist solely of a shift in the percent duration of backwater flooding during the growing season (page 8 HGM draft). However, the introduction to the HGM draft states that the project is likely to have indirect effects on wetlands due to the alteration of the extent and duration of backwater flooding in portions of the lower Yazoo Basin. The study focuses mainly on change in the duration variable (V_{DUR}). There is also no analysis of potential stage (depth) changes as a result of the project.

Changes in depth are crucial, since 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. Hydrologic conditions can directly modify or change chemical and physical properties such as nutrient availability, degree of substrate anoxia, soil salinity, sediment properties, and pH. Hydrology is the single most important determinant of the establishment and maintenance of specific types of wetlands and wetland processes, and even small changes in hydrology can result in significant biotic changes.

Specific comments

Page 19, Para. 2. It is stated that mitigation areas would consist of agricultural lands within the two year floodplain. Other appendices state that mitigation lands are within the 87-foot elevation at Steele Bayou, which is the one year floodplain. This contradiction should be corrected.

Page 19, Para. 3. The metric values for several landscape variables (V_{TRACT}, $V_{CONNECT}$, and V_{CORE}) were all set to reference conditions, because they could not be determined until actual mitigation sites had been identified. This procedure assumes that all selected mitigation tracks will be connected and unfragmented. This assumption is however unlikely and should be stated in the document.

Page 19, Para. 3. The metric value for V_{POND} was set to reflect incorporation of 40-80% microdepressional areas. However, in practice, many agriculturally converted areas have undergone some type of leveling operation. The effect of land leveling on the model results should be explained.

Page 20, Para. 1. The metric value for the V_{SOIL} and V_{CEC} variables were set to reflect no altered soils in the mitigation area. However, the potential changes in soils due to tilling and/or oxidation of hydric soils through drainage should be explored.

Page 20, Para. 1. The V_{DUR} variable for the mitigation areas was set based on the assumption that the percent duration of backwater flooding will be <5%. According to the Corps standard, a V_{DUR} of <5% is considered to be a non-jurisdictional wetland area. It appears that an impact site that has a V_{DUR} of <5% is considered a non-wetland, yet a mitigation site with a V_{DUR} of <5% is considered satisfactory for a wetland mitigation site. This discrepancy should be explained. Also, if backwater flooding for these mitigation wetlands is <5%, these wetlands may not even be in the same geomorphic class as the wetlands being altered by the project. Explanation of this inconsistency should be included.

Page 20, Para. 1. There is the lack of a clear, fundamental "future without" condition for the proposed mitigation areas. According to Smith and Klimas (2002), approximately 5,600 hectares of former bottomland forest and wetlands that had been converted to agriculture have been replanted and more than 7,000 hectares are scheduled for acquisition and reforestation in the future. Considerable reforestation is already underway on private lands, primarily under the Wetland Reserve Program of the Department of Agriculture. Additional agricultural areas would be restored through the Service's Partners and Carbon Sequestration programs. Therefore, it would seem logical to conclude that a large portion of the proposed mitigation areas, in a reasonably foreseeable "future without" projection, would be restored without the proposed mitigation action. This likelihood should be incorporated into the "future without" analysis.

Water Quality Appendix

The YBWA project is the last piece of a project to provide drainage and flood control to agriculture land in the Yazoo Basin. Drainage and flood control activities in the past have included channelization of several streams including Steele Bayou and the Big and Little Sunflower Rivers. These streams now have greatly degraded water quality, resulting in segments of these streams being designated as impaired waterbodies. We believe the document should discuss the water quality impacts of the Pumps project in light of past drainage and flood control activities in the backwater area.

Specific Comments

Page 16-15, Para. 23. The paragraph states that the EPA released national water quality criteria in 1997, and that the most recent Mississippi criteria were published in 1995. We recommend that this document reflect EPA's most recent criteria which were updated in 2002. The water quality criteria were adopted by the Mississippi Commission on Environmental Quality on October 24, 2002, and were approved by EPA on June 27, 2003.

Page 16-18, Table 16-17. The mercury concentrations in the water samples from the lower and upper Big Sunflower areas were <2 ug/l with the exception of water sample BPC-3. We recommend that the narrative for the table mention that several of these samples may have

exceeded the chronic state and national criteria if detection limits were lowered to at least 0.012 ug/l.

Page 16-21, Para 30. This document states that mercury was detected in seven of the 39 samples, and that sample HB-1 contained mercury concentrations that exceeded the state and national acute criteria. Table 16-7 shows that mercury was detected in all nine samples from the backwater lakes and in one sample from the upper Big Sunflower River (sample BPC-3). We recommend that this paragraph be rewritten to avoid contradiction with Table 16-7.

Page 16-21, Para. 33. The sentence states that zinc concentrations were elevated in sample BPC-3 because "this sample was analyzed for total metals not dissolved metals and the high reading is likely due to suspended sediment." It should be clarified in the document why Sample BPC-3 was the only sample analyzed for total metals and not dissolved metals.

Page 16-22 through 16-27, Figures 16-2a through 16-3b. These figures show total DDT detected in sediment samples, and two of the figures show effects range-low (ER-L) and effects range-medium (ER-M) for total DDT. ER-L represents a level where biological effects would rarely be observed. ER-M represents a level in which biological effects would occur. The figures should indicate whether the samples are surface sediment or core sediment samples. Also, we recommend the ER-L and the ER-M be provided on each figure.

Page 16-28, Para. 37. It is mentioned that toxaphene was one of the pesticides not detected in the sediment. It is well known that toxaphene was heavily used on agricultural lands in the project area, and fish from the project area contain elevated levels of toxaphene. We recommend reviewing the results of the toxaphene detection study to verify the results.

Page 16-29, Para 39. This paragraph presents an in depth discussion on whether or not DDT levels increase with depth. We recommend a table showing DDT concentrations at various depths for each sediment sample be provided in the document. Such information would be beneficial for the reader to understand the discussion.

Page 16-53, Para 62. The paragraph states that sediment from the Big Sunflower River is not toxic because bioaccumulation assays showed that the total DDT concentrations accumulated in test organisms were well below LR50 levels (50% mortality). It was concluded that sediments from the Big Sunflower River should not pose a threat to aquatic life. The conclusion implies that DDT levels in sediment throughout the project area are not causing problems for aquatic life. However, total DDT concentrations in the project area are at levels in fish tissue that exceed predator protection and fish consumption advisory levels. These elevated total DDT concentrations in fish tissue likely indicate that there are hot spots of sediment which were not tested. We recommend that this paragraph be revised to remove this contradiction.

Page 16-53, Para 63. It is mentioned that contaminant levels in fish are important because of the potential impacts to both fish and humans. We recommend this document also

discuss that contaminant levels in fish are also important because of impacts to fish-eating birds and mammals. Many fish collected from project area waterbodies contained total DDT concentrations that exceeded the predator protection level of 1.0 ppm (the EPA recommended level for total DDT in fish tissue for protection of fish-eating birds and mammals is 1.0 ppm). These findings indicate that total DDT concentrations in whole body fish samples pose a significant threat not only to fish and humans, but also to fish-eating birds (great blue herons, great egret, little green heron) and mammals (river otter, mink).

Page 16-64, Para. 66. The document discusses the fish samples that contained mercury concentrations above the limit of no consumption levels. We recommend that this appendix also discuss the number of samples containing mercury concentrations above the level of 0.1 (Eisler 1987) for the protection of fish-eating mammals and birds.

Page 16-64, Para. 68. It is stated that the Mississippi levels of concern for arsenic, lead, selenium, cadmium, and chromium in fish tissue are 1.0 mg/kg for each trace metal. They further state that none of the fish tissue samples collected from the backwater area contained concentrations that equaled or exceeded the state levels for arsenic, copper, lead, and selenium. We recommend that the appendix also discuss that levels of concern for trace metals in fish tissue have been developed by researchers. Walsh, et al. (1977) recommended levels for arsenic and cadmium in fish tissue for the protection of fish eating birds and mammals at 0.5 ppm. The recommended predator protection level for chromium is 0.2 ppm (Eisler [1986], Schmitt and Finger [1987]). We also recommend that this document state how many samples contained trace metal concentrations that exceeded the recommended levels for predator protection.

Pages 16-72 to 16-74. This section presents a lengthy discussion on the production of methyl mercury, the toxic form of mercury that is bioaccumulated by aquatic organisms. In general, the section states that reforestation of the backwater area will cause an increase in the production of methyl mercury because the large amount of detritus on the forest floor will provide the organic precursors for the production of the same. There are other environmental variables that affect both the availability of mercuric ions for methylation (changing elemental or inorganic mercury to methyl mercury) and the growth of the methylating microbial populations. These variables should be considered in any assessment regarding the production of methyl mercury. Methylation rates are higher in low pH environments, and sulfide can bind mercury and limit the production of methyl mercury. Methyl mercury production can vary due to seasonal changes in nutrients, oxygen, temperature, resuspension of sediment, total organic carbon, and hydrodynamics. We recommend that this section be revised to include a discussion regarding methyl mercury production and these additional environmental variables.

Page 16-93, Para. 94. This section discusses an environmental enhancement feature that would increase the water depth behind the Steele Bayou structure three feet during the low water period to provide increased wetted surface along the channel bank. As it is currently written, it is unclear to us how the environmental enhancement would occur. We recommend adding a discussion of how the removal of irrigation water from area streams would constitute an environmental enhancement feature.

Page 16-101, Para. 116. Methyl parathion is discussed as an insecticide that is moderately toxic to fish and degrades rapidly. Based on our information, methyl parathion is highly toxic to other aquatic organisms including crustaceans. Additionally, the insecticide has chronic effects on fish in low concentrations including reduction in sex hormone and inhibition of feeding behavior. This insecticide is also moderately persistent, to persistent, in the environment. We recommend that this information be included in the discussion.

Page 16-102, Para. 120. The document mentions that there would be an increase in corn acreage during the future with or without the project. The Corps should state whether or not there will be an increased pesticide runoff due to the increase in corn acreage. It is our understanding that more insecticides will be required for future corn yields than for current soybean yields.

Page 16-105, Para. 125. This paragraph discusses reforestation to prevent soil erosion and reduce sediment yield in area streams, which have been designated as impaired waterbodies due to sediment loading. It is our understanding that the sediment yields in the streams are due to both channel processes (head cutting, bank sloughing, channel scouring) and land sources (agriculture, silviculture, construction sites, gullies). These sediment yields from channel processes are caused by channelization and straightening of the project area streams by past drainage and flood control projects. The water quality appendix should discuss sediment yields from channel processes and, if appropriate, measures to reduce within-channel sediment yields.

Page 16-107, Para. 137. The DDT contamination problem and the siltation and sediment deposition problems in project area streams are discussed. The sediment deposition problems have resulted in several segments of project area streams being designated as impaired waterbodies. As a result, the Mississippi Department of Environmental Quality has developed a sediment TMDL for these impaired segments. The document further discuss that installation of BMPs under the Steele Bayou project has resulted in measured decreases in sediment and fish tissue concentrations of DDT. Completion of several channelization projects caused the sediment deposition problems and the DDT contamination problem through agricultural intensification. We recommend that the discussion for this paragraph be presented in light of the fact that past drainage and flood control projects caused the aforementioned issues to arise in the first place.

Waterfowl Appendix

Overall, the initial part of the document is a well-written and fair discussion of the role of winter habitat in waterfowl biology and some of the unique characteristics of habitats in the Mississippi Delta. This part was understandable and balanced. Our ability to judge the remainder of the document, where the analysis of impacts is addressed, is weakened by the fact that we were not involved with you in the development or assessment of the model. As written, the impact analysis is hard to understand. The hydrologic and land use changes that drove estimated changes in duck carrying capacity in your model are not fully explained to

the reader. Except for the items identified below, the Service did not find anything in the analysis that suggested serious flaws in the document.

The report would be more useful if it had a Discussion or Summary section explaining the factors that made duck use-days (DUDs) generally increase.

Example of Service-suggested text:

> "The trends in changes in DUDs among alternative scenarios primarily resulted from changes in hydrology, or resulted from changes in land use. The alternatives to baseline conditions reduced the total area affected by flooding, but the habitat types had greater value as foraging habitats and more than offset the decrease in acres flooded."

Specific comments

Page 18, Table 5. The data for rice abundance and corresponding duck use-days for harvested fields on private lands has changed as a result of recent research. Specifically, the value is much lower. We recommend amending the text to reflect recent data.

Page 18, Table 5. The value for soybeans (DUDs/ac = 253) seems high. The value in Service-published documents is lower. We recommend this value be re-examined.

Page 18, Footnote 3 at the end of Table 5. It is unclear to us why this footnote is here. We recommend reviewing this footnote for appropriateness. Also, the footnote references 'Duck-use days/ac' but not 'Duck-use days/ha.' We are unsure why the number '237' in Table 5 is the same number mentioned in item #18 on the top of page 19. We recommend reviewing this number and location for appropriateness.

Page 19, Para. 18. This paragraph does not flow from the preceding material. We recommend that this paragraph be explained more fully, so the reader can see how it relates to the preceding material.

Page 19, Para.19. The numbers of DUDs in the first paragraph of text under RESULTS are not consistent with those in Table 7. We recommend reviewing the number '44,526.90' in the far right column under TOTAL DUD in Table 7. We believe this may be a typo or the comma may be in the wrong place.

Page 36, Para.34. There is a typo in the text. The number "6664,773.2" should be 664,773.2 (see Table 22).

Terrestrial and Fish Appendices

The documents are well written and the basic premise of the Habitat Evaluation Procedures (HEP) for fish and wildlife habitat is scientifically based. However, as stated in our introductory comments, the assumptions on which both HEPs are based are not valid. To implement a project to drain wetlands and then assume that it will not intensify forested

wetland clearing, and that it will result in the reforestation of 62,500 acres is not logical or feasible.

We recommend consideration of one additional aquatic resource impact in the appendix, or the EIS; that is accounting for the potential impacts of pump operations on biota (i.e., entrainment and impingement of aquatic organisms).

Mitigation Appendix

The introduction states that "the reformulation goal was to develop a project that provides an appropriate balance between environmental sustainability and flood damage reduction." In our FWCA 2(b) report dated November 6, 2002, the Service has pointed out that the recommended plan to construct a 14,000 cfs pumping plant to drain low lying, floodplain wetlands combined with a proposal to reforest wetlands now subject to intensified drainage does not result in a balance between environmental sustainability and flood damage reduction.

The introduction also states, "the determination that compensatory mitigation was not required for the recommended plan was based on the assumption that the nonstructural reforestation component would provide, at a minimum, the acres to offset environmental effects…". However, we believe that a plan to reforest lands within the one year floodplain combined with a structural pumping plant is not a nonstructural feature or component. In our opinion, a nonstructural plan would actually restore the ecological integrity of the two year floodplain, where agriculture would remain a high-risk endeavor.

Also the introduction states that, "…the probability of additional clearing of bottom-land hardwoods as a result of changes in hydrology is low." We believe that with implementation of the large pumping plant, the probability of land clearing would become high because past trends indicate that if the pumps are installed in an area, a false sense of complete flood control would prevail and farming would intensify.

In addition, we are concerned that the viability of some 8,382 acres of "jurisdictional wetlands" on nearby National Wildlife Refuges, National Forest, and Wetland Reserve Program lands would be adversely affected by the project and that the intent of the project is contrary to the purposes of these public lands.

Summary Comments

Since the release of the DSEIS in September 2000, little has changed regarding this project; with the exception of the inclusion of a discussion in the Wetland Appendix of the impacts of the Big Sunflower River Maintenance Project combined with the YBWA Project. The Corps' recommended plan, the Corps' estimation of the extent of wetland impacts, and the Corps' evaluation of project impacts to wetland functions and values have not appreciably changed despite our repeated suggestions. We are disappointed that the Corps failed to include any of our recommendations; recommendations that would have been beneficial toward assembling a scientifically sound set of appendices. Based on our review, the

appendices underestimate project impacts and thereby preclude development of appropriate off-setting mitigation recommendations to protect fish and wildlife resources.

As an alternative to the Corps' current plan, the Service continues to recommend that the two year floodplain be designated a nonstructural flood damage reduction zone dedicated to the preservation of natural floodplain values rather than draining and subsequently clearing those lands for agricultural intensification. In order to target flood protection where it most needed in the YBWA, we further recommend local structural measures in the form of ring levees around cities such as Rolling Fork to protect valuable infrastructure and public health. This is consistent with the emerging Federal flood reduction policy which has evolved over three decades; a policy that continues to move toward nonstructural floodplain enhancement and natural floodwater storage to achieve a sustainable balance between economic development and environmental conservation.

Since these documents appear to contain information that could be considered influential or highly influential scientific information, the Service recommends that the Corps determine if subject appendices should be 1) reviewed by other agencies within their area of expertise (EPA, Natural Resources Conservation Service, U.S. Geological Survey), or 2) independently peer reviewed by members of the scientific community in accordance with the Information Quality Act.

Thank you for the opportunity to review these documents. If you have any questions, please contact me at (601) 321-1122.

Sincerely,

for Curtis B. Jones

Ray Aycock
Field Supervisor
Mississippi Field Office

cc: MS Dept. of Wildlife, Fisheries and Parks, Jackson, MS
MS Dept. of Environmental Quality, Jackson, MS
U.S. Environmental Protection Agency, Atlanta, GA

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APPENDIX C
RECOMMENDATIONS FOR BLACK BEAR HABITAT IN MISSISSIPPI

APPENDIX C

Recommendations for restoration/reforestation of black bear habitat in Mississippi

This document addresses the objectives and strategies for plantings and landscape design to specifically enhance habitat for the federally threatened Louisiana black bear (*Ursus americanus luteolus*) and state endangered American black bear (*Ursus americanus americanus*).

Goals and strategies:

1. Private lands management: Follow current criteria set by the Service for priority bear zones, which would provide wooded corridors between the Mississippi River riparian areas and other forested areas.

2. Habitat management: To benefit bears, management generally focuses on maintaining suitable den sites, ensuring availability of preferred food resources, and maintaining or creating adequate travel and dispersal corridors. Timber species, size classes, cavities, openings, corridors, food sources, etc., are important considerations for all phases of forest management. However, most forest management practices for resident fish and wildlife populations will generally benefit bears. Below are some specific suggestions modified from the BBCC's Black Bear Management Handbook:

> Tracts of mature bottomland hardwood forest, composed of a mix of tree species, will likely provide for basic habitat needs and require minimal management. Natural disturbance, in the form of tree falls and windstorms, typically can provide sufficient forest openings needed for forage and cover.
>
> From a black bear standpoint, a productive forest provides a diversity of animal foods from hard mast producing trees (oaks, pecan, etc.) and soft mast producing plants (berries, paw paw, mulberry, plum, palmetto, etc.). Black bears depend largely on fall and early winter mast crops to provide enough fat reserves to survive winter torpor. Maintaining a diversity of age classes, stand types, and vegetative composition within the forest will provide excellent conditions for black bears.
>
> Stand thinnings (intermediate cuts) should be made when economically/silviculturally feasible, with 5- to 15-year intervals preferred. Intermediate cuts should be designed to improve species composition, remove individual trees of poor quality and vigor, promote regeneration of desirable timber species, encourage food production and create escape and nesting cover for bears and a variety of other wildlife species. Existing and potential den trees (trees that may someday develop a cavity above the flood line large enough to accommodate a bear) should be protected.

Mid-story timber stand improvement (TSI) can be accomplished in such a manner as to remove less desirable species (i.e., American hornbeam, box elder, eastern hop hornbeam, etc.) while encouraging those desirable to bears (mulberry, swamp dogwood, spicebush, etc).

Timber management should favor uneven age stand management with avoidance of excessive clear-cut areas.

State Best Management Practice Guidelines for Streamside Management Zones (SMZs) should be followed, with selective harvesting of timber allowed within the SMZ. Den trees and potential den trees are to be identified and protected throughout all silvicultural operations.

Protection of existing canebrake areas should be encouraged. Extensive stands of switch-cane (*Arundinaria sp.)* provide bottomland habitat diversity, cover, and a seasonal food supply. In areas where natural cover is deemed to be a limiting factor, natural regeneration of existing stands of cane should be encouraged to expand through the removal of overstory trees and clearing of competing vegetation. On suitable sites, opportunities exist for artificial regeneration of switch-cane.

Strategies:

1. Provide a diverse mix of hard and soft mast producing species to provide year-round food and cover and future den trees.
    - Plant cypress and overcup oak (not more than 5%, unless it is an overcup site) in low areas of each tract, if applicable, for future den trees.
    - Plant soft mast in small clusters in 2-5% of the tract, preferably in the middle and in ¼ acre contagious clumps. Specifically, plant blackgum, red mulberry, paw paw, devil's walking stick, French mulberry, roughleaf dogwood, Chickasaw plum, mayhaw, persimmon, black cherry and/or palmetto, if applicable to site and available.

2. Create den areas by leaving felled treetops or brush for ground nesting cover on areas of higher elevation, where possible, especially in areas lacking in ground above the 10-year flood zone.
    - Spoil mounds otherwise built for hydrology that might occur out of the flood zone can be enhanced for den sites, if:
        - Built to a height above the 10 year flood zone, specifically:
            - 10 meters by 10 meters on top
            - shrubby vegetation planted or brush left on top for cover
        - Activities are restricted on or within 100 meters of the base of the mounds (buffer zone) during the non-denning season (May-October) and 300 meters around the denning season (November- April).

APPENDIX D
DOI COMMENTS ON CORPS' YAZOO BACKWATER AREA REFORMULATION REPORT, NOVEMBER 3, 2000

United States Department of the Interior

OFFICE OF THE SECRETARY

OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE

Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

November 3, 2000

ER-00/697

Colonel Robert Crear,
District Engineer - Vicksburg District
U. S. Army Corps of Engineers
4115 Clay Street
Vicksburg, MS 39183-3435

Dear Colonel Crear:

The Department of the Interior has reviewed the Yazoo Backwater Area Reformulation Report - Flood Control, Mississippi River and Tributaries (Supplement No. 1 to the 1982 FEIS), Humphreys, Issaquena, Sharkey, Warren, Washington, and Yazoo Counties, Mississippi, as requested.

The enclosed comments constitute the comments of the Department. They relate primarily to fish and wildlife resources, and how the proposed project will impact them. If you have any questions concerning these comments, please contact Bruce Bell, Regional National Environmental Policy Act (NEPA) Coordinator, Fish and Wildlife Service (FWS), at 404/679-7089, or Keith Taniguchi, Chief, Division of Habitat Conservation and Environmental Contaminants, FWS, at 404/679-7223

Thank you for the opportunity to review and comment on the Yazoo Backwater Area Reformulation Report. I can be reached at 404/331-4524.

Sincerely,

James H. Lee

James H. Lee
Regional Environmental Officer

Enclosure

bcc: FWS-ES, RO, BBell
OEPC, WASO

YAZOO BACKWATER AREA REFORMULATION REPORT AND ASSOCIATED DRAFT SUPPLEMENT NUMBER 1 TO THE 1982 FINAL EIS

ER-00/697

Introduction

Both documents address the remaining unconstructed features of the Yazoo Backwater Area Project in the Yazoo Basin, Mississippi. The project area is located in west-central Mississippi and includes portions of Humphreys, Issaquena, Sharkey, Warren, Washington, and Yazoo Counties, as well as a very small portion of Madison Parish, Louisiana. The Reformulation Report and its appendices are incorporated by reference in the DSEIS; therefore, the following Fish and Wildlife Service (Service) comments on the DSEIS are likewise directed, by reference, at the relevant portions of those supporting documents.

The general comments identify key areas of concern that together constitute an overview of our most compelling issues and concerns associated with the environmental compliance documents.

These issues and areas of concern are then substantiated and explained at length in the specific comments. Because of the breadth and complexity of the comments, a summary is also included.

General Comments

We have determined the compliance documentation is inadequate and does not meet the intended purpose of the Council on Environmental Quality's (CEQ) Implementing Regulations. Unsubstantiated justification for the selection of the recommended plan, a lack of explanation regarding analytical methods, use of inaccurate and inappropriate methodology, and inadequate evaluation and unequal treatment of alternatives, cast doubt on the DSEIS conclusions, and make it difficult to determine if every significant factor was considered in formulating the recommended plan. Additionally, that plan conflicts with the laws, regulations, policies and programs of other Federal agencies (e.g., the Service's Partners for Fish and Wildlife Program, the Department of Agriculture's Conservation Reserve and Wetland Reserve Programs, etc.) operating in the project area.

The formulation of NEPA compliance documentation is guided by Implementing Regulations (40 CFR 1500-1508) and additional guidance developed by CEQ (46 Fed. Reg. 18026), other environmental legislation, agency specific NEPA compliance and planning guidance, and input from other agencies and the public. The Service is concerned the Corps did not adequately follow these various mandates, nor address comments and planning concerns from the Service and the public, in formulating the proposed plan and its associated compliance documentation.

In our view, the DSEIS fails to fulfill the purpose of CEQ's Implementing Regulations. According to the DSEIS, its stated purpose is to present the reevaluation of environmental

effects of the Yazoo Backwater Area Project. The DESIS further states that it is analytical, self-supporting and informs decision makers. CEQ's guidance regarding the purpose of an EIS (Section 1502.1 and question 25) states in part:

> "It shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment... Statements shall be concise, clear and to the point, and shall be supported by evidence that the agency has made the necessary environmental analyses...The body of the EIS should be a succinct statement of all the information on environmental impacts and alternatives that the decision maker and the public need, in order to make the decision and to ascertain that every significant factor has been examined."

The Service cannot support the Corps' position that the recommended plan represents a balanced approach to meeting the economic and environmental needs of the Yazoo Backwater area. Accordingly, we do not concur with the assertion that the document is analytical, self-supporting and informs decision makers. As substantiated in the detailed comments below, the document is disorganized and, because of inadequate treatment of alternatives, does not substantiate the selection of the recommended plan. In fact, it hinders decision makers and the public from ascertaining the actual impacts of the proposed plan, as well as the six remaining plans included in the final evaluation suite. The main report and data appendices are incorporated by reference as part of the DSEIS and the reader is urged to review those appendices for specific methodologies and detailed information. Based upon our review, those methodologies and detailed information are often either absent, or are not presented in a clear and comprehensible fashion.

Because of their procedural shortcomings, fundamental failure to meet accepted planning criteria and inaccurate or inappropriate methodologies, we find that the documents are inadequate and do not comply with the spirit and intent of NEPA or the Implementing Regulations promulgated by CEQ. The NEPA established policy, set goals, and provided the means for all Federal agencies to follow a basic charter for protection of the environment. Section 102 of the NEPA established "action forcing" provisions to make sure that Federal agencies follow the spirit and intent of the NEPA. Section 1500.1 of CEQ's Implementing Regulations discusses the basic purpose of the regulations which were promulgated to implement section 102 of the NEPA. Those regulations outline what Federal agencies must do to comply with the procedures and achieve the goals established in the NEPA. Part (b) of Section 1500.1 requires that environmental information is made available to decision makers and the public before decisions are made and actions are taken. Specifically, part (b) states:

> "(b) NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail."

Section 1500.1 goes on further to discuss the basic purpose of NEPA compliance documentation and the CEQ regulations. Part (c) states:

> "(c) Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork--even excellent paperwork--but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. These regulations provide the direction to achieve this purpose."

Substantial inadequacies in the DSEIS preclude a fully informed and aware decision; therefore, the desired outcome of the NEPA compliance process cannot be achieved. The procedural inadequacies of the DSEIS collectively result in a document that focuses on the justification of a large 14,000 cfs pumping plant to drain low lying, marginal farmed wetlands and forested wetlands. The document repeatedly points out that the selected 14,000 cfs pump proposal is more cost-effective and beneficial to the environment than larger, more environmentally damaging pump plan alternatives, rather than evaluating and disclosing the environmental effects of the recommended plan. The lack of detailed analyses and comparisons of the selected plan to less environmentally damaging nonstructural or combined structural/ nonstructural alternatives conflict with the spirit and intent of NEPA, other environmental legislation, CEQ's Implementing Regulations and the Corps' own planning guidance.

Following the 1993 spring flooding on the Missouri and Mississippi Rivers, the President's Interagency Floodplain Management Review Committee Report called for a real and renewed emphasis on nonstructural approaches to flooding that would enhance the floodplain environment and provide for natural floodwater storage. In brief and unsubstantiated discussions, the DSEIS dismisses nonstructural plans and approaches that restore frequently flooded areas within the two-year floodplain as economically infeasible. The DSEIS then refers the reader to a single table in the Main Report that shows the costs, benefits and cost-benefit ratios of floodproofing, structure raising, demolition of structures in the project area, etc. No detailed explanation of the methodology, or verification of conclusions, accompany that Economic Analysis Table.

Part 1502.24 of CEQ's regulations clearly outline the necessity to include discussions of methodology in the document. It reads as follows:

> "Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix."

Throughout the DSEIS, summary data and observations that are based upon analyses in separate appendices are presented, and conclusions are drawn absent any supporting discussions of such methodologies or rationales. Table footnotes are often the only discussion of methodology presented. Likewise, review of referenced appendices frequently

reveals a discussion of how the raw data were produced, but there is rarely a discussion of how the raw data from the appendices were used to produce the information and conclusions presented in the body of the DSEIS.

The DSEIS also contains several examples of inaccurate and inappropriate evaluation methodologies. For example, the DSEIS discussion of alternative screening, which occurred during the scoping and alternative formulation process, concludes that the Environmental Protection Agency's (EPA) contracted report (Shabman Report) on the economic analysis of non-structural alternatives was unreasonable and did not meet study objectives. Therefore, the non-structural approach contained in that report was dropped from further consideration. This approach and other plans were screened from further consideration in a manner that contradicts the CEQ's regulations.

In 1981, CEQ published in the Federal Register further guidance regarding their NEPA regulations in the form of the forty most asked questions concerning those regulations. Question 2 of those forty questions addressed the analysis of alternatives outside the jurisdiction of the agency. The second part of that question and the answer provided by CEQ read as follows:

> "2b. Must the EIS analyze alternatives outside the jurisdiction or capability of the agency or beyond what Congress has authorized?
>
> A. An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Section 1506.2(d). Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a)."

The Corp's principal reasons for screening out the EPA approach centered on a specific policy decision by the Office of the Chief of Engineers (OCE) that the economic benefits of reforestation for carbon sequestration and nutrient load reduction could not be used to economically justify a non-structural flood damage reduction alternative. No analysis was presented in the DSEIS to substantiate OCE's policy decision. Given the burgeoning growth of the carbon sequestration reforestation market world-wide, we do not concur with the Corps' rationale that such benefit categories are unquantifiable or invalid, particularly in view of their fundamental potential to address the issue of global climate change.

Thus, reasonable alternatives not within the jurisdiction of the Corps were not given substantial treatment in the DSEIS so that a reviewer could evaluate their comparative merits (Part 1502.14). In light of the increasing national emphasis on restoration of floodplains and natural flood water storage, the Service recommends that serious consideration and analysis be given to nontraditional, nonstructural approaches similar to those presented in the Shabman Report.

We are also concerned that differing techniques were utilized to quantify project impacts on terrestrial and aquatic resources. Terrestrial effects were evaluated considering all species life requirements and a single index was calculated to display project impacts. Conversely, impacts on aquatic resources were displayed calculated as two separate indices based on the spawning and rearing habitat requirements of those resources. The Corps, with no explanation, selected spawning impacts as the sole index to measure project effects on aquatic resources. This significant departure in analytical methodology from that used to evaluate terrestrial resources does not fully assess the projects impacts on aquatic resources. We recommend that analytical techniques should be similar, and that the spawning and rearing impacts be combined to present a comprehensive and valid determination of aquatic resource impacts.

The DSEIS briefly lists and describes all of the alternatives, but does not adequately evaluate, compare, and present their impacts. Instead, the document details the accomplishments as justification for selecting the recommended plan, Plan 5; erroneously emphasizing that it would not result in as much environmental damage as other plans in the final array of alternatives. Plan 7, envisioned by the Service to be a combination of structural and truly non-structural measures that would restore the natural values of the two-year floodplain through implementation of a spatially explicit non-structural flood damage reduction zone (NSFDRZ), would still utilize pumps to provide flood protection above the two-year floodplain. As presented in the DSEIS, that plan was incorrectly formulated and the Corps determined it was economically infeasible. Because of the lack of a detailed analysis of all alternatives, the reader has no clear basis for choosing among the plans. The Service recommends that all alternatives in the final array be correctly formulated (see following comment) and treated equally in the final document.

Section 1502.14 contains the most pointed guidance regarding the treatment of alternatives and is of primary importance. That section reads:

> "This section is the heart of the environmental impact statement. Based on the information and analysis presented in the sections on the Affected Environment (Sec. 1502.15) and the Environmental Consequences (Sec. 1502.16), it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public. In this section agencies shall:
>
> (a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
> (b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.
> (c) Include reasonable alternatives not within the jurisdiction of the lead agency.
> (d) Include the alternative of no action.

(e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.
(f) Include appropriate mitigation measures not already included in the proposed action or alternatives."

Clearly, the Implementing Regulations require equal treatment of all alternatives in both the analysis and reporting phases of compliance document preparation in order to foster better decisions and comply with the national charter for protection of the environment.

CEQ's Implementing Regulations (1502.14) and clarifying questions (Question 7) clearly recognize the importance of accurately formulating and presenting alternatives; the guidance states in part:

"...it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public."

The DSEIS did not accurately present, nor did it adequately evaluate the combined structural/non-structural alternative advanced by the Service in a December 15, 1999, letter to the Corps. Specifically, that alternative should have been formulated to include four basic elements recommended by the Service; only two of which were accurately included in plan 7 of the final suite of alternatives. Instead, the Corps failed to incorporate a spatially explicit NSFDRZ – the NSFDRZ was to include all lands within the two-year floodplain, not merely those below 91 feet, National Geodetic Vertical Datum (NGVD). The DSEIS also failed to include a coordinated plan of operation for the proposed pumping plant and flood gates specifically designed to balance the dual objectives of floodplain restoration below the two-year event and structural flood damage reduction above the two-year event.

Primarily due to inaccuracies in the impact analyses, the DSEIS failed to accurately depict project impacts associated with each alternative in the final array. Moreover, those analyses did not correctly incorporate or evaluate the data provided by the Service to substantiate its alternative future without-project scenario. In a September, 1999, planning aid report, the Service provided to the Vicksburg Corps District an alternate description of existing conditions related to land use in the study area, and a forecast of changes in those conditions over the future without-project. That report reiterated the fact that the Service did not concur with the District's projection that existing conditions would remain constant throughout the future without-project. Additionally, the Service requested that, in the absence of agreement on future without-project conditions, both alternative scenarios be utilized in the evaluations of all flood damage-reduction alternatives, as required by the Corps' Principles and Guidelines. In essence, the Service requested that two differing no action alternatives be used in the analysis of project impacts. Our review of the Corp's treatment of the Service's "No Action" alternative and substantiating data revealed that the Corps' evaluation team misinterpreted the Service projections and inaccurately and improperly applied the data that were presented to them.

Because the Corps' future without-project land use projections are not substantiated and conflict with the current trend of wetland restoration in the project area, the Service continues to maintain that there is a substantial degree of risk and uncertainty that such a projection will result in significant underestimation of project impacts. This is a serious deficiency, because a description of baseline and the most likely future without condition are essential to an accurate evaluation and depiction of the impacts associated with all alternatives.

In effect, the "No Action" alternative serves as the basis against which all other alternatives are measured in order to properly compare alternatives and select a recommended plan. If a reviewer does not have a firm grasp of the existing conditions and the baseline projection, there would be no concept of the measurement units being applied in the analysis of impacts; thus, any analytical results would appear valid. It is only when the baseline and future without condition are well-defined and clearly illustrated that reliable and specific measurement of alternative impacts can be made, and decision makers can ascertain that every significant factor has been examined. These concerns should be addressed in the final document, which should clearly list current land use and proposed land use for each alternative in both tabular and spatial form. Doing so would more nearly follow CEQ's Implementing Regulations (1502.14), and clarifying question number 3, which respectively read in part:

> "...(b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits" and, "...(d) Include the alternative of no action." and specifically regarding the no action alternative, Question 3 states: "This analysis provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives."

We are also concerned that in order to quantify the plan's effects on the environment, the DSEIS and supporting documents present erroneous information, as detailed in the specific comments that follow, in a manner that is misleading and confusing. As a result, the reader is left with no clear concept of the consequences pump operations will actually have on the Yazoo Backwater Area ecosystem. The final document should clearly identify the selected plan's effects on the environment.

Moreover, the indirect effects of the recommended plan are significant and are inadequately evaluated in the DSEIS. The presence of the largest pumping plant in the world would intensify and expand agriculture, induce additional flood damage-susceptible development, and substantially increase future disaster assistance and recovery costs. Regardless of the flood control benefits provided to those areas, implementation of the selected plan would perpetuate the historical, structural approach to agricultural drainage in the Mississippi Delta. In essence, implementation of the proposed plan will reduce, rather than increase, the economic and environmental sustainability of project-area land uses.

The manner and extent to which the recommended plan will conflict with other Federal policies in the project area (Part 1502.16, part (c)) are either not included, or they are incorrectly portrayed, in the DSEIS. The applicable part of CEQ's Implementing Regulations states:

"(c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned. (See Sec. 1506.2(d).)"

As stated previously, Federal flood reduction policy is moving toward non-structural floodplain enhancement and natural flood water storage to achieve a sustainable balance between economic development and environmental conservation. The recommended plan (Plan 5) is a traditional, structural proposal that contains no non-structural flood damage reduction project features. Instead, the Corps' proposal contains an inadequately formulated and largely nonviable environmental enhancement and mitigation component. The hydrology of wetlands subject to the Corps' jurisdiction under the Clean Water Act would be significantly reduced by pump operations. As a result, and contrary to the Corps' insistence that their regulatory program will protect those wetlands affected by reduced hydrology, those areas will become open to unregulated and unmitigated conversion to non-wetland uses. Accordingly, we believe that implementation of the recommended plan would conflict with Executive Orders on Floodplain Management and Wetlands. Contrary to conclusions in the DSEIS, the selected plan conflicts with federally sponsored conservation programs and partnerships including the North American Waterfowl Plan, Partners in Flight, Black Bear Conservation Committee, and various landowner-driven conservation programs, such as the Wetland Reserve and Conservation Reserve Programs administered by the U.S. Department of Agriculture. All of these conservation programs have the central goal of restoring a sustainable natural ecosystem in the lower Yazoo Basin. In our view, the selected plan represents a significant step in the opposite direction, inasmuch as it will substantially curtail --if not summarily end-- the current wetland restoration trend in the lower Yazoo Basin.

Part 1502.12 of CEQ's Implementing Regulations states:

"Each environmental impact statement shall contain a summary which adequately and accurately summarizes the statement. The summary shall stress the major conclusions, areas of controversy (including issues raised by agencies and the public), and the issues to be resolved (including the choice among alternatives). The summary will normally not exceed 15 pages."

The DSEIS does not contain a summary as outlined above. Instead, the document contains a brief abstract which, along with the first four sections of the document, describes and justifies the recommended plan. The statement made in the introduction regarding areas of controversy (page SEIS-2) states, "The controversy is whether the solution should be an entirely nonstructural approach, a combination structural and nonstructural approach, or an entirely structural approach." We entirely disagree with the Corps' gross over-simplification of the basis of controversy associated with this project. Actually, the historical shortcomings of single-purpose structural flood control projects, their adverse impacts to natural resources, and the nationally significant issues embodied by the proposed plan in terms of economic and ecological sustainability, more accurately and succinctly describe the remaining areas of controversy. The Service has developed a non-structural approach, in contrast to the Corps' proposal. The Service's approach and comprehensive planning goal for the Yazoo Backwater area were detailed in a December 15, 1999, letter to Mr. Douglas Kaimen

(Vicksburg District) and in a March 17, 2000, letter to Major General Phillip Anderson of the Mississippi Valley Division. The future of Federal flood reduction emphasizes nonstructural approaches that enhance the floodplain and utilize natural storage. The forgoing complexities and the full extent of the controversy should be discussed in the final document.

Specific Comments

Draft Supplement No. 1 to the 1982 Yazoo Area Pump Project Final Environmental Impact Statement

Page SEIS-1, para 2 - The first sentence of this paragraph states that the document is analytical, self-supporting, and informs decision makers and the public. The last sentence encourages the reader to reference the appendices for specific methodologies and detailed information which often do not exist, or that inadequately cover the subject matter.

Page SEIS-1, para 3 - This paragraph states that the selected plan represents a balanced approach to flood damage reduction and environmental opportunities in the Yazoo Backwater Area. That plan consists of a 14,000 cfs pumping plant and a goal to reforest 62,500 acres of wetlands below 91 feet, NGVD. The Service believes this statement is inaccurate; a balanced plan would restore the ecological functions and values within a designated and dedicated NSFDRZ (i.e., the two- year floodplain), below which, agriculture would remain a high risk land-use. Under that approach, the proposed pumps could be used to structurally reduce economic impacts of larger floods above the two-year event. A balanced plan would also fully acknowledge and consider economically and environmentally sustainable development in the context of the Project Design Flood.

Page SEIS-3, para 7and 8 - These paragraphs state that except for remaining compliance requirements as listed in Table SEIS-1, there are no unresolved issues for this stage of planning. The Service believes significant issues remain unresolved, and recommends that alternatives which comprehensively consider the economic and environmental needs of the project area be reformulated and analyzed (e.g., the designation and dedication of a NSFDRZ). By the time the final EIS is distributed, Corps decision makers are required to ensure that all environmental protection statutes and requirements listed in Table SEIS-1 are met. Of the twenty statutes and requirements listed in the table however, slightly more than half remain to be met. Please review the general comments section for a synopsis of our major concerns and revise the subject table accordingly.

Page SEIS- 3 through 6, para 10 and 11 - The Executive Order on Flood Plain Management, EO 11988, directs Federal agencies to reduce flood loss risk; minimize impacts on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. While the proposed action would reforest a limited acreage of the floodplain (i.e., a maximum of 9,091 acres of private agricultural land below 87 feet, NGVD), it would also drain wetlands and perpetuate farming of frequently flooded, poorly drained floodplain wetlands above that elevation. Alternatives that would have avoided adverse and incompatible development were prematurely discounted and discarded. Although the proposed plan would reduce adverse floodplain impacts, it would not avoid or

minimize those impacts. On that basis, the Service concludes that the recommended plan fails to meet the spirit and intent of EO 11988.

Page SEIS-6, para 12 and 13 - The Executive Order on Wetlands, EO 11990, directs Federal agencies to avoid, to the extent possible, long-term and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands if a practical alternative exists. The proposed action should be reformulated to significantly avoid and reduce adverse impacts to wetlands by dedicating the two-year floodplain as a NSFDRZ, instead of draining those cleared and forested wetlands above 87 feet in order to intensify marginal farming. The statement that impacts from the structural component were avoided by increasing the pumping elevation to 87 feet is inaccurate and misleading, since there are thousands of acres of wetlands above 87 feet that would be adversely impacted by operating the pumps. We agree that wetland impacts may have been reduced somewhat, but they were certainly not avoided. As such, we believe that the proposed plan also fails to meet the spirit and intent of EO 11990. We recommend that this section be revised to include the actual wetland acreage that would be impacted by implementing the recommended plan.

Page SEIS-11, para 29 - We concur with the implied goal of no-net-loss of natural resources. However, the Corps has opted to use conditions as they exist today as the baseline point for measurement of those impacts. This approach fails to consider the well-documented relationship between previous flood control/drainage and agricultural intensification in the Mississippi Alluvial Valley, which has resulted primarily from publically financed drainage and flood control projects. The Service believes that, at a minimum, the Corps should consider the initial point of reference for measuring project impacts on project area wetlands as the late 1950's. At that time, data were collected regarding environmental resources in the project area which resulted in the Comprehensive Review of the Mississippi River and Tributaries Project Report, transmitted to Congress on April 6, 1962. That report included a recommendation to acquire 70,000 acres of sump areas to "produce optimum flood control and fish and wildlife benefits," which was subsequently authorized by the Flood Control Act of 1965, but never implemented.

Page SEIS-11, para 30 - This paragraph lists plan objectives which do not coincide with those listed on page 43 of the main report. While some of the listed objectives are similar, others are completely different. Most importantly, specific objectives used to provide the basis for plan formulation, impact assessment, and plan selection are not identified. Absent such explanations, it is impossible to validate the analysis or determine if the logic applied was appropriate. The differing objectives raise concerns about the extent to which confusion and misunderstanding of study objectives could have translated into mistakes in plan formulation and analytical errors. The final document should be revised to correspond with the same set of objectives.

Page SEIS-12, para 33 and 34 - These paragraphs state that traditional nonstructural measures were included in the alternative plan formulation process. Those traditional nonstructural measures included such obviously structural solutions as levees or walls around structures, raising structures in place, structure replacement, and waterproofing

walls and openings. While such measures are traditional structural solutions to urban flooding, they are not appropriate to the non-structural reduction of agricultural flooding and drainage. Furthermore, they do not meet the criteria that define nonstructural measures.

Page SEIS-15, para 36 - The last sentence of this paragraph refers the reviewer to Table 4 on page 54 of the main report to review why several "nonstructural" measures were eliminated from further consideration. However, it appears that, although the referenced table is labeled as an economic analysis summary of nonstructural measures, the measures analyzed appear to be, in fact, structural means and methods to provide flood damage reduction. Furthermore, the details and methodology for that analysis are absent. Page 53 paragraph 134 of the main report discusses the table, but does not discuss how costs, benefits, and benefit ratios were derived. References are made to hydrologic data, computer-based elevation models, and other computer-based models used to determine first costs, annual costs, annual benefits and benefit-cost ratios. Again, no discussion of exactly how these models function and how they were applied to the data is offered. Without such discussion, it is impossible to verify the data; accordingly, we recommend that these shortcomings be rectified in the final document.

Page SEIS-16, para 40 - This paragraph should explain the relationship between elevation (e.g., 87 feet, NGVD) and the areal extent of flooding (e.g., the 1-year floodplain) in a more precise and spatially accurate manner. The Corps' explanation would consistently and erroneously lead one to believe that flood protection will accrue to all lands in the project area above 87 feet which is patently false. Because this is the only reference regarding that relationship in the entire document, we believe the average reader will not keep this critically important relationship in mind when reviewing other portions of the text. Accordingly, we suggest that a series of maps that spatially depict this relationship be included and referred to frequently when the text refers to elevational data in reference to both backwater and headwater flooding.

Page SEIS-16, para 42 - Again, this paragraph refers to the main report where Tables 5 and 6 are presented. Once again, the pattern of simply presenting numbers without explanation is evident. There is no discussion of how the costs and benefits were derived, nor are the categories defined. Furthermore, there is no reference to where these data or discussions can be found. These shortcomings should be rectified in the final document.

Page SEIS-21, para 53 - This paragraph discusses portions of the final array of alternatives and states that three operational measures were included as project features, yet the discussion that follows only lists two operational features. The final document should be revised to clarify this discrepancy.

Page SEIS-23, para 58 - This sentence provides the rationale for the Corps' dismissal of the Shabman approach to non-structural flood control from further consideration. The reasons given are partially discussed in paragraph 57; however, the reader is also informed that the alternative "does not meet the overall objectives of the study," yet the objectives that were unmet and the Corps' analytical basis for that conclusion are not provided. Such an analysis should be presented in the final document to support this assertion. Moreover, our general

comments above discuss the OCE policy decision on the use of carbon sequestration reforestation and nutrient load reduction to economically justify non-structural measures. That general comment also explains the fundamental reasons for our nonconcurrance with the OCE decision.

Page SEIS-23, para 59 and Table SEIS-3 - The last sentence of this paragraph and the table subjectively evaluate the various plans. As such, they are more justification than evaluation. Given the purpose of the DSEIS, we recommend that these subjective references and the table be deleted from the final document.

Page SEIS-24, para 60 - This paragraph initiates the discussion of the alternatives and is supposed to describe the no action alternative. Unfortunately, very little is said about baseline conditions and the future without condition, or any of the underlying assumptions. The Corps assumes that land-use conditions will continue without a project exactly as they exist today. The Service does not agree with that position. The Corps acknowledges this critically important area of disagreement, and erroneously refers the reader to Appendix 2 for a discussion of our position, which was not included. Please refer to the general comments section above to review our concerns regarding the baseline and future without-project conditions.

Page SEIS-25, para 62 - This section describes Plan 3 inconsistently with the description of plan 3 provided on page 70 of the main report. The time intervals of the pumping operational elevation do not match, and the description in the main report includes the reestablishment of forest on 27,435 acres of open land. These discrepancies need to be rectified in the final report. Corresponding portions of the analyses for plan 3 should be verified and updated as necessary.

Page SEIS-28, para 68 - The reviewer is referred to Table SEIS-4 where a summary comparison of plans is presented. Since no data are presented for plan 1, comparisons with other plans are not possible. The table should be recast to supply relevant data that will facilitate a comparison of all alternatives, including "No Action."

Page SEIS-28, para 69 - The last two sentences of this paragraph refer the reader to Table SEIS-5 and present economic conclusions. The pattern of numerically displaying data without the benefit of discussion or a reference to an appendix that fully describes the methodology is once again evident. Please see our previous comments regarding page SEIS-16, paragraph 42.

Pages SEIS-30 through 33, para 70-72 - This section of the DSEIS presents an unsubstantiated justification for the Corps' selection of Plan 5, as the recommended plan. In contrast to CEQ's Implementing Regulations, this section appears to justify a decision that has already been made, rather than allowing decision makers to evaluate alternatives and make decisions based on a full understanding of environmental consequences. Sections 1501(c) and 1502.14 of CEQ's regulations clearly explain that the purpose of NEPA and the EIS is to present alternatives and their respective impacts in a comparative form that sharply define the issues and provides a clear basis for choice among options. In contrast, this section presents strong evidence of the Corps' attempt to justify their selection of Plan 5. We

recommend that the Corps reinitiate the NEPA planning process, follow the spirit and intent of the Act, and objectively reformulate and re-evaluate all reasonable alternatives. Only after all alternatives are formulated correctly and evaluated equally should decision makers determine which alternative is the preferred approach.

Page SEIS-33, para f - This sentence states the recommended plan supports efforts to recover the pondberry, a federally listed endangered plant. In an October 16, 2000, letter to the Corps District Engineer, the Service presented a detailed review of Appendix 14 which is the Corps' Biological Assessment of impacts of the project on endangered and threatened species. In that letter, the Service concurred that the recommended plan will not likely adversely affect the Louisiana black bear, and concluded that further consultation for that species was not required. However, the Service did not concur with the Corps' determination that the project is not likely to adversely affect pondberry. The Service concluded that the recommended plan is likely to adversely affect pondberry and recommended that the Corps initiate formal consultation to ensure it will not jeopardize the continued existence of pondberry, as required by Section 7(a)(2) of the Endangered Species Act. We recommend that this sentence be removed from the document, and that the final document be modified to accurately reflect the status and outcome of the consultation process.

Page SEIS-35, para 75 - This paragraph states that the benefits for Plan 5 were updated based on 1999 crop budgets and 1999 current normalized prices, which are presented in Table SEIS-6. Previous discussions in paragraphs 69-71 stated that data presented in Table SEIS-5 were used by the Corps to select their recommended plan. Therefore, data used by the Corps to select a plan were outdated and the plan selection process was flawed. Section 1502.14(b) of CEQ's Implementing Regulations clearly indicate that all alternatives should be treated in a similar manner, which was clearly not true in this case. We recommend that data for all plans be updated to the same level, and that evaluations be completely displayed in the final compliance documentation .

Page SEIS-35, para 78 - This paragraph states that initiation of pumping at 87 feet avoids adverse effects to terrestrial, wetland, waterfowl and aquatic resources below 87 feet NGVD. That statement is true to some degree for any selected elevation; however, it is not true that those effects will be avoided throughout the 1-year floodplain. The degree to which this is true for all plans and their pumping elevations, should be clarified and a comparative analysis should be provided in the final documentation.

Page SEIS-37, Table SEIS-7 - Data displayed in the table are incorrect. For example, the acreage figure presented for aquatic resources is 72,316. The correct figure for the 2-year average seasonal flooded acreage is 129,013. Additionally, it is apparent that here and throughout the evaluation, the Corps characterized aquatic impacts solely on the basis of spawning impacts. The Service believes that aquatic impacts should have been characterized on the basis of both spawning and rearing impacts combined. Terrestrial impacts are characterized by evaluating the combined life requirements of all evaluation species, and aquatic impacts should be characterized in the same manner. We recommend that spawning and rearing impacts be combined for the purpose of treating aquatic impact characterizations. Data in the table and all subsequent evaluations should be corrected, based on an accurate evaluation of aquatic impacts.

Page SEIS-39, para 79 - This paragraph states that reforestation of 62,500 acres of agricultural land as proposed in the recommended plan will provide a net gain for environmental resources, a premise with which the Service strongly disagrees. First, that plan does not minimize adverse impacts to fish and wildlife resources. Secondly, because the reforestation plan is so inadequately formulated and presented, its potential for implementation is almost nil. For example, there are only 9,091 acres of cleared, privately owned land below 87 feet. Thus, there is no assurance that the desired acreage figure would be attained. The Service recommends that a risk assessment of the reforestation measure be conducted to substantiate this conclusion. Furthermore, the recommended plan would result in water-level reductions that would have the effect of expanding and intensifying agriculture in yet more flood-prone and poorly drained areas. The measure would also serve as a powerful disincentive to possible willing sellers, rather than promoting the reforestation effort. In fact, there is every likelihood that the recommended plan, its reforestation measure notwithstanding, will significantly reduce -- if not summarily end --the current landowner-driven wetland reforestation trend in the Yazoo Backwater Area.

Page SEIS-40, para 83 and 84 - This section states that, if a minimum threshold to achieve no- net-loss of environmental values is not achieved from willing sellers, the remaining acreage would be acquired as mitigation in fee title and refers the reader to Table SEIS-8. The DSEIS does not explain how this minimum threshold level was determined. Additionally, 12,980 acres is presented as the amount required to achieve no-net-loss of environmental resources for the recommended plan. No explanation of how this figure was derived is presented. The final document should present that methodology, and clarify whether this is the acreage actually targeted for reforestation under the recommended plan.

Page SEIS-41, para 86 - This paragraph states that establishment and survival monitoring of seedlings will cease after 3 years, and that land use monitoring will occur every 5 years through the use of remote sensing techniques. This section does not discuss how easement compliance will be assured or how easement violations will be remedied. These easement compliance issues should be fully discussed in the final document.

Page SEIS-44, para 97 - Despite the recent restoration trend, the Corps predicts that no changes in land use for future without-project conditions are expected. No increase in reforestation is predicted by the Corps "...because the ceilings for enrollment in Sharkey and Issaquena Counties have been reached," despite the fact that more than 9,000 acres of additional restoration have been quantified since the Service's September 1999, future without-project projection was provided. Although not explained, the ceilings referred to are associated with Federal conservation programs administered by the U.S. Department of Agriculture. Moreover, we are aware of efforts by the Congress to substantially raise those caps. In contrast to the Corps' projection, the Service estimates that over the 50-year project life, 43,432 acres of agricultural lands would be reforested in the study area (again, more than 9,000 acres of which have already occurred). This information and the rationale for this Service position, although referred to, was not included in the DSEIS. In fact, careful review of Table SEIS-10 reveals that the Corps has inaccurately incorporated the Service's data in that table. We believe the data presented in that table for the FWS Future Without-Project acreage for soybeans should be 161,855 and the figure presented for Bottom-land Hardwood should be 247,650.

Page SEIS-46, para 98 and Table SEIS-11 - Data referred to by this paragraph and contained in Table SEIS-11 are inaccurate. A comparison to those figures presented in Table SEIS-10 reveals discrepancies among the numbers presented. More importantly, the data displayed in this table should be presented based on the differing opinions of the Corps and the Service regarding most probable land use without the project. This table should be modified to accurately depict both the Service's and Corps' alternative without-project futures.

Page SEIS-49, Table SEIS-12 - Data presented in the table are in error. The data presented for the Service's projection of future without-project conditions for soybeans in Reach 1 should be 0 not 13, and the correct figure for BLH should be 58, not 54. Similarly, data for soybeans and BLH in Reach 2 should be 21 and 41 respectively, not 26 and 36 as presented. These data should be corrected in the final document.

Page SEIS-49, Table SEIS-13 - Data presented in this table are inexact. Data for DUD/ac and the Corps future without-project projection are correct, however, the data for the Service future without-project was not accurately presented. Data for the Corps' projection was derived from Table 7 of Appendix 11. Data for the Service's projection should have been derived from Table 10 of Appendix 11. Therefore the table should appear as follows:

Land Use	DUD /acre	Reach 1		Reach 2		Reach 3		Reach 4	
		Corps	FWS	Corps	FWS	Corps	FWS	Corps	FWS
Fallow	1037	186	186	109	109	51	51	203	203
Rice	580	510	510	370	370	26	26	101	101
Soybean	253	603	0	1,002	457	256	256	633	633
BLH	57	2,088	2,691	349	894	1,815	1,815	836	836
Total	N/A	3,387	3,387	1,830	1,830	2,148	2,148	1,773	1,773

Page SEIS-50, Table SEIS-14 - Since data in this table are dependent on the data in Table SEIS-13 (see above comment), the data presented are erroneous. The table should appear as follows:

Reach	Average Seasonal Duck acres	Baseline DUD	Corps Future w/o DUD	FWS Future w/o DUD
1	3,387	760,257	760,257	750,609
2	1,830	601,032	601,032	592,312
3	2,148	236,190	236,190	236,190
4	1,773	476,892	476,892	476,892
Total	9,138	2,074,371	2,074,371	2,056,003

Pages SEIS-50 through 52, para 107-109 and Table SEIS-16 - Data presented in the discussion of terrestrial resources in paragraphs 107 through 109 and corresponding data presented in the referenced table conflict; the data presented in the table do not agree with data previously presented in the DSEIS. Paragraph 107 states "However, 273,398 acres of bottom-land hardwoods (including swamp cover type) provide the highest quality and most stable habitat." Addition of the acreage figures for those cover types from Table SEIS-10 yields an acreage figure of 233,869, yet table SEIS-16 utilizes an acreage figure of 197,200 for forested lands. There is an obvious discrepancy between the reported acreages of forested habitat types and the acreage utilized for computation of impacts.

Assuming that the Corps' acreage figure reported in Table SEIS-16 is correct, the data presented in the table are in error. Based on the 197,200 forested acreage figure reported in the table and our verification of the computations, we believe the table should read as

Evaluation Species	Corps Forested Acres	FWS Forested Acres	Baseline HU	Corps Future Without-Project AAHU	FWS Future Without-Project AAHU
Non-water Dependent	197,200	233,104	577,796	577,796	688,186
Wood Duck	66,851	79,022	32,088	32,088	32,088
Mink	60,540	71,563	7,265	7,265	13,333
Total			617,149	617,149	733,607

follows:

Page SEIS-53, Table SEIS-17 - Acreage figures presented is the table are not supported by a discussion of the methodology utilized to derive them. We recommend that a discussion of the methodology utilized to arrive at those acreages be presented in the final document.

Pages SEIS-54 through 56 and Tables SEIS-20,21, and 22 - Data discussed in paragraphs 114, 115, and 116 (which are displayed in Tables SEIS 20, 21 and 22) do not match the data presented in technical Appendix 13. Additionally, the data presented in those tables are incorrect and present an inaccurate projection of the Service's future without-project analysis. We recommend that the acreage figures presented in Tables SEIS-20 and 21 be the product of the average flooded acres currently displayed, and the relative distribution by reach presented in Table SEIS-19. This approach would allow for a rapid validation of the acreage presented for the baseline and Corps' future without-project projections by reference to Appendix 13.

The Corps has also inaccurately interpreted the Service's projections of future without-project conditions. In so doing, they inaccurately and inappropriately added 30,293 acres, divided equally, to the acreage for reaches 1 and 2. The correct acreage figure should have

been 35,904, and that acreage should have been distributed exactly in accordance with Tables 3a and 3b of the Service's September 1999 planning aid report.

In an effort to validate the data presented in Tables SEIS-20 through 22, we multiplied the average daily flooded acres by reach times the relative wetland distribution displayed in Table SEIS-19, and multiplied the result by the Wetland Functional Capacity Index (FCI) values for forested and farmed conditions to determine the Functional Capacity Units (FCU) displayed in the tables. Our validation revealed that computational errors were made, and that the data presented in Table SEIS-20 should be:

Reach	Average Daily Flooded Wetland Acres	Baseline FCU	Corps Future Without Project FCU	FWS Future Without Project FCU
1	15,658	83,615	83,615	139,225
2	2,160	11,534	11,534	66,553
3	14,106	75,324	75,324	75,324
4	3,210	17,144	17,144	17,144
Total	35,134	187,616	187,616	298,246

Similar treatment of the data in Table SEIS-21 would yield the following data:

Alternative	Acres Reforested		Corps Net Effect		FWS Net Effect	
	Corps	FWS	AAHU	Change %	AAHU	Change %
2	107,000	71,096	170,413	-27.6	286,871	39.1
3	0	0	(6,680)	-1.1	109,778	15.0
4	40,600	4,696	74,532	12.1	190,990	26.0
5	62,500	26,596	107,674	17.4	224,132	30.1
6	77,300	41,396	134,987	21.9	251,445	34.3
7	107,000	71,096	181,328	29.4	297,786	40.6

Because Table SEIS-22 is a summation of data in Tables SEIS-20 and 21, it should read:

Reach	Baseline FCU	Corps Future Without Project FCU	FWS Future Without Project FCU
1	96,756	96,756	143,825
2	24,891	24,891	71,629
3	79,053	79,053	79,053
4	18,401	18,401	18,401
Total	219,102	219,102	312,908

Pages SEIS-58 and 59, para 120 and 121, and Table SEIS-26 - The data in this table should be displayed by reach and broken down into two tables, one for spawning habitat and the other for rearing habitat. Table SEIS-26 for spawning habitat should read:

Reach	Average Daily Flooded Acres	Baseline HU	Corps Future Without Project HU	FWS Future Without Project HU
1	24,270	72,958	72,958	80,664
2	13,851	22,914	22,914	31,446
3	20,278	70,269	70,269	70,269
4	13,917	33,966	33,966	33,966
Total	72,316	200,107	200,107	216,345

Similarly Table SEIS-26 for rearing habitat should read:

Reach	Average Daily Flooded Acres	Baseline HU	Corps Future Without Project HU	FWS Future Without Project HU
1	47,426	62,304	62,304	67,269
2	22,867	12,026	12,026	16,704
3	34,075	43,694	43,694	43,694
4	24,645	22,858	22,858	22,858
Total	129,013	140,882	140,882	150,526

Those data should be combined and evaluated as the actual project impact on aquatic resources.

Page SEIS-67, Table SEIS-28 - The data displayed in the table cannot be verified or validated because there is no explanation of the methodology by which they were derived. The methodology utilized to produce the data in the table should be clearly and succinctly discussed in the final document. The data in the table SEIS-28 and in the text discussion would be clarified by the use of figures (maps) and actual acreage tables for each projection, as well as the percentage change expected to occur with each projection. We recommend that two figures (maps) presenting the data differences be produced, and that a table be displayed that depicts the acreage at baseline and at the project life (50 year) end-point for both the Corps' projections and the Service's projections.

Page SEIS-68, Para 143 and 144 and Table SEIS-29 - The data in the table and therefore the summary statements found in these paragraphs are incorrect. Again, there is no discussion regarding the methodology used to produce the data. Based on the discussion found in Appendix 11 and the inadequate explanation of the data found in paragraphs 143 and 144, we believe the data presented in the table are inaccurate and should be presented as follows:

Alternative	Seasonal Daily Acres Impacted	Seasonal Daily Acres Reforested		Corps Net Effect		FWS Net Effect	
		Corps	FWS	DUD[a]	Change	DUD[a]	Change
2	0	4,050	4,050	-824,505	-39.7	-534,061	-14.1
3	-836	0	0	-190,790	-9.2	99,654	4.8
4	-814	3,697	4,050	-936,609	-45.2	-646,165	-31.4
5	-353	3,902	4,050	-873,432	-42.1	-582,968	-28.4
6	1,302	4,708	4,050	-634,017	-30.6	-343,573	-16.7
7	1,451	4,778	4,050	-612,924	-29.5	-322,480	-15.7

a/ Includes the loss of 2,166 DUD from the clearing of 38 acres at the pump site on Plans 3 through 7.

Pages SEIS-69 and 70, para 145-148, and Table SEIS-30 - The discussion refers the reader to Appendix 12 and presents data directly from Table SEIS-30. We believe the data presented in the table are incorrect. Of the several methods utilized in this compliance documentation and its appendices to determine impacts, all typically quantify impacts by comparing future without-project conditions to future with-project conditions. In other words, a baseline level or index is determined and a specific value calculated. Projections of with-project conditions are made and a measure of that same index is calculated for the projected end of project condition. The net effect of the project is the difference between the two indices. If baseline starting conditions are different but impact effects are identical, applying a correction factor to one or the other of the end points should yield similar impacts. By starting with the data initially presented in the table and the logic discussed in the table's footnotes, we were able to determine that the data presented for the Corps' net effect is

displayed properly. However, the data presented for the FWS net effect is not correct, and we recommend that the table be revised as follows:

Alternative	Acres Reforested		Corps Net Effect		FWS Net Effect	
	Corps	FWS	AAHU	Change %	AAHU	Change %
2	107,000	71,096	170,413	-27.6	286,871	39.1
3	0	0	(6,680)	-1.1	109,778	15.0
4	40,600	4,696	74,532	12.1	190,990	26.0
5	62,500	26,596	107,674	17.4	224,132	30.1
6	77,300	41,396	134,987	21.9	251,445	34.3
7	107,000	71,096	181,328	29.4	297,786	40.6

Page SEIS-70 through 72, para 149 through 155, and Tables SEIS-31 and 32 - The discussion presents background information regarding wetland impacts and makes observations regarding the data displayed in the tables. Some of the data in the tables are in error. In table SEIS-31, the FCU figure for the FWS Net Effect presented for reach 6 is inaccurate. Rather than the 91,751 figure presented, our verification of the calculation revealed that figure to be 100,209. Additionally, it appears that the percentage change figures were erroneously calculated by using the Corps' baseline FCU rather than the FWS baseline FCU as the divisor in the computation. Therefore, all the percentage figures for the FWS Net Effect presented in the table are inaccurate.

In table SEIS-32, The data presented for both the Corps Net Effect and the FWS Net Effect impacts are inaccurate. We believe the table should read:

Alternative	Daily Acres Impacted		Daily Acres Reforested		Corps Net Effect		FWS Net Effect	
			Corps	FWS	HU	Change %	HU	Change %
2	0	0	0	0	0	0	0	0
3	(3,495)	(1,637)	0	0	(8,473)	(26.9)	(4,107)	(28.0)
4	(2,610)	(1,220)	0	0	(6,394)	(20.3)	(3,127)	(21.3)
5	(1,277)	(586)	0	0	(3,261)	(10.4)	(1,637)	(11.2)
6	1,000	490	0	0	2,090	6.6	892	6.1
7	1,697	817	0	0	3,728	11.8	1,660	11.3

Page SEIS-72 and 73, para 156 and 157 - These paragraphs set the stage for the following discussion of aquatic impacts. We believe the aquatic impacts should present a combined index of spawning and rearing requirements, as noted previously.

Page SEIS-73, para 158-159 and Table SEIS-33 - Again the discussion simply presents observations regarding net habitat unit impacts and percentage changes based on data presented in the table. We recommend the table be revised as follows:

Alternative	Daily Acres Impacted	Daily Acres Reforested		Corps Net Effect		FWS Net Effect	
		Corps	FWS	HU	Change %	HU	Change %
2	0	34,218	29,159	80,070	40.0	68,232	34.1
3	(23,539)	0	0	(55,223)	-27.6	(55,223)	-27.6
4	(18,037)	25,538	21,766	17,410	8.7	8,584	4.3
5	(10,998)	28,840	24,478	41,608	20.8	31,401	15.7
6	(4,712)	31,861	27,165	63,387	31.7	52,398	26.2
7	1,022	34,701	29,558	83,450	41.7	71,415	35.7

Page SEIS-74, para 161-162 and Table SEIS-34 - Here again, the discussion is largely comprised of observations regarding the percentage of change based on data presented in the table. We again question the accuracy of that data. We believe the table should be revised as follows, and that the text be revised accordingly:

Alternative	Daily Acres Impacted	Daily Acres Reforested		Corps Net Effect		FWS Net Effect	
		Corps	FWS	HU	Change %	HU	Change %
2	0	60,478	51,094	41,730	29.6	35,255	25.0
3	(40,391)	(40,391)	(40,391)	(27,914)	-19.8	(27,914)	-19.8
4	(29,676)	16,488	16,488	11,333	8.0	11,333	8.0
5	(15,073)	37,906	44,699	26,111	18.5	20,398	14.5
6	(3,043)	55,499	49,349	38,250	27.2	31,907	22.6
7	4,652	67,182	52,741	46,312	32.9	39,557	28.1

Page SEIS-75 and 76, para 163 thorough 166 - Our previous specific comment regarding the Corps' assessment of project impacts on the endangered pondberry plant apply here, as well.

Pages SEIS-78-80, para 174 through 177 and Tables SEIS-35, 36, and 37 - This section presents general observations regarding project impacts based on summary data presented in Tables SEIS-35, 36, and 37. The data in the tables do not treat all impacts and projections equally. The reported aquatics HU changes presented in Table SEIS-35 are based on spawning impacts only, and the rearing impacts appear to have been omitted. Moreover, a table presenting a summary of effects for all categories based on the Service's future-without project projections is missing. Table SEIS-36 is apparently based on a compilation of the data presented in table SEIS-35. Table SEIS-37 presents data for the Service's position, but a table similar to Table SEIS-35 is not displayed. A table similar to Table SEIS-35 should be constructed to present the Service's baseline comparison in order to verify the data presented in table SEIS-37. The discussion in this section and Tables SEIS-35, 36, 37, and the proposed new table should also be revised to reflect the detailed comments presented previously.

Page SEIS-82, para 182, and Table SEIS-39 - The text and table fail to discuss the relationship of the recommended plan with the present actions in the study area. We are specifically concerned with the Corps' failure to treat the Big Sunflower Maintenance Project within the context of formulating non-structural approaches to agricultural drainage in the Yazoo Backwater Area. Our concerns emanate from the obvious and inextricable hydrological and physiographic overlap between the two projects. Channel work on the Big Sunflower Project will impact approximately 80 percent of the Service-proposed NSFDRZ for the Yazoo pumps. We are particularly concerned that the proposed work on the Little Sunflower River will drain wetlands restored under the auspices of the Conservation Reserve Program (CRP) and Wetland Reserve Program (WRP), as well as a portion of Delta National Forest. Thus, there are substantial questions associated with the Corps' failure to consider and evaluate both projects, inasmuch as the recommended plans conflict with each other, and could have potential effects on the endangered pondberry. One of the principal issues to be addressed during a comprehensive re-evaluation of both projects would be the extent to which much of the channel work on the Big and Little Sunflower Rivers are actually justified.

Page SEIS-82, para 183 - This paragraph presents incorrect data for the WRP and CRP. According to our latest information, there are currently 24,132 acres enrolled in the WRP program and 9,223 acres enrolled in the CRP program. We recommend that these figures be revised in the final document, and that all relevant discussions, especially those for the future without-project conditions, be revised accordingly.

Page SEIS-84, para 184 - The statement that other Legislative authorities (Clean Water Act, etc) and Executive Orders have addressed wetland protection is incorrect. It is widely acknowledged that these initiatives have been minimally effective in reducing the losses of wetlands both nationally and in the Yazoo Backwater Area. The economics of row crop farming in concert with Federal agriculture programs have resulted in adverse impacts to 80 percent of the nation's wetlands. Implementation of the recommended plan will likewise reduce the extent of wetlands within the Corps' jurisdiction, leaving them open to subsequent unregulated and unmitigated conversion to non-wetland uses.

Page SEIS-88, para 192 and Tables SEIS-41 and 42 - The discussion refers the reader to the tables to review the compensatory acreage figure calculated and the respective mini-

mum threshold of acreage that would need to be reforested to reportedly achieve a no-net-loss of environmental resource value. The calculations to produce the data reported in the tables were inaccurate, and the data reported are in error. Table SEIS-41 should read:

Alternative	Compensatory Mitigation (acres)	Minimum Threshold (acres)
Plan 1	None	None
Plan 2	None	None
Plan 3	27,832	27,832
Plan 4	None	21,540
Plan 5	None	13,273
Plan 6	None	5,828
Plan 7	None	388

Table SEIS-42 should be revised to read:

Alternative	Compensatory Mitigation (acres)	Minimum Threshold (acres)
Plan 1	None	None
Plan 2	None	None
Plan 3	30,244	30,244
Plan 4	None	23,415
Plan 5	None	14,334
Plan 6	None	6,342
Plan 7	None	1,705

Page SEIS-89, para 193 and 194 - The acreage figures presented in this discussion are inaccurate and should be revised. Those figures are based on the discussion found in Appendix 1. Careful review of that Appendix reveals that the calculations used to generate those figures are also flawed. Therefore, we believe the acreage of reforestation required to offset terrestrial losses from the Yazoo Backwater Levee is 3,696, not the 3,617 figure presented in the text. Additionally, the 481 acre figure presented as required to offset the 296 acres cleared as part of the inlet and outlet channel construction in 1987 was inaccurately rounded off to 481 acres, rather than the correct figure of 482 acres. Therefore, the minimum acreage of reforestation required would be 18,512, rather than the 17,078 figure presented in paragraph 194.

Page SEIS-91, para 206 - The Service strongly disagrees with the conclusion that the recommended plan represents a balanced approach to solving the flood damage-reduction problem, and meeting the environmental opportunities in the study area. We believe that implementation of a non-structural Federal water resource development project under the authority of the Mississippi River & Tributaries (MR&T) Project that will: (1) provide a water

and related land resource base sufficient to support economically and ecologically sustainable development; (2) result in a substantial realignment of land use with land capability; and, (3) in terms of policy, purpose, and result, reflect "new directions" in the MR&T approach to floodplain management, wetland conservation, and air and water quality improvement, would provide a truly balanced solution to the long-standing and nationally significant water and related land resource problems in the Yazoo Backwater Area.

Appendix 1 - Mitigation

Page 1-11, Table 1-5 - Data presented in this table do not match the corresponding data presented in Table SEIS-30 of the DSEIS, nor the data presented in Table 18 of Appendix 12 which are purportedly the basis for this table. It appears from the title, that this table should present the net hydrologic impacts and reforestation benefits. We recommend that the table be revised as follows:

Plan	Net Change in Average Annual Habitat Units						
	Barred Owl	Gray Squirrel	Carolina Chickadee	Pileated Woodpecker	Wood Duck	Mink	Total
1	0	0	0	0	0	0	0
2	31,653	45,403	45,088	24,677	20,415	3,177	170,413
3	0	0	0	0	(5,615)	(957)	(6,572)
4	12,655	18,152	18,026	9,866	13,070	2,871	74,641
5	19,481	27,944	27,750	15,187	14,400	3,019	107,782
6	24,094	34,561	34,321	18,784	14,983	2,625	129,368
7	33,352	47,840	47,508	26,001	24,047	2,689	181,436

This table is also described in paragraph 24 to depict the net result of reforestation. However, the table's title implies the data displayed are a combination of the data displayed in Table 1-4 and the reforestation impacts; however, the data depict reforestation impacts only. We recommend that the text describing Table 1-5 be corrected in the final compliance documentation to reflect that the table presents total net impacts, and that the table be corrected as outlined above.

Page 1-13, para 28 - This paragraph discusses data presented in Table 1-6 and points out that three plans will cause a reduction of wetland acreage. Objective (f) of the Corps' planning objectives states "Provide, at a minimum, no net loss of natural resources." Based on the data presented in table 1-6, those three plans would fail to meet the Corps' stated objective.

Page 1-14, Table 1-7 - Some of the data presented in the table are incorrect. Based on our verification of the data, the last three columns should read:

Alternative	Total FCU Change	Total FCU/ Total FCI	Mitigation Acres Required
1	0	0	0
2	77,919	32,602	0
3	(52,754)	(22,073)	(22,073)
4	23,783	9,951	0
5	51,995	21,755	0

Page 1-21, para 42 and Table 1-13 - The discussion implies that Table 1-13 is a summary of impacts for all plans. Our review of those data revealed that the Aquatic AAHU impacts data are based solely on spawning habitat impacts. Discussions in Appendix 10 indicate that the spawning acreage also supports fish rearing. We are concerned that aquatic impacts have been significantly underestimated due to this approach. If those waters provide both spawning and rearing functions, then spawning and rearing impacts are additive. Because determinations of terrestrial impacts were handled in an additive manner, fisheries impacts should be handled similarly.

Page 1-25, para 52, 53, and 54 - The discussion in these paragraphs reviews the calculations for the reanalysis of mitigation requirements for the Lake George area. Some of those calculations were inaccurate, and the correct additional mitigation requirement is 3,696 acres.

Pages 1-25 and 1-26, para 55 - Calculations for determining the mitigation requirement for previous clearing at the pump site were improperly rounded down; the correct figure should be 482 acres.

Page 1-27 and 1-28, para 56 through 59, and Tables 1-15 and 1-16 - The discussion and tables should be corrected based on our previous specific comments on the applicable parts of the DSEIS outlined above.

Page 1-29, Table 1-17 - Because of the previously mentioned calculation errors, the data displayed in this table are also incorrect. If the corrections for the pump structure are applied, then the figure will change from 481 to 482, and the figure presented for the Lake George area will change from 3,617 to 3,696; the correct result for total acreage to be acquired will therefore be 17,158 rather than 17,058.

Page 1-45, para 100 - The acreage figure (4,098) presented is incorrect. Based on the preceding comments the correct figure is 4,178.

Page 1-47, Table 1-22 - The data presented in the table are inaccurate. The revised table should read as follows:

Alternative	Compensatory Mitigation (acres)	Minimum Threshold (acres)	
		Corps	FWS
1	None	None	None
2	None	None	None
3	27,832	27,832	30,244
4	None	21,540	23,415
5	None	13,273	14,334
6	None	5,828	6,342
7	None	388	1,705

Pages 1-51 through 1-56 - The discussion contained herein recounts the status of mitigation associated with various projects both within and outside the project area and the State of Mississippi. We recommend that all projects not directly related to the Yazoo Backwater Reformulation Study area (at a minimum those detailed in paragraphs 116, 118, 119, 120, and 121) be deleted from the document, as they are not germane to the issue of unmet mitigation for the Yazoo Basin projects. This is especially true inasmuch as non-structural flood damage reduction must occur within the project area to achieve any reduction in flood damages.

Summary Comments

As stated in the General Comments, the DSEIS and related documents are inadequate in several areas, including the use of unsubstantiated assertions, the lack of adequate explanations of analytical methods, the use of inaccurate and inappropriate methodologies, the inadequate formulation, evaluation, and unequal treatment of alternatives, and possible precedent-setting, nationally significant departures from well-established national environmental laws, regulations, and policies.

The recommended plan also fails to meet numerous water development planning criteria contained in the Corps' Principles and Guidelines for Water and Related Land Resource Development Planning, including: (a) failure to fully meet the Office of Management and Budget's reformulation directive; (b) failure to fully address related national environmental legislation, including the Clean Water Act, Endangered Species Act, and the Fish and Wildlife Coordination Act; (c) failure to address the planning concerns, goals, and objectives presented by the Service; (d) presentation of incomplete and inaccurate characterizations of baseline and future without-the-project conditions; (e) failure to incorporate separable, spatially explicit non-structural flood control features; (f) failure to consider and quantify, in the assessment of cumulative impacts, the well-documented relationship between flood control/drainage and agricultural expansion and intensification in the Mississippi Alluvial Valley; (g) failure to completely and accurately characterize environmental problems and concerns; (h) failure to include an analysis of the feasibility and viability of the Corps' proposed "environmental features;" (i) failure to consider the catastrophic impacts of the Project

Design Flood in the formulation, assessment, and evaluation of alternatives; and, (j) failure to consider alternatives designed to promote economically and ecologically sustainable development in concert with Project Design Flood protection measures.

The deficiencies and inadequacies of the DSEIS coupled with the planning process-related deficiencies previously noted, substantiate our conclusion that the recommended plan does not meet the needs of the Yazoo Backwater Area and that the environmental compliance documents fail to meet CEQ's applicable Implementing Regulations and policy guidance. Accordingly, the Service recommends that the planning process be reinitiated. Non-structural alternatives that will fully address the Service's planning goals and objectives should be formulated and evaluated, and a new draft supplemental EIS should be subsequently be prepared and circulated for review.

Based on our findings and concerns, and depending on the Corps' decision to proceed with either this proposal or any similar plan selected for inclusion in the final statement, we may refer this project to CEQ under Section 1504 of the Council's Regulations for Implementing the Procedural Provisions of NEPA. The Service wishes to further coordinate with the Corps at the earliest possible time in order to reach a solution to our issues and concerns that could preclude the necessity for referral. Coordination can be initiated by contacting the Yazoo Basin Team Leader, U.S. Fish and Wildlife Service, Vicksburg, Mississippi, at 601/629-6600.