

FINAL REPORT



EVALUATION OF PROPOSED WILDLIFE MANAGEMENT LAKE

Prepared for

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Prepared by



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TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
1.1 BACKGROUND	1
1.2 SETTING	2
2.0 METHODS	3
3.0 RESULTS AND DISCUSSION	4
3.1 WETLANDS AND PERMITTING CONSIDERATIONS	4
3.2 OFFSETTING THE LOSS OF UPLAND PONDS	5
3.3 AUGMENTATION OF WOOD DUCK HABITAT	6
3.4 OTHER ECOLOGICAL CONSIDERATIONS	6
4.0 CONCLUSIONS	9
5.0 LITERATURE CITED	10

INTRODUCTION

Entergy Operations, Inc., River Bend Station (Entergy-RBS) requested that Woodward-Clyde Consultants (WCC) perform an evaluation of the potential environmental consequences of constructing a "wildlife management lake" on Entergy-RBS property in West Feliciana Parish, Louisiana. This report discusses the background and setting of the proposed lake, methods used in the evaluation, results, and conclusions.

1.1 BACKGROUND

In the early 1970s, Gulf States Utilities Company (GSU) applied for a permit to construct a nuclear-fueled steam electric generating facility to be called River Bend Station on a 3,300-acre tract of land just south of St. Francisville, Louisiana, adjacent to the Mississippi River. Pursuant to the National Environmental Policy Act (NEPA; 42 U.S.C. §§ 4321 *et seq.*) an *Environmental Report - Construction Permit Stage* (ER-CPS) was prepared and submitted to the (then) Atomic Energy Commission. The ER-CPS contained a series of largely-conceptual commitments relating to natural resource management at RBS, among which was a statement that a "wildlife management lake" would be created by impoundment of a natural drainage area near the bluff overlooking the river. Associated with the lake was to be a road connected to the main River Access Road.

Whereas detailed plans for the size, configuration, and location of the plant *per se* on the property changed between the time of ER-CPS submission (1973/74) and the beginning of the major construction effort (1979/80), there were no changes in the basic commitments to natural resource management on the site. Virtually all of these commitments, including those related to the wildlife management lake, were carried forward from the ER-CPS to the *Environmental Report - Operating License Stage* (ER-OLS).

Original concepts of the functions of the lake were very limited. Part of the rationale for its construction was as an "offset" (mitigation) for the anticipated removal of 5 to 7 farm ponds with an aggregate estimated surface area of about 2-5 acres from the upland portion of the property. The lake was also envisioned as augmenting habitat for wood ducks (*Aix sponsa*),

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general populations of which were declining in the early 1970s due to pervasive losses of bottomland hardwood forests throughout the southcentral U.S. The only other stated purpose of the lake was as a sort of "backdrop" or setting for an outdoor classroom. Mention was made of stocking the lake with fish, yet there was no apparent intention to develop an actual fishery.

1.2 SETTING

The original conceptual design of the wildlife management lake entailed installation of an earthen dam and concrete spillway at the point where the old tramway crosses the first intermittent upland tributary north of the River Access Road. At the anticipated weir crest (50 ft above mean sea level [msl]) the dam would inundate the "floor" of most of the valley of the tributary, forming a shallow lake of approximately 34 surface acres. Much of the area to be impounded is contiguous with the Mississippi River (and Alligator Bayou) floodplain. Although the average depth of the lake would be less than 6 ft, most of its shoreline would be very steep, due to the sharp ridges and bluff which abut the riparian lowlands.

Evaluation of the potential environmental consequences of constructing the wildlife management lake at RBS involved the following activities:

- Review of readily available documents (e.g., ER-CPS, ER-OLS, relevant correspondence, applicable regulations)
- Field inspection of the proposed lake site
- Interviews with knowledgeable parties at River Bend Station (e.g., Environmental Services Group personnel, Licensing personnel, representatives of the River Bend Sportsman's Club)
- Consultation with regulatory and conservation agencies and academicians

This evaluation was performed by Dr. John V. Conner, who, prior to joining WCC, worked as a contractor or direct-hire employee at RBS from 1972 through early 1990. He is therefore familiar with the property and the relevant history of its development. Dr. Conner is a Certified Senior Ecologist (Ecological Society of America, #419, 1993) and a Certified Fisheries Scientist (American Fisheries Society, #1426, 1981). Several of his 30+ scientific publications are based directly or indirectly on field ecological studies conducted on RBS property. While on the faculties of both Texas A&M University (1965-69) and Louisiana State University (LSU) (1972-82) Dr. Conner was involved in extension and research relating to artificial lake construction and management, and he still occasionally engages in lake management consulting.

3.1 WETLANDS AND PERMITTING CONSIDERATIONS

Much of the area to be impounded in creating the wildlife management lake appears to be jurisdictional wetland. That is, it appears to fit the regulatory definition of a "wetland" and therefore would be considered "navigable waters of the U.S." (33CFR320-330). An *official* wetlands determination ("delineation") can only be performed by the U.S. Army Corps of Engineers (USACE) or, in some cases, the Environmental Protection Agency or the U.S. Department of Agriculture's Soil Conservation Service (SCS). Such a formal determination has not been performed for the subject area, but there is little doubt that a "delineation" would classify the lower (western) third to two-thirds of the proposed lake bed as "wet." The area in question is an extension of the Mississippi River floodplain, and is subject to varying degrees of inundation by river backwaters during the spring in most years. The vegetation of most of the proposed lake bed is dominated by representatives of hydrophytic species (e.g., black willow [*Salix niger*], various sedges [Cyperaceae]). Despite the deposition of eroded soil from the former "Primary Spoil Area" (more recently referred to as the 500 Yard) in parts of the proposed lake bottom area (especially to the east), much of the underlying "native" soil would be considered hydric. Thus, the three criteria for wetlands classification -- hydrology, hydrophytic vegetation, and hydric soils -- are satisfied in at least part (probably most) of the area to be inundated by the proposed wildlife management lake. The foregoing discussion is based largely on the report author's personal familiarity with the proposed lake location, including a field inspection on November 15, 1994.

Placing of fill in a wetland requires a permit under Section 404 of the federal Clean Water Act (CWA) (33CFR325) and a water quality certification under Section 401 of the CWA (33 U.S.C. §1341; see also 33CFR320.4(d)). In this case, permitting authority rests with the USACE (New Orleans District), which would coordinate acquisition of the water quality certification by the Louisiana Department of Environmental Quality. While it is true that construction of the lake would "create additional aquatic habitat," the proposed action would in fact replace *a wetland* with a deepwater (i.e., permanent) aquatic habitat. Moreover, installation of the dam/spillway would clearly constitute *discharge of fill into wetlands*.

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In view of the national policy of "no net loss of wetlands," obtaining a permit to construct the wildlife management lake as described in the formal commitments would presumably require a relatively detailed analysis of practical alternatives (which would be carefully scrutinized). The permit itself, if issued, would probably contain compensatory mitigation requirements (e.g., replacement at a ratio no less than 1:1). The degree of mitigation required would depend largely on a detailed assessment of the "function and value" of the wetland to be replaced.

An issue that may arise in consideration of the permitting of the proposed lake is whether the USACE, as a formal reviewer of RBS NEPA documentation, has not somehow already "tacitly approved" the impoundment since no specific objection was raised. However, until the early 1980's, the Corps would not likely have considered the area in question "jurisdictional." This is because, up until that time, the Corps tended to focus on more narrowly-defined navigable waters and habitats immediately adjacent to such waters (William James, USACE, Nashville, TN; personal communication). Moreover, the descriptions of the proposed lake in the NEPA documents are sufficiently vague that it would not have been readily evident that a portion of the river floodplain was involved.

3.2 OFFSETTING THE LOSS OF UPLAND PONDS

Based on the recollection of this report author, the actual aggregate surface area of upland pond habitat ultimately lost through development of what became the industrial portion of RBS property was no more than 3 acres. None of the 5 or 6 ponds in question was a natural feature; all were SCS-style stock-watering ponds, ranging in size from about 0.1 to 0.7 acres. At the time GSU acquired the property, several of these ponds were in somewhat advanced stages of disrepair (e.g., partially-breached dams, sediment encroachment), and at least one was nearly dewatered. Several additional upland ponds (some of which are larger than an acre in surface area) remain essentially as they were in the early 1970s. It is also noteworthy that GSU expanded its property eastward in 1984 or 1985, which acquisition included two relatively large upland ponds. One of the latter by itself exceeds the aggregate area of all the ponds removed during construction of RBS.

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3.3 AUGMENTATION OF WOOD DUCK HABITAT

The proposed lake would substantially enhance habitat for the wood duck (*Aix sponsa*), according to Dr. Robert E. Noble of the School of Forestry, Wildlife, and Fisheries at LSU. Dr. Noble was involved in preparation of the ER-CPS, and has returned to the site periodically over the subsequent years on consulting assignments and class field trips. He was interviewed via telephone on December 7, 1994. Dr. Noble pointed out that the regional trend toward declining wood duck populations in the 1960s and 1970s was successfully reversed in subsequent years, in part because of creation of lakes such as that contemplated herein. Another major factor has been widespread deployment of artificial nesting boxes under a variety of federal, state, and private programs (which included RBS property).

It is reasonable to expect that construction of the wildlife management lake, as proposed, will result in a net increase in the density of the local wood duck population. A question remains as to the current need for enhancement, compared to that which clearly existed in 1973.

3.4 OTHER ECOLOGICAL CONSIDERATIONS

Aside from the strictly regulatory issues related to permitting and water quality certification, the ecological value of the proposed lake area in its more natural state should be considered. The area is not, of course, entirely pristine because of the manmade tramline fill built in the mid-19th Century, clearing of parts of the forest by the previous landowner(s), and some encroachment of sediment from the 500 Yard. But it still includes an estimated 15 to 20 acres of wetland (or terrain that is at least functionally equivalent to wetland). Regardless of the extent to which it may be "wet," virtually all of the proposed lake area is an *ecotone* (ecological edge) -- an area of transition where two major communities meet and integrate (Smith 1980). Ecotones are often characterized by high diversity, because they tend to support species adapted to both adjacent communities as well as additional species that are relatively dependent upon edges (Allee *et al.* 1949). Wild turkey (*Meleagris gallopavo*) and white-tailed deer (*Odocoileus virginianus*) are examples of predominantly "edge" species, but many nongame animals (especially songbirds) also fall in the category (Odum 1971; Rue 1978). Creation of the wildlife management lake in the proposed location would interpose a third major habitat between the upland and the bottomland swamp. By intent, the lake would dramatically change the community composition and structure within the immediate

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"footprint" of the lake and its periphery. In the absolute sense of taxonomic diversity the lake would, at least initially, result in a marked increase in the local "species richness." Whether this is beneficial or detrimental depends almost entirely on the perspective of concerned parties (see below).

The area immediately upstream of (east of) the tramline was one of several "stations" routinely visited for aquatic ecological sampling by LSU researchers during the mid- to late 1970s (Conner 1981). Much of this research was focused on evaluating the functional importance of the Mississippi River/Alligator Bayou floodplain, with particular emphasis on its role as spawning and "nursery" habitat for fishes. General concern had been voiced for decades about the impacts of various flood-control measures on fisheries resources (e.g., Viosca 1927, 1928; Gunter 1956, 1957), largely on the basis of intuitive reasoning and the presumption that Mississippi River fisheries behave similarly to those of other major continental drainages (Welcomme 1979). Early sampling of fish eggs and larvae in the river suggested that several species spawned and/or underwent portions of their early development somewhere *other than* in the river (Gallagher and Conner 1980). It was presumed, largely on the basis of "conventional wisdom," that the floodplain was used by these fishes for spawning and early development. At that point in time virtually all of the evidence was anecdotal and no attempt to actually document the phenomenon had been made in inland waters of North America. Several studies of fish reproduction/development in backwaters and overflow habitats of various streams across the U.S. began in 1980/81, including one in the Alligator Bayou floodplain at RBS. Boyer (1982) showed that, indeed, the lowland portions of RBS property are spawning and nursery habitat for several riverine fishes and some of the swamp residents. The lower (western) part of the proposed wildlife management lake area was one of Boyer's sampling sites, and did not appear to differ materially from other similar stations. It was apparent from this study that the easternmost marginal stations (i.e., most remote from the river), including the one in the proposed wildlife management lake area, were the most productive of young fish. Construction of the proposed lake under the current conceptual design would eliminate up to 20 acres of spawning and/or nursery habitat for transient fishes.

According to representatives of the River Bend Sportsman's Club, the proposed lake site is one of the more productive white-tailed deer hunting areas on RBS property. It was once (during the report author's tenure onsite) one of the main "corridors" through which wild

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turkeys moved from roosting sites in the bottomland swamp into foraging areas along some of the ridgetops. Because of its relative seclusion (compared to the River Access Road or the 500-kv transmission line right-of-way heading westward), the proposed lake bed area is probably a significant migration route for any wildlife that regularly moves between the upland and lowland portions of RBS property. Construction of the proposed lake would presumably interfere with this function to some degree.

From a strictly ecological perspective, it is the opinion of this report author that construction of the proposed wildlife management lake as vaguely "designed" in the licensing commitments is undesirable. A significant portion of the area that would be changed has been shown to be spawning and/or nursery habitat for certain riverine and swamp fishes. Relative to the total area of such habitat in lowlands on RBS property, the 15-20 acres that would be lost is small, but the intended function of the proposed artificial lake does not seem to this author to offer adequate justification for the action. It comes down, fundamentally, to a choice between a natural spawning/nursery habitat for fish *versus* an artificial lake that would benefit waterfowl. The relative priorities of the opposing uses is not a technical issue, but rather a matter of subjective judgement.

Although they may have had some merit 20+ years ago at the time they were conceived, the stated reasons for building the lake are much less compelling today. Wood duck densities would probably be increased by the lake, but there no longer appears to be a particular need. Mitigation of the loss of a few acres of upland manmade ponds has been achieved indirectly through expansion of RBS property to the east.

In this author's judgement, even if those stated reasons were still valid, other means of fulfilling the objectives would be preferable to replacing **any amount** of riparian wetland. Note that there are additional commitments in the NEPA documents which suggest (if not explicitly state) an intent to avoid disturbing the floodplain swamp on RBS property. As knowledge accrued over the years of ecological research onsite -- virtually all of which occurred after the lake commitment was broached -- the ecological value of the particular area in question became much more apparent. Specifically, it was not recognized at the time the commitment was made that the proposed lake site would include so much riparian wetland. In a sense, building the lake (at least in the exact location suggested in the commitment) would be inconsistent with the intent stated elsewhere to preserve the floodplain.

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