

# **APPENDIX A1**

## **U.S. FISH AND WILDLIFE SERVICE PLANNING AID INPUT for LCA COMPREHENSIVE STUDY**

**Completed by U.S. Fish and Wildlife Service, Lafayette, Louisiana**

**August 13, 2003**

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# **Louisiana Coastal Area Comprehensive Study Fish and Wildlife Benefits Evaluation**

**Completed by U.S. Fish and Wildlife Service, Lafayette, Louisiana**

**August 13, 2003**

A team of scientists led by Dr. Robert Twilley of the University of Louisiana at Lafayette (LCA Modeling Team) is assisting the development and evaluation of restoration alternatives for the Louisiana Coastal Area Comprehensive Study (LCA). That team has developed a comprehensive modeling approach which utilizes numerical modeling and coarser-scale “desktop” modeling to forecast wetland conditions under future without-project (FWOP) and future with-project (FWP) scenarios. The numerical modeling includes the use of hydrodynamic, ecological, and water quality simulation models to predict hydroperiod, salinity, and sediment distribution. The desktop modeling has involved the development of a set of modules to convert numerical modeling results into landscape and ecological responses (e.g., acres of wetlands created). Outputs from the numerical models are utilized in the desktop models at different time intervals and space scales to predict habitat change, habitat loss, salinity, and a host of other pertinent variables. Desktop modules developed for this study include 1) Land-Building, 2) Habitat Switching, 3) Water Quality and 4) Habitat Use.

The Habitat Use module provides a methodology for estimating the impacts of restoration alternatives on fish and wildlife resources in the study area. That methodology is very similar to the Habitat Evaluation Procedures (HEP) developed by the U.S. Fish and Wildlife Service (Service). Twelve representative species/species groups of fish, shellfish, and wildlife were selected for evaluation, and include white shrimp, brown shrimp, American oyster, Gulf menhaden, spotted seatrout, Atlantic croaker, largemouth bass, American alligator, muskrat, mink, river otter, and dabbling ducks. The Service’s published Habitat Suitability Index (HSI) models for the fish and shellfish species were modified to only include those variables for which output would be available from numerical or other desktop models. Important variables for those species included salinity, temperature, water depth, and percent wetland area. Models for the wildlife species were developed with methods similar to those used for the fish and shellfish models. All of the wildlife models utilized three variables, i.e., habitat type, percent wetland area, and water depth.

Originally, the Service intended to use the Habitat Use module outputs to determine impacts to fish and wildlife resources in the study area. Several inconsistencies and problems were noted, however, when comparing outputs among restoration alternatives and across the four coastal Subprovinces. Of particular concern is the projected increase in habitat values for most of the evaluation species under the No Action alternative and the inverse relationship between wetland dependent wildlife benefits and increases in their preferred habitats under some scenarios. Therefore, the Service decided to use an interim method to determine impacts to fish and wildlife until the LCA numerical and desktop models are further refined to more accurately project impacts to fish and wildlife resources. The Service fully intends to continue assisting the LCA

Modeling Team and the other involved agencies as part of an ongoing effort to refine model outputs. The Service fully recognizes that the plan selection process is ongoing, and that the estimates presented here reflect a set of wetland restoration measures that continues to be refined. Therefore, the benefit estimates presented in this evaluation should be viewed as interim values.

## **Evaluation Methodology**

To determine impacts of the Preferred Plan on fish and wildlife resources, the Service used a modification of the HEP. Biologists with the USACE, Louisiana Department of Wildlife and Fisheries, and the Service selected 10 of the 12 evaluation species from the Habitat Use module. The species selected represent fish and wildlife resources which utilize the full range of coastal wetland habitats, from swamp to saline marsh. Estuarine-dependent species selected for evaluation include Atlantic croaker, spotted seatrout, Gulf menhaden, brown shrimp, and white shrimp. Wildlife species selected for evaluation include mink, river otter, muskrat, American alligator, and dabbling ducks. The largemouth bass was not selected as an evaluation species because its HSI model is primarily used for lacustrine and riverine habitats, not estuarine habitats. Therefore, it was difficult to draw inferences from the published HSI model and apply them to estuarine habitats, as was done for the other evaluation species. In addition, largemouth bass prefer low-salinity habitats such as fresh and intermediate marsh; thus, benefits to that species could be inferred from benefits to other low-salinity species (e.g., dabbling ducks and American alligator). In addition, the American oyster was not selected as an evaluation species because it is not impacted by the quality of emergent wetland habitat. Habitat suitability for each of the selected species is dependent on emergent wetland habitat conditions.

To determine impacts on each evaluation species, the Service incorporated habitat change and wetland acres projected by the LCA numerical and desktop models and an HSI for each species for each wetland type into the HEP methodology to determine impacts in terms of net Average Annual Habitat Units (AAHUs). To derive AAHUs, a species' HSI for a specific habitat type is multiplied by the acreage of that habitat type to obtain Habitat Units, which are annualized over the evaluation period (i.e., 50 years). Net AAHUs represents the difference in AAHUs between the Preferred Plan, and No Action conditions.

Because the models used to project future habitat types assigned a single average salinity value to a very large area or "salinity box", salinities are essentially averaged across those areas. In some cases, this has eliminated actual salinity gradients and caused unexpected shifts in projected salinities (those shifts appear at target year 10, the first future projection). Not having a better method for projecting future habitat type changes, the Service has used the existing habitat type data until the methodology can be improved.

HSI values for each wetland type were derived for the wildlife species using the wetland type-habitat suitability relationships found in the LCA Habitat Use module. For the estuarine-dependent species, HSI values were provided by the National Marine Fisheries Service utilizing the published salinity-habitat suitability relationships found in each species' HSI model. The HSI values for each evaluation species, by wetland type, are displayed in Table 1.

**Table 1. HSI Values for each Evaluation Species by Wetland Type**

<b>Evaluation Species</b>	<b>Swamp</b>	<b>Fresh Marsh</b>	<b>Intermediate Marsh</b>	<b>Brackish Marsh</b>	<b>Saline Marsh</b>
Atlantic Croaker	0	0.4	0.8	1.0	0.6
Spotted Seatrout	0	0.1	0.2	0.5	0.9
Gulf Menhaden	0	0.2	0.4	0.6	0.9
Brown Shrimp	0	0.1	0.3	0.8	1.0
White Shrimp	0	0.2	1.0	1.0	0.7
Mink	0.68	0.40	0.29	0.24	0
River Otter	0.68	0.39	0.67	1.0	0
Muskrat	0.04	0.21	0.11	1.0	0.43
American Alligator	0.26	0.55	1.0	0.55	0
Dabbling Ducks	0.66	1.0	0.69	0.66	0.08

**Evaluation of the Preferred Plan**

Subprovince 1

In this Subprovince, restoration features of the Preferred Plan are as follows: 1) a 5,000 cubic feet per second (cfs) diversion into the Maurepas Swamp at Convent/Blind River; 2) a 1,000 cfs diversion into the Maurepas Swamp at Hope Canal; 3) a 10,000 cfs diversion into the Breton Sound Basin at White’s Ditch; 4) a 110,000 cfs diversion into the Breton Sound Basin at American/California Bay with sediment enrichment; 5) a 12,000 cfs diversion at Bayou Lamoque; 6) Seabrook salinity control structure; 7) optimize Caernarvon Freshwater Diversion Project to optimize marsh creation; 8) opportunistic use of the Bonnet Carre Spillway; 9) gap Amite River Diversion Canal spoil banks; 9) restore Labranche wetlands through sediment delivery; 10) rehabilitate and operate the Violet Siphon; 11) study the diversion of freshwater from the Mississippi River through the IHNC; and 12) nourish land bridge marshes.

Under the No Action Alternative, wetland loss continues with over 47,000 acres lost by year 50. Under the Preferred Plan, wetland acreage would increase through deltaic land-building resulting in a gain of over 118,000 acres by year 50. Compared to the No Action Alternative, the Preferred Plan would result in a gain of over 166,700 wetland acres (Table 2) at year 50. Freshwater diversion associated with the Preferred Plan would also increase fresh and

intermediate marsh acreages, compared to the No Action Alternative under which the acreage of all habitat types would decrease between years 10 and 50. The proposed diversions into brackish and/or saline marsh areas (White’s Ditch, American/California Bay, and Bayou Lamoque) would result in greater amounts of fresh and intermediate marsh, at the expense of brackish and saline marsh, compared to No Action.

**Table 2. Subprovince 1 wetland type distribution (acres) for the No Action and Preferred Plan Alternatives**

Subprovince 1 - No Action Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	71,279	218,350	215,393	211,989	210,104	207,760
Intermediate marsh	160,752	101,797	101,113	99,948	99,045	98,156
Brackish marsh	180,441	151,820	150,303	148,071	146,116	142,972
Saline marsh	113,149	61,278	58,879	58,241	55,652	54,802
Swamp	<u>353,904</u>	<u>336,154</u>	<u>333,897</u>	<u>331,680</u>	<u>329,497</u>	<u>327,350</u>
Total wetlands	879,525	869,399	859,586	849,929	840,414	831,040

Subprovince 1 - Preferred Plan Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	71,279	231,822	245,951	263,623	282,554	300,482
Intermediate marsh	160,752	225,491	242,345	252,678	261,799	269,920
Brackish marsh	180,441	63,800	62,750	62,099	61,086	60,190
Saline marsh	113,149	56,738	55,297	54,485	52,360	51,558
Swamp	<u>353,904</u>	<u>329,470</u>	<u>325,290</u>	<u>321,915</u>	<u>319,112</u>	<u>315,646</u>
Total wetlands	879,525	907,320	931,632	954,801	976,912	997,796

Of the five wildlife species evaluated, four would benefit from the proposed restoration features associated with the Preferred Plan. Mink, which prefer swamp and fresh and intermediate marsh, would benefit from the projected increase in those wetland types. Overall, mink habitat value, in terms of AAHUs, would increase by 5.7 percent. The American alligator and dabbling ducks also prefer fresher environments and, thus, would benefit from the projected increase in fresh and intermediate marshes. Habitat value for the American alligator and dabbling ducks would increase by 22.2 percent and 11.7 percent, respectively. The river otter prefers brackish marsh, but swamp, fresh marsh, and intermediate marsh also provide desirable habitat for that species. Although brackish marsh would decline with the Preferred Plan, the projected increase in swamp and fresh and intermediate marshes would offset the predicted loss of the otter’s preferred habitat, brackish marsh. Therefore, the HEP analysis indicates that the Preferred Plan would result in a 5.5 percent increase in AAHUs for the river otter. The muskrat is the only evaluation species, which would be negatively impacted by the Preferred Plan. Brackish marsh is considered its preferred habitat and has a much higher value for that species than fresh and intermediate marshes. Due to the anticipated decline in brackish marsh acreage, a net decrease in muskrat AAHUs of 19.7 percent is projected under FWP conditions. Table 3 displays AAHUs by wetland type for each of the evaluation species.

**Table 3. Impacts (AAHUs) of the Preferred Plan Alternative on coastal wildlife in Subprovince 1**

Wetland Type	Mink		Otter		Muskrat		Alligator		Dabbling Ducks	
	No Action	Preferred Plan								
Fresh	55,262	73,435	53,880	71,600	29,012	38,554	75,985	100,974	138,155	183,589
Intermediate	37,723	62,131	87,154	143,544	14,309	23,567	130,080	214,245	89,755	147,829
Brackish	38,899	29,164	162,081	121,518	162,081	121,518	89,145	66,835	106,974	80,202
Saline	0	0	0	0	59,407	26,495	0	0	11,052	4,929
Swamp	340,892	335,157	231,807	227,907	13,636	13,406	88,632	87,141	224,989	221,204
<b>Total</b>	<b>472,777</b>	<b>499,888</b>	<b>534,922</b>	<b>564,568</b>	<b>278,445</b>	<b>223,539</b>	<b>383,842</b>	<b>469,194</b>	<b>570,925</b>	<b>637,752</b>

Four of the five fish species evaluated would be adversely affected by the Preferred Plan Alternative (Table 4). Atlantic croaker, Gulf menhaden, and white shrimp typically utilize low-salinity habitats as juveniles and more brackish habitats as subadults and adults. Of those species, white shrimp would receive a minute positive effect under the Preferred Plan and Atlantic croaker would experience a minute negative impact. Gulf menhaden would experience a moderate decrease of 16.8 percent in AAHUs. In response to the loss of their preferred brackish habitats, spotted seatrout and brown shrimp would experience greater decreases in AAHUs of 27.6 percent and 24.7 percent, respectively.

**Table 4. Impacts (AAHUs) of Preferred Plan Alternative on coastal fisheries in Subprovince 1**

Wetland Type	Croaker		Menhaden		Spotted Seatrout		White Shrimp		Brown Shrimp	
	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan
Fresh	55,262	73,435	27,631	36,718	13,815	18,359	55,262	73,435	13,815	18,359
Intermediate	104,064	171,396	52,032	85,698	26,016	42,849	130,080	214,245	39,024	64,273
Brackish	162,081	121,518	97,249	72,911	81,041	60,759	162,081	121,518	129,665	97,214
Saline	82,893	36,969	124,339	55,454	124,339	55,454	110,524	49,293	138,155	61,616
Swamp	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>404,300</b>	<b>403,318</b>	<b>301,251</b>	<b>250,780</b>	<b>245,211</b>	<b>177,421</b>	<b>457,947</b>	<b>458,490</b>	<b>320,659</b>	<b>241,462</b>

## Subprovince 2

Restoration features of the Preferred Plan include: 1) a 5,000 cfs diversions at Edgard with sediment enrichment; 2) a 5,000 cfs pulsed diversion at Myrtle Grove; 3) a 60,000 cfs diversion at Fort Jackson with sediment enrichment; 4) wetland creation; 5) barrier island restoration; 6) reauthorization of the Davis Pond Diversion at 5,000 cfs; 7) initiate the Mississippi River Delta Management Study; and 8) the Third Delta freshwater and sediment diversion.

Under the No Action Plan an additional 163,000 acres of wetlands would be lost over 50 years. Implementation of the Preferred Plan would reduce that loss to less than 58,000 acres. Over 50 years, the net effect of the Preferred Plan would be to save almost 106,000 wetland acres. The No Action alternative used for this analysis does not include the Davis Pond Freshwater Diversion Project. The Service believes that the current LCA modeling analysis for No Action, which included the Davis Pond Diversion, does not accurately project the likely distribution of wetland types in the Barataria Basin.

The Preferred Plan would cause a shift toward fresher conditions in Subprovince 2 compared to the No Action Alternative. The diversions at Myrtle Grove and Fort Jackson would result in greater amounts of fresh and intermediate marsh, at the expense of brackish marsh, compared to the No Action scenario. Those diversions, with the associated sediment enrichment, would also result in the restoration/creation of several thousand acres of wetlands. Habitat distribution with this alternative compared to the No Action alternative is shown in Table 5. However, the Service believes that the current LCA modeling analysis for the Preferred Plan, which indicates that no brackish and saline marsh would exist at year 10, is inaccurate. Refinement of model output is planned in the future.

**Table 5. Subprovince 2 wetland type distribution (acres) for the No Action and Preferred Plan Alternatives**

### Subprovince 2 - No Action Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	180,876	306,490	290,379	275,368	260,297	244,994
Intermediate marsh	85,267	996	750	747	494	488
Brackish marsh	65,338	107,558	87,039	70,958	59,271	52,168
Saline marsh	117,809	0	0	0	0	0
Swamp	<u>294,397</u>	<u>289,559</u>	<u>290,879</u>	<u>289,560</u>	<u>286,968</u>	<u>282,291</u>
Total wetlands	743,687	704,602	669,046	636,633	607,030	579,940

### Subprovince 2 - Preferred Plan Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	180,876	321,531	317,750	308,436	299,097	289,385
Intermediate marsh	85,267	152,727	150,297	141,436	131,829	122,469
Brackish marsh	65,338	0	0	0	0	0
Saline marsh	117,809	0	0	0	0	0
Swamp	<u>294,397</u>	<u>283,288</u>	<u>281,021</u>	<u>277,855</u>	<u>274,526</u>	<u>274,018</u>
Total wetlands	743,687	757,547	749,068	727,726	705,452	685,872

Except for muskrat, each of the wildlife species evaluated would benefit from the proposed restoration features associated with the Preferred Plan. The American alligator and dabbling ducks would benefit the most with 21.1 percent and 9.1 percent increases in AAHUs, respectively. Mink, which prefers swamp and fresh marsh, would also benefit from the projected increase in those wetland types. Overall, mink AAHUs would increase by 4.0 percent. The river otter prefers brackish marsh, but swamp, fresh marsh, and intermediate marsh also provide desirable habitat for that species. Although brackish marsh would decline with this alternative, the projected increase in swamp and fresh and intermediate marshes would offset the loss of the otter's preferred habitat. Our analysis indicates that the Preferred Plan would result in a 5.5 percent increase in AAHUs for the river otter. Brackish marsh is considered preferred muskrat habitat and has a much higher value for that species than fresh and intermediate marshes. The projected reduction in brackish marsh, compared to the No Action Alternative, results in a 10.0 percent decrease in AAHUs for the muskrat. Table 6 displays AAHUs by wetland type for each of the evaluation species.

**Table 6. Impacts (AAHUs) of the Preferred Plan on coastal wildlife in Subprovince 2**

Wetland Type	Mink		Otter		Muskrat		Alligator		Dabbling Ducks	
	No Action	Preferred Plan								
Fresh	84,918	93,618	82,795	91,278	44,582	49,150	116,762	128,725	212,294	234,046
Intermediate	12,680	30,014	29,296	69,342	4,810	11,385	43,725	103,496	30,170	71,412
Brackish	14,132	7,997	58,884	33,322	58,884	33,322	32,386	18,327	38,864	21,993
Saline	0	0	0	0	25,836	25,836	0	0	4,807	4,807
Swamp	288,465	284,411	196,156	193,400	11,539	11,376	75,001	73,947	190,387	187,711
<b>Total</b>	<b>400,195</b>	<b>416,041</b>	<b>367,131</b>	<b>387,342</b>	<b>145,650</b>	<b>131,068</b>	<b>267,874</b>	<b>324,495</b>	<b>476,521</b>	<b>519,969</b>

Of the five fish species evaluated, all but brown shrimp would benefit under the Preferred Plan (Table 7). Brown shrimp, which prefer brackish marshes, would experience a very slight decrease in AAHUs. Atlantic croaker, Gulf menhaden, and white shrimp, which typically utilize low-salinity habitats as juveniles and more-brackish habitats as subadults and adults, would receive the greatest benefits (AAHU increases of 14.4 percent, 8.7 percent, and 18.2 percent, respectively). Those benefits, derived largely from a substantial increase in marsh acreage through deltaic landbuilding, would more than offset the adverse affects of the conversion of brackish habitats to fresher habitats. For spotted seatrout, the negative effects of losing the brackish marsh under the Preferred Plan would be compensated for by the beneficial effects of substantial deltaic land building and increases in low-salinity habitat acreages.

**Table 7. Impacts (AAHUs) of the Preferred Plan on coastal fisheries in Subprovince 2**

Wetland Type	Croaker		Menhaden		Spotted Seatrout		White Shrimp		Brown Shrimp	
	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan
Fresh	84,918	93,618	42,459	46,809	21,229	23,405	84,918	93,618	21,229	23,405
Intermediate	34,980	82,797	17,490	41,398	8,745	20,699	43,725	103,496	13,117	31,049
Brackish	58,884	33,322	35,331	19,993	29,442	16,661	58,884	33,322	47,107	26,658
Saline	36,050	36,050	54,074	54,074	36,050	36,050	48,066	48,066	60,083	60,083
Swamp	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>214,831</b>	<b>245,787</b>	<b>149,354</b>	<b>162,275</b>	<b>95,466</b>	<b>96,814</b>	<b>235,593</b>	<b>278,502</b>	<b>141,537</b>	<b>141,194</b>

Subprovince 3

Features of the Preferred Plan are as follows: 1) a 1,000 cfs pump at Bayou Lafourche; 2) features to convey Atchafalaya River water to the eastern Terrebonne marshes; 3) freshwater introduction via Blue Hammock Bayou and south of Lake DeCade; 4) the Penchant Basin Restoration Plan; 5) relocation of the Atchafalaya River navigation channel to Shell Island Pass; 6) increased sediment transport down the Wax Lake Outlet; 7) modification of operation of the Old River Control structure; 8) multi-purpose operation of the Houma Navigation Canal Lock; 9) maintain north Cote Blanche Bay shore; 10) rebuild the Pointe Chevreuil reef; 11) restore the Isle Dernieres and Timbalier Islands; 12) restore and maintain the landbridge between Sister Lake and the Gulf; and 13) armor the Pointe au Fer Gulf shoreline.

At year 50, wetland loss under the No Action Plan (over 203,000 acres) would be greater in Subprovince 3 than in any other Subprovince. The Preferred Plan would reduce that loss to less than 84,000 acres. That loss would be the greatest Preferred Plan loss of any Subprovince. However, over 50 years, the Preferred Plan would save over 119,000 wetland acres in Subprovince 3, compared to the No Action Alternative.

According to model projections at year 50, the Preferred Plan would save substantially more fresh marsh than would the No Action alternative. Marsh-building processes on the Atchafalaya and Wax Lake Deltas would be made more efficient with relocation of the navigation channel and sediment enrichment of the Wax Lake Outlet. The Penchant Basin Restoration Plan would improve the health and productivity of flotant marsh in western Terrebonne and greater volumes of fresh water, sediments, and nutrients would be delivered to marshes south of the Penchant Basin. Conveyance of Atchafalaya River water to marshes in eastern Terrebonne would improve productivity and reduce marsh loss in areas where marine processes are advancing inland. Under the Preferred Plan, brackish marsh would decrease nearly 20 percent over 50 years, saline marsh would increase by over 200 percent, and swamp would decrease by nearly 4 percent. Habitat distribution for this alternative, compared to the No Action alternative, is shown in Table 8.

**Table 8. Wetland type distribution (acres) at year 50 for Subprovince 3 for the No Action and the Preferred Plan Alternatives**

Subprovince 3 - No Action Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	341,733	39,008	38,143	37,981	36,677	33,294
Intermediate marsh	193,569	647,998	645,519	639,828	627,832	619,079
Brackish marsh	201,216	100,504	86,608	69,219	55,812	40,046
Saline marsh	113,513	61,496	41,509	25,620	12,985	5,355
Swamp	<u>388,811</u>	<u>339,603</u>	<u>331,847</u>	<u>331,263</u>	<u>334,418</u>	<u>337,828</u>
Total wetlands	1,238,841	1,188,609	1,143,626	1,103,911	1,067,724	1,035,601

Subprovince 3 - Preferred Plan Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	341,733	221,320	214,225	203,142	188,130	175,592
Intermediate marsh	193,569	553,530	565,762	578,639	594,813	605,659
Brackish marsh	201,216	35,430	33,706	33,033	32,436	32,088
Saline marsh	113,513	74,540	54,970	37,977	23,936	16,490
Swamp	<u>388,811</u>	<u>340,952</u>	<u>335,023</u>	<u>331,678</u>	<u>329,060</u>	<u>325,335</u>
Total wetlands	1,238,841	1,225,772	1,203,685	1,184,469	1,168,376	1,155,164

Each of the five wildlife species evaluated would benefit from the proposed restoration features associated with the Preferred Plan Alternative. Muskrat, American alligator, and dabbling ducks would benefit the most, with 4.9 percent, 4.9 percent and 7.4 percent increases in AAHUs, respectively. Except for the muskrat, each of those species prefer fresher marshes, which would occur in substantially greater acreages with this alternative. Although the river otter and muskrat prefer brackish marsh, the projected increase in fresh and saline marshes would offset the relatively minor decrease in their preferred habitat. Table 9 displays AAHUs by wetland type for each of the evaluation species.

**Table 9. Impacts (AAHUs) of the Preferred Plan Alternative on coastal wildlife in Subprovince 3**

Wetland Type	Mink		Otter		Muskrat		Alligator		Dabbling Ducks	
	No Action	Preferred Plan								
Fresh	76,239	104,130	74,333	101,526	40,026	54,668	104,829	143,178	190,598	260,324
Intermediate	116,600	114,693	269,386	264,980	44,228	43,504	402,069	395,493	277,428	272,890
Brackish	29,338	28,402	122,243	118,343	122,243	118,343	67,233	65,089	80,680	78,107
Saline	0	0	0	0	26,022	28,368	0	0	4,841	5,278
Swamp	363,829	357,708	247,404	243,241	14,553	14,308	94,596	93,004	240,127	236,087
<b>Total</b>	<b>586,006</b>	<b>604,933</b>	<b>713,366</b>	<b>728,091</b>	<b>247,071</b>	<b>259,192</b>	<b>668,727</b>	<b>696,764</b>	<b>793,674</b>	<b>852,685</b>

The Preferred Plan would benefit all five fish species evaluated (Table 10). For species such as Atlantic croaker, Gulf menhaden, and white shrimp, which typically utilize low-salinity habitats as juveniles and more-brackish habitats as subadults and adults, those benefits are likely due to the substantial increase in fresh marsh acreage. Brackish marsh species such as brown shrimp and spotted seatrout would also benefit by increased acreage of fresh marsh habitat. Those increases, together with the increased acreage of saline marsh, would more than compensate for the small loss of preferred brackish marsh habitat, and would result in a small positive benefit for spotted seatrout (4.0 percent) and a slight increase for brown shrimp (2.5 percent) under the Preferred Plan.

**Table 10. Impacts (AAHUs) of the Preferred Plan Alternative on Coastal Fisheries in Subprovince 3**

Wetland Type	Croaker		Menhaden		Spotted Seatrout		White Shrimp		Brown Shrimp	
	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan
Fresh	76,239	104,130	38,120	52,065	19,060	26,032	76,239	104,130	19,060	26,032
Intermediate	321,655	316,394	160,828	158,197	80,414	79,099	402,069	395,493	120,621	118,648
Brackish	122,243	118,343	73,346	71,006	61,121	59,172	122,243	118,343	97,794	94,675
Saline	36,309	39,583	54,464	59,374	54,464	59,374	48,412	52,777	60,515	65,971
Swamp	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>556,446</b>	<b>578,450</b>	<b>326,757</b>	<b>340,642</b>	<b>215,059</b>	<b>223,677</b>	<b>648,963</b>	<b>670,743</b>	<b>297,990</b>	<b>305,326</b>

#### Subprovince 4

Preferred Plan restoration features are as follows: 1) salinity control at Oyster Bayou, Long Point Bayou, Black Lake Bayou, Alkali Ditch, Black Bayou, and the Highway 82 Causeway; 2) modification of the existing Cameron-Creole Watershed structures; 3) the East Sabine Hydrologic Restoration Project; 4) freshwater introduction at Pecan Island, Rollover Bayou, Highway 82, Little Pecan Bayou, and South Grand Chenier; 5) shoreline stabilization along the Gulf of Mexico; 6) beneficial use of dredged material along the Calcasieu Ship Channel; and 7) introduction of fresh water via the Sabine Irrigation Canal.

Under the Preferred Plan, wetland loss over 50 years would be limited to slightly more than 8,000 acres. However, under the No Action Alternative, the 50 year wetland loss would exceed 47,000 acres. Over the 50 year project life, the Preferred Plan Alternative would save over 39,000 wetland acres compared to the No Action Alternative.

The Preferred Plan Alternative, which utilizes perimeter structural salinity control and small freshwater diversions, would reduce the encroachment of marine processes and protect fresh and intermediate marshes throughout Subprovince 4. Consequently, under the Preferred Plan, the acreage of fresh and intermediate marshes would increase and brackish marsh acreage would

decrease, compared to the No Action Alternative. Habitat distribution for those alternatives is shown in Table 11.

**Table 11. Wetland type distribution (acres) at year 50 for Subprovince 4 for the No Action and Preferred Plan Alternatives**

Subprovince 4 - No Action Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>Acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	346,923	327,770	329,149	322,709	317,432	312,800
Intermediate marsh	284,702	252,741	252,199	247,418	242,973	238,517
Brackish marsh	137,529	203,099	210,131	207,889	205,021	202,292
Saline marsh	30,307	0	0	0	0	0
Swamp	<u>3,674</u>	<u>2,493</u>	<u>2,325</u>	<u>2,301</u>	<u>2,269</u>	<u>2,239</u>
Total wetlands	803,134	786,103	793,804	780,317	767,695	755,848

Subprovince 4 - Preferred Plan Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>Acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	346,923	329,535	335,420	331,951	328,759	326,685
Intermediate marsh	284,702	319,515	321,051	317,444	314,143	310,088
Brackish marsh	137,529	144,385	153,770	156,162	153,788	155,884
Saline marsh	30,307	0	0	0	0	0
Swamp	<u>3,674</u>	<u>2,505</u>	<u>2,359</u>	<u>2,347</u>	<u>2,330</u>	<u>2,311</u>
Total wetlands	803,134	795,940	812,599	807,903	799,020	794,968

Of the five wildlife species evaluated, all but muskrat would benefit from the proposed restoration features associated with the Preferred Plan Alternative. Mink, river otter, American alligator, and dabbling ducks would benefit with 3.0 percent, 0.7 percent, 4.9 percent, and 2.6 percent increases in AAHUs, respectively. Each of those species, except the river otter, prefers the fresher wetland types such as fresh and intermediate marsh, which would occur in substantially greater acreages with this alternative. Although the river otter prefers brackish marsh, the projected increase in fresh and intermediate marsh would offset the loss of its preferred habitat. The muskrat, however, would experience a 6.4 percent reduction in habitat value due to brackish marsh decreases under the Preferred Plan. Table 12 displays AAHUs by wetland type for each evaluation species.

**Table 12. Impacts (AAHUs) of the Preferred Plan Alternative on coastal wildlife in Subprovince 4**

Wetland Type	Mink		Otter		Muskrat		Alligator		Dabbling Ducks	
	No Action	Preferred Plan								
Fresh	132,081	134,802	128,779	131,432	69,343	70,771	181,611	185,353	330,202	337,006
Intermediate	76,001	86,171	175,588	199,084	28,828	32,685	262,071	297,141	180,829	205,027
Brackish	40,623	35,166	169,263	146,523	169,263	146,523	93,095	80,588	111,714	96,705
Saline	0	0	0	0	6,646	6,646	0	0	1,237	1,237
Swamp	2,970	3,006	2,020	2,044	119	120	772	782	1,961	1,984
<b>Total</b>	<b>251,675</b>	<b>259,145</b>	<b>475,650</b>	<b>479,084</b>	<b>274,199</b>	<b>256,747</b>	<b>537,550</b>	<b>563,864</b>	<b>625,942</b>	<b>641,959</b>

Compared to the No Action Alternative, Atlantic croaker, Gulf menhaden, and white shrimp, which utilize low salinity marshes as nursery habitat, would be benefited under the Preferred Plan Alternative. Those benefits are likely due to increases in fresh and intermediate marsh acreages under this alternative. Species such as spotted seatrout and brown shrimp would also benefit from gains in fresh and intermediate marsh. However, those benefits would not compensate for the substantial loss of preferred brackish marsh habitat. As a result, spotted seatrout and brown shrimp would experience small decreases in AAHUs of 2.0 percent and 2.7 percent, respectively.

**Table 13. Impacts (AAHUs) of the Preferred Plan Alternative on coastal fisheries in Subprovince 4**

Wetland Type	Croaker		Menhaden		Spotted Seatrout		White Shrimp		Brown Shrimp	
	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan	No Action	Preferred Plan
Fresh	132,081	134,802	66,040	67,401	33,020	33,701	132,081	134,802	33,020	33,701
Intermediate	209,657	237,713	104,829	118,856	52,414	59,428	262,071	297,141	78,621	89,142
Brackish	169,263	146,523	101,558	87,914	84,632	73,262	169,263	146,523	135,410	117,219
Saline	9,274	9,274	13,911	13,911	13,911	13,911	12,365	12,365	15,457	15,457
Swamp	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>520,275</b>	<b>528,312</b>	<b>286,338</b>	<b>288,082</b>	<b>183,977</b>	<b>180,301</b>	<b>575,781</b>	<b>590,832</b>	<b>262,509</b>	<b>255,518</b>

## Coastwide Benefits Summary

The coastwide effects of the Preferred Plan Alternative for each Subprovince would include a substantial increase in fresh marsh, a moderate increase in intermediate marsh, a substantial reduction in brackish marsh, a small gain in saline marsh, and a slight decrease in swamp (Table 14). Thus, the Preferred Plan Alternative would result in a combined net increase of over 431,000 wetland acres at year 50, compared to the No Action scenario.

**Table 14. Coastwide wetland type distribution (acres) at year 50 for the No Action and the Preferred Plan Alternatives**

### Coastwide wetland acreage - No Action Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>Acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	940,811	891,618	873,064	848,047	824,509	798,847
Intermediate marsh	724,289	1,003,532	999,582	987,941	970,344	956,240
Brackish marsh	584,524	562,981	534,080	496,138	466,220	437,477
Saline marsh	374,778	122,774	100,388	83,861	68,637	60,157
Swamp	<u>1,040,785</u>	<u>967,809</u>	<u>958,948</u>	<u>954,803</u>	<u>953,153</u>	<u>949,707</u>
Total wetlands	3,665,188	3,548,713	3,466,062	3,370,791	3,282,862	3,202,429

### Coastwide wetland acreage - Preferred Plan Alternative

<u>Wetland type</u>	<u>acres00</u>	<u>Acres10</u>	<u>acres20</u>	<u>acres30</u>	<u>acres40</u>	<u>acres50</u>
Fresh marsh	940,811	1,104,208	1,113,345	1,107,151	1,098,540	1,092,144
Intermediate marsh	724,289	1,251,263	1,279,454	1,290,197	1,302,585	1,308,136
Brackish marsh	584,524	243,615	250,226	251,294	247,311	248,162
Saline marsh	374,778	131,278	110,267	92,462	76,296	68,047
Swamp	<u>1,040,785</u>	<u>956,215</u>	<u>943,694</u>	<u>933,795</u>	<u>925,028</u>	<u>917,310</u>
Total wetlands	3,665,188	3,686,579	3,696,985	3,674,899	3,649,759	3,633,799

By year 50 under the No Action Alternative, loss of coastal wetlands would continue with nearly 463,000 acres being lost. However, under the Preferred Plan Alternative, those losses would be nearly eliminated with only 31,389 acres being lost under the Preferred Plan Alternative. Under the No Action Alternative, the acreage of all habitat types would decrease, except for intermediate marsh, which might increase. Saline marsh would experience the greatest decrease (60 percent) over 50 years. Because the drastic shifts in saline and intermediate marsh acreage are projected to occur by year 10, they may be unrealistic artifacts of the salinity projection methodology. Future refinement of the methodology may yield estimates depicting a more gradual change in habitat type acreages.

Coastwide effects on evaluated fish and wildlife species reflect the acreage changes of the various wetland types. Due to the large increase in their preferred fresh and intermediate habitats, dabbling ducks and the American alligator would be most benefited, with a 10.6 and 7.5 percent increases in AAHUs, respectively (Table 15). Other fish and wildlife that utilize low-salinity habitats, such as mink, Atlantic croaker, and white shrimp, would also benefit, but to a

lesser degree. However, Gulf menhaden, which utilize low-salinity habitats as juveniles, would experience a coastwide 2.1 percent decrease in AAHUs (due to the substantial impacts of the Preferred Plan in Subprovince 1). Consistent with the decrease in brackish marsh acreage, species which prefer brackish habitats (such as muskrat, spotted seatrout, and brown shrimp), would experience decreases in AAHUs of 7.9 percent, 8.3 percent, and 7.7 percent, respectively.

**Table 15. Coastwide impacts (AAHUs) on fish and wildlife at year 50 for the No Action and the Preferred Plan Alternatives**

<b>Species</b>	<b>No Action Alternative</b>	<b>Preferred Plan Alternative</b>	<b>Difference</b>	<b>Percent Change</b>
Mink	1,710,654	1,780,006	69,353	4.1
Otter	2,091,068	2,159,085	68,017	3.3
Muskrat	945,364	870,546	-74,818	-7.9
Alligator	1,857,992	2,054,316	196,324	10.6
Dabbling Ducks	2,467,062	2,652,365	185,303	7.5
Atlantic Croaker	1,695,852	1,755,867	60,015	3.5
Gulf Menhaden	1,063,699	1,041,780	-21,919	-2.1
Spotted Seatrout	739,713	678,213	-61,500	-8.3
White Shrimp	1,918,283	1,998,567	80,284	4.2
Brown Shrimp	1,022,695	943,500	-79,195	-7.7

**APPENDIX A2**

**PEIS MAIL LIST**

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## APPENDIX A2

### PEIS MAIL LIST

#### Business (Dredging Construction Oil and Gas Companies)

**Count: 55**

Apache Louisiana Minerals, Inc. Mr. John Woodard / Houma  
 Apache Louisiana Minerals, Inc. Scott Rosteet / Cameron  
 Avoca Inc. Mr. Paul Hogan / President / New Orleans  
 Bernard Mcmenamy Cont Inc Dredging Mar & Gen Contractors / Florissant  
 Berry Brothers Gen Contractors Inc. Attn: Weldon Miller / Berwick  
 Bud Brodtmann Environmental Professional Ltd / Metairie  
 Carr Oil Company Inc / Franklin  
 Castex Laterre, Inc / Houma  
 CF Bean Corporation Mr. William J. Ashy / Lafayette  
 Circle, Inc. / Belle Chasse  
 Cl Jack Stelly & Associates Inc / Lafayette  
 CNG Producing Company / New Orleans  
 Cockrell Oil Corporation / Houston  
 Conrad Industries Mr. J. Parker Conrad / President / Morgan City  
 David, Saunders & Miller / Metairie  
 Diamond Services Corporation / Morgan City  
 Engineering Development Group Inc / Metairie  
 Ford Construction Company Co / Dyerburg  
 Geological Consultant Robert P Waldron Inc / Metairie  
 George Strain Continental Land and Fur Co. Suite 500 / Metairie  
 Glynn Haines CO-MAR Offshore Corporation / Morgan City  
 Grand Isle Material Co Inc / Grand Isle  
 Grand Isle Shipyard Inc Robert Pregeant / Raceland  
 Grasso Services Division / Galveston  
 Gulf Coast Pre-stress Co Inc / Pass Christian  
 Hank Smart Roy O Martin Lumber Co Inc / Alexandria  
 Hydro Consultants Inc Mr. Ernest Gammon / Baton Rouge  
 J H Menge & Co. Attn: Buren Jones / New Orleans  
 Je Jumonville Contractor Inc / Plaquemine  
 John Connolly Shinteaux Env Ser / Baton Rouge  
 Kaiser Aluminum & Chemical Corp. Chairman Env. Department / Arabi  
 Larry Doiron Inc General Contracting / Morgan City  
 Luhr Bros Inc / Columbia  
 Massaman Construction Company / St. Louis  
 Matzinger Petroleum Company / Houston  
 Mike Plaisance Plaisance Dragline & Dredging Co Inc / Golden Meadow  
 Mr. Jim Porter Mid-Continent Oil & Gas / Baton Rouge  
 P Hutchinson Construction / New Orleans  
 Pontchartrain Materials Corp / New Orleans  
 Port Aggregates, Inc. Timothy J. Guinn / Lake Charles  
 Potashnick-Harrison Construction Company / Cape Girardeau  
 Rebstock Drilling Co / Kenner  
 Richard B. Koen Martin Marietta Aggregates / St. Rose

St. Mary Land & Exploration Co. Ms. Linda Ditsworth Suite 1100 / Denver  
 Stanley Stockstill Inc / St. Martinville  
 Swiftships Inc Mr. Robert Ness / President / Morgan City  
 T Baker Smith & Son Inc. / Houma  
 Tennessee Gas Pipeline Sugar Mill Point / Houma  
 Texaco Inc. / New Orleans  
 Thompson Marine Transport Mr. Bob Thompson / Morgan City  
 Trigon Exploration Inc / Lafayette  
 Walk Haydel's Assoc Mr. Frank H. Walk Chairman / New Orleans  
 WHC Inc / Lafayette  
 Williams Inc Mr. Hugh C Brown, Jr. / Patterson  
 Williams-McWilliams Co Inc / Metairie

#### Business (Levee Boards)

**Count: 28**

Amite River Basin Comm. Exe. Director: Dietmar Rietschier / Baton Rouge  
 Atchafalaya Basin Levee District Director William Tyson / Port Allen  
 Board of Commissioners Lake Charles Harbor And Terminal District / Lake Charles  
 Board of Commissioners Southeast Arkansas Levee District / Rohwer  
 Bossier Levee District / Benton  
 Caddo Levee District Administrator : Sam Windham / Shreveport  
 Campti-Clarence Levee District / Natchitoches  
 Cane River Levee and Drainage District / Natchitoches  
 City Parish Department of Public Works Fred Raiford, Director / Baton Rouge  
 Fifth Louisiana Levee District Madison Parish Courthouse / Tallulah  
 Grand Isle Independent Levee District David Camardelle / Grand Isle  
 Lafourche Basin Levee District Administrative Manager: Randy Trosclair / Vacherie  
 Lake Borgne Basin Levee District Robert Turner / Violet  
 Mr. Ed Preau C / Water Res Design & Dev Div LA-DOTD / Baton Rouge  
 Natchitoches Levee And Drainage District / Natchitoches  
 Nineteenth Louisiana Levee District / Colfax  
 North Bossier Levee District / Benton  
 Orleans Levee District Executive Director: Max Hearn / New Orleans  
 Pontchartrain Levee District Executive Director: Stephen Cupit / Litcher  
 Red River, Atchafalaya, & Bayou Boeuf Levee District Vice President: Jessie Lachney / Alexandria  
 Red River-Bayou Pierre Levee and Drainage District / Coushatta

South Lafourche Levee District Executive Director:  
Windell Curole / Galliano  
South Louisiana Tidal Water Control Levee District /  
Galliano  
Teche-Vermillion Fresh Water District Executive Director:  
Jason Dupuis / Lafayette  
Tensas Basin Levee District Executive Director : John  
Stringer / Monroe  
Terbonne Levee & Conservation Dist. Executive  
Director: Jerome Zeringue / Chauvin  
West Cal Port Harbor and Terminal District John Dixon -  
Director / Sulphur  
West Jefferson Levee District Exe. Director: Gerald  
Spohrer / Marrero

#### **Business (Local and Other)**

**Count: 20**

Arkansas State Bank Department / Little Rock  
B.W. Farrell Inc. / Paducah  
C & M Contractors, Inc. Attn: Kenny Daigle / Lafitte  
Camp, Carmouche, Barsh, Hunter, Gray & Hoffman 9th  
Floor - La Saving Bldg / Lake Charles  
Entergy / Gretna  
Entergy Land & R/W Manager / New Orleans  
Gravity Drainage Dist No 4 of Calcasieu Parish Louisiana  
Ken Boudreaux / Lake Charles  
JC Seafood / Arabi  
John Price SSA Gulf Terminals / New Orleans  
Kansas City Southern Railway Company / Kansas City  
Kathy Pitre Lafourche Telephone Co Inc / La Rose  
Marilyn Smith Digital Engineering and Imaging Inc /  
Kenner  
New Orleans International Airport / New Orleans  
O'Neil Malbrough Shaw Coastal, Inc. / Houma  
South Central Planning and Development Mr. Craig  
Roussel / Gray  
Southern Railway System / Atlanta  
St Charles Grain Elevator Attn: Darryl G. Peltier / Ama  
Vinson & Elkins-Attys Mr. Larry W Nettles / Houston  
Wally "The Gator" Landry President Crucial, Inc. / New  
Orleans  
William L Yeates Jr. Director of Public Works / Covington

#### **Business (Port Commissions) Area Clearinghouse and Planning Commissions**

**Count: 25**

Board of Commissioners Harbor and Terminal District of  
St. Bernard Port / Chalmette  
Board of Commissioners Morgan City Harbor And  
Terminal District / Morgan City  
Board of Commissioners Vinton Harbor District / Vinton  
Caddo-Bossier Parishes Port Comm / Shreveport  
Crescent River Port Pilots Assoc. Mike Buccola / Belle  
Chasse  
Dept of Planning, Zoning and Codes Executive Director  
Mr. John Raines / Lafayette  
Executive Director Mr. John Lebourgeois-RPC Amoco  
Building / New Orleans  
Grayling Hadnott Acadiana Regional Dev. Distr. /  
Lafayette  
Greater Krotz Springs Port Commission / Krotz Springs  
Greater Ouachita Port Commission / Monroe  
Lafayette Area Planning Commission Mr. Roger Hedrick,  
Director / Lafayette  
Mr. Channing F. Hayden, Jr. Steamship Association of  
Louisiana World Trade Center - Suite 2217 / New Orleans

N Delta Reg Plng & Dev District Federal Programs Review  
Coord. Ms. Judy Milton / Monroe  
Nw Regional Clearinghouse Federal Programs Review  
Coord. Ms. Helen Esparaza / Shreveport  
Ouachita Council of Governments Mr. David Creed /  
Monroe  
Ouachita Port Commission Mr. Saul A. Mintz / President F.  
Strauss & Son Inc. / Monroe  
Plaquemines Parish Government Plaq Port Harbor & Term  
Dist Andrew MacInnis-CAM / Belle Chasse  
Port Manchac South Tangipahoa Port Commission /  
Ponchatoula  
Port of Greater Baton Rouge David Beck Director of  
Engineering / Port Allen  
Port of New Orleans Board of Commissioners Chief  
Engineer / New Orleans  
Regional Planning Commission Federal Programs Review  
Coord. Karen Kirkland / Baton Rouge  
South Central Planning & Development Ms. Marie Fertitta  
/ Gray  
South LA Port Commission Suite. 100 - Drawer K /  
LaPlace  
Ted M. Falgout Greater Lafourche Port Commission /  
Galliano  
Terbonne Parish Council Waterways & Permit  
Committee Paul Labat / Houma

#### **Coastal Restoration Branch Master List**

**Count: 1566**

A. J. Planche Friends of Jean Lafitte Park / Marrero  
A.J. Gibbs Crescent River Port Pilots' Association / Belle  
Chasse  
Aaron Viles Gulf States Field Director U.S. Public Interest  
Research Group / New Orleans  
Acadiana Regional Clearinghouse Grayling Hadnot Dir of  
Planning / Lafayette  
Adam Babich Associate Professor Tulane Law School /  
New Orleans  
Addison Ellis Private Citizen / Covington  
Albert Prater Calcasieu Parish Police Jury Gov. Access  
Channel / Lake Charles  
Albert S. Enos / Belle Chasse  
Albin Champagne, Jr. / LaRose  
Alex Mccorquodale UNO- Lakfront Dept. of  
Environmental and Civil Engineering / New Orleans  
Alex Plaisance Louisiana Landowners Assoc. & Restore /  
Golden Meadow  
Alexis Duval Houma-Terrebonne Chamber Crcl-ror /  
Houma  
Alfred Lippman Lippman, Mahjouz and Martin / Morgan  
City  
Allen Dupont Shaw Environmental, Inc. / Baton Rouge  
Allied Towing Service Inc. Attn: Mr Gary Sercovitch /  
Venice  
Alton Farbe / Ponchatoula  
Amanda Phillips LA. DNR CRD / Baton Rouge  
American Commercial Barge Line Co. Attn: Bryan Christy  
/ New Orleans  
American Commercial Barge Line Co. Attn: Port Captain /  
Jeffersonville  
American Commercial Barge Line Co. Mr. Dennis M.  
Hill/dir-fleet O / Jeffersonville  
American Press Brenda Merchant / Lake Charles  
Ancil Taylor Bean Stuyvesant / New Orleans  
Andrew Adams Citizen / Cut Off  
Andrew and Manita Hyde Small Business Owner / New  
Orleans  
Andrew J. Lewis Publisher-The Woodville Republican /

Woodville  
 Andy Nyman LSU School of Renewable Resources / Baton Rouge  
 Ann Ballard Johnson Controls / Baton Rouge  
 Anne Perry LED / Patterson  
 Ansythe Exploration Co. Inc. 1030 Oil & Gas Building / New Orleans  
 Ante Lepetie / Harvey  
 Anthony Cross The Environmental Management Society / Baton Rouge  
 Apex Oil Co Attn: Capt Terry Philips / Port Allen  
 Archie Chaisson / Thibodaux  
 Army Times & Federal Times / Springfield  
 Art & Mary Courville / Carencro  
 Arthur Lemann IV Lemann and Associates / New Orleans  
 Assoc Federal Coast Pilots / Metairie  
 Associated Branch Pilots / Metairie  
 Att: Peter Spotts Christian Science Monitor / Boston  
 Attorney J. Tomas Anderson / Hammond  
 Audubon Society-Natl Chrmn Field Research Director / Taverier  
 AUX, LLC / Thibodaux  
 B & H Towing Inc Attn: W N Lay / Paducah  
 B. Scott Higginbotham City of Lake Charles / Lake Charles  
 Barbara Benson Providence Engr. Suite 100 / Baton Rouge  
 Barbara Keeler U.S. EPA Region 6 / Dallas  
 Barry Guidry Business owner / Lafayette  
 Barry Hunt Hunt Homes Inc / Johnson Bayou  
 Barry Wilson Louisiana Department of Wildlife & Fisheries / Grand Chenier  
 Bayou Black Elementary School Ms. Cindy Gaudet / Houma  
 Bayou State Bowhunters Association / Homer  
 Beau Tate LA. DNR CRD / Baton Rouge  
 Ben Taylor / Hammond  
 Bernard Chaillot Lafayette Daily Advertiser / Youngsville  
 Berwick Bay Oil Co Inc. / Morgan City  
 Berwick Duval CCA / Houma  
 Beth Lundy / Lake Charles  
 Beul Knapp UNO / Metairie  
 Beverly Ethridge EPA Water Quality Russell B Long Fed Bldg / Baton Rouge  
 BG Merdith W.B. Temple-Commander US Army Eng. Division, North Atlantic Fort Hamilton Military Community / Brooklyn  
 Bienville Press / Arcadia  
 Big River Industries Attn: Jack Moore 1150-C Hungry Neck Blvd / Mount Pleasant  
 Bill Bagley Univ of La. Monroe / Monroe  
 Bill Branch LSU Ag Center / Baton Rouge  
 Bill Bruce J.G. Gray Est / Lake Charles  
 Bill Busch UNO Lakefront Campus Dept of Geol and Geophy / New Orleans  
 Bill Herke Citizens For A Clean Environment / Baton Rouge  
 Bill Kappel UNO / New Orleans  
 Bill Scaife BP / Covington  
 Bill Streever BP-Environmental Studies Leader / Anchorage  
 Billy Broussard / Kaplan  
 Billy Nungesser / Belle Chasse  
 Bloomberg News Attn: Mary Schlangenstein / Dallas  
 Bo Bolourchi DOTD / Baton Rouge  
 Bo Walters Fenstermaker Suite 260 / Houston  
 Bob Crain Department of Environmental Quality Capitol Regional Office / Baton Rouge  
 Bob Faulk / LaRose  
 Bob Jacobson URS Suite 601 / Baton Rouge  
 Bob Jones Terrebone Parish / Houma  
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 Bob Marshall-venture Editor The Times-Picayune / New Orleans  
 Bob Roberts LA. DNR CRD / Baton Rouge  
 Bob Schmidt HNTB Suite J / Baton Rouge  
 Bobby Hession / Creole  
 Bobby Hession Louisiana Department of Health / Cameron  
 Bonnie Lewis Florida Parishes Social Science Research Center-SLU / Hammond  
 Bordelon Bros Towing Attn: Mitch Danos / Lockport  
 BP & Exploration & Production Attn: Mr.Keith Hayles Gulf of Mexico Logistics Manager / Houston  
 Brad Miller LA. DNR CRD / Baton Rouge  
 Bradley E. Spicier LA. Dept of Agriculture & Forestry Room 1070 / Baton Rouge  
 Brent Duet HNTB Suite J / Baton Rouge  
 Brent Hoofpaair McNeese Wetland Station / Lake Charles  
 Bret Acosta / Garyville  
 Brian Azcona Chart University of New Orleans / New Orleans  
 Brian Crother Biology Graduate Student Organization / Hammond  
 Brian Fortson St. Tammany Parish / Convington  
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 Mr. Roy Rogge / Abita Springs  
 Mr. Rudy Sparks Williams Inc. / Patterson  
 Mr. Russ Bourgeois East Ascension Sportman's League / Geismar  
 Mr. Russell Boudreaux Lake Pontchartrain Fisherman's Association / Metairie  
 Mr. S. M. Landry / Belle Chasse  
 Mr. Sam Becker Water Quality Protection Div-EPA / Dallas  
 Mr. Sandy Corkern LSU Fisheries Ext Rm 314 / Courthouse / Franklin  
 Mr. Seneca Bouton / New Iberia  
 Mr. Shell Armstrong St. Charles Herald / Boutte  
 Mr. Sherrill Sagrera Vermillion Parish Coastal Advisory Committee / Abbeville  
 Mr. Simon Zalman L.P.C. Bass Club / Lake Charles  
 Mr. Stacey Thibodeaux / Rayne  
 Mr. Stephen Conway St. Tammany Parish / Folsom  
 Mr. Stephen Perry, Chief of Staff Governor's Office, State of Louisiana / Baton Rouge  
 Mr. Stephen Smith / Schriever  
 Mr. Steve Anderson / Boutte  
 Mr. Steve Cagle / Monroe  
 Mr. Steve Estopinal / Violet  
 Mr. Steve Garrett Webster Bassmasters / Minden  
 Mr. Steve Gibson Louisiana Military Anglers / Shreveport  
 Mr. Ted Beaulieu Acadiana Bay Assoc. / Lafayette  
 Mr. Ted Porter / New Iberia  
 Mr. Terrell Rabalais / Lafayette  
 Mr. Terrell Rabalis USDA/NRCS / Franklin  
 Mr. Terry Boudreaux / Waggaman  
 Mr. Terry McFarlan Evangeline Bass Busters / Evangeline  
 Mr. Terry Melancon East Ascension Sportman's League / Prairieville  
 Mr. Terry Nunez / Slidell  
 Mr. Terry Stingley / Westwego  
 Mr. Thomas Cambell L.A. Dept of Agriculture and Forestry / New Orleans  
 Mr. Thomas D. Hixson MML&H / Alexandria  
 Mr. Thomas L. Palmer / Franklin  
 Mr. Tim Adcock / Bossier City  
 Mr. Tim Fogleman Acadia Bass Club / Crowley  
 Mr. Tim Landers U.S. EPA Mail Code 4502T / Washington  
 Mr. Tim Landreneau USDA/NRCS / Alexandria  
 Mr. Tim Osborn National Marine Fisheries Service Regional Programs - Suite 220 / Lafayette  
 Mr. Timmy Vincent / Abbeville  
 Mr. Timmy Vincent National Audubon Society / Pierre  
 Mr. Tingle Warner St. Tammany Bass Club / Covington  
 Mr. Todd Nagel Indian Point Bass Club / Baton Rouge  
 Mr. Todd Turner / Greenwell Springs  
 Mr. Todd Votteler / Austin  
 Mr. Tom Butler / Thibodaux  
 Mr. Tom Harrington USACE / Lewisville  
 Mr. Tom Hymel / Breaux Bridge  
 Mr. Tom Podany USACE-NOD / New Orleans  
 Mr. Tommy Becnel / Prairieville  
 Mr. Tommy G. Price Concerned Citizens of The Mermentau Basin / Lake Arthur  
 Mr. Tracy Falk / New Orleans  
 Mr. Tru Bilich / Empire  
 Mr. Tyrone Foreman New Orleans Sierra Club / New Orleans  
 Orleans  
 Mr. Vaughn Fontenot Church Point Bass Club / Church Point  
 Mr. Vic Gulizo / Marrero  
 Mr. Vincent Cottone ChevronTexaco / New Orleans  
 Mr. Vincent Gennardo WGNO-TV Ch 26 / New Orleans  
 Mr. Von Vargo Wednesday Evening Bass Club / Covington  
 Mr. W. Damain Kerek / St. Amant  
 Mr. W. K. Chambers Gulf Breeze Beach / Johnson Bayou  
 Mr. Wade Fruge / Bayou Vista  
 Mr. Wallace Ellender, III American Sugar Cane League / Bourg  
 Mr. Warren Charbonnet / Ponchatoula  
 Mr. Warren King Hunters Against Poachers / Gonzales  
 Mr. Wayne & Mrs. Linda Zaunbrecher LA Farm Bureau Federation, Inc. / Gueydan  
 Mr. Wayne Ceruti Linwood Hunting Club / Gretna  
 Mr. Wayne Fairley Federal Emergency Mgmt Admin Federal Center / Denton  
 Mr. Wayne Mire / Thibodaux  
 Mr. Wayne Page / Carriere  
 Mr. Wayne Sron Lacassine NWR / Lake Arthur  
 Mr. Wayne Wallace Southeast Bass Association / Albany  
 Mr. Wes Crain Calcasieu Parish Office of Planning and Development / Lake Charles  
 Mr. Wes Mcquiddy EPA 6WQ-EM / Dallas  
 Mr. Whitney Lombas / Cutoff  
 Mr. William E. Pope Gulf Breeze Beach / Cameron  
 Mr. William Ebdon / Lafitte  
 Mr. William Guarino / Braithwaite  
 Mr. William Weathers / Abbeville  
 Mr. William Weber St. Bernard Parish Coastal Advisory Comm / Slidell  
 Mr. Wilson Melerie St. Bernard Coastal Inspector / Chalmette  
 Mr. Wilton Delaune / Cut Off  
 Mr. Woody Crews Gray & Company / Metairie  
 Mr. Yancey Rills / Plaquemine  
 Mrs. Barbara Barnes Lake Pontchartrain Basin Foundation / Mandeville  
 Mrs. Linda Clarke / New Orleans  
 Ms Anna Hamilton LWA/EPA / Santa Fe  
 Ms Bonnie Gallahan Ecv-1, Room 6109 / Washington  
 Ms Lida Ochsner-Durant Orleans Audubon Society / New Orleans  
 Ms Lori Johnson LA. Chapter of Wildlife Society NBS / Lafayette  
 Ms Terri Bewig / Mandeville  
 Ms Vicki Rester LA Dept of Economic Development Office of Policy and Research / Baton Rouge  
 Ms Virginia Tippie-director Coastal America / Washington  
 Ms. Adele Swearingen / Lafayette  
 Ms. Ann Burruss CRCL / Baton Rouge  
 Ms. Ann Pettit League of Women Voters / New Orleans  
 Ms. Anna Hamilton Lee Wilson and Assoc. / Santa Fe  
 Ms. Barbara Dodds LWFA Sportman's Organization / Covington  
 Ms. Barbara Hodge / Metairie  
 Ms. Barbara Kavanaugh LSU/CCEER/ISD / Baton Rouge  
 Ms. Becky Weber EPA 6WQ-EM / Dallas  
 Ms. Bess Pope Gulf Breeze Beach / Cameron  
 Ms. Beth Guerra / Violet  
 Ms. Bonnie Lafont / Thibodaux  
 Ms. Brenda Merchant / Vinton  
 Ms. Brenda R. Davis Calcasieu Rod & Gun Club / Moss Bluff  
 Ms. Brenda Woodon Allen Company / Metairie  
 Ms. Carla Dartez / Morgan City  
 Ms. Carolyn Kasse Falgout / Amite

Ms. Carrol Sittig / Crowley  
 Ms. Carroll Boutte / New Iberia  
 Ms. Cathy Grouchy USFWS Site 400 / Lafayette  
 Ms. Cathy Wascom Citizens For A Clean Environment / Baton Rouge  
 Ms. Charlotte Bollinger / Lockport  
 Ms. Charlotte Fremaux Louisiana League of Women Voters / Metairie  
 Ms. Charlotte Riche Greater Lafourche Chamber of Commerce / LaRose  
 Ms. Cheryl Gonsoulin / New Iberia  
 Ms. Cindy Steyer NRCS Louisiana State University / Baton Rouge  
 Ms. Claire Robene / Garyville  
 Ms. Cynthia Becnel Plaquemines Parish / Belle Chasse  
 Ms. Cynthia Langston Middleberg Riddle & Gianna / New Orleans  
 Ms. Cynthia Willard-Lewis / New Orleans  
 Ms. Della Hebert Avoyelles Wildlife Federation / Moreauville  
 Ms. Denise Gaudet / Thibodaux  
 Ms. Diane Borden-Billiot / Hackberry  
 Ms. Dianne Lindstedt Louisiana Sea Grant Louisiana State University / Baton Rouge  
 Ms. Eloise Yerger Wall, Development Citizens For A Clean  
 Ms. Emelise Cormier LA DEQ Environmental Technical Division / Baton Rouge  
 Ms. Gail Ralieghe LA Dept Trans and Dev / Baton Rouge  
 Ms. Glenda Austin / Many  
 Ms. Gwen Broussard The Meridional Environmental Department / Abbeville  
 Ms. Helen Vinton Southern Mutual Help Association, Inc. / New Iberia  
 Ms. Janice Terrell East Ascension Sportman's League / Gonzales  
 Ms. Jeannine Chambers Gulf Breeze Beach / Johnson Bayou  
 Ms. Jennifer Koss NOAA F/HC-3 / Silver Spring  
 Ms. Jodie Singer East Ascension Sportman's League / Prairieville  
 Ms. Joyce Mazourek USFWS / Baton Rouge  
 Ms. Karen Turni The Times-Picayune - St. Bernard / Chalmette  
 Ms. Karen Woodard- LA -DOTD Room 436 / Baton Rouge  
 Ms. Karolien Debusschere Coastal Environmental, Inc. / Baton Rouge  
 Ms. Kat Zarinski / Slidell  
 Ms. Kathy Terracina 1048 Canal Blvd / Thibodaux  
 Ms. Laura Heap / Baton Rouge  
 Ms. Leslie Mcveigh BTNEP / Thibodaux  
 Ms. Leslie Rodrigue La. Farm Bureau / Edgard  
 Ms. Linda Delaney St. Bernard Parish Coastal Advisory Committee / Arabi  
 Ms. Linda Pace LA. DNR Coastal Resources Coordinator CMD / Baton Rouge  
 Ms. Lisa Creasman / Baton Rouge  
 Ms. Lisa Madry / Austin  
 Ms. Lori Wilson USDA/NRCS Suite 180 / Lafayette  
 Ms. Marianne Morales Zimmer President East Jefferson Levee District / Harahan  
 Ms. Marilyn Rotolo LA Seafood Management Council / Empire  
 Ms. Martha A. Messinger L.W.F.A. Sportsmen Organizations / Bastrop  
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 Ms. Mary Alice Darby Southern University, Col. of Business / Baton Rouge  
 Ms. Myra Kattengell St. Bernard Parish Government / Chalmette  
 Ms. Nichole Adams / Baton Rouge  
 Ms. Pam Gauthreaux / Houma  
 Ms. Pam Kaster Citizens For A Clean Environment / Zachary  
 Ms. Pam Mintz EPA 6WQ-EM / Dallas  
 Ms. Patty Vogt / Port Sulphur  
 Ms. Paulette Irons / New Orleans  
 Ms. Phyllis Darenbourg LA. DNR CRD / Baton Rouge  
 Ms. Rachel Sweeney NOAA- NMFS C/O LSU / Baton Rouge  
 Ms. Rebecca Triche CRCL Suite B-101 / Baton Rouge  
 Ms. Rhonda Bell The Times-Picayune River Parishes Bureau / LaPlace  
 Ms. Robin Hote LA Division of Administration / Baton Rouge  
 Ms. Sherrill Authment / Cameron  
 Ms. Sheryl Rimes Baton Rouge Sportman's League / Denham Springs  
 Ms. Shirley Welles / Ponchatoula  
 Ms. Sue Hawes USACE / New Orleans  
 Ms. Suzanne L. Moore / Abbeville  
 Ms. Tanya Anderson / Baton Rouge  
 Ms. Teresa Mctigue National Marine Fisheries Service Suite 220 / Lafayette  
 Ms. Theresa Authment / Cameron  
 Ms. Vickie Doufourc Shaw Coastal Inc / Westwego MVD-PA / Vicksburg  
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 Nancy Jo Craig / Baton Rouge  
 Nancy Rabalais Lumcon / Chauvin  
 Nancy Walters US Fish & Wildlife Service / Lacombe  
 Nat Phillips VP La. Fruit Co. / New Orleans  
 Natl Audubon Soc-B. Rouge Chp Ms. Doris Falkenheiner / Baton Rouge  
 Natl Wetlands Res Ctr, USFWS Dr. Robert Stewart Jr. / Lafayette  
 Naveen Chillara Shaw Coastal Inc. / Houma  
 Navios Ship Agencies Inc Attn: Paul Chatelain / St. Rose News / Port Arthur  
 News / Winnboro  
 News - Telegram / Sulphur Springs  
 News / Jennings  
 Nick Limberis McNeese Student - Cal. Pa. School Bd. / Lake Charles  
 Nicole Youngman Tulane University - Dept. of Sociology / New Orleans  
 No. Lafourche Con. Levee & Drainage Dist. / Raceland  
 NOAA Coastal Services Center Library / Charleston  
 NOBR Steamship Pilots / Jefferson  
 Noreen Clough-regional Director US Fish & Wildlife Service / Atlanta  
 NRCS Louisiana State Office Benny Landreneau / Alexandria  
 NRCS Office-LSU Campus Parker Coliseum / Baton Rouge  
 Ntl Wetlands Research Ctr Scott Wilson / Lafayette  
 O.J. Trosclair / Garyville  
 Office of Environmental Affairs Attn: Heather Szapary Orleans City Hall, Suite 8 E 0 6 / New Orleans  
 Office of Senator John Breaux Mr. Malcolm Myer Suite 802 / Baton Rouge  
 OFFSHORE MARINE SERVICE ASSOCIATION Robert J. Alario, President / Harahan  
 Olvice L. Greenwood Conoco Phillips / Sulphur  
 Oneil Malbrough Jefferson Parish / Westwego  
 Operations Division Port Allen Lock /  
 Orlando Adams Parsons-Brinckerhoff Suite 225 / New Orleans  
 Orleans Levee Board Attn: Stevan G Spencer Ste 202 / New Orleans

Oscar Vera Parson Brinckerhoff Suite 225 / New Orleans  
Pam Pontiff / Morgan City  
Pasadena Towing Service Inc. / Pasadena  
Patricia Leander-ofc Of Economic & Budget Policy LA  
House of Representatives / Baton Rouge  
Patrick Breaux LA DEQ Bayou Lafourche Regional Office  
/ Raceland  
Patrick Gordon Planning and Zoning Director / Houma  
Patrick Williams NMFS - Habitat Conservation Division  
Louisiana State University / Baton Rouge  
Paul Conners UNO Lakefront Campus Coastal Research  
Lab / New Orleans  
Paul Cox / Lake Charles  
Paul Gremilion LA. DNR CRD / Baton Rouge  
Paul J. Leboeuf / Belle Chasse  
Paul Looney Volkert Environemntal Group Inc. / Mobile  
Paul Mack / Belle Chasse  
Paul Perret / New Orleans  
Paul Templet, Phd LSU - Inst. For Env. Studies / Baton  
Rouge  
Peggy Choate Village of Saline / Saline  
Perry Tamplain / Garyville  
Personnel Officer, US Forest Svc. Kisatchie National  
Forest / Pineville  
Peter Defur, Phd Environmental Defense Fund /  
Washington  
Peter Gerica Lk Pontch Fishermen's Assoc / New Orleans  
Peter Huyakorn Hydro-Geologic / Herndon  
Peter M. Smith WS Nelson / New Orleans  
Peter Vunovich Jr. Oyster Industry & (plaq C2m) / Port  
Sulphur  
Phil Mccarty UNO Lakefront Campus Dept of Geol and  
Geophy / New Orleans  
Plaquemines Parish Council Mr. Michael Mudge / Belle  
Chasse  
Port Allen Lock Survey Field Off ED-SS Bulletin Board /  
Port Allen  
Port Allen Survey Field Office / Port Allen  
Port of New Orleans Board of Commissioners / New  
Orleans  
Port of New Orleans J. Ron Brinson President / CEO / New  
Orleans  
Port of New Orleans Jeff Plauche Permit Coordinator /  
New Orleans  
Port of New Orleans Patrick J. Gallwey - Director  
Port of New Orleans Paul Zimmerman / New Orleans  
Port Ship Service Inc. / Arabi  
Press / Mobile  
Profess. Eng. Env. Consultants Inc. Attn: Mr Priyo  
Manjumdar / Marrero  
Project Leader U.S. Fish and Wildlife Service Southeast LA  
Refuges / Lacombe  
Quay Dortch Lumcon / Chauvin  
Quin Kinler USDA/NRCS / Baton Rouge  
R. E. Turner LSU Coastal Ecology Institute Dept of  
Oceanography & Coastal Science / Baton Rouge  
Ralph Broome Contract Specialist Natural Resource  
Conservation Service / Alexandria  
Ralph Laukhuff La. Hydroelectric / Vidalia  
Ralph Pausina Pausina Oyster Corporation / New Orleans  
Ralph Rabalais President & BOD CCA Westbank Chapter /  
Terrytown  
Randall Hood Windrush Industries / Lake Charles  
Randy Gros Gulf States Marine Fisheries / Marrero  
Randy Hanchey La Dept. of Natural Resource Coastal  
Restoration Division / Baton Rouge  
Randy Moertle Coastal Environmental, Inc. / Lockport  
Ray Champagne SWAP / Marrero  
Ray Fremin / Belle Chasse  
Ray J. Cheramie R.C. Cattle Co. / Lockport  
Raymond W. Bianchini Comm. Fisherman / Gretna  
Rebecca Howard USGS-NWRC / Lafayette  
Rebecca Shirley Abbeville-Vermillion Chamber of  
Commerce / Abbeville  
Reginald and Betty Oubre / New Orleans  
Remy Amedee / Garyville  
Republication / Woodville  
Retif Oil & Fuel Attn: J F Thompson / New Orleans  
Rex Moore, Assignments Editor KLFY-TV  
Rhebb Rybiski / Raceland  
Ricardo Johnson John Chance Land, Inc. / Lafayette  
Rich Major Providence Engineering Suite 100 / Baton  
Rouge  
Richard Armstrong / Diamondhead  
Richard Aycock USDA/NRCS / Alexandria  
Richard Campanella Center For Bio-Env. Research-Tulane  
U. / New Orleans  
Richard Demay BTNEP Nicholls State University /  
Thibodaux  
Richard Grillot Construction INC / Belle Chasse  
Richard McCulloh LA. Geological Survey LSU Coast and  
Environment Bldg / Baton Rouge  
Richard W. Fox Terra, Co. / Covington  
Rick Bryan Central LA Audubon Society / Pineville  
Rick Smith Weeks Marine / Covington  
River City Towing Service / Denham Springs  
Riverbarge Excursion Lines Attn: Jeff Kindl / New Orleans  
Robert Arceneaux / Meroux  
Robert Becnel Farmer / Belle Chasse  
Robert C. Esenwein C.E.P Vice President Turner Collie &  
Braden Inc. / Houston  
Robert C. Mccad / Lake Charles  
Robert Cashner Pontchartrain Inst. of Envir. Studies UNO -  
Lakefront Campus / New Orleans  
Robert Day Indian River Lagoon National Estuary Program  
/ Palm Bay  
Robert Dolese-Director Parish Planning Commission /  
Baton Rouge  
Robert Ensminger / DeRidder  
Robert Hastings Southeastern Louisiana University /  
Hammond  
Robert Heath Professional Eng. and Env. Consultants /  
Marrero  
Robert Kelly Parsons Corp. Suite 100 / Norcross  
Robert L. Allen Assistant Director, LSU CCEER 1002-T  
Energy, Coast and Env Bldg / Baton Rouge  
Robert Lazor, CEWESEP-W US Army Engineer, Res &  
Dev Center / Vicksburg  
Robert W. Sabate Subsurface Geologist / Metairie  
Robin Knox Weston Solutions Suite 229 / New Orleans  
Rogerest Romero Cameron Parish Police Jury / Cameron  
Roland J. Chiasson 4-C's Land Corp. / Lockport  
Ron Boustang USGS-NWRC / Lafayette  
Ronald M. Madden Pine Bluff Sand & Gravel / Baton  
Rouge  
Ronald Paille USFWS Suite 400 / Lafayette  
Ronald Sanders Oases Offshore / Covington  
Ronnie Barcak Coe/ Galveston / Galveston  
Roy Keller Director, LA Technology Transfer Off. South  
Stadium Dr. LSU / Baton Rouge  
Roy Walter USFWS -Sabine Refuge / Hackberry  
RT Cerniglia / Kenner  
Russ Wise News One / LaPlace  
Russel Walters CH Fenstermaker and Assoc. / Lafayette  
Russell G. Olivier Manager Safety, Security and Env. IMC  
Phosphates MP Inc. / Uncle Sam  
Rusty Belsome Associated Federal Pilots / Metairie  
Rusty Gaude' LSU Agcenter / Belle Chasse  
Rusty Vincent Management Committee CCA / Sulphur  
Sam Hamilton U.S. Fish and Wildlife Service / Atlanta

Sam Holder / River Ridge  
 Sammy Acordo Jr. / Garyville  
 Samuel P. Miano / Garyville  
 Sandra Thompson LA. DNR / Baton Rouge  
 Saure Defelice Defelice Land Co. / Belle Chasse  
 Scott Privat Office of US Senator John Breaux Suite 1300 / Lafayette  
 Scott Romero USDA/NRCS / Jennings  
 Sean McMahon, Asst. Dir. Gov. Relation Ntl. Audubon Society Washington DC Policy Office / Washington  
 Senator Ken Hollis 9th Senatorial Dist / Metairie  
 Senator Lynn Dean / Braithwaite  
 Shea Penland Department of Geology / New Orleans  
 Shelly Beville LA. DNR / Baton Rouge  
 Shirley Laska Center For Hazards UNO Dept. of Sociology / New Orleans  
 Shreveport Area Office U.S. Army Corps of Engineers / Bossier City  
 Sidney Coffee Gov's Office of Coastal Activities / Baton Rouge  
 Sidney Coffee LA. DNR CRD / Baton Rouge  
 Sierra Club Delta Chapter / New Orleans  
 Skip Harris Valentine Paper Inc. / Lockport  
 South Lafourche Levee District Board Of Commissioners / Galliano  
 Southeastern La University Lab School Ms. Paulette Walkwitz  
 Southern Herald / Liberty  
 Southern University Lab School Mr. James Machen / Baton Rouge  
 Springhill Journal / Springhill  
 St Mary Parish Council Mr. Derhyl Hebert-dir Of  
 St. James Parish Government Mr. Dale Hymel / Convent  
 St. John the Baptist Parish Attn: Chris Guidry Chief Administrative Officer / LaPlace  
 St. Tammany News-Banner Scott Harrington, Mng. Ed. / Covington  
 Stapp Towing Company Inc. / Dickinson  
 State Rep. Ben Nevers Dist 75 / Bogalusa  
 Stefanie Regal, Reporter WWL-TV, Channel 4 / New Orleans  
 Stephen Stefanski Jr. Executive Assistant Representative Chris John / Lafayette  
 Steve Cochran Edf-116 Th Floor / New York  
 Steve Gauthreaux HESCO / Hammond  
 Steve Mathies CH2M / New Orleans  
 Steve Mire / Garyville  
 Steven A. Denham / Atlanta  
 Stu Scheer / Chauvin  
 Students Environmental Action Coalition / Baton Rouge  
 Sullivan Vullo / Port Sulphur  
 Susan King Legislative Analyst / Baton Rouge  
 Sweet Lake Land & Oil Co., Inc. Attn: Thomas G. Wright / Lake Charles  
 T Baker Smith & Son Inc Lou Schoher / Houma  
 T Baker Smith & Son Inc. Attn: Steven Smith / Houma  
 Tad Loupe LA DEQ / Raceland  
 Tangipahoa Parish Engineer Attn: Maurice Jordan / Amite  
 Tari Bradford US Courthouse Suite 2240 / Shreveport  
 Taylor Towing Co Inc Attn: Mr. Daniel S Taylor / Bayou La Batre  
 Ted Beaulieu Acadiana Bay Association / Broussard  
 Ted Kahn Port of Iberia / Jeanerette  
 Ted Mcmanus Daily Review / Morgan City  
 Teddy Babin DOTD / Lafayette  
 Teddy Leleux / New Iberia  
 Teri Goodmann Development Director National Rivers Hall of Fame / Debuque  
 Terrebonne Parish Attn: James Miller / Houma  
 Terrebonne Port Commission Attn: Ed Watson - Director / Houma  
 Terry Lejeune Big River Industries / Baton Rouge  
 Texaco Exploration & Production Attn: Daniel Ledet / Morgan City  
 Texas Gas Transmission, LLC / Lafayette  
 Theresa M. Jones / New Orleans  
 Theriot, Alex & Assoc Livingston Parish / Denham Springs  
 Tideland Barge Co Attn: Mr. Gene Drake / Metairie  
 Tiffany Crane UNO / New Orleans  
 Tim Allen / Houma  
 Tim Vincent National Audubon Society / Perry  
 Times / Shreveport  
 Times-Picayune Amy Ragsdale  
 Tina Sanchez Mobile Project Impact & Mobil NEP / Mobile  
 Tmr Exploration Inc Attn: Jack Lagrove / Bossier City  
 Tod Davison Director Mitigation Division FEMA Region IV / Atlanta  
 Todd Truax / Lake Charles  
 Tom Denes URS / Bethesda  
 Tom Gallagher Hydroqual Inc. / Mahwah  
 Tom Hess LA. Dept. Wildlife & Fisheries / Grand Chenier  
 Tom Holtzclaw Hatch Mott MacDonald Infrastructure and Environment / Monroe  
 Tom Wells WS Nelson / New Orleans  
 Tommy Milioto / La Place  
 Tommy Wright Sweet Lake Land & Oil Co. / Sulphur  
 Toni DeBosier Dept of Forestry and Ag. Suite F / Lafayette  
 Troy Pleblier / Lake Charles  
 Troy Rice Indian River Lagoon National Estuary Program / Palm Bay  
 Troy Voisin Seafood / Dulac  
 Tulane Environmental Law Clinic Karla Raettig / New Orleans  
 U. S. Coast Guard Marine Safety Office Attn: Port Operations Dept. / New Orleans  
 U.S. Army Corps of Engineers Area Engineer Lafayette Area Office / Lafayette  
 U.S. Coast Guard Commander (m) 8th District / New Orleans  
 U.S. Department of Housing & Urban Development Environmental Officer / New Orleans  
 U.S. Dept of Agriculture Nat'l Resource Conserv Ser / Alexandria  
 U.S. Dept of Agriculture NRCS Natl Env Coord/ecol Sci Div / Washington  
 U.S. Dept of Housing And Urban Development Hale Boggs Federal Bldg. / New Orleans  
 U.S. EPA Ofc of Fed Act (A-104) Rm  
 U.S. Fish and Wildlife Service Cameron Prairie National Wildlife Refuge / Bell City  
 U.S. Geological Survey Dr. Jeff Williams / Woods Hole  
 United Commercial Fisherman's / Chalmette  
 United Gas Pipe Line Company Marine Transportation Dept / Houma  
 University Lab School Dr. Glen Bowman Louisiana State University / Baton Rouge  
 US Department of Housing and Urban Development Attn: Terrance B. Course / New Orleans  
 USACE Inst. For Water Resources Attn: CEIWR-MD Ken Orth / Alexandria  
 USCG Marine Sfty Dtcmt Lake Charles Attn: Waterways Management / Lake Charles  
 USGS Attn: Charles Demas / Baton Rouge  
 Vann Fortier / Abbeville  
 Vernon Behrhorst National Rivers Hall of Fame / Lafayette  
 Vibhas Aravamuthan PhD Research Assocait Oceanographer Louisiana State University / Baton Rouge  
 Viciki Ludden Gulf Restoration Network / New Orleans  
 Vicki Murillo Gulf Restoration Network / New Orleans

Vince Wilson LSU Environmental Graduate Org. Energy Coast and Environmental Bldg. / Baton Rouge  
 Virginia Burkett / Many  
 W. Dale Martin Blind River Properties / Maurepas  
 W.P. Edwards III Vermilion Corporation / Abbeville  
 Wade Matherne / Lockport  
 Wall Street Journal Renaissance Tower Attn:newsroom / Dallas  
 Walter R. Dunn / Des Allemands  
 WDSU-TV Jeff Hamburger / New Orleans  
 Webster Pierce, Jr. / Cut Off  
 Weeks Marine Inc / Covington  
 Western Gas Resources Inc Attn: Ttyrone C Ben / St. Bernard  
 WGNO-TV 26 (ABC) Kath Quinn (PD) / New Orleans  
 WGNO-TV 26 Ralph Mipro News Director / New Orleans  
 Whitney Baccigahopi / Grand Chenier  
 WILK - Amite Record / Gloster  
 Will Norman LA. DNR / Baton Rouge  
 William "Bud" Watson, III New Orleans - Baton Rouge  
 Pilot Association / Jefferson  
 William Mitsch / Columbus  
 William Straw FEMA Region IV / Atlanta  
 Willie Cooper Stae Executive Director Consolidated farm Services Agency / Alexandria  
 Winn Parish Enterprise News Amer / Winnfield  
 WLPB-TV, Channel 27 (PBS) Beth George Courtney / Baton Rouge  
 WMIS / Natchez  
 WNAT / WQNZ / Natchez  
 WQBC / Vicksburg  
 WWL / New Orleans  
 WWL/WAJY / New Orleans  
 WYES-TV, Channel 12 (PBS) Beth Arroyo, Program Director / New Orleans  
 Yazoo River Towing / Vicksburg

**Conservation Groups (GCCA, BASS, etc.)**

**Count: 6**

Bonnet Carre' Rod & Gun Club Chairman Environmental Committee / Norco  
 CLIO Sportsman League / Metairie  
 Ducks Unlimited Director Ken Babcock / Ridgeland  
 Gulf Coast Conservation Assn. / Baton Rouge  
 Gulf States Marine Fisheries Commission Jeff Rester / Ocean Springs  
 President Mr. Wayne Allemond Association of Louisiana Bass Clubs / Marrero

**Environmental Organizations (Audubon Society, Sierra Club, LWF, etc.)**

**Count: 16**

Audubon Society- Baton Rouge Chapter Ms. Dorothy Prowell / Baton Rouge  
 Audubon Society, New Orleans Jennifer Coulson President / Metairie  
 Coalition of Coastal Parishes / Thibodaux  
 Coalition To Restore Coastal Louisiana Mr. Mark Davis / Exec Director / Baton Rouge  
 Donald Landry South La Environmental Council / Houma  
 Doug Daigle, Hypoxia Proj Mgr Mississippi River Basin Alliance / New Orleans  
 Environmental Defense Fund Mr. James T. B. Tripp / New York  
 La Nature Conservancy Mr. Keith Ouchley Director BBCC / Baton Rouge

Lake Pontchartrain Basin Foundation / Metairie  
 Louisiana Audubon Council Dr. Barry Kohl-Conserv Chr / New Orleans  
 Mr Carlton Dufrechou Lake Pontchartrain Basin Foundation / Metairie  
 National Audubon Society / New York  
 National Wildlife Federation / Washington  
 Natural Resources Defense Council Inc / New York  
 Randy Lanctot Louisiana Wildlife Federation / Baton Rouge  
 Sierra Club Russel Butz EPEC Organizer / Covington

**Federal Agencies**

**Count: 17**

Carl J. Breville USDA Forest Service / Pineville  
 CEMVD-PM-R US Army Corps of Engineers Attn: Chief / Vicksburg  
 Division Administrator Federal Highway Administration / Baton Rouge  
 Mark Schexnayder LSU Ag Center / Metairie  
 Mr Ron Brinkman US Minerals Management Service / New Orleans  
 Policy Review Branch US Army Corps of Engineers-HQ Cecw-ar / Washington  
 U.S. Advisory Council on Historic Preservation / Lakewood  
 U.S. Advisory Council on Historic Preservation-Executive Director Suite 809 / Washington  
 U.S. Army Corps of Engineers Mr. Ron Ventola CELMN-OD-S / New Orleans  
 U.S. Coast Guard 8th District Guy Tetreau Hale Boggs Federal Building / New Orleans  
 U.S. Dept of Agriculture Marine Advisory Agent LA Cooperative Extension Svc / Baton Rouge  
 U.S. Dept of Commerce - NOAA Ofc of Ecology & Conservation Rm 6117: Mr. William Archambault / Washington  
 U.S. Dept of Energy Office of Env Compliance Room 3g-092 Eh22 / Washington  
 U.S. Dept of The Interior Fish & Wildlife Service / Lacombe  
 U.S. Dept of The Interior Office of Env Policy & Compliance / Washington  
 U.S. EPA-Office Fed. Activities EIS Section Mail Code 2252-A / Washington  
 USEPA Region 6 Marine and Wetlands Section 6WQ-EM Attn: Troy Hill / Dallas

**Individuals (Mr., Mrs., Boat Captains, etc.)**

**Count: 31**

Armand Brinkhaus / Sunset  
 AUX LLC / Thibodaux  
 Barbara B. Kyle / Houston  
 Capt. K.C. Siverd / St. Bernard  
 Capt. O. T. Melvin Jr. / La Rose  
 Cecil Picard Suite 200 / Abbeville  
 Daniel Oakley / Sulphur  
 Dr. John C Moser / Pineville  
 Federal Aviation Administration/DOTD Joyce M. Porter / Fort Worth  
 Lafourche Parish Council James P. Ledet / Thibodaux  
 Linda Mathies U.S. Army Corps of Engineers OD-T / New Orleans  
 Montgomery Watson / Metairie  
 Mr. George Pivach Jr. / Belle Chasse  
 Mr. H. J. Broussard Jr. / New Iberia

Mr. Jay Vincent / Harvey  
 Mr. John E. Hine / Houston  
 Mr. John Edwin Kyle, Jr. / Houston  
 Mr. John Taliancich / Empire  
 Mr. Joseph V Frank III / Natchez  
 Mr. Jules A. Toups Sr / Empire  
 Mr. Marvin J Buras / Empire  
 Mr. R W Collins, III Southdown Animal Hospital / Houma  
 Mr. Ray Gibbens / Venice  
 Mr. Robert D. Gorman / Thibodaux  
 Nolan Robicheaux Mike Hooks Inc / Lake Charles  
 Roy Kiesel & Tucker Mr. Victor L. Roy III / Baton Rouge  
 Tim Stine / Sulphur  
 Virginia H. Barber / Houston  
 Virginia Kyle Hine / Houston  
 W. a. Monteleone / New Orleans  
 Wildlife Photographer Mr. C. C. Lockwood Cactus Clyde  
 Productions / Baton Rouge

**Libraries and Museums (Public University, Parish, etc.)**

**Count: 65**

Acadia Parish Library / Crowley  
 Allen Parish Library / Oberlin  
 Ascension Parish Library / Donaldsonville  
 Assumption Parish Library / Napoleonville  
 Avoyelles Parish Library / Marksville  
 Beauregard Parish Library / DeRidder  
 Bienville Parish Library / Arcadia  
 Bossier Parish Library / Bossier City  
 Calcasieu Public Library / Lake Charles  
 Cameron Parish Library / Cameron  
 Catahoula Parish Library Bushley Street / Harrisonburg  
 Claiborne Parish Library / Homer  
 Concordia Parish Library / Ferriday  
 Desoto Parish / Mansfield  
 Earl K. Long Library LA Collection, Sybil A. Boudreaux  
 UNO - Lakefront Campus / New Orleans  
 East Baton Rouge Parish Library / Baton Rouge  
 East Carroll Parish Library / Lake Providence  
 Evangeline Parish Library / Ville Platte  
 Franklin Parish Library / Winnsboro  
 Grant Parish Library / Colfax  
 Iberville Parish Library / Plaquemine  
 Jackson Parish Library / Jonesboro  
 Jefferson Davis Parish Library / Jennings  
 Jefferson Parish Library / Metairie  
 Lafayette Natural History Museum & Planetarium /  
 Lafayette  
 Lafayette Public Library / Lafayette  
 Lafourche Parish Library / Thibodaux  
 Lasalle Parish Library / Jena  
 Leslie Blanchard Iberia Parish Library / New Iberia  
 Library Louisiana State University Mrs. Roberta A. Scull /  
 Baton Rouge  
 Lincoln Parish Library / Ruston  
 Livingston Parish Library / Livingston  
 Louisiana Collection Special Collections Tulane University  
 Libraries / New Orleans  
 Madison Parish Library / Tallulah  
 Morehouse Parish Library / Bastrop  
 Natchitoches Parish Library / Natchitoches  
 New Orleans Public Library Mr. Colin Hamer / Louisiana  
 Opelousas-Eunice Public Library / Opelousas  
 Ouachita Parish / Monroe  
 Plaquemines Parish Library / Buras  
 Pointe Coupee Parish Library / New Roads  
 Rapides Parish Library / Alexandria  
 Red River Parish Library / Coushatta

Richland Parish Library / Rayville  
 Sabine Parish Library / Many  
 Shreve Memorial Library / Shreveport  
 St. Bernard Parish Library / Chalmette  
 St. Charles Parish Library / Luling  
 St. James Parish Library / Litcher  
 St. John The Baptist Parish Library / LaPlace  
 St. Martin Parish Library / St. Martinville  
 St. Mary Parish Library / Franklin  
 St. Tammany Parish Library / Covington  
 State Library of Louisiana Louisiana Section / Baton Rouge  
 Tangipahoa Parish Library / Amite  
 Tensas Parish Library / St. Joseph  
 Terrebonne Parish Library / Houma  
 Union Parish Library / Farmerville  
 Vermilion Parish Library Jackie Choate / Abbeville  
 Vernon Parish Library / Leesville  
 Washington Parish Library / Franklinton  
 Webster Parish Library / Minden  
 West Baton Rouge Parish Library / Port Allen  
 West Carroll Library Highway 17 & Amp Marietta Street /  
 Oak Grove  
 Winn Parish Library / Winnfield

**Local Ports**

**Count: 7**

Port of Iberia Executive Director: Roy Pontiff / New Iberia  
 Port of New Orleans Joseph G. Cochiara Jr. Sr. Manager  
 For Mgt. Services / New Orleans  
 Port of New Orleans Sr. Manager For Operations Deborah  
 Keller / New Orleans  
 Port of South Louisiana Globalplex Intermodal Terminal /  
 LaPlace  
 Port of South Louisiana James Nelson Assistant Port  
 Director / LaPlace  
 Port of South Louisiana Kay Jackson Director of Business  
 Development / LaPlace  
 Port of South Louisiana Mitch Smith Operations Director /  
 LaPlace

Locally Elected Officials (Mavors, Police Jurors, etc.)**Count: 567**

"Barry" Verret District 8 - Iberia Councilman / New Iberia  
 "Bill" Wild District 12 - Jefferson Davis Police Juror / Welsh  
 "Bob" Manuel District 5 - Evangeline Police Juror / Ville Platte  
 "Buck" Richardson District 3 - East Feliciana Police Juror / Clinton  
 "Chris" Roberts District 1 - Jefferson Councilmember / Terrytown  
 "Chuck" Nassauer District 3 - Washington Council Member / Bogalusa  
 "Don" Davis District 10 - Jefferson Davis Police Juror / Iowa  
 "Donald" Woods District 1 - Jefferson Davis Police Juror / Lake Arthur  
 "Jay" Friedman District 7 - Plaquemines Member of Parish Council / Buras  
 "Jeff Big Daddy" Naquin District 2 - Assumption Police Juror / Labadieville  
 "Jeff Petit" Kershaw District 2 - West Baton Rouge Council Member / Port Allen  
 "Jerry" Binder District 12 - St. Tammany Council Member / Slidell  
 "Joe" Clark District 9 - Plaquemines Member of Parish Council / Venice  
 "Joe" Fuller District F - Rapides Police Juror / Alexandria  
 "Joe" Impastato District 7 - St. Tammany Council Member / Lacombe  
 "Johnny" Guinn District 5 - Jefferson Davis Police Juror / Jennings  
 "Ken" Burkhalter District 14 - St. Tammany Council Member / Slidell  
 "Ken" Wheat District 1 - Washington Council Member / Bogalusa  
 "Kenny" Alfred District 4 - St. Mary Councilman / Morgan City  
 "Kim" Elfert District 3 - Terrebonne Council Member / Houma  
 "Marty" Dean District 1 - St. Tammany Council Member / Covington  
 "Marty" Gould, Jr. District 5 - St. Tammany Council Member / Mandeville  
 "Mike" Mudge District 4 - Plaquemines Member of Parish Council / Belle Chasse  
 "Mike" Nothnagel District 4B - Beauregard Police Juror / Longville  
 "Pat" Miller District 3 - St. Landry Council Member / Opelousas  
 "Pete" Lambert District 9 - Terrebonne Council Member / Montegut  
 "Ram" Ramchandran District 3 - St. Charles Councilman / Destrehan  
 "Randy" Menard District 9 - Lafayette Member / Lafayette  
 "Ray" Fremin, Jr. District 3 - Iberia Councilman / New Iberia  
 "Ray" Pynes District 12 - Vernon Police Juror / Leesville  
 "Rick" Fremin District 2 - Plaquemines Member of Parish Council / Belle Chasse  
 "Rob" Stevenson District 8 - Lafayette Member / Lafayette  
 "Steve" Bordelon District B - Rapides Police Juror / Pineville  
 "Steve" Eastman District 7 - Jefferson Davis Police Juror / Jennings  
 "Steve" Lee District 7 - St. John the Baptist Councilman / LaPlace

"Steve" Stefancik District 11 - St. Tammany Council Member / Slidell  
 "Steve" Vaughn District 5 - Plaquemines Member of Parish Council / Belle Chasse  
 "Tommy" Lasseigne District 4 - Lafourche Council Member / Thibodaux  
 "Wayne" Ardoin District 9 - St. Landry Council Member / Opelousas  
 "Zeb" Simon District 12 - Iberia Councilman / Jeanerette  
 A. "Buddy" Mincey District 5 - Livingston Councilman / Denham Springs  
 A. J. "Fatty" Broussard District 2 - Acadia Police Juror / Crowley  
 A. J. "Jay" Credeur District 6 - Acadia Police Juror / Church Point  
 Adrian Thompson District 3 - Ascension Council Member / Gonzales  
 Albert "Dewey" Dukes District 7 - Pointe Coupee Police Juror / New Roads  
 Albert Foulcard District 2 - St. Mary Councilman / Franklin  
 Albert Hollier District 7 - St. Landry Council Member / Arnaudville  
 Allen J. St. Pierre District 2 - St. John the Baptist Councilman / Reserve  
 Allen Parish Police Jury / Oberlin  
 Alton Stevenson District 1 - Acadia Police Juror / Crowley  
 Alvin Tillman District 1 - Terrebonne Council Member / Houma  
 Alvin W. "Coach" Thomas, Jr. District 1 - Ascension Council Member / Donaldsonville  
 Amos Cormier, Jr. District 6 - Plaquemines Member of Parish Council / Port Sulphur  
 Andrew Hayes District 1 - Allen Police Juror / Oakdale  
 Anthony "Twine" Desselle District 5 - Avoyelles Police Juror / Marksville  
 April Black District 5 - St. Charles Councilman / St. Rose  
 Ascension Parish Police Jury / Donaldsonville  
 Barbara Gibson Village of Sun / Sun  
 Barbara J. Jacob St. Charles Parish Council Secretary / Destrehan  
 Barry Bagert District 9 - St. Tammany Council Member / Pearl River  
 Barry Minnich District 7 - St. Charles Councilman / Luling  
 Beauregard Parish Police Jury / DeRidder  
 Bernard E. Broussard District 6 - Iberia Councilman / New Iberia  
 Bert F. Babers, III District 6 - West Feliciana Police Juror / St. Francisville  
 Betty Nelson District 9 - West Baton Rouge Council Member / Port Allen  
 Billy D. Shoemaker District 4 - West Feliciana Police Juror / Tunica  
 Bobby Badeaux District 1 - Lafayette Member / Scott  
 Bradley Eastman District 4 - Jefferson Davis Police Juror / Jennings  
 Brent Callais District 8 - Lafourche Council Member / Cut Off  
 Brian A. Fabre District 2 - St. Charles Councilman / Luling  
 Bruce Boudreaux District 1 - St. Landry Council Member / Opelousas  
 Bruce Conque District 6 - Lafayette Member / Lafayette  
 Buddy Farris District 2 - Allen Police Juror / Oakdale  
 Byrel H. Book District 4A - Beauregard Police Juror / Longville  
 Byron Lee District 3 - Jefferson Councilmember / Marrero  
 Byron Sharper Metro District 7 - East Baton Rouge Councilman / Baton Rouge  
 C. Ray Naquin City of New Orleans Mayor / New Orleans  
 Caesar Comeaux District 5 - Iberia Councilman / New

Iberia  
 Carl "Stan" Cain District 7 - Livingston Councilman / Walker  
 Carlo S. Bruno District 4 - Tangipahoa Councilman / Independence  
 Carlos Archfield District 3A - Beauregard Police Juror / DeRidder  
 Carlos D. Notariano District 8 - Tangipahoa Councilman / Hammond  
 Cecelia S. Broussard District 4 - Acadia Police Juror / Crowley  
 Charles "I Spy" Ketchens District 5 - St. James Councilman / Vacherie  
 Charles A. "Chuck" Walters District 8 - St. Mary Councilman / Amelia  
 Charles Davis District 5 - St. Helena Police Juror / Amite  
 Charles Frank Haynes, Jr. District 5 - East Feliciana Police Juror / Clinton  
 Charles H. Reppel Special Asst. to the Parish President St. Bernard Parish Government / Chalmette  
 Charles Precht, III District 3 - Cameron Police Juror / Bell City  
 Charles R. Kelly Metro District 5 - East Baton Rouge Councilman / Baton Rouge  
 Cheryl K. Fontenot District 4 - Ascension Council Member / Gonzales  
 Christa M. Duplantis District 5 - Terrebonne Council Member / Houma  
 Christopher "Chris" Canulette District 8 - St. Tammany Council Member / Slidell  
 Christopher "Chris" Williams District 3 - Lafayette Member / Lafayette  
 City / Parish President Mr. Walter Comeaux / Lafayette  
 City of Abbeville Mark F. Piazza Mayor / Abbeville  
 City of Baker Leroy Davis Mayor / Baker  
 City of Bogalusa James "Mack" McGehee Mayor / Bogalusa  
 City of Breaux Bridge Jack Dale Delhomme Mayor / Breaux Bridge  
 City of Bunkie Gerard Moreau, Jr. Mayor / Bunkie  
 City of Carencro Glenn L. Bresseaux Mayor / Carencro  
 City of Covington Candace Watkins Mayor / Covington  
 City of Crowley Isabella L. Delahoussaye Mayor / Crowley  
 City of Denham Springs James E. Durbin Mayor / Denham Springs  
 City of Deridder Gerald Johnson Mayor / De Ridder  
 City of Donaldsonville Raymond "Ray" Jacobs Mayor / Donaldsonville  
 City of Eunice E. Lynn Lejeune Mayor / Eunice  
 City of Franklin Vincent J. St. Blanc, III Mayor / Franklin  
 City of Gonzales John A. "Johnny" Berthelot Mayor / Gonzales  
 City of Hammond Mayson H. Foster Mayor / Hammond  
 City of Harahan Paul D. Johnston Mayor / Harahan  
 City of Jennings Terry W. Duhon Mayor / Jennings  
 City of Kaplan Levi J. Schexnider Mayor / Kaplan  
 City of Kenner Philip L. "Phil" Capitano Mayor / Kenner  
 City of Lake Charles "Randy" Roach Mayor / Lake Charles  
 City of Leesville Jim Shapkoff Mayor / Leesville  
 City of Mandeville "Eddie" Price Mayor / Mandeville  
 City of Marksville Richard Michel Mayor / Marksville  
 City of Morgan City Tim Tregle Mayor / Morgan City  
 City of New Iberia Ruth Fontenot Mayor / New Iberia  
 City of New Roads Sylvester Muckelroy Mayor / New Roads  
 City of Oakdale Bobby Abrusley Mayor / Oakdale  
 City of Patterson J. L. "Jimmy" Bernauer Mayor / Patterson  
 City of Pineville Clarence Ray Fields Mayor / Pineville  
 City of Plaquemine Mark A. "Tony" Gulotta Mayor / Plaquemine  
 City of Ponchatoula Julian E. Dufreche Mayor / Ponchatoula  
 City of Port Allen Lynn B. Robertson Mayor / Port Allen  
 City of Rayne James J. "Jimbo" Petitjean Mayor / Rayne  
 City of Scott Hazel D. Myers Mayor / Scott  
 City of St. Gabriel George L. Grace Mayor / Sunshine  
 City of St. Martinville Eric Martin Mayor / St. Martinville  
 City of Sulphur Ron LeLeux Mayor / Sulphur  
 City of Thibodaux Charles Caillouet Mayor / Thibodaux  
 City of Ville Platte "Phil" Lemoine Mayor / Ville Platte  
 City of Westlake Dudley R. Dixon Mayor / Westlake  
 City of Westwego Robert E. Billiot Mayor / Westwego  
 City of Zachary Charlene M. Smith Mayor / Zachary  
 Clayton "Snookie" Fauchaux St. Charles Parish Council Member At Large, Division B / Luling  
 Clayton J. Voisin District 7- Terrebonne Council Member / Dulac  
 Clement Guidroz District 4 - Pointe Coupee Police Juror / Jarreau  
 Clerk of Council Polly Boudreaux / Chalmette  
 Clifford "Ted" Nelson District 12 - Pointe Coupee Police Juror / Ventress  
 Clinton A. Miley, Sr. District 2 - Washington Council Member / Bogalusa  
 Council Member At Large Eastern Division Lynn B. Dean / Braithwaite  
 Council Member At Large Mr. Eddie L. Sapir Orleans Parish / New Orleans  
 Council Member At Large Oliver M. Thomas Orleans Parish / New Orleans  
 Council Member At Large Western Division "Joey" DiFatta / Chalmette  
 Council Member at Large, Division A John F. Young Jefferson Parish / Metairie  
 Council Member At Large, Division A Mr. Cleveland Farlough St. John the Baptist / Reserve  
 Council Member at Large, Division A Thomas J. "Tom" Capella Jefferson Parish / Metairie  
 Council Member At Large, Division B Joel S. McTopy St. John the Baptist / LaPlace  
 Craig Taffaro, Jr. District D - St. Bernard Councilman / Meraux  
 Curtis Anderson District 5 - West Baton Rouge Council Member / Port Allen  
 Curtis Clay District 10 - Vernon Police Juror / Leesville  
 Curtis J. Boudoin District 2 - Iberia Councilman / New Iberia  
 Cynthia Willard-Lewis District E - Orleans Councilmember / New Orleans  
 Dale Bourgeois District 2 - Lafayette Member / Carencro  
 Dale Laborde District 4 - Avoyelles Police Juror / Mansura  
 Daniel Lorraine District 9 - Lafourche Council Member / Golden Meadow  
 Danny Harrell District 3 - Livingston Councilman / Denham Springs  
 Dantin V. "Danny" LeBlanc District 4 - West Baton Rouge Council Member / Port Allen  
 Darrell P. Ourso Council Member, Metro District 9 / Baton Rouge  
 Darrell P. Ourso Metro District 9 - East Baton Rouge Councilman / Baton Rouge  
 Darryl Farque District 7 Police Juror / Lake Charles  
 Darwin Sharp District 7 - Washington Council Member / Franklinton  
 David Boneno Metro District 11 - East Baton Rouge Councilman / Baton Rouge  
 Davis Manuel District 1 - Evangeline Police Juror / Ville Platte  
 Debbie D. Edwards District 9 - Tangipahoa Councilman / Ponchatoula

Dempsey Lambert District 5 - Ascension Council Member / Prairieville  
 Derryl Wayne Walls District 4 - St. Charles Councilman / Des Allemands  
 Desmond J. Hilaire District 1 - St. Charles Councilman / Hahnville  
 Dewey A. Harrell District 6 - Livingston Councilman / Livingston  
 Dexter Q. Brown District 10 - St. Landry Council Member / Opelousas  
 Donald H. Wilmore District E - Rapides Police Juror / Boyce  
 Donald Ray Willson District 6 - St. Helena Police Juror / Kentwood  
 Douaine Conner District 4 - Cameron Police Juror / Creole  
 Douglas A. "Doug" Hillensbeck District 7 - Ascension Council Member / Prairieville  
 Douglas Ohmer District 3 - Assumption Police Juror / Labadieville  
 Douglas Wayne Sonnier District 5 - Allen Police Juror / Oberlin  
 Dudley "Dut" Jarreau District 10 - Pointe Coupee Police Juror / Livonia  
 Dwight Hill District 4B - East Feliciana Police Juror / Jackson  
 E. R. "Butch" Jones District 1 - West Feliciana Police Juror / St. Francisville  
 East Feliciana Parish Police Jury / Clinton  
 Eddie Wagner District 9 - Livingston Councilman / Albany  
 Edval Simon, Jr. District 8 - Vermilion Police Juror / Delcambre  
 Edwin M. Reeves, Jr. District 5 - Iberville Council Member / Plaquemine  
 Elton Lagasse District 2 - Jefferson Councilmember / River Ridge  
 Elton M. Aubert District 6 - St. James Councilman / Vacherie  
 Elwyn Bocz District 1 - St. James Councilman / Gramercy  
 Elzie R. Bryant District 1 - Avoyelles Police Juror / Centerpoint  
 Ernal J. Broussard District 7 - Vermilion Police Juror / Abbeville  
 Eugene P. Stevens, Jr. District 8 - Iberville Council Member / Plaquemine  
 Evangeline Parish Police Jury Courthouse Building / Ville Platte  
 Ezra Reed District C - Rapides Police Juror / Deville  
 Felton Moreau District 8 - Acadia Police Juror / Eunice  
 Floyd Younger West Feliciana Parish Police Jury / St. Francisville  
 Frank E. Johnson District 4 - St. Helena Police Juror / Pine Grove  
 Franklin Parish Police Jury Jenny Curtis, Parish Secretary / Winnsboro  
 Fred Mills, Jr. District 6 - St. Martin Council Member / St. Martinville  
 Gary D. Courville District 13 - St. Landry Council Member / Eunice  
 Gary Duhon District 11 - St. Mary Councilman / Morgan City  
 Gary T. Singletary District 6 - St. Tammany Council Member / Pearl River  
 Gaulman Gaspard District 10 - Vermilion Police Juror / Kaplan  
 George T. Gros District 7 - Iberia Councilman / New Iberia  
 George Valentine District 8 - Ascension Council Member / Geismar  
 Gerald M. "Mike" McLeod District 1 - Beauregard Police Juror / Singer  
 Geraldine "Gerry" Battley District 8 - Pointe Coupee Police Juror / New Roads  
 Glenn P. Romero District 9 - Iberia Councilman / New Iberia  
 Greg Nothnagel District 5 - Beauregard Police Juror / DeRidder  
 Guy Buckley District 1 - Tangipahoa Councilman / Kentwood  
 Guy Cormier District 1 - St. Martin Council Member / St. Martinville  
 H. G. "Buddy" Ridgel District 5 - Tangipahoa Councilman / Tickaw  
 H. G. "Buddy" Ridgel District 5 - Tangipahoa Councilman / Tickfaw  
 Harlan James Cashiola District 7 - West Baton Rouge Council Member / Port Allen  
 Harold F. Lapeyre District 6 - Terrebonne Council Member / Houma  
 Harry B. Levy District 6 - Jefferson Davis Police Juror / Jennings  
 Henry Billiot District 10 - St. Tammany Council Member / Mandeville  
 Henry Dupre District 7 - Assumption Police Juror / Belle Rose  
 Henry Hines District 8 - Avoyelles Police Juror / Bunkie  
 Hill Johnson District 4 - Evangeline Police Juror / Ville Platte  
 Houston Burns District 6 - Vernon Police Juror / Leesville  
 Howard "Pete" Dowden District 2 - Vernon Police Juror / Anacoco  
 Howard Oubre, Jr. District 7 - Iberville Council Member / Plaquemine  
 Hubert Faulk District 2 - Vermilion Police Juror / Abbeville  
 Huet "Picheau" Dupre District 4 - St. Landry Council Member / Opelousas  
 Huey P. Brown District 6 - West Baton Rouge Council Member / Port Allen  
 Hurlin Dupre District 6 - St. Landry Council Member / Port Barre  
 Irma L. Cry St. Tammany Parish Council / Slidell  
 J. Michael Walker, Sr. Metro District 8 - East Baton Rouge Councilman / Baton Rouge  
 Jackie L. Grimes District 4 - Vernon Police Juror / Leesville  
 Jaclyn S. Hotard District 4 - St. John the Baptist Councilman / LaPlace  
 Jacquelyn Brechtel Clarkson District C - Orleans Councilmember / New Orleans  
 James "Jimmy" Brazan District 7 - St. James Councilman / Vacherie  
 James A. "Red" Thompson, II District 3 - St. Tammany Council Member / Folsom  
 James B. Tuck District 1 - Vernon Police Juror / Leesville  
 James Boswell District 3C - Beauregard Police Juror / Longville  
 James C. Eaglin District 2 - St. Landry Council Member / Opelousas  
 James Doxey District 6 - Cameron Police Juror / Cameron  
 James Francis Hunt, Sr. District 1A - East Feliciana Police Juror / Clinton  
 James Hebert District 8 - St. Martin Council Member / Breaux Bridge  
 James T. "Jim" Benham Metro District 12 - East Baton Rouge Councilman / Baton Rouge  
 Jared "Burger" Beiriger District 11 - Ascension Council Member / Gonzales  
 Jefferson Davis Parish Police Jury Courthouse / Jennings  
 Jefferson Parish Dr. Mary G. Curry / Harahan  
 Jefferson Parish Mrs. Marnie Winter Director Envir & Dev

Control Dept. / Jefferson  
 Jefferson Parish Police Jury Parish Council / Gretna  
 Jennifer Sneed District 5 - Jefferson Councilmember /  
 Metairie  
 Jerome W. Fitch District 11 - Iberia Councilman /  
 Jeanerette  
 Jerry Hodnett District 3 - Plaquemines Member of Parish  
 Council / Belle Chasse  
 Jerry M. Kern District 3B - Beauregard Police Juror /  
 DeRidder  
 Jerry McDonald Parish President Sabine Parish / Many  
 Jerry P. Savoy District 6 - Ascension Council Member / St.  
 Amant  
 Jerry P. Wood District G - Rapides Police Juror /  
 Alexandria  
 Jerry Shirley District 3E - Beauregard Police Juror /  
 DeRidder  
 Jimmie McCoy District 2 - Livingston Councilman /  
 Watson  
 Jimmie Pellerin District 5 - Acadia Police Juror / Rayne  
 Jimmy Bello District 5 - Pointe Coupee Police Juror /  
 Ventress  
 Jimmy L. James District 5 - Vernon Police Juror / Pitkin  
 Joe "Coach" Thomas District 13 - St. Tammany Council  
 Member / Slidell  
 John "Jay" Batt District A - Orleans Councilmember / New  
 Orleans  
 John "Sassy" Pourciau District 2 - Pointe Coupee Police  
 Juror / Batchelor  
 John Calvin James District 6 - Assumption Police Juror /  
 Napoleonville  
 John Carroll Duhon District 1 - Vermilion Police Juror /  
 Maurice  
 John Cobb District 3 - West Feliciana Police Juror / St.  
 Francisville  
 John Hamilton District 11 - Vernon Police Juror / New  
 Llano  
 John K. Roach District 5 - West Feliciana Police Juror / St.  
 Francisville  
 John L. Barthelemy, Jr. District 1 - Plaquemines Member  
 of Parish Council / Pointe-a-la-Hache  
 John M. Barnett District 1B - East Feliciana Police Juror /  
 Ethel  
 John P. Marceaux District 2 - Jefferson Davis Police Juror  
 / Lake Arthur  
 John R. Sexton District 11 - Iberville Council Member /  
 Rosedale  
 John W. Humble, Sr. District 3 - Acadia Police Juror /  
 Morse  
 John W. Strother District 3 - Allen Police Juror / Oakdale  
 Joseph "Bozo" Bergeron District 11 - Pointe Coupee Police  
 Juror / Fardoche  
 Joseph "Joe" Greco Metro District 4 - East Baton Rouge  
 Councilman / Greenwell Springs  
 Joseph M. "Tooney" Davis, Jr. District 1 - St. Mary  
 Councilman / Jeanerette  
 Judy Darby Hoffmeister District B - St. Bernard  
 Councilman / Chalmette  
 Jule Charles Wascom District 1 - St. Helena Police Juror /  
 Greensburg  
 Juliet Williams District 1 - Pointe Coupee Police Juror /  
 Lettsworth  
 Julio C. Mayorga St. Bernard Parish Government  
 Community Development / Chalmette  
 Karl "Bubba" Chaney District 6 - East Feliciana Police  
 Juror / Clinton  
 Keith J. Leonard District 6 - St. Mary Councilman /  
 Berwick  
 Keith K. Washington, Sr. District 3 - West Baton Rouge  
 Council Member / Brusly  
 Keith O. Miller District 11 - St. Landry Council Member /  
 Lawtell  
 Keith W. Lacombe District 9 - Avoyelles Police Juror /  
 Simmesport  
 Keith Wade District 4 - Assumption Police Juror /  
 Napoleonville  
 Kenneth W. "Kenny" Henderson District C - St. Bernard  
 Councilman / Chalmette  
 Kent Fontenot District 7 - Allen Police Juror / Reeves  
 Kent Schexnaydre District 2 - Ascension Council Member /  
 Gonzales  
 Kevin J. Voisin District 7 - St. Mary Councilman / Morgan  
 City  
 Kirby Roy, III District 2 - Avoyelles Police Juror /  
 Hessmer  
 L. Phillip Gouaux District 7 - Lafourche Council Member /  
 Lockport  
 Lafayette Parish Police Jury Courthouse Building /  
 Lafayette  
 Lance Marino St. Charles Parish Council Council Member  
 At Large, Division A / Norco  
 Larry James Fontenot District 9 - Jefferson Davis Police  
 Juror / Jennings  
 Larry L. Johnson District 8 - West Baton Rouge Council  
 Member / Port Allen  
 Lenwood Broussard District 5 - Lafayette Member /  
 Lafayette  
 Leonard "Buck" Jackson District 4 - Iberville Council  
 Member / Carville  
 Leroy A. Faul District 11 - Jefferson Davis Police Juror /  
 Welsh  
 Lester Rainey, Jr. District 1 - St. John the Baptist  
 Councilman / Edgard  
 Linda Calvert Mayor's Office of Env. Affairs NO City Hall  
 / New Orleans  
 Lindel Toups District 6 - Lafourche Council Member /  
 Gheens  
 Lionell Wells District 7 - Tangipahoa Councilman /  
 Hammond  
 Lloyd "Red" Higginbotham District 5 - St. Martin Council  
 Member / St. Martinville  
 Lloyd Brown District 4 - Iberia Councilman / New Iberia  
 Lorri Burgess Metro District 10 - East Baton Rouge  
 Councilman / Baton Rouge  
 Louis "Pete" Kelley, Jr. District 10 - Iberville Council  
 Member / Plaquemine  
 Louis C. Benjamin, Jr. District 4 - Lafayette Member /  
 Lafayette  
 Louis J. Congemi District 4 - Jefferson Councilmember /  
 Kenner  
 Louis Kent District 7 - East Feliciana Police Juror / Clinton  
 Luther "Buster" Hardee, III District 14 - Vermilion Police  
 Juror / Kaplan  
 Lynda Banta District 8 - Plaquemines Member of Parish  
 Council / Buras  
 M. Larry Richard District 13 - Iberia Councilman / New  
 Iberia  
 Maggie F. Daniels District 1 - Iberia Councilman / New  
 Iberia  
 Magnus "Sonny" McGee District 1 - Cameron Police Juror  
 / Cameron  
 Marc E. Guillory District 6 - Evangeline Police Juror /  
 Ville Platte  
 Marc Mouton District 7 - Lafayette Member / Lafayette  
 Mark A. Borrel District 3 - Avoyelles Police Juror /  
 Marksville  
 Mark Atzenhoffer District 5 - Lafourche Council Member  
 / Bayou Blue  
 Mark Madary District A - St. Bernard Councilman / Arabi  
 Mark Poche District 6 - Vermilion Police Juror / Erath

Marlin N. Gusman District D - Orleans Councilmember /  
New Orleans

Marshall H. Harris District 4 - Livingston Councilman /  
Denham Springs

Martha Jane Tassin Metro District 6 - East Baton Rouge  
Councilman / Baton Rouge

Martin M. McConnell District 10 - Ascension Council  
Member / Gonzales

Martin S. Triche District 5 - Assumption Police Juror /  
Napoleonville

Marvin Thomas District 6 - Washington Council Member /  
Franklinton

Matthew H. Jewell District 12- Iberville Council Member /  
Maringouin

Matthew R. Hollins District 4 - Allen Police Juror / Mittie

Maxwell Chreene District 9 - Vermilion Police Juror /  
Abbeville

Mayor's Office of Env. Affairs Yarrow Etheredge City of  
New Orleans / New Orleans

McKinley "Pop" Keller District 6 - Avoyelles Police Juror  
/ Bunkie

Melanie "Miss Mel" Bueche District 6 - Pointe Coupee  
Police Juror / Lakeland

Melton Alfred District 3 - Jefferson Davis Police Juror /  
Jennings

Melvin Haymon District 8 - Vernon Police Juror / New  
Llano

Merlin Price St. Mary Parish Council / Morgan City

Michael "Mike" Matherne District 3 - Lafourche Council  
Member / Thibodaux

Michael A. Petitto District 3 - Tangipahoa Councilman /  
Amite

Michael E. "Mike" Harper District 3D - Beauregard Police  
Juror / DeRidder

Michael F. Delatte District 2 - Lafourche Council Member  
/ Thibodaux

Michael W. Domingue District 3 - St. Mary Councilman /  
Franklin

Mike Huval District 4 - St. Martin Council Member / Parks

Milton "Rocky" Ourso, Jr. District 2- Iberville Council  
Member / White Castle

Minos Broussard District 3 - Vermilion Police Juror /  
Erath

Mitchell "Mitch" Ardoin District 3 - Evangeline Police  
Juror / Mamou

Mix F. Vosburg District 9 - Pointe Coupee Police Juror /  
New Roads

Mr. Jess Curole Lafourche Parish CZM Administrator / Cut  
Off

Myron Matherne District 9 - Assumption Police Juror /  
Pierre Part

N. R. "Rusty" Williamson District 2 - Beauregard Police  
Juror / Merryville

Naray Hulin District 14 - Iberia Councilman / New Iberia

Nicholas P. Migliacchio District 9- Iberville Council  
Member / Plaquemine

Odell Trahan District 3 - St. Martin Council Member / St.  
Martinville

Otis L. Wilson District 7 - West Feliciana Police Juror / St.  
Francisville

Parish President "Joey" Durel Lafayette Parish / Lafayette

Parish President Aaron F. Broussard Jefferson Parish /  
Kenner

Parish President Benny Rousselle Plaquemines Parish  
Government / Belle Chasse

Parish President Charlotte Angelette Randolph Lafourche  
Parish / Larose

Parish President Donald "Don" Menard St. Landry Parish /  
Cankton

Parish President Donald "Don" Schwab Terrebonne Parish  
/ Houma

Parish President Henry "Junior" Rodriguez St. Bernard  
Parish / St. Bernard

Parish President M. E. "Toye" Taylor Washington  
Parish / Bogalusa

Parish President Michael "Mike" Grimmer Livingston  
Parish / Walker

Parish President Mr. Albert D. Laque St. Charles Parish /  
Boutte

Parish President Mr. Dale Hymel, Jr. St. James Parish /  
Lutcher

Parish President Mr. Gordon A. Burgess Tangipahoa Parish  
/ Loranger

Parish President Mr. J. Mitchell Ourso, Jr. Iberville Parish  
/ Plaquemine

Parish President Mr. Kevin C. Davis St. Tammany Parish /  
Slidell

Parish President Mr. Wilfred Langlains Iberia Parish /  
New Iberia

Parish President Mr. William A. Cefalu St. Mary Parish /  
Morgan City

Parish President Nickie Monica St. John the Baptist Parish /  
LaPlace

Parish President Riley "Pee Wee" Berthelot West Baton  
Rouge Parish / Addis

Parish President Ronnie Hughes Ascension Parish /  
Gonzales

Parish President Suzanne D. Blanchard St. Martin Parish  
Parish / Martinville

Pat Cluse District 7 - St. Martin Council Member / Breaux  
Bridge

Pat Culbertson Metro District 3 - East Baton Rouge  
Councilman / Baton Rouge

Patricia "Pat" Brister District 4 - St. Tammany Council  
Member / Mandeville

Patrick Lawless District 1 - Assumption Police Juror / Belle  
Rose

Paul P. Naquin, Jr. District 9 - St. Mary Councilman /  
Baldwin

Peter Rhodes District 8 - Terrebonne Council Member /  
Houma

Peter Soprano District 10 - St. Mary Councilman / Garden  
City

Pierre J. Galley District 13 - Jefferson Davis Police Juror /  
Lacassine

Planning Department City of Kenner / Kenner

Plaquemine Parish Government / Port Sulphur

Plaquemines Parish Police Jury / Pointe-a-la-Hache

Pointe Coupee Parish Police Jury / New Roads

Police Jury St. Martin Parish / St. Martinville

President Metro Council, City of Baton Rouge Mr. Bobby  
R. Simpson / Baton Rouge

Public Works Superintendant Allen J. Benoit / Berwick

Purvis Abshire District 12 - Vermilion Police Juror /  
Kaplan

R. E. "Sonny" Weatherford District 6 - Allen Police Juror /  
Kinder

Ralph A. Patin, Jr. District 4 - St. James Councilman /  
Convent

Randal J. Mouch District 1 - West Baton Rouge Council  
Member / Addis

Randall L. Rushing District 1 - Livingston Councilman /  
Walker

Randy Stevens District 2 - West Feliciana Police Juror /  
Jackson

Ravis Menard District 11 - Vermilion Police Juror / Kaplan

Reid Weeks District 7 - Vernon Police Juror / Rosepine

Relton Sumrall District 5 - Washington Council Member /  
Franklinton

Renee Gill Pratt District B - Orleans Councilmember / New

Orleans  
 Richard "Blood" Thomas District 9 - Evangeline Police Juror / Ville Platte  
 Richard "Butch" Lindsay District A - Rapides Police Juror / Pineville  
 Richard "Dickie" Duhe District 6 - St. Charles Councilman / Norco  
 Richard Champagne Town of Lockport / Lockport  
 Richard Dale Wolfe District 3 - St. John the Baptist Councilman / Reserve  
 Richard Dudley District 4A - East Feliciana Police Juror / Jackson  
 Richard W. Billings District H - Rapides Police Juror / Forest Hill  
 Robert "Bob" Ray District 9 - St. Martin Council Member / Breaux Bridge  
 Robert J. Broussard District 8 - Jefferson Davis Police Juror / Jennings  
 Robert Johnson District 2 - East Feliciana Police Juror / Ethel  
 Rodney Brown District 4 - Washington Council Member / Bogalusa  
 Rodney Littleton, Acting Director City of New Orleans Env. Affairs Off. Orleans Parish / New Orleans  
 Roger D. Faust District 2 - Tangipahoa Councilman / Loranger  
 Roger Duncan District 10 - Iberia Councilman / New Iberia  
 Ronald "T" Doucet District 8 - Evangeline Police Juror / Ville Platte  
 Ronald Dugas District 8 - St. Landry Council Member / Sunset  
 Ronald E. Buschel District 5 - St. Landry Council Member / Washington  
 Ronald J. Darby District 4 - Vermilion Police Juror / Abbeville  
 Ronald L. Sharp District 8 - Livingston Councilman / Springfield  
 Ronnie Bankston District 6 - Tangipahoa Councilman / Hammond  
 Ronnie S. Smith District 6 - St. John the Baptist Councilman / LaPlace  
 Russell Fitzmorris District 2 - St. Tammany Council Member / Covington  
 Russell Young District 3 - Pointe Coupee Police Juror / New Roads  
 Salaris G. Butler District 6 - Iberville Council Member / Plaquemine  
 Sam B. Fulton, Jr. District 9 - Vernon Police Juror / Leesville  
 Scott Perry, Jr. District I - Rapides Police Juror / Alexandria  
 Scott Trahan District 5 - Cameron Police Juror / Creole  
 Sean P. Roussel District 5 - St. John the Baptist Councilman / LaPlace  
 Sidney Fontenot District 2 - Evangeline Police Juror / Basile  
 St. Bernard Parish Police Jury Courthouse Annex St. Bernard / Chalmette  
 St. Charles Parish Police Jury St. Charles Parish Council / Hahnville  
 St. Helena Parish Police Jury St. Helena / Greensburg  
 St. James Parish Police Jury Convent Courthouse St. James / Convent  
 St. John The Baptist Parish Police Jury St. John the Baptist / Edgard  
 St. Landry Parish Police Jury St. Landry / Opelousas  
 St. Mary Parish Police Jury Courthouse St. Mary / Franklin  
 St. Tammany Parish Council St. Tammany / Covington  
 Steve F. Bierhorst District 5 - St. Mary Councilman / Patterson  
 Steve Trahan District 2 - Cameron Police Juror / Hackberry  
 T. J. Prejean, Jr. District 13 - Vermilion Police Juror / Abbeville  
 T.J. Smith, Jr. St. Tammany Parish Council St. Tammany / Covington  
 Tangipahoa Parish Police Jury Tangipahoa / Amite  
 Teri Chatagnier Cavalier District 4 - Terrebonne Council Member / Gray  
 Terrebonne Parish Police Jury Al Levron Terrebonne / Houma  
 Theodore Fontaine, Jr. District D - Rapides Police Juror / Alexandria  
 Thomas "Cade" Benoit District 7 - Acadia Police Juror / Church Point  
 Thomas E. Dominique, Sr. District 3 - Iberville Council Member / White Castle  
 Thomas J. Wicker District 2 - St. Helena Police Juror / Greensburg  
 Thomas Nelson District 2 - St. Martin Council Member / St. Martinville  
 Timothy P. "Timmy" Roussel District 2 - St. James Councilman / Lutcher  
 Todd Foles District 8 - Assumption Police Juror / Pierre Part  
 Todd Lambert District 9 - Ascension Council Member / Gonzales  
 Tommy L. McMahon District 3 - Vernon Police Juror / Evans  
 Tony "Ricky" Melerine District E - St. Bernard Councilman / Violet  
 Town of Abita Springs Louis Fitzmorris Mayor / Abita Springs  
 Town of Addis Carroll P. Bourgeois Mayor / Addis  
 Town of Amite City Reggie Goldsby Mayor / Amite  
 Town of Arcadia Eugene Smith Mayor / Arcadia  
 Town of Arnaudville "Kathy" M. Richard Mayor / Arnaudville  
 Town of Baldwin Wayne J. Breaux Mayor / Baldwin  
 Town of Ball Roy Hebron Mayor / Pineville  
 Town of Basile Berline Boone Mayor / Basile  
 Town of Boyce Julius Patrick, Jr. Mayor / Boyce  
 Town of Brusly Joey Normand Mayor / Brusly  
 Town of Cheneyville Coral A. Johnson Mayor / Cheneyville  
 Town of Church Point Roger Boudreaux Mayor / Church Point  
 Town of Clinton H. Toler Hatcher Mayor / Clinton  
 Town of Cottonport Cleveland Carmouche Mayor / Cottonport  
 Town of Delcambre Carol Broussard Mayor / Delcambre  
 Town of Duson John E. Lagneaux Mayor / Duson  
 Town of Elizabeth Robert "Bob" Crafton Mayor / Elizabeth  
 Town of Elton "Cathy" Hollingsworth Mayor / Elton  
 Town of Evergreen Drew Robert Mayor / Evergreen  
 Town of Fordoche Justin K. Cox Mayor / Fordoche  
 Town of Franklinton Earle R. Brown, Sr. Mayor / Franklinton  
 Town of Glenmora Tyrone Doyle Mayor / Glenmora  
 Town of Golden Meadow Joey Bouziga Mayor / Golden Meadow  
 Town of Gramercy Terry Borne Mayor / Gramercy  
 Town of Grand Coteau Jean J. Coco Mayor / Grand Coteau  
 Town of Grand Isle David J. Camardelle Mayor / Grand Isle  
 Town of Greensburg "Ken" L. Carter Mayor / Greensburg  
 Town of Gueydan Chris Theriot Mayor / Gueydan  
 Town of Henderson Earl "To Bit" Patin Mayor / Henderson  
 Town of Hornbeck Clarence Beebe Mayor / Hornbeck  
 Town of Independence Phillip F. Domiano Mayor /

Independence  
 Town of Iota John D. Sittig Mayor / Iota  
 Town of Kentwood Harold J. Smith Mayor / Kentwood  
 Town of Killian Gillis Windham Mayor / Killian  
 Town of Kinder Fred A. Ashy Mayor / Kinder  
 Town of Krotz Springs Gary G. Soileau Mayor / Krotz Springs  
 Town of Lake Arthur E. R. "Red" Giles Mayor / Lake Arthur  
 Town of Lecompte Rosa S. Jones Mayor / Lecompte  
 Town of Leonville Joel Lanclos, Jr. Mayor / Leonville  
 Town of Livingston D. Derral Jones Mayor / Livingston  
 Town of Livonia Ronald "TB" Scallan Mayor / Livonia  
 Town of Lockport Richard Champagne Mayor / Lockport  
 Town of Lutcher Troas A. Poche Mayor / Lutcher  
 Town of Madisonville Peter Gitz, Jr. Mayor / Madisonville  
 Town of Mamou James S. Fontenot Mayor / Mamou  
 Town of Mansura Harold Quebedeaux Mayor / Mansura  
 Town of Maringouin John Fitzgerald Overton, Sr. Mayor / Maringouin  
 Town of Melville Willie "Butch" Haynes, III Mayor / Melville  
 Town of Merryville Foy W. Rhodes Mayor / Merryville  
 Town of New Llano Freddie Boswell Mayor / New Llano  
 Town of Oberlin "Phil" Beard Mayor / Oberlin  
 Town of Pearl River James Lavigne Mayor / Pearl River  
 Town of Port Barre John B. Fontenot Mayor / Port Barre  
 Town of Roseland Charles Bracey Mayor / Roseland  
 Town of Rosepine Keith Foshee Mayor / Rosepine  
 Town of Simmesport James "Boo" Fontenot Mayor / Simmesport  
 Town of Slaughter Bobbie Bourgeois Mayor / Slaughter  
 Town of Sorrento Camile J. Trabeau Mayor / Sorrento  
 Town of Springfield Charles E. "Charlie" Martin Mayor / Springfield  
 Town of St. Francisville William "Billy" D'Aquila Mayor / St. Francisville  
 Town of Sunset Danny J. Louviere Mayor / Sunset  
 Town of Vinton David T. Riggins Mayor / Vinton  
 Town of Walker Travis Clark Mayor / Walker  
 Town of Washington Joseph "Joe" Pitre Mayor / Washington  
 Town of Welsh Jimmy Cormier Mayor / Welsh  
 Town of White Castle Maurice A. Brown Mayor / White Castle  
 Town of Woodworth David C. Butler, II Mayor / Woodworth  
 Town of Youngsville Wilson B. Viator, Jr. Mayor / Youngsville  
 Tyrone Brown Williams District 1 - Lafourche Council Member / Thibodaux  
 Tyrone Dufour District 7 - Avoyelles Police Juror / Plaquemine  
 Ulysses Z. Addison, Jr. Metro District 2 - East Baton Rouge Councilman / Baton Rouge  
 Vermilion Parish Police Jury / Abbeville  
 Vernon Parish Police Jury / Leesville  
 Village of Albany Thomas Allen Stewart Mayor / Albany  
 Village of Anacoco Leroy Cooley Mayor / Anacoco  
 Village of Angie John Dawsey Mayor / Angie  
 Village of Cankton Susan Menard Mayor / Cankton  
 Village of Chataignier Herman Malveaux Mayor / Ville Platte  
 Village of Estherwood Jeanelle F. Schexnider Mayor / Estherwood  
 Village of Fenton Frank D. Broxton Mayor / Fenton  
 Village of Folsom Marshall Brumfield Mayor / Folsom  
 Village of Forest Hill Marcia F. Young Mayor / Forest Hill  
 Village of French Settlement Clyde L. Wheat Mayor / French Settlement

Village of Grosse Tete Philip "Tunnie" Sarullo Mayor / Grosse Tete  
 Village of Hessmer Lynn Bordelon Mayor / Hessmer  
 Village of Loreauville Forbus J. Mestayer, Sr. Mayor / Loreauville  
 Village of Maurice Barbara L. Picard Mayor / Maurice  
 Village of McNary Don Parker, II Mayor / Glenmora  
 Village of Mermentau Myrtis A. Gautreaux Mayor / Mermentau  
 Village of Moreauville Lionel J. Bordelon Mayor / Moreauville  
 Village of Morganza Charles "Chuck" Landry Mayor / Morganza  
 Village of Morse Leon Clement Mayor / Morse  
 Village of Napoleonville Darrell Jupiter, Sr. Mayor / Napoleonville  
 Village of Norwood David C. Jett Mayor / Norwood  
 Village of Palmetto Earline H. Bihm Mayor / Palmetto  
 Village of Parks John Dugas Mayor / Parks  
 Village of Pine Prairie Terry L. Savant Mayor / Pine Prairie  
 Village of Plaquemine Terry St. Romain Mayor / Plaquemine  
 Village of Port Vincent Mary T. Gourdon Mayor / Port Vincent  
 Village of Reeves Shelley Tyler Mayor / Reeves  
 Village of Rosedale Lawrence J. "Football" Badaeux Mayor / Rosedale  
 Village of Simpson Donnis Brinkley Mayor / Simpson  
 Village of Tangipahoa James Fultz Mayor / Tangipahoa  
 Village of Tickfaw Anthony "Tony" Lamonte Mayor / Tickfaw  
 Village of Turkey Creek Blaine Janet Mayor / Turkey Creek  
 Village of Wilson Bennie C. Jones, Jr. Mayor / Wilson  
 Warren Taylor District 1- Iberville Council Member / White Castle  
 Wayne "Spider" Carter Metro District 1 - East Baton Rouge Councilman / Zachary  
 Wayne J. Thibodeaux District 2 - Terrebonne Council Member / Gray  
 Wayne M. Roy District 13- Iberville Council Member / St. Gabriel  
 Wayne Touchet District 5 - Vermilion Police Juror / Abbeville  
 West Baton Rouge Parish Police Jury / Port Allen  
 William "Billy" Gil District 12 - St. Landry Council Member / Eunice  
 William A. "Bill" Guidry District 7 - Evangeline Police Juror / Ville Platte  
 Willie J. Morgan District 3 - St. Helena Police Juror / Greensburg  
 Wilson F. Malbrough, Jr. District 3 - St. James Councilman / Paulina

#### Louisiana District Conservationist

**Count: 38**

District Conservationist Acadia Parish Crowley Service Center / Crowley  
 District Conservationist Allen Parish Oberlin Service Center / Oberlin  
 District Conservationist Ascension Parish Donaldsonville Service Center / Donaldsonville  
 District Conservationist Assumption Parish Donaldsonville Service Center / Donaldsonville  
 District Conservationist Avoyelles Parish Marksville Service Center / Marksville  
 District Conservationist Beauregard Parish Deridder Service Center / DeRidder

District Conservationist Calcasieu Parish Lake Charles Service Center / Lake Charles  
 District Conservationist Cameron Parish Lake Charles Service Center / Lake Charles  
 District Conservationist East Baton Rouge Parish Denham Springs Service Center / Denham Springs  
 District Conservationist East Feliciana Parish Clinton Service Center / Clinton  
 District Conservationist Evangeline Parish Ville Platte Service Center / Ville Platte  
 District Conservationist Iberia Parish New Iberia Service Center / New Iberia  
 District Conservationist Iberville Parish Donaldsonville Service Center / Donaldsonville  
 District Conservationist Jefferson Davis Parish Jennings Service Center / Jennings  
 District Conservationist Jefferson Parish Boutte Service Center / Boutte  
 District Conservationist Lafayette Parish Lafayette Service Center / Lafayette  
 District Conservationist Lafourche Parish Thibodaux Service Center / Thibodaux  
 District Conservationist Livingston Parish Denham Springs Service Center / Denham Springs  
 District Conservationist Orleans Parish Boutte Service Center / Boutte  
 District Conservationist Plaquemines Parish Council Boutte Service Center / Boutte  
 District Conservationist Pointe Coupee Parish New Roads Service Center / New Roads  
 District Conservationist Rapides Parish Alexandria Service Center / Alexandria  
 District Conservationist St. Bernard Parish Boutte Service Center / Boutte  
 District Conservationist St. Charles Parish Boutte Service Center / Boutte  
 District Conservationist St. Helena Parish Amite Service Center / Amite  
 District Conservationist St. James Parish Donaldsonville Service Center / Donaldsonville  
 District Conservationist St. John The Baptist Parish Boutte Service Center / Boutte  
 District Conservationist St. Landry Parish Opelousas Service Center / Opelousas  
 District Conservationist St. Martin Parish Breaux Bridge Service Center / Breaux Bridge  
 District Conservationist St. Mary Parish Franklin Service Center / Franklin  
 District Conservationist St. Tammany Parish Franklinton Service Center / Franklinton  
 District Conservationist Tangipahoa Parish Amite Service Center / Amite  
 District Conservationist Terrebonne Parish Thibodaux Service Center / Thibodaux  
 District Conservationist Vermillion Parish Abbeville Service Center / Abbeville  
 District Conservationist Vernon Parish Leesville Service Center / Leesville  
 District Conservationist Washington Parish Franklinton Service Center / Franklinton  
 District Conservationist West Baton Rouge Parish Addis Service Center / Addis  
 District Conservationist West Feliciana Parish Clinton Service Center / Clinton

#### Louisiana Flood Plain Administrators

**Count:**        **286**

Permit Administrator Killian, Village of / Killian

Adrienne Labat Planning Coordinator St. John the Baptist Parish / LaPlace  
 Al Courouveau Building Inspector Ponchatoula, City of / Ponchatoula  
 Alan Dwyer Special Services Director West Feliciana Parish / St. Francisville  
 Ali Mustapha Assistant City Engineer Shreveport, City of / Shreveport  
 Alice Galland Town Clerk Plaquemine, Town of / Plaquemine  
 Amanda Castello Chief Bldg. Official Zachary, City of / Zachary  
 Amber Higginbotham Town Clerk Church Point, Town of / Church Point  
 Andre Bass Building Inspector Winnfield, City of / Winnfield  
 Angela Canady Permit Official Baker, City of / Baker  
 Arthur Israel Building Inspector Walker, Town of / Walker  
 Barbara E. Dupree\*\*\* Clerk Martin, Village of / Coushatta  
 Barry Brewer Administrator Port Allen, City of / Port Allen  
 Bea Guidry Permit Officer Kaplan, City of / Kaplan  
 Becky Blanchard City Clerk Breaux Bridge, City of / Breaux Bridge  
 Becky Culpepper FPA Westlake, City of / Westlake  
 Becky Garner Town Clerk Goldonna, Village of / Goldonna  
 Ben Adams Building Inspector Jonesville, Town of / Jonesville  
 Bernard Frances Code Enforcement Officer Donaldsonville, City of / Donaldsonville  
 Betsy Jordan Clerk Robeline, Village of / Robeline  
 Betty Jo Moberly Clerk Campti, Town of / Campti  
 Beverly Perry Clerk Merryville, Village of / Merryville  
 Bill Smith Parish Administrator DeSoto Parish / Mansfield  
 Bob Carpenter Mayor Calvin, Village of / Calvin  
 Bonnie Dugas Clerk Mermentau, Village of / Mermentau  
 Bonnie G. Price Clerk Carencro, City of / Carencro  
 Bonnie Sonnier Permit Official St. Martin Parish / St. Martinville  
 Brad Duhon Permit Official Scott, City of / Scott  
 Brandon Mellieon Building Inspector Plaquemine, City of / Plaquemine  
 Brenda Hilton Town Clerk Hornbeck, Town of / Hornbeck  
 Brenda Jones Secretary Red River Parish / Coushatta  
 Brent Cooley Building Inspector Minden, City of / Minden  
 Bruce Fleming Director of Planning West Monroe, City of / West Monroe  
 Bryan Harmon Dept. of Public Works East Baton Rouge Parish / Baton Rouge  
 Buddy Redmon City Superintendent Bunkie, Town of / Bunkie  
 Candance Thomas Municipal Clerk Tickfaw, Town of / Tickfaw  
 Carl Robichaux Parish Engineer Ascension Parish / Gonzales  
 Carla Richard Clerk Erath, Town of / Erath  
 Carmen Judice Permit Official Iberia Parish / New Iberia  
 Carol Martin Clerk Rodessa, Village of / Rodessa  
 Carolyn Davis-Goff Clerk Boyce, Town of / Boyce  
 Cathy Fitch Clerk Oak Ridge, Village of / Oak Ridge  
 Charlene E. Hill Clerk Parks, Village of / Parks  
 Charlene Picard/OfficeMgr Acadian Metrocode Lafayette Parish / Lafayette  
 Charlene Picard/OfficeMgr Acadian Metrocode Lafayette, City of / Lafayette  
 Charlene Smith Clerk Haughton, Town of / Haughton  
 Charles Dixon Clerk Greensburg, Town of / Greensburg  
 Charles Germany Clerk Rayville, Town of / Rayville  
 Charlie Driver Building Inspector New Llano, Town of / New Llano

Cheryl Thomas Clerk Glenmora, Town of / Glenmora  
 Christi Morgan Clerk Gonzales, City of / Gonzales  
 Christine Logarbo Clerk Morse, Village of / Morse  
 Chuck Vincent Building Inspector Denham Springs, City of / Denham Springs  
 Cinderella Miller Clerk Cankton, Village of / Cankton  
 Cindy Mallett Clerk Lake Arthur, Town of / Lake Arthur  
 Cindy Murry Planning & Zoning Clerk Abita Springs, Town of / Abita Springs  
 Clegg Chaumont Superintendent Oberlin, Town of / Oberlin  
 Collins Bonicard Building Inspector Tangipahoa Parish / Hammond  
 Connie McKeel Clerk Waterproof, Town of / Waterproof  
 Connie Treadway Permit Officer Plaquemines Parish / Port Sulphur  
 Corrine Jones Admin Asst for Parish Planning Natchitoches Parish / Natchitoches  
 Cynthia Taylor Clerk Arnaudville, Town of / Arnaudville  
 D. Michael Metcalf Gretna, City of / Gretna  
 Dale Kelly Building Inspector Leesville, City of / Leesville  
 Danette Cloud Clerk Pine Prairie, Village of / Pine Prairie  
 Danny Hebert Bldg. Inspector Crowley, City of / Crowley  
 Darla Duet Permit Officer Lafourche Parish / Thibodaux  
 Dave Lowery City Manager Patterson, City of / Patterson  
 David C. Butler, II Mayor Woodworth, Village of / Woodworth  
 David Dupont Building Inspector Iberville Parish / Plaquemine  
 David Sellers Building Inspector Kentwood, Town of / Kentwood  
 Dawn B. Stott Town Clerk Olla, Town of / Olla  
 Deborah Strickland Sec./Treasurer St. Helena Parish / Greensburg  
 Debra Blackledge Clerk Cottonport, Town of / Cottonport  
 DeeDee Wagner Permits & Address Admin. Livingston Parish / Livingston  
 Denise Frank Town Clerk Epps, Village of / Epps  
 Denise Moore Town Clerk Grand Coteau, Town of / Grand Coteau  
 Denise Mose Clerk Kinder, Town of / Kinder  
 Derhyl Hebert Dir. of Planning & Zoning Morgan City, City of / Morgan City  
 Diane Mataya Town Clerk Lockport, Town of / Lockport  
 Dolores Melancon Clerk Leonville, Town of / Leonville  
 Dolores Pousson Clerk Iota, Town of / Iota  
 Donald Simmons Building Inspector St. Francisville, Town of / St. Francisville  
 Donna Baudoin Permits Director Abbeville / Abbeville  
 Donna Bergeron Town Clerk Livonia, Town of / Livonia  
 Donna Tyler Clerk Colfax, Town of / Colfax  
 Donna Veillon City Treasurer Ville Platte, City of / Ville Platte  
 Donnie Ousse Bldg. Inspector Rayne, City of / Rayne  
 Doris McGee Clerk Palmetto, Village of / Palmetto  
 Doris Narron Town Clerk Benton, Town of / Benton  
 Dorothy Kropog Assistant Village Clerk Albany, Village of / Albany  
 Doug Burguiers FPA Lake Charles, City of / Lake Charles  
 E. A. Greer Secretary/Morehouse Par PJury Morehouse Parish / Bastrop  
 Earl Matherne Permit Officer St. Charles Parish / Hahnville  
 Elisha Matthews Secretary/Treasurer East Carroll Parish / Lake Providence  
 Elizabeth Allen Clerk Pearl River, Town of / Pearl River  
 Eloise Means Town Clerk Bonita, Village of / Bonita  
 Elton Pickering Director of Public Works Beauregard Parish / DeRidder  
 Emily Bentley Clerk Clinton, Town of / Clinton  
 Eva Taylor Asst. Secretary/Treasurer Madison Parish / Tallulah  
 Evelyn Sandidge Clerk Pioneer, Village of / Pioneer  
 Faye Boyd Permit Official Franklinton, Town of / Franklinton  
 Floodplain Administrator Bossier Parish / Benton  
 Floodplain Administrator Clerk Clarence, Village of / Clarence  
 Flora Hicks Clerk Collinston, Village of / Collinston  
 Frankie Crooks Code Enforcement Officer Pineville, City of / Pineville  
 Gary Beadle Director of Planning & Zoning Berwick, Town of / Berwick  
 Genevieve Ellis Permit Official Richmond, Village of / Tallulah  
 Genie Drouin Clerk Hessmer, Village of / Hessmer  
 Gerald Odom Clerk Tallulah, City of / Tallulah  
 Gilbert Pitre City Inspector Jennings, City of / Jennings  
 Glen Couvillion Floodplain Administrator Alexandria, City of / Alexandria  
 Glenda Thomas Clerk South Mansfield, Village of / South Mansfield  
 Gloria Dean King Clerk Delhi, Town of / Delhi  
 Grady Stephens Business Manager Vernon Parish / Leesville  
 Greg Prejean (Bubba) Floodplain Administrator Sulphur, City of / Sulphur  
 Guy Pucheu(pro. pea-shoe) Clerk Mamou, Town of / Mamou  
 Heuetta Benoit Clerk Gueydan, Town of / Gueydan  
 Holly Gilmore Clerk Jackson, Town of / Jackson  
 Irvin Richoux, Sr. Building Inspector Grand Isle, Town of / Grand Isle  
 James Boyd Fire Protection Chief Bastrop, City of / Bastrop  
 James Demouchet Permit Official Caddo Parish / Shreveport  
 James Hall Building Inspector Bogalusa, City of / Bogalusa  
 Jamie Liner Clerk Golden Meadow, Town of / Golden Meadow  
 Jana Klock Clerk Cheneyville, Town of / Cheneyville  
 Jason Benoit Senior Planner Houma, City of / Houma  
 Jason Benoit Senior Planner Terrebonne Parish / Houma  
 Jean Blackard Clerk Mer Rouge, Village of / Mer Rouge  
 Jeff L. James Mayor Rosepine, Town of / Rosepine  
 Jennifer Perkins Clerk Natchez, Village of / Natchez  
 Jenny Curtis Parish Secretary Franklin Parish / Winnsboro  
 Jerry DeWitt Code Enforcement Officer DeRidder, City of / DeRidder  
 JoAnn Basinger Town Clerk Ringgold, Town of / Ringgold  
 Jody Chenier Director of Operations St. James Parish / Convent  
 Joe Graves Clerk Wisner, Town of / Wisner  
 Joe Sontoyo Fire Chief Ferriday, Town of / Ferriday  
 John Boudreaux Floodplain Administrator Assumption Parish / Napoleonville  
 John Boudreaux Floodplain Administrator Napoleonville, Village of / Napoleonville  
 John Pinsonat Building Inspector New Roads, City of / New Roads  
 John Quebodeaux Permit Officer Acadia Parish / Crowley  
 Joy Fontenot Clerk DeQuincy, City of / DeQuincy  
 Joy S. Rhodes Clerk Plain Dealing, Town of / Plain Dealing  
 Joyce Core Clerk Folsom, Village of / Folsom  
 Juanita Fowler Director of Planning & Zoning Natchitoches, City of / Natchitoches  
 Judy Massey Clerk Ridgecrest, Town of / Ridgecrest  
 Judy Shelton Town Clerk Pollock, Town of / Pollock  
 Jules Lefeaux Town Clerk Brusly, Town of / Brusly  
 June Farmer Permit Administrator Port Vincent, Village of

/ Port Vincent  
 Karen Carlton Secretary/Treasurer Winn Parish / Winnfield  
 Karen Davis Clerk Springfield, Town of / Springfield  
 Kathy Dickens Clerk Vidalia, Town of / Vidalia  
 Kay Kleinpeter Clerk Grosse Tete, Village of / Grosse Tete  
 Kay Smith Secretary-Treasurer LaSalle Parish / Jena  
 Keith Chiro Permit Officer Kenner, City of / Kenner  
 Ken Amedee Clerk Rosedale, Village of / Rosedale  
 Laura Adams Floodplain Manager Catahoula Parish /  
 Harrisonburg  
 Lee Butler Utilities Supervisor Maringouin, Village of /  
 Maringouin  
 LeeAnn Clement Town Clerk Lake Providence, Town of /  
 Lake Providence  
 Leslie Thibodeaux Clerk Fordoche, Village of / Fordoche  
 Linda Duhon Floodplain Administrator Vermilion Parish /  
 Abbeville  
 Linda Gaspard Clerk Washington, Town of / Washington  
 Linda Lowery E-911 Admin/Floodplain Manager Caldwell  
 Parish / Columbia  
 Linda S. LeBlanc Town Clerk Welsh, Town of / Welsh  
 Linda Sikes Sec./Treasurer Tensas Parish / St. Joseph  
 Lisa Richardson Building Permit Officer Ouachita Parish /  
 Monroe  
 Lorraine M. Brummett Clerk Grand Cane, Village of /  
 Grand Cane  
 Lorraine Thibodeaux Clerk Baldwin, Town of / Baldwin  
 Louria\* Jefferson Permit Official Arcadia, Town of /  
 Arcadia  
 Lydia A. Boxie Clerk Sunset, Town of / Sunset  
 Lydia Z. Louque Permit Official Gramercy, Town of /  
 Gramercy  
 Mack Thompson Parish Engineer Allen Parish / Oberlin  
 Margaret Doucet Code Enforcement Officer Opelousas,  
 City of / Opelousas  
 Margie Holden Clerk McNary, Village of / McNary  
 Marie Beeson Clerk Elizabeth, Town of / Elizabeth  
 Marilyn Dilmore Clerk Sterlington, Town of / Sterlington  
 Marilyn Juneau Clerk Moreauville, Village of /  
 Moreauville  
 Mark Hudson Civil Engineer Bossier City, City of / Bossier  
 City  
 Mark Ramagos City Manager Morganza, Town of /  
 Morganza  
 Mary Hebert Clerk Maurice, Town of / Maurice  
 Mary Hebert Tax Collector Jeanerette, City of / Jeanerette  
 Mary Lou Lacassin Clerk Krotz Springs, Town of / Krotz  
 Springs  
 Mary Lou Lee Clerk Amite City, Town of / Amite City  
 Mary Pringle Clerk Forest Hill, Village of / Forest Hill  
 Mary Vice Clerk Vinton, Town of / Vinton  
 Maurice T. Bourgeois, Jr. City Clerk Westwego, City of /  
 Westwego  
 Maxine Ard Assistant Clerk Montpelier, Village of /  
 Montpelier  
 Maxine Buller Clerk Lecompte, Town of / Lecompte  
 Melissa Becker Rapides Parish / Alexandria  
 Melissa Blanco Permit Clerk St. Landry Parish / Opelousas  
 Mercedes Williams Clerk St. Joseph, Town of / St. Joseph  
 Marilyn Morris Tax Collector St. Gabriel, Town of / St.  
 Gabriel  
 Michael Andrus Building Inspector Monroe, City of /  
 Monroe  
 Michael Hunnicut Dir. of Comm. Development St. Bernard  
 Parish / Chalmette  
 Michelle Jones Clerk Oakdale, City of / Oakdale  
 Mike Allen Supervisor of Public Works Farmerville, Town  
 of / Farmerville  
 Mike Centineo Building Official Orleans Parish (New  
 Orleans) / New Orleans  
 Mildred Johns Clerk Mangham, Town of / Mangham  
 Mindy Ezernick Town Clerk Zwolle, Town of / Zwolle  
 Minnie Hutchinson Clerk Tangipahoa, Village of /  
 Tangipahoa  
 Mr. Carol J. Vinning Planning Director St. Mary Parish /  
 Franklin  
 Mr. Chris Young Fire Chief Jonesboro, Town of /  
 Jonesboro  
 Ms. Donny Duffy Clerk Livingston, Town of / Livingston  
 Ms. Eylene Bolling Secretary Claiborne Parish / Homer  
 Ms. Louise Jeansonne Asst. Administrator Marksville,  
 Town of / Marksville  
 Ms. Lynn Hicks Clerk Cotton Valley, Town of / Cotton  
 Valley  
 Ms. Paris Sumrall Mayor Varnado, Village of / Varnado  
 Ms. Willie Bishop Clerk Ball, Town of / Ball  
 Nancy Burney Clerk Cullen, Town of / Cullen  
 Nancy Robbins Town Clerk Gilbert, Village of / Gilbert  
 Neil Minor Planning & Zoning Director Franklin, City of /  
 Franklin  
 Nell Tassin Town Clerk Mansura, Town of / Mansura  
 Pam Guidry Building Inspector Henderson, Town of /  
 Breaux Bridge  
 Pam Mattingly Assistant Director of Planning Calcasieu  
 Parish / Lake Charles  
 Pam Stokes Clerk Delta, Village of / Delta  
 Patricia Griffith Permit Clerk Evangeline Parish / Ville  
 Platte  
 Patricia Lemoine Clerk Lutcher, Town of / Lutcher  
 Patti Vincent City Clerk Delcambre, Town of / Delcambre  
 Paulette St. Romain Permit Official Pointe Coupee Parish /  
 New Roads  
 Peggy Robinson Permit Official West Carroll Parish / Oak  
 Grove  
 Penny Fields Town Clerk Haynesville, Town of /  
 Haynesville  
 Pete Panepinto Building Official Hammond, City of /  
 Hammond  
 Phyllis Barnhill Clerk Many, Town of / Many  
 Phyllis Savoy Loreauville, Village of / Loreauville  
 Rachel Denison Town Clerk Columbia, Town of /  
 Columbia  
 Ray Rozas (Shorty) Bldg. Inspector Eunice, City of /  
 Eunice  
 Rebecca Langlinois Clerk Youngsville, Town of /  
 Youngsville  
 Reggie Edmiston Building Inspector Ruston, City of /  
 Ruston  
 Renee Dixon Clerk Melville, Town of / Melville  
 Rhonda King Clerk Newellton, Town of / Newellton  
 Richard Durrett Parish Engineer Lincoln Parish / Ruston  
 Robert Meeker Building Inspector Grant Parish / Colfax  
 Rodney Warren Permit Official Bienville Parish / Arcadia  
 Ron Keller Planning Director St. Tammany Parish /  
 Mandeville  
 Rose Johnson Town Clerk Basile, Town of / Basile  
 Roxy Fletcher City Clerk Winnsboro, City of / Winnsboro  
 Ruby Maggio Building Permit Office Thibodeaux, City of /  
 Thibodeaux  
 Russell Wagoner Secretary/Treasurer Concordia Parish /  
 Vidalia  
 Sadie G. Jones Clerk Clayton, Town of / Clayton  
 Sallie Broadway Clerk Provencal, Village of / Provencal  
 Sandra Miller Town Clerk Oak Grove, Town of / Oak  
 Grove  
 Sandra Turley Clerk Iowa, Town of / Iowa  
 Sandy S. Sarver Clerk Estherwood, Village of / Estherwood  
 Sarah Hebert Asst. Clerk Broussard, Town of / Broussard  
 Shannon Burke Covington, City of / Covington  
 Shannon Reeves Town Clerk Roseland, Town of /

Roseland  
 Sharon Eiland Clerk Doyline, Village of / Doyline  
 Sharon Johnson Permit Officer Union Parish / Farmerville  
 Sharon Keel Clerk Jena, Town of / Jena  
 Sharon Stewart Clerk Logansport, Town of / Logansport  
 Shedrick Berard Safety Director St. Martinville, City of /  
 St. Martinville  
 Sheila McManus Clerk Montgomery, Town of /  
 Montgomery  
 Sherry Boyd Town Clerk Sibley, Town of / Sibley  
 Sherwin LeFranc FPA Jefferson Davis Parish / Jennings  
 Shirley Byrd Sec./Treasurer Webster Parish / Minden  
 Sonia Marquette Floodplain Administrator West Baton  
 Rouge Parish / Port Allen  
 Stacey Adler Clerk White Castle, Town of / White Castle  
 Stacey Swindle Clerk Florien, Village of / Florien  
 Stanley Polivick City Engineer Slidell, City of / Slidell  
 Steve Benton Floodplain Administrator Madisonville,  
 Town of / Madisonville  
 Sue White Town Clerk/Permit Admin French Settlement,  
 Village of / French Settlement  
 Susan E. Robinson Clerk Grayson, Village of / Grayson  
 Sybil Josey Clerk Mound, Village of / Mound  
 Sylvia Forbes Flood Administrator Washington Parish /  
 Franklinton  
 Talona Hathcock Clerk Harrisonburg, Village of /  
 Harrisonburg  
 Tara Albares Town Clerk Sorrento, Town of / Sorrento  
 Tekisha Guidry Town Clerk Duson, Town of / Duson  
 Terrence Green Permit Administrator Greenwood, Town of  
 / Greenwood  
 Therese Wilcox Clerk Harahan, City of / Harahan  
 Tina Forrest Independence, Town of / Independence  
 Tina Horn Parish Administrator Cameron Parish / Cameron  
 Tina Lemoine OEP Assistant Avoyelles Parish / Marksville  
 Tom Rodrigue Jefferson Parish / Marrero  
 Tommy Burgess Floodplain Administrator Richland Parish  
 / Rayville  
 Toria Comeaux Clerk Port Barre, Town of / Port Barre  
 Travis Beebee Building Inspector Homer, Town of / Homer  
 Trudy Boudreaux Clerk/Floodplain Administrator Baskin,  
 Village of / Baskin  
 Vacant - Talk to Mayor Town Clerk Richwood, Town of /  
 Richwood  
 Vera Lucas Clerk Addis, Town of / Addis  
 Verian Guillory Clerk Elton, Town of / Elton  
 Vernell S. Franklin Clerk Simmesport, Town of /  
 Simmesport  
 Vicki Adkins Permit Officer Springhill, City of / Springhill  
 Wayne Berggren Bldg. Inspector Mandeville, City of /  
 Mandeville  
 Wesley Dunn Clerk Mansfield, City of / Mansfield  
 Wilbur J. Rozas Clerk Chataignier, Village of / Chataignier  
 Willie B. Robinson Clerk Coushatta, Town of / Coushatta  
 Winston Copell Building Inspector New Iberia, City of /  
 New Iberia  
 Yvette Crain Clerk Jean Lafitte, Town of / Lafitte

**Media (Newspaper, TV, Radio)**

**Count: 197**

Abbeville Meridional / Abbeville  
 Acadian Press / Mamou  
 Acadian Tribune / Rayne  
 American Press Attn: Hector San Miguel / Lake Charles  
 American Press Attn: Linda Young / Lake Charles  
 American Waterways Operators / Mandeville  
 Amite Tangi-Digest / Amite  
 Ascension Citizen / Gonzales

Avoyelles Journal / Marksville  
 Baton Rouge Business Report / Baton Rouge  
 Bill Capo WWL-TV, Channel 4 / New Orleans  
 Bob Breck Fox 8 Live WVUE-TV / New Orleans  
 Bobby Brennan Fox 8 Live WVUE-TV / New Orleans  
 Bunkie Record / Bunkie  
 Callais Cablevision Channel 5 / La Rose  
 Cameron Parish Pilot / Cameron  
 Carissa Mire The Daily Iberian / New Iberia  
 Carl Arredondo WWL-TV, Channel 4 / New Orleans  
 Catherine Carlock Simpson News Mgr LA Dept of Wildlife  
 & Fisheries / Baton Rouge  
 Chief / Donaldsonville  
 Church Point News / Church Point  
 Citizen / Coushatta  
 Citizen / Welsh  
 City Business Deon Roberts / Metairie  
 City Business Editor: Terry O'Connor / Metairie  
 Courier / Daily Comet / Houma  
 Daily Comet Editor Jeffrey Zeringue / Thibodaux  
 Daily Comet Todd Siegrist / Thibodaux  
 Daily Shipping Guide Garry Naquin / New Orleans  
 Daily Star Lillian Mirando / Hammond  
 Daily World Exec Editor Harland Kirgan / Opelousas  
 David Bernard WWL-TV, Channel 4 / New Orleans  
 David Krapf Workboat Magazine / Mandeville  
 Denham Springs-Livingston News / Denham Springs  
 Dennis Woltering WWL-TV, Channel 4 / New Orleans  
 Dir - Advertising & Promotion LA Dept of Commerce &  
 Industry / Baton Rouge  
 Don Hoffman Where Magazine / New Orleans  
 Eunice News / Eunice  
 Franklin Banner Tribune / Franklin  
 Galen H Rogers Gently Freak Productions / New Orleans  
 Gambit Weekly Michael Tisserand / New Orleans  
 Gazette / Ville Platte  
 Gonzales Weekly / Gonzales  
 Herald / Kaplan  
 Huey Stein - Editor The Enterprise / Vacherie  
 Jeanerette Enterprise / Jeanerette  
 Jeff Duhe-News Director Louisiana Public Broadcasting /  
 Baton Rouge  
 John Gumm WWL-TV, Channel 4 / New Orleans  
 John Snell-Anchor Person WVUE-TV / New Orleans  
 KADN / Lafayette  
 KALB-TV / Alexandria  
 Kane - News Director / New Iberia  
 KAPB / KWLB / Marksville  
 KATC-TV / Lafayette  
 Katheline Gilbert The Courier Weekend Editor / Houma  
 KDBS / KRRV / Alexandria  
 Keith Magill The Courier Executive Editor / Houma  
 Ken Hocke Workboat Magazine / Mandeville  
 Kenner Star Candy Lovitt-Managing Editor / Kenner  
 Kent Prince, News Editor Associated Press / New Orleans  
 KEUN-AM / KJJB-AM / Eunice  
 KFNV-AM-FM / Ferriday  
 KGLA / Marrero  
 Kim Holden Fox 8 Live WVUE-TV / New Orleans  
 Kimberly Krupa The Courier / Houma  
 KJIN / KCIL / Houma  
 KLCL / KHLA / Lake Charles  
 KLFY-TV / Lafayette  
 KLLA / Leesville  
 KMRC-KFXY / Morgan City  
 KPEL AM FM / Lafayette  
 KPLC - TV Ch 7 Assignment Editor Sheletta Smith / Lake  
 Charles  
 KPLC - TV Ch 7 Environmental Ed Teresa Schmidt / Lake  
 Charles

KPLC - TV Ch 7 News Director Cynthia Victorian / Lake Charles  
 KPLC-TV / Lake Charles  
 KQKI / KDLP Ernst Polk / Morgan City  
 KSIG / Crowley  
 KSLO / KOGM / Opelousas  
 KSMB / Lafayette  
 KSYL / Alexandria  
 KTIB / Thibodaux  
 KVIP-AM-FM / Ville Platte  
 KVVP / Leesville  
 KWB Channel 39 / Morgan City  
 KWCL-AM-FM / Oak Grove  
 La Prensa Attn: Gina Cortez / Metairie  
 Lafayette Advertiser Attn: Charles Lenox / Lafayette  
 Lafayette Advertiser Attn: Ann Wakefield / Lafayette  
 Lafayette Advertiser Attn: Bill Decker / Lafayette  
 Lafourche Gazette Vicki Chaisson, ED / La Rose  
 Leader / Leesville  
 Ledger / Kentwood  
 Livingston Parish News / Denham Springs  
 L'Observateur Leonard Gray / LaPlace  
 Louisiana Network Inc Attn: Jeff Palermo / Baton Rouge  
 Louisiana Shipbuilding & Repairs Association / New Orleans  
 Marty Authement The Courier Features Editor / Houma  
 Matt Gresham The Courier / Houma  
 Mikel Schaefer WWL-TV, Channel 4 / New Orleans  
 Morgan City Daily Review / Morgan City  
 Ms Fran Marcus New York Times / New Orleans  
 Ms Janet Plume Journal of Commerce / New Orleans  
 New Orleans Port Record / New Orleans  
 News / Denham Springs  
 News / De Quincey  
 News Director KVPO Radio / Morgan City  
 News Examiner / Litcher  
 News One State Capitol Station / Baton Rouge  
 Plaquemines Newspaper Publishing Inc / Belle Chasse  
 Pointe Coupee Banner / New Roads  
 Port of Lake Charles Harbor and Terminal District / Lake Charles  
 Port of New Orleans Gary Lagrange / New Orleans  
 Post Signal / Crowley  
 Rajun Cajun Radio Station / La Rose  
 Randy Decuir Avoyelles Journal / Marksville  
 River Parishes Guide / Boutte  
 Roger Hooper, Ed & Publisher Go Gulf Magazine / Baton Rouge  
 Scott Turick The Daily Iberian / New Iberia  
 Slidell Sentry News / Slidell  
 St Bernard News / Metairie  
 St Charles Herald Guide Daniel Moore / Boutte  
 St Helena Echo / Greensburg  
 St Mary Journal / Morgan City  
 St Tammany News Banner / Covington  
 Stanley R Dufrene - Public Affairs Union Carbide / Dow Chemical / Hahnville  
 Supervisor US Coast Guard (MSO) / Morgan City  
 Tangi-Talk / Amite  
 Teche News / St. Martinville  
 Terrebonne Press / Houma  
 Terry Westerfield WGNO TV Ch 26 / New Orleans  
 The Advocate Amy Wold / Baton Rouge  
 The Advocate Angela Simoneaux / Lafayette  
 The Advocate Ben Reed Asst. State Editor / Baton Rouge  
 The Advocate Bill Bankston / Baton Rouge  
 The Advocate Bobby Lamb Business Editor / Baton Rouge  
 The Advocate Carl Redman Managing Editor / Baton Rouge  
 The Advocate Chris Baughman City Desk / Baton Rouge  
 The Advocate Curt Eysink City Editor / Baton Rouge  
 The Advocate Emily Kern Westside Bureau / Port Allen  
 The Advocate Fred Kalmbach City Desk / Baton Rouge  
 The Advocate Joe Macaluso Outdoor Writer / Baton Rouge  
 The Advocate John LaPlante Capitol Bureau Chief / Baton Rouge  
 The Advocate John Mcmillan / Gonzales  
 The Advocate Johnny Brooks News / Baton Rouge  
 The Advocate Linda Lightfoot Executive Editor / Baton Rouge  
 The Advocate Madeleine Lamb People Editor / Baton Rouge  
 The Advocate Mike Dunne News / Baton Rouge  
 The Advocate Milford Fryer Suburban Editor / Baton Rouge  
 The Advocate Randy McLain News / Baton Rouge  
 The Advocate Roy Miller State Editor / Baton Rouge  
 The Advocate Tim Belehrad Newsfeatures Ed. / Baton Rouge  
 The Chamber Chris Laborde / New Orleans  
 The Currents Naval Support Activity, PAO / New Orleans  
 The Observer / Baker  
 The Rayne Independent / Rayne  
 The Times Picayune Attn: Sandra Barbier / Gretna  
 The Waterways Journal 666 Security Building / St. Louis  
 Times of Acadiana / Lafayette  
 Times Picayune / Metairie  
 Times Picayune Andrea Shaw / Gretna  
 Times Picayune Bob Marshall-Venture Editor / New Orleans  
 Times Picayune Charlie Crumpley - Money Section / New Orleans  
 Times Picayune Coleman Warner / New Orleans  
 Times Picayune Jed Horne, City Editor / New Orleans  
 Times Picayune Jefferson Bureau Drew E Broach / Metairie  
 Times Picayune Leslie Williams / New Orleans  
 Times Picayune St. Bernard Bureau Karen Turni / Chalmette  
 Times Picayune St. Tammany Bureau Ron Thibodeaux / Slidell  
 Times Picayune Terri Troncale / New Orleans  
 Times Picayune  
 Times-Picayune Mr. Mark Schleifstein / New Orleans  
 Town Talk / Alexandria  
 WABL / Amite  
 WBOK / New Orleans  
 WBRZ / Baton Rouge  
 WBYU / WSHO / New Orleans  
 WCKW-AM / Metairie  
 WDSU-TV / New Orleans  
 West Side Journal / Port Allen  
 WFCG / Franklinton  
 WFPR / WHMD / Hammond  
 WGGZ-FM / Baton Rouge  
 WGNO-TV 26 Paula Pendarvis News Director / New Orleans  
 WGSO Attn: Charles Travis / Metairie  
 White Castle Times / Plaquemine  
 WIBR / Baton Rouge  
 William A Evans Waterways Journal / Mandeville  
 WJBO / WFMT / Baton Rouge  
 WLPB-TV / Baton Rouge  
 WNOE-AM-FM / New Orleans  
 WQUE-FM / New Orleans  
 WSMB / New Orleans  
 WVUE-TV / New Orleans  
 WWL / WAJY / New Orleans  
 WWOZ / New Orleans  
 WYES-TV / New Orleans

WYNK Radio / Baton Rouge

**Other Membership Organizations**

**Count: 8**

American Rivers / Signal Mountain  
 Barbara Dodds League of Women Voters / Covington  
 Bicycle Awareness Committee of New Orleans Mr. Robin  
 P. Robert / New Orleans  
 Concerned Citizens For Informed Choices / Slidell  
 LA League of Women Voters / Baton Rouge  
 La State Governors Advisory Committee On Bicycling Mr.  
 Bill Keller - Chairman / New Orleans  
 Lake Pontchartrain Sanitary District / Baton Rouge  
 Ms. Jean Armstrong LA League of Women Voters / Baton  
 Rouge

**Standard Personal-Coordination Names for EA & EIS**

**Count: 11**

David Bernhart NMFS - Protected Species Division / St.  
 Petersburg  
 Donald Gohmert State Conservationist - NRCS /  
 Alexandria  
 Field Supervisor U.S. Fish and Wildlife Service / Lafayette  
 Gary Zimmerer FEMA - Region VI, Federal Center /  
 Denton  
 Gregory P. Ducote Interagency Affairs - LADNR CMD /  
 Baton Rouge  
 Larry Wiesepape, Ph.D LA DEQ Permits Division / PER-  
 REGC / Baton Rouge  
 Miles Croom NMFS - Habitat Conservation Division / St.  
 Petersburg  
 Pam Breaux SHPO, Dept. of Culture Recreation and  
 Tourism / Baton Rouge  
 Richard D. Hartman NMFS - Habitat Conservation  
 Division Louisiana State University / Baton Rouge  
 Rob Lawrence EPA, Region VI - Off. of Planning and  
 Coord. / Mail Code 6EN-XP / Metairie  
 Russell C. Watson Field Supervisor U.S. Fish and Wildlife  
 Service / Lafayette

**State Agencies**

**Count: 28**

Cultural & Historical/ Research & Development Research  
 Coord Melanie Marcotte / Charenton  
 Darin M. Lee Coastal Resources Scientist Supervisor LA  
 DNR - CRD / Thibodaux  
 David Frugé, Administrator LA Dept. of Natural Resources  
 Coastal Management Division / Baton Rouge  
 East Baton Rouge City-Parish Council / Baton Rouge  
 Edgar S. Bordes City of New Orleans Mosquito & Termite  
 Control Board / New Orleans  
 Governors Office for Coastal Activities State Land & Nat  
 Resources Bldg. / Baton Rouge  
 Katherine Vaughn Deputy Secretary of Louisiana DNR /  
 Baton Rouge  
 LA Dept of Natural Resources Coastal Resources Program  
 Consistency Coordinator / Baton Rouge  
 LA Dept of Natural Resources Office of Conservation  
 Surface Mining Division / Baton Rouge  
 LA Dept of Natural Resources Title & Records Section  
 Division of State Lands / Baton Rouge  
 LA Dept of Public Works / Baton Rouge  
 LA Dept of Transportation & Dev Asst Chief Engr Water  
 Resources Office of Public Works / Baton Rouge

LA Dept of Wildlife & Fisheries Mr. Tim Morrison / Baton  
 Rouge  
 LA Dept Wildlife & Fisheries Mr. Gary Lester-Nat  
 Heritage Pgm / Baton Rouge  
 LA Dept Wildlife & Fisheries Mr. Maurice B. Watson /  
 Baton Rouge  
 LA Dept Wildlife & Fisheries Secretary / Baton Rouge  
 LA Dept. of Agriculture & Forestry Mr. Matthew  
 Keppinger Office of Ag & Environmntal Science / Baton  
 Rouge  
 LA Dept. of Agriculture & Forestry Office of Forestry /  
 Baton Rouge  
 LA Dept. of Culture Recreation & Tourism/office of State  
 Parks Div. of Outdoor Recreation / Baton Rouge  
 LA Dept. of Environmental Quality Environmental  
 Planning Division Ep-sip / Baton Rouge  
 LA Dept. of Health & Hospitals Office of Public Health  
 Attn: Engineering/sewerage Unit / Baton Rouge  
 LA Dept. of Natural Resources Louisiana Geological  
 Survey / Baton Rouge  
 LA Dept. of Transportation & Dev. Federal Projects  
 Section Rm 207 - PO 94245 / Baton Rouge  
 LA Division of Administration State Land Office / Baton  
 Rouge  
 LA Division of Administration State Planning Office /  
 Baton Rouge  
 LA State Attorney Gen's Office Mr. William W. Goodell  
 Jr/asst. A G State Lands & Natl. Res. Div. / Baton Rouge  
 LA State Board of Commerce & Industry Research  
 Division / Baton Rouge  
 Lisa Miller LA DEQ MF-CG / Baton Rouge

**State Elected Officials (Gov Lt., Gov Sec.State, etc.)**

**Count: 4**

Bob Odom LA Dept of Ag & Forestry / Baton Rouge  
 Governor of Louisiana Hon. Kathleen Babineaux Blanco  
 State Capitol / Baton Rouge  
 Lieutenant Governor "Mitch" Landrieu / Baton Rouge  
 Secretary of State Honorable W. Fox Mckeithen / Baton  
 Rouge

**State Representatives**

**Count: 102**

State Representative 45th Representative District /  
 Lafayette  
 A. G. Crowe State Representative 76th Representative  
 District / Pearl River  
 Alexander "Alex" Heaton State Representative 95th  
 Representative District / New Orleans  
 Arthur A. Morrell State Representative 97th Representative  
 District / New Orleans  
 Austin J. Badon, Jr. State Representative 100th  
 Representative District / New Orleans  
 Avon R. Honey State Representative 63rd Representative  
 District / Baton Rouge  
 Beverly Bruce State Representative 7th Representative  
 District / Mansfield  
 Billy Montgomery State Representative 9th Representative  
 District / Haughton  
 Brett Geymann State Representative 35th Representative  
 District / Lake Charles  
 Bryant O. Hammett, Jr. State Representative 21st  
 Representative District / Ferriday  
 Carl Crane State Representative 70th Representative  
 District / Baton Rouge  
 Carla Blanchard Dartez State Representative 51st

Representative District / Morgan City	District / Dry Creek
Cedric Bradford Glover State Representative 4th	Hollis Downs State Representative 12th Representative
Representative District / Shreveport	District / Ruston
Cedric Richmond State Representative 101st	Israel "Bo" Curtis State Representative 26th Representative
Representative District / New Orleans	District / Alexandria
Charles D. Lancaster, Jr. State Representative 80th	Jack D. Smith State Representative 50th Representative
Representative District / Metairie	District / Stephenville
Charles I. "Chuck" Hudson State Representative 40th	Jalila Jefferson State Representative 91st Representative
Representative District / Opelousas	District / New Orleans
Charles McDonald State Representative 14th	James R. "Jim" Fannin State Representative 13th
Representative District / Fairbanks	Representative District / Jonesboro
Charles W. "Charlie" Dewitt State Representative 25th	James W. "Jim" Tucker State Representative 86th
Representative District / Alexandria	Representative District / New Orleans
Charmaine Marchand State Representative 99th	Jane H. Smith State Representative 8th Representative
Representative District / New Orleans	District / Bossier City
Cheryl Gray State Representative 98th Representative	Jean M. Doerge State Representative 10th Representative
District / New Orleans	District / Minden
Clara Guilbeau Baudoin State Representative 39th	Jeffery "Jeff" Arnold State Representative 102nd
Representative District / Carencro	Representative District / New Orleans
Dale Erdey State Representative 71st Representative	Joe R. Salter State Representative 24th Representative
District / Livingston	District / Florien
Damon J. Baldone State Representative 53rd	John A. Alario, Jr. State Representative 83rd
Representative District / Houma	Representative District / Westwego
Dan "Blade" Morrish State Representative 37th	John La Bruzzo State Representative 81st Representative
Representative District / Jennings	District / Metairie
Dan Flavin State Representative 36th Representative	John Smith State Representative 30th Representative
District / Lake Charles	District / Leesville
Daniel R. "Danny" Martiny State Representative 79th	Joseph F. Toomy State Representative 85th Representative
Representative District / Kenner	District / Gretna
Derrick Shepherd State Representative 87th Representative	Karen Carter State Representative 93rd Representative
District / Marrero	District / New Orleans
Diane Winston State Representative 77th Representative	Karen Gaudet St. Germain State Representative 60th
District / Covington	Representative District / Pierre Part
Don Trahan State Representative 31st Representative	Kay Kellogg Katz State Representative 16th Representative
District / Lafayette	District / Monroe
Donald "Don" Cazayoux, Jr. State Representative 18th	Kenneth L. Odinet, Sr. State Representative 103rd
Representative District / New Roads	Representative District / Arabi
Donald Ray Kennard State Representative 65th	LeLon Kenney State Representative 20th Representative
Representative District / Baton Rouge	District / Columbia
Edwin R. "Ed" Murray State Representative 96th	Loulan Pitre, Jr. State Representative 54th Representative
Representative District / New Orleans	District / Cut Off
Elcie Joseph Guillory State Representative 34th	M. J. "Mert" Smiley, Jr. State Representative 88th
Representative District / Lake Charles	Representative District / St. Amant
Emile "Peppi" Bruneau State Representative 94th	Mack "Bodi" White State Representative 64th
Representative District / New Orleans	Representative District / Baker
Eric Lafleur State Representative 38th Representative	Michael A. "Mike" Walsworth State Representative 15th
District / Ville Platte	Representative District / West Monroe
Ernest Baylor, Jr. State Representative 3rd Representative	Michael G. "Mike" Strain State Representative 74th
District / Shreveport	Representative District / Covington
Ernest D. Wooton State Representative 105th	Michael Jackson State Representative 61st Representative
Representative District / Belle Chasse	District / Baton Rouge
Ernie Alexander State Representative 43rd Representative	Mickey Frith State Representative 47th Representative
District / Lafayette	District / Kaplan
Errol "Romo" Romero State Representative 48th	Mickey J. Guillory State Representative 41st
Representative District / New Iberia	Representative District / Eunice
Francis Thompson State Representative 19th	Mike Futrell State Representative 66th Representative
Representative District / Delhi	District / Baton Rouge
Gary Beard State Representative 69th Representative	Mike Powell State Representative 6th Representative
District / Baton Rouge	District / Shreveport
Gary L. Smith, Jr. State Representative 56th Representative	Monica Walker State Representative 28th Representative
District / Norco	District / Bunkie
Gil Pinac State Representative 42nd Representative District	N. J. Damico State Representative 84th Representative
/ Crowley	District / Marrero
Glenn Ansardi State Representative 92nd Representative	Nita Rusich Hutter State Representative 104th
District / Kenner	Representative District / Chalmette
Gordon Dove State Representative 52nd Representative	Pete Schneider State Representative 90th Representative
District / Houma	District / Slidell.
Harold L. Ritchie State Representative 75th Representative	Rick Gallot State Representative 11th Representative
District / Franklinton	District / Ruston
Herman Ray Hill State Representative 32nd Representative	Rick L. Farrar State Representative 27th Representative

District / Pineville  
 Robby Carter State Representative 72nd Representative District / Greensburg  
 Robert R. "Bobby" Fauchaux, Jr. State Representative 57th Representative District / Gramercy  
 Ronnie Johns State Representative 33rd Representative District / Sulphur  
 Roy "Hoppy" Hopkins State Representative 1st Representative District / Oil City  
 Roy Burrell State Representative 2nd Representative District / Shreveport  
 Roy Quezairé State Representative 58th Representative District / Donaldsonville  
 Sharon Weston Broome State Representative 29th Representative District / Baton Rouge  
 Shirley Bowler State Representative 78th Representative District / River Ridge  
 Stephen J. "Steve" Scalise State Representative 82nd Representative District / Jefferson  
 Sydnie Mae Maraist Durand State Representative 46th Representative District / St. Martinville  
 T. Taylor Townsend State Representative 23rd Representative District / Natchitoches  
 Thomas H. "Tom" McVea State Representative 62nd Representative District / St. Francisville  
 Tim Burns State Representative 89th Representative District / Mandeville  
 Tommy Wright State Representative 22nd Representative District / Jena  
 Troy Hebert State Representative 49th Representative District / Jeanerette  
 Warren Triche, Jr. State Representative 55th Representative District / Thibodaux  
 Wayne Waddell State Representative 5th Representative District / Shreveport  
 Wilfred Pierre State Representative 44th Representative District / Lafayette  
 William Daniel State Representative 68th Representative District / Baton Rouge  
 Willie Hunter, Jr. State Representative 17th Representative District / Monroe  
 Yvonne Dorsey Welch State Representative 67th Representative District / Baton Rouge

**State Senators**

**Count:        39**

"Butch" Gautreaux State Senator 21st Senatorial District / Morgan City  
 "Don" Hines State Senator 28th Senatorial District / Bunkie  
 "Joe" McPherson State Senator 29th Senatorial District / Woodworth  
 "Ken" Hollis State Senator 9th Senatorial District / Metairie  
 "Mike" Michot State Senator 23rd Senatorial District / Lafayette  
 "Nick" Gautreaux State Senator 26th Senatorial District / Abbeville  
 "Tom" Schedler State Senator 11th Senatorial District / Slidell  
 Ann Duplessis State Senator 2nd Senatorial District / New Orleans  
 Arthur "Art" Lentini State Senator 10th Senatorial District / Kenner  
 Ben Nevers State Senator 12th Senatorial District / Bogalusa  
 Charles D. Jones State Senator 34th Senatorial District / Monroe  
 Cleo Fields State Senator 14th Senatorial District / Baton

Rouge  
 Craig Romero State Senator 22nd Senatorial District / New Iberia  
 Diana E. Bajoie State Senator 5th Senatorial District / New Orleans  
 Donald "Don" Cravins State Senator 24th Senatorial District / Arnaudville  
 Francis C. Heitmeier State Senator 7th Senatorial District / New Orleans  
 Gerald "Jerry" Theunissen State Senator 25th Senatorial District / Jennings  
 Heulette "Clo" Fontenot State Senator 13th Senatorial District / Livingston  
 J. Chris Ullo State Senator 8th Senatorial District / Marrero  
 James David Cain State Senator 30th Senatorial District / Dry Creek  
 Jay Dardenne State Senator 16th Senatorial District / Baton Rouge  
 Joel T. Chaisson, II State Senator 19th Senatorial District / Destrehan  
 John J. Hainkel, Jr. State Senator 6th Senatorial District / New Orleans  
 Kenneth M. "Mike" Smith State Senator 31st Senatorial District / Winnfield  
 Lambert C. Boissiere, Jr. State Senator 3rd Senatorial District / New Orleans  
 Lydia Patrice Jackson State Senator 39th Senatorial District / Shreveport  
 Max T. Malone State Senator 37th Senatorial District / Shreveport  
 Melvin L. "Kip" Holden State Senator 15th Senatorial District / Baton Rouge  
 Noble Ellington State Senator 32nd Senatorial District / Winnsboro  
 Paulette R. Irons State Senator 4th Senatorial District / New Orleans  
 Reggie P. Dupre, Jr. State Senator 20th Senatorial District / Bourg  
 Robert "Rob" Marionneaux, Jr. State Senator 17th Senatorial District / Grosse Tete  
 Robert Adley State Senator 36th Senatorial District / Benton  
 Robert J. Barham State Senator 33rd Senatorial District / Oak Ridge  
 Robert W. "Bob" Kostelka State Senator 35th Senatorial District / Monroe  
 Senator "Jody" Amedee State Senator 18th Senatorial District / Gonzales  
 Sherri Smith Cheek State Senator 38th Senatorial District / Shreveport  
 Walter J. Boasso State Senator 1st Senatorial District / Arabi  
 Willie Landry Mount State Senator 27th Senatorial District / Lake Charles

**Tribes**

**Count:        5**

Chitimacha Tribe Director of Cultural Affairs Kim Walden / Charenton  
 Chitimacha Tribe Mr. Alton D. Leblanc Jr. Chairman / Charenton  
 Coushatta Tribe Mr. Lovelin Poncho Chairman / Elton Cultural & Historic Preservation Tunica-Biloxi Indians of La Chairman Earl Barbry Sr. / Marksville  
 Jena Band Choctaw Beverly C. Smith, Chairperson / Jena

**United States District Conservationist**

**Count:        2**

Allen Bolotte Dist. Cons. U.S. - NRCS / Boutte  
Michael Jordan Avoyelles Parish-Dist. Conservationist /  
Marksville

**Universities, University Affiliated Persons (Professors)**

**Count: 7**

Craig A. Johnson - Director Louisiana Geographic  
Information Cent. Louisiana State University / Baton  
Rouge  
Dr. Jack Van Lopik Executive Director Office of Sea Grant  
Development-LSU / Baton Rouge  
Louisiana State University Curator of Anthropology  
Department of Geography / Baton Rouge  
Louisiana State University Sea Grant Legal Program /  
Baton Rouge  
Melanie Reed Tulane Environmental Law Clinic / New  
Orleans  
Tulane University Army ROTC / New Orleans  
Tulane University Dr. Oliver Houck Tulane Law School /  
New Orleans

**US Representatives**

**Count: 7**

Hon. "Chris" John U. S. Representative 7th Congressional  
District / Crowley  
Hon. Billy Tauzin U. S. Representative 3rd Congressional  
District / Washington  
Hon. David Vitter U. S. Representative 1st Congressional  
District / Metairie  
Hon. Jim McCreery U. S. Representative 4th Congressional  
District / Shreveport  
Hon. Richard Baker U. S. Representative 6th Congressional  
District / Baton Rouge  
Hon. Rodney Alexander U. S. Representative 5th  
Congressional District / Quitman  
Hon. William Jefferson U. S. Representative 2nd  
Congressional District / New Orleans

**US Senators**

**Count: 2**

Honorable John B. Breaux U.S. Senate Hale Boggs Federal  
Bldg / New Orleans  
Honorable Mary Landrieu U.S. Senate / New Orleans

**Scoping Meeting - April 2004**

**Count: 94**

Mr. Chris Liner  
Mr. Darryl Chauvin, Atchafalaya River Coalition  
Mr. Dustin Walker  
Mr. E.J. Blaize  
Mr. Forrest Forbes, OMI, Inc.  
Mr. Jeff Evans  
Mr. Jeff Stanford, DMJM & Harris, Inc.  
Mr. Ken Savastano  
Mr. Mike Landers  
Mr. Terry O'Connor, The People  
Mr. Tony Fazzio  
Mr. Troy Clautier, MidSouth Bank  
Ms. Charmaine Cacciopi  
Ms. Jane Arnette, SCIA  
Ms. Jeanne Fritsche, GSE Associates  
Ms. Lynn Hadhy, Cajun Cultural Coalition

Ms. Sandy Kain, Congressman Billy Tauzin's Office  
Ms. Shirley Laska, CHART, UNO  
CF Bean LLC  
Mr. Alex Kaplun  
Mr. Ralph Lugvihuff, LA Hydroelectric  
Mr. Rob Hamilton, Rob Hamilton Construction, Inc.  
Mr. Robert C. Esenwein, TurnerCollie @ Braden, Inc.  
Mr. Robert Graveolet, Plaquemines Parish Assessor  
Mr. Andrew MacInnes, Plaquemines Parish  
Mr. Daniel J. Babin, Gulf Fish Inc.  
Mr. Jenneke Visser  
Mr. Aaron Meredith, Outdoor Action with Aaron  
Mr. Al Levron, Terrebonne Parish Government  
Mr. Allen Dupont, SHAW Environmental, Inc.  
Mr. Andy Jurkowski, Madison Dearborn Partners  
Mr. Barry Blackwell, Terrebonne Parish Consolidated  
Mr. Ben Bienvenu, LCPA-West  
Mr. Bill New, New Offshore, Inc.  
Mr. Bruce L. Badon, Burk-Kleinpeter, Inc.  
Mr. Burt Marmande  
Mr. Charles J. Starkovich, USDA-NRCS  
Mr. Charles R. Caillouet, Jr., Vision Unlimited  
Mr. Dan Arceneaux, CZM - St. Bernard  
Mr. Daniel Bolinger, DMJM & Harris, Inc.  
Mr. Daniel C. McCool, Political Science Department  
Mr. Danny McKearan, Bean/Stuveysant Dredging  
Mr. Cullen Curole, Lafourche Parish  
Mr. David S. Williams, CTE Engineers  
Mr. Denis de la Houssaye, Iberia Parish Coastal  
Mr. Dennis Lambert, Moffatt Nichol  
Mr. Don Samples  
Mr. Doug Daigle, Mississippi River Basin Alliance  
Mr. Ed Landgraf, Shell/Terrebonne CZM  
Mr. Ed Nugent, Coalition to Close the MRGO  
Mr. Freddie Castello III  
Mr. Gene Simon, Bertucci Contracting  
Mr. George Rey  
Mr. Harold Schoeffler, Sierra Club  
Mr. Hugh Babylon  
Mr. Jay Lobrano, Lobrano & Lobrano  
Mr. Jerry Bostic, Port of Morgan City  
Mr. Jerry Lee Mayeaux  
Mr. Jim Rausch, Dredging Contractors of America  
Mr. Jim Hufft  
Mr. John Higgins, Business Publishers Inc.  
Mr. John Arms  
Mr. John P. Laguens  
Mr. John Woodard  
Mr. Kenny Smith, Terrebonne Chamber of Commerce  
Mr. Louis Walker  
Mr. Mart Black, TPCG Cultural Res. & Eco. Dev.  
Mr. Michael Scurto, Terrebonne Levee  
Mr. Paul Medus  
Mr. Paul Yakupzach, Terrebonne Coastal Mgt.  
Mr. Percy J. Rodriguez  
Mr. R. George Rey, Pres., COTS Technology,  
Mr. Ryan Richard, Richard's Restaurant Supply  
Mr. Sal Maiorana  
Mr. Sam Hotard, Guarantz Broadcasting  
Mr. Scott Rogers, American Press  
Mr. Shane Bagala, Acadiana Bay Association  
Mr. Sid Sundbery, Houma-Terrebonne Chamber of  
Mr. Steve Peyronnin, Coalition to Restore Coastal  
Mr. Stu Scheer, LA Charter Boat Association  
Mr. Tom Hess, LDWF Rockefeller Refuge  
Mr. W. Alex Ostheimer  
Ms. Andi Stohler, TEC Icon  
Ms. Barbara Coman  
Ms. Carolyn Woosley, CRCL, SWLA Team Green  
Ms. Christian Walker

Ms. Cindy Brown, The Nature Conservancy  
Ms. Jennifer Armand, Restore or Retreat  
Ms. Kelly Krenz  
Ms. Kim M. Sylve, Grand Bayou Families United  
Ms. Linda M Walker, League of Women Voters of  
Ms. Margaret Sullivan, Coastal Environments, Inc.  
Ms. Ruth Lancy , Time Magazine  
Ms. Sharon Alford, Houma Area CVB

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# **APPENDIX B1**

## **PROGRAMMATIC BIOLOGICAL ASSESSMENT**

### **LOUISIANA COASTAL AREA (LCA) ECOSYSTEM RESTORATION STUDY**

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# **APPENDIX B1**

## **PROGRAMMATIC BIOLOGICAL ASSESSMENT**

### **LOUISIANA COASTAL AREA ECOSYSTEM RESTORATION STUDY**

#### **1.0 PURPOSE**

The purpose of this programmatic biological assessment (PBA) is to determine the potential impacts of the Louisiana Coastal Area (LCA) Ecosystem Restoration Plan (LCA Plan), which is described in the final Programmatic Environmental Impact Statement (FPEIS) of the LCA Ecosystem Restoration Study, on Federally-listed threatened and endangered species, and their critical habitat, that occur within the proposed action area. This review evaluates the LCA Plan and provides information on potential impacts of this programmatic plan to Federally-listed threatened and endangered species and their critical habitat to decision makers to make determinations on whether to proceed with the plan.

#### **2.0 PROPOSED ACTION**

The proposed action is implementation of the final LCA Plan, which is to develop, evaluate, and apply subprovince and coast -wide ecosystem restoration opportunities. Restoration would be achieved by combining a series of measures that would be expected to achieve one or more of the following objectives: minimize and/or control salinity changes, provide continuous reintroduction of fresh water, mimic historic hydrology, maximize Atchafalaya River inflow, build land through delta development, and maximize geomorphic features. Conceptual restoration measures include constructing river and/or sediment-delivery diversions, maintaining land bridges, restoring barrier islands, installing water control structures, creating marsh, and achieving beneficial use of dredged material.

Detailed descriptions of the LCA Plan can be found in chapter 2 of the FPEIS; historic, existing, and future without conditions are discussed in chapter 3 of the FPEIS, and direct, indirect, and cumulative impacts of the LCA Plan are discussed in chapter 4 of the FPEIS. Because the outputs of the LCA Plan are conceptual and at a program-level, the site-specific locations of each recommended measure have not been identified.

#### **3.0 LOCATION AND GENERAL DESCRIPTION OF THE PROPOSED ACTION AREA**

For the purposes of coast wide ecosystem planning, the Louisiana coastal study area is divided into four subprovinces. Subprovince 1 encompasses the coastal portion of the Pontchartrain Basin, Breton Sound basin, and the eastern half of the Mississippi River Delta. Subprovince 2

encompasses the deltaic plain between the Mississippi River and Bayou Lafourche, including the Barataria Basin and the western half of the Mississippi River Delta. Subprovince 3 encompasses the deltaic complex between Bayou Lafourche and Freshwater Bayou Canal, including the Terrebonne, Atchafalaya, and Teche-Vermilion basins. Subprovince 4 encompasses the Chenier Plain between Freshwater Bayou Canal and the Louisiana-Texas border, including the Mermentau and Calcasieu-Sabine basins. Detailed descriptions of the subprovinces can be found in chapter 1 of the FPEIS.

## 4.0 SPECIES DESCRIPTIONS

Seventeen endangered or threatened species have been identified which may occur within the boundaries of the proposed action area. However, the proposed activities would not be located within suitable habitat for five of those species: the gopher tortoise (*Gopherus polyphemus*), inflated heelsplitter mussel (*Potamilus inflatus*), Louisiana quillwort (*Isoetes louisianensis*), red-cockaded woodpecker (RCW, *Picoides borealis*), and ringed sawback turtle (*Graptemys oculifera*). Any suitable habitats for those species would be located outside the region of influence for the proposed action. Therefore, detailed species descriptions for those species are not included in this PBA. Descriptions of the remaining 12 species follow.

A total of 28 cetaceans have been reported in the Gulf of Mexico waters (Davis et al. 2002 see <http://www.fws.gov>). Of these, five Mysticeti [i.e., baleen whales including the blue whale (*Balaenoptera musculus*), finback whale (*Balaenoptera physalus*) and sei (*Balaenoptera borealis*); and Odontoceti (i.e., toothed whales including the humpback (*Megaptera novaeangliae*) and sperm whale (*Physeter macrocephalus*)] have been reported in the Gulf of Mexico and all are listed as endangered species. Generally, infrequent historical sightings and strandings in the study area of these endangered cetaceans suggest that most of these species are rare, accidental, or uncommon. All whales are principally marine deepwater species and would not likely be impacted by the proposed action. Strandings of whales have occurred throughout the gulf coast.

### 4.1 BIRDS

#### 4.1.1 Bald Eagle (*Haliaeetus leucocephalus*)

##### Status

The bald eagle was initially considered to have two distinct subspecies when the southern bald eagle was listed as an endangered species on March 11, 1967. Following the enactment of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the entire species was listed as endangered in 43 of the conterminous 48 states and threatened in the remaining five states (Michigan, Minnesota, Oregon, Washington, and Wisconsin) on February 14, 1978. On August 11, 1995, the bald eagle was officially down-listed from endangered to threatened in the lower 48 states. There is no critical habitat currently designated for the bald eagle.

## Species and Habitat Description

The bald eagle is a large bird of prey with white head and tail feathers, dark body feathers, yellow beak and black talons. The bald eagle is one of eight sea and fish eagles in the genus *Haliaeetus*, and is the only species of sea eagle native to North America. Male bald eagles generally measure almost 3 feet from head to tail, weigh 8 to 10 pounds, and have a wingspan of about 6.5 feet. Females are larger, reaching 42 inches in length, weigh up to 14 pounds, and have a wingspan as wide as 8 feet. Juvenile bald eagles are a mixture of brown and white with a black bill, and do not develop the characteristic white head and tail feathers until they are sexually mature. Bald eagles are believed to live as long as 30 years in the wild. Bald eagles are predominantly piscivorous, but they are also opportunistic and will supplement their diets with birds, small mammals, reptiles, amphibians, and carrion. Humans are thought to be the adult eagle's only significant predator (USFWS 1989c).

Bald eagles may range for long distances, but will return to within 100 miles of where they were raised to build a large nest. Each pair of birds can have several nests, reusing them several times.

Nesting rarely occurs farther than 2 miles from water. Most eagles select nest sites that include a dominant tree or stand of trees and prefer tall mature trees in an open stand with a clear flight path to water, usually associated with riparian habitat along coasts, rivers, and lakes. Most nests are located in the upper 30 feet of the tree with canopy cover above and a clear view of open water. The cone-shaped nest may be 6 feet in diameter and 6 to 8 feet in height, and may be lined with Spanish moss, cornhusks, or grasses. In the southeastern United States, nesting activities generally begin in early September with egg laying beginning as early as late October and peaking in the latter part of December (USFWS 1989c). In southeastern Louisiana, nests are often built in large bald cypress trees that are located near fresh to intermediate marshes or open water, and infrequently in large pine trees near large lakes in central and northern Louisiana.

Bald eagles reach sexual maturity between 4 and 5 years of age. Bald eagles pair with the same mate until one dies, at which time the survivor will accept a new mate. Once each year bald eagles lay one to three eggs, which hatch after 33 to 35 days of incubation. Although both males and females participate in incubating the eggs, the female does most of the incubating. Fledglings will take their first flights in about 3 months, but may not leave the nest for several more months. Final fledging occurs between 12 to 16 weeks after hatching. Both parents participate in parental care, which may extend 4 to 6 weeks after fledging. As is typical for raptors, young eagles are fully developed at the time of fledging. Fledging generally occurs from March to April. It is estimated that only about 50 percent of fledglings survive to adulthood.

## Range and Population Dynamics

Historically, the bald eagle ranged throughout North America, except extreme northern Alaska and Canada and central and southern Mexico. Nesting occurred along major lakes and rivers on both coasts of the United States, coastal plains of the Southeast, as well as the East Coast from the Chesapeake Bay to the Florida Keys, and north along the west coast of Florida to the Panhandle. The nesting range also appears to have been continuous along the entire Mississippi

and other major rivers, through Louisiana and into eastern Texas, with a low density along the Gulf coast. The bald eagle currently ranges throughout much of North America, nesting on both coasts from Florida to Baja California, Mexico in the south, and from Labrador to the western Aleutian Islands, Alaska, in the north (USFWS 1999a).

An estimated quarter to a half million bald eagles lived on the North American continent prior to the arrival of the first Europeans (Gerrard and Bortolotti 1988). The first major decline in the bald eagle population probably began in the mid- to late 1800s. Widespread shooting for feathers and trophies led to extirpation of eagles in some areas. Shooting also reduced part of the bald eagle's prey base. Big game animals like bison, which were essentially important to eagles as carrion, were decimated. Waterfowl, shorebirds, and small mammals were also reduced in numbers. Carrion treated with poisons was used as bait to kill livestock predators and ultimately killed many eagles as well. These were the major factors, in addition to the loss of habitat from forest clearing and development, which contributed to a reduction in bald eagles numbers through the 1940s.

Following World War II in the late 1940s, organochlorine pesticides such as dichloro-diphenyl-trichloroethane (DDT) were initially used to control mosquitoes but also became popular as general crop pesticides. In the late 1960s and early 1970s, bald eagle numbers had decreased due to the use of such pesticides, which were linked to the thinning of eggshells and resulted in reproductive failure (USFWS 1999a). In response to that decline, the bald eagle was listed as endangered south of the 40<sup>th</sup> parallel on March 11, 1967, under the Endangered Species Preservation Act of 1966. Nationwide bald eagle surveys conducted in 1973 and 1974 revealed that the eagle population throughout the lower 48 states was declining. At the species' lowest numbers in the Southeast, the breeding range had been reduced to remnant populations in South Carolina, Louisiana, and east Texas, with apparently secure nesting only in Florida.

In 1963, the National Audubon Society surveyed the lower 48 states and located 417 active bald eagle nests. By 1994, 4,452 occupied bald eagle territories were identified (an occupied territory is an area occupied by a pair of adult bald eagles, and the pair may or may not be engaging in nesting or breeding behavior). In Louisiana there were 36 occupied breeding areas during the 1987-1988 nesting season, and 226 occupied breeding areas during the 2002-2003 nesting season. Several factors have contributed to the resurgence of the bald eagle, including the ratification of the Bald Eagle Protection Act in 1940, the species' listing as endangered under the Endangered Species Preservation Act of 1966 and the ESA of 1973, the Migratory Bird Treaty Act, the Lacey Act, and the prohibition of DDT in 1972.

### **Management and Protection**

The bald eagle adapts poorly to radical changes in its environment, and has a relatively low reproductive rate with deferred maturity and a small clutch size (i.e., 1 to 3 eggs). Consequently, the bald eagle may always require monitoring and management. Protective measures for the species consist mainly of legal and regulatory procedures, and habitat protection and improvement. The bald eagle is currently protected by Federal and state laws, which are enforced by the U.S. Fish and Wildlife Service (USFWS) and the Louisiana Department of

Wildlife and Fisheries (LDWF), respectively. Nest sites are also protected under management programs on Federal lands (i.e., National Wildlife Refuges [NWR] and National Forests).

To facilitate recovery of the bald eagle and ecosystems upon which it depends, the lower 48 states were divided into five recovery regions, and recovery within those regions has been successful (USFWS 1999a). An expanding population requires the successful production of young, and reproduction has generally met or exceeded target levels established by recovery teams across the nation since 1990. Certain geographically restricted areas still have contamination threats, but with a national average of more than one fledgling per occupied breeding area since 1990, the eagle population continues to increase in overall size and maintains a healthy reproductive rate.

The USFWS proposal to delist the bald eagle was published in the Federal Register on July 6, 1999. Should the USFWS remove the bald eagle from the threatened and endangered species list, protection for the bird would continue under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests except when specifically authorized by the Department of the Interior. The BGEPA, the successor to the Bald Eagle Protection Act, prohibits, except under certain specified conditions, the taking, possession, transportation, export or import, barter, or offer to sell, purchase or barter a bald or golden eagle, alive or dead, or any part, nest, or eagle egg. If the bald eagle would be delisted, the USFWS would also work with state wildlife agencies to monitor the status of the species for a minimum of five years, as required by the ESA. If at any time it becomes evident that the bald eagle again needs protection under the ESA, the USFWS would relist the species (USFWS 1999a).

#### **4.1.2 Brown Pelican (*Pelecanus occidentalis*)**

##### **Status**

The brown pelican was originally listed as endangered throughout its range on October 13, 1970. The species was delisted in Alabama, Florida, Georgia, North Carolina, South Carolina, and points northward along the Atlantic coast on February 4, 1985. The brown pelican remains endangered throughout the remainder of its range, which includes Louisiana, Mississippi, Texas, California, Mexico, Central and South America, and the West Indies. No critical habitat is designated for the brown pelican within Louisiana.

##### **Species and Habitat Description**

The brown pelican is a large water bird that can be found year around along the Gulf of Mexico coastal waters from Texas to Florida and is one of two species of pelican in North America, the other being the white pelican (*Pelecanus erythrorhynchos*). Adult brown pelicans are dark gray-brown with white about the head and neck. Immature brown pelicans are gray-brown on their head and neck with white underparts. The brown pelican weighs up to 8 pounds and larger individuals have wingspans of more than 7 feet. They spend their entire life cycle in or near marine and estuarine waters, seldom venturing more than 20 miles out to sea. Brown pelicans

feed mainly on fish, including menhaden, mullet, sardines, and pinfish, which they capture by plunge diving (USFWS 1989a).

Preferred nesting sites are small coastal islands, which provide protection from mammalian predators (mainly raccoons), and have sufficient elevation to prevent widespread flooding of nests. The nests are usually built in available vegetation (e.g., black mangrove trees), but ground nesting may also occur. Ground nests vary from practically nothing to well built nests of sticks, reeds, straw, palmetto leaves, and grasses. Tree nests are made of similar materials, only they are more firmly constructed. Sand spits and offshore sandbars are used extensively as daily loafing and nocturnal roost areas.

Brown pelican breeding activity in Louisiana can vary from as early as February to as late as September. They nest in colonies on small coastal islands in salt and brackish waters. Nesting islands are often chosen near channels where shipping and shrimping operations make fish easily available to nesting pairs. Normal clutch size is three eggs, and both parents share incubation and rearing of the young. The species is considered to be long-lived; one pelican captured in Edgewater, Florida, in November 1964 was banded in September 1933.

### **Range and Population Dynamics**

In the United States, the brown pelican is found along the California coast, and from North Carolina to Texas. It is also found in Mexico, the West Indies and many Caribbean Islands, and as far south as Guyana and Venezuela in South America (USFWS 1995a). Brown pelicans were extirpated from the Louisiana coast during the 1960s, but were reintroduced from Florida in 1968. Extensive use of pesticides, which were ultimately ingested by brown pelicans, has been noted as the primary cause of decline of the species (USFWS 1989a). This threat has been essentially eliminated, resulting in delisting of the species in Alabama and Florida, and stable populations in Louisiana, Mississippi, and Texas coastal regions.

Historically, brown pelicans used the Shell Keys NWR in south-central Louisiana (Emmons 1990). Refuge Staff at the Delta NWR, located in Plaquemines Parish, Louisiana, have noted that brown pelicans tend to use the refuge more during the winter months and the coastal barrier islands during the spring. They suspect that the majority of the pelicans that use that refuge are immature and non-breeding birds (Wigginton 1990). Brown pelicans use the area around Breton NWR in St. Bernard and Plaquemines Parishes, Louisiana, as loafing, feeding, and nesting areas. Flocks typically containing 50 to 100 birds are routinely observed by refuge staff on or near all islands in the Breton and Chandeleur Sounds (Wigginton 1990, Guidry 1994).

The Louisiana population numbered as many as 50,000 birds in the 1930s. By 1963, brown pelicans had completely disappeared from Louisiana. The LDWF and Florida Game and Fresh Water Fish Commission jointly implemented a restoration project from 1968 to 1980, and a total of 1,276 pelicans were reintroduced at three release sites in southeastern Louisiana. Restored nesting populations were established at North Island in the Chandeleur Island chain and at Queen Bess/Camp Island in Barataria Bay. North Island production was 909 fledglings between 1974 and 1979, and first nested successfully when the birds were 2 years of age. Reintroduced birds at the Queen Bess/Camp Island site first nested successfully at 3 years of age (McNease and Joanen

1984). The 13-year reintroduction project suffered a setback in 1975 when approximately 40 percent of the population was killed by a pesticide incident, but the subsequent trend in numbers of nesting pairs continued a generally upward trend. In 1983, the estimated number of nesting pairs in Louisiana was 602. In 1997, the LDWF estimated that there were approximately 10,000 pelican nests with 25,000 adults nesting in Louisiana, primarily on the Chandeleur Islands (Larry McNeese, LDWF personal communication 1997; Elizabeth Souheaver, USFWS, Southeast Louisiana Refuges, personal communication 1997). During the 2000 nesting season, a substantial portion of the Chandeleur Island nesting population relocated to an island created by dredge material at the mouth of Baptiste Collette Pass, but the birds returned to the Chandeleur Islands for the 2001 nesting season (Tom Hess, LDWF, Rockefeller Refuge, personal communication 2002). The LDWF estimates that there were approximately 16,400 pelican nests in Louisiana during the 2001 breeding season (Hess 2001). Other nesting areas in Louisiana are Raccoon and Wine Islands in the Isles Dernieres barrier island system, Queen Bess Island in Barataria Bay, West Breton Island in Breton Sound, and most recently, Rabbit Island in Calcasieu Lake. Current population estimates for Louisiana are estimated to be near 50,000 birds.

## Management and Protection

The brown pelican is extremely susceptible to disturbance and habitat alteration in key nesting areas. It is, therefore, important to prevent disturbance to nesting colonies (e.g., by low-flying aircraft, noise disturbance from project-related activities, etc.) that could cause nest desertion and egg losses, as well as the control of pesticide use and other types of environmental pollution. Consequently, regular surveying occurs in Louisiana. Protective measures for the species consist mainly of legal and regulatory procedures, and habitat protection and improvement. The brown pelican is currently protected by Federal and state laws, which are enforced by the USFWS and the LDWF, respectively. Nest sites are also protected under management programs on Federal lands (i.e., NWRs).

### 4.1.3 Piping Plover (*Charadrius melodus*)

#### Status

On January 10, 1986, the piping plover was Federally listed as endangered in the Great Lakes watershed, and as threatened elsewhere in its range. Critical habitat for the wintering population was designated in 2001; that designation included 142 areas along the coast of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas, to provide sufficient wintering habitat to support the piping plover at the population level and geographic distribution necessary for recovery of the species. Critical habitat for breeding populations in the Great Lakes and Great Plains was designated in 2001 and 2002, respectively.

#### Species and Habitat Description

The piping plover, named for its melodious mating call, is a small North American shorebird approximately 8 inches long with a wingspread of about 15 inches (Palmer 1967). Its light sand-colored plumage blends in well with beaches and sand flats, part of its primary habitat. During

the breeding season, the legs are bright orange, and the short bill is orange with a black tip. There are two single dark bands, one around the neck and one across the forehead between the eyes. The black breast band and brow bar are generally more pronounced in breeding males than females (Wilcox 1959). Breeding birds have white underparts, a light beige back and crown, a white rump, and a black upper tail with a white edge. In flight, each wing shows a single, white wing stripe with black highlights at the wrist joints and along the trailing edges. In winter, the bill turns black, the legs remain orange but pale, and the black plumage bands are lost on the head and neck. Chicks have speckled gray, buff, and brown down, a black beak, orange legs, and a white collar around the neck. Juveniles resemble wintering adults and obtain their adult plumage the spring after they fledge (Prater et al. 1977).

The primary constituent elements for piping plover critical habitat (wintering) are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), associated dune systems, and flats above annual high tide. Primary constituent elements of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important for roosting plovers (USFWS 2002).

Northward migration to the breeding grounds occurs during late February, March and early April (Patterson 1988, MacIvor 1990). Plovers will breed at 1 year of age (MacIvor 1990, Strauss 1990, Haig 1992) and are monogamous, but usually shift mates between years (Wilcox 1959, Haig and Oring 1988, MacIvor 1990).

Southward migration to the wintering grounds along the southern Atlantic coast and Gulf of Mexico shoreline extends from late July through September. Individuals can be found on their wintering grounds throughout the year but sightings are rare in May, June, and early July (USFWS 2001b). In general, wintering piping plovers feed extensively on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependant on a mosaic of sites distributed through the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change.

The following units are designated critical habitat in Louisiana: (1) Texas/Louisiana border to Cheniere au Tigre in Cameron and Vermilion Parishes; (2) Atchafalaya River Delta in St. Mary Parish; (3) Point Au Fer Island in Terrebonne Parish; (4) Isles Dernieres in Terrebonne Parish; (5) Timbalier Island to East Grand Terre Island in Terrebonne, Lafourche, Jefferson, and Plaquemines Parishes; (6) Mississippi River Delta in Plaquemines Parish, and (7) Breton Islands and Chandeleur Island Chain in Plaquemines and St. Bernard Parishes (see 50 CFR Part 17, pages 36127 to 36131, or <http://plover.fws.gov/#maps>, for detailed descriptions and/or maps).

### **Range and Population Dynamics**

Piping plovers breed only in North America within three geographic regions encompassing three distinct breeding populations: the Northern Great Plains, the Great Lakes, and the Atlantic Coast. The piping plover's primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies (USFWS 1988, 1989a, 1989b, 1996, 2002).

Loss and degradation of habitat due to development and shoreline stabilization have been major contributors to the species' decline. Recreational activity, coastal development, and dune stabilization have resulted in loss of suitable sandy beaches and other littoral habitats. Breeding success continues to be affected by human disturbance (foot and vehicular traffic), which destroys nests and young (USFWS 1989b, 1996). Since piping plovers spend 55 to 80 percent of their annual cycle associated with wintering areas, factors that affect their well being on the wintering grounds can substantially affect their survival and recovery (USFWS 1996).

Between 1986 and 1987, there were an estimated 1,258 to 1,326 breeding pairs of piping plovers in the Northern Great Plains breeding population. The 1991 International Piping Plover Census estimated that there were 1,486 breeding pairs in the Northern Great Plains. The 1996 census for that population indicated that it numbered about 3,284 adults, which would be the largest of the three breeding populations (i.e., Northern Great Plains, Great Lakes, and Atlantic Coast).

Russell (1983) reviewed historic records and estimated pre-settlement Great Lakes piping plover populations at 492 to 682 breeding pairs; those totals may be high, but there are no other estimates of pre-settlement population. Coinciding with major industrial development, piping plovers were extirpated from most of the Great Lakes beaches in the late 1970s and early 1980s. In 1977, the Great Lakes population was estimated at 31 nesting pairs (Lambert and Ratcliff 1979), but declined to 17 pairs by 1985 (USFWS 1985). Since 1986, nests have been recorded at 30 breeding sites with populations ranging from 12 to 25 breeding pairs.

Historical trends for the Atlantic Coast piping plover population have been gathered from largely qualitative records. In the nineteenth century, piping plovers were a common summer resident along the Atlantic Coast; by the twentieth century, uncontrolled hunting and egg collecting greatly reduced their populations. Following the passage of the Migratory Bird Treaty Act in 1918, piping plover numbers recovered to some extent. Raithel (1984) showed that Rhode Island piping plover numbers reached a twentieth century peak following a 1938 hurricane, which flattened sand dunes and shoreline developments. After World War II, populations declined due to dune stabilization efforts and construction of summer homes. The population partially recovered following another severe hurricane in 1954, but then began a decline that continued through the early 1980s. Recent population estimates indicate that, since the late 1980s, piping plover populations have increased steadily along the Atlantic Coast from 790 adults in 1986 to 1,349 adults in 1995 (USFWS 1996) and 2,581 adults in 1996 (USFWS 1999b).

### **Management and Protection**

Habitat alterations such as marina construction, erosion control measures, and residential development affect the dynamic nature of the beach ecosystem by altering sediment patterns and hydrology, and inhibiting dune formation. Those actions may degrade or destroy habitat for a

variety of marine plants and animals (USFWS 1996, 1997; Cuthbert et al. 1998). Off-road vehicles and high levels of foot traffic may erode sand dunes and result in direct mortality by trampling (Bowles et al. 1990, USFWS 1997).

The piping plover is currently protected by Federal and state laws, which are enforced by the USFWS and the LDWF, respectively. Critical habitat is also protected under management programs on Federal lands (i.e., NWRs).

## **4.2 FISH**

### **4.2.1 Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)**

#### **Status**

On September 30, 1991, the Gulf sturgeon was listed as a threatened species under the ESA, and the USFWS designated critical habitat for this species throughout its range on February 28, 2003. In Louisiana, Gulf sturgeon critical habitat includes the Pearl River System in Washington and St. Tammany Parishes, the Bogue Chitto River, as well as Lake Pontchartrain, Lake Borgne, Lake Catherine, and the Rigolets.

#### **Species and Habitat Description**

The Gulf sturgeon, also known as the Gulf of Mexico sturgeon, is an anadromous fish (breeds in freshwater after migrating up rivers from marine and estuarine environments). The Gulf sturgeon inhabits coastal rivers from Louisiana to Florida during spring and summer, and the estuaries, bays, and marine environments of the Gulf of Mexico during fall and winter. It is a nearly cylindrical, primitive fish embedded with bony plates or scutes. The head ends in a hard, extended snout; the mouth is inferior and protrusible and is preceded by four conspicuous barbels. The tail (caudal fin) is distinctly asymmetrical; the upper lobe is longer than the lower lobe (heterocercal). Adults range from 4 to 8 feet [(1.2 to 2.4 meters) in length, with adult females larger than adult males.

Gulf sturgeon are long-lived, with some individuals reaching at least 42 years of age (Huff 1975). Age at sexual maturity for females ranges from 8 to 17 years, and for males from 7 to 21 years (Huff 1975). In the spring (from late February to mid-April) when the river surface temperatures are 63 to 70 degrees Fahrenheit (°F) [17 to 21 degrees Celsius (°C)], sexually mature, ripe males and females migrate into the rivers (Carr, Tatman, and Chapman 1996) to spawn. It is believed that Gulf sturgeon exhibit a spawning periodicity similar to Atlantic sturgeon, which have a long inter-spawning period, with females spawning at intervals ranging from every 3 to 5 years, and males every 1 to 5 years (Smith 1985 see <http://www.fws.gov>).

Gulf sturgeon eggs are demersal (they sink to the bottom), adhesive, and vary in color from gray to brown to black (Vladykov and Greeley 1963, Huff 1975, Parauka et al., 1991). During their early life history stages, sturgeon require hard substrates for eggs to adhere to, and for shelter for developing larvae (Sulak and Clugston 1998 see <http://www.fws.gov>). Egg collection sites have consisted of limestone bluffs and outcroppings, cobble, limestone bedrock covered with gravel,

and small cobble, gravel, and sand (Marchant and Shutters 1996 see <http://www.fws.gov>, Sulak and Clugston 1999 see <http://www.fws.gov>, Heise et al. 1999a see <http://www.fws.gov>, Fox et al. 2000 see <http://www.fws.gov>, Craft et al. 2001 see <http://www.fws.gov>). Water depths at egg collection sites have ranged from 4.6 to 26 ft (1.4 to 7.9 m), with temperatures ranging from 64.8 to 75.0°F (18.2 to 23.9°C) (Fox et al. 2000, Ross et al. 2000, Craft et al. 2001). Laboratory experiments indicate that optimal water temperature for survival of Gulf sturgeon larvae is between 59 and 68°F (15 and 20°C), with low tolerance to temperatures above 77°F (25°C) (Chapman and Carr 1995 see <http://www.fws.gov>). Young-of-the-year Gulf sturgeon appear to disperse widely, using extensive portions of the river as nursery habitat. They are typically found on sandbars and sand shoals over rippled bottom and in shallow, relatively open, unstructured areas.

Gulf sturgeon feeding habits in freshwater vary depending on the fish's life history stage. Young-of-the-year Gulf sturgeon remain in freshwater feeding on aquatic invertebrates and detritus approximately 10 to 12 months after spawning occurs (Mason and Clugston 1993, Sulak and Clugston 1999 see <http://www.fws.gov>). Juveniles less than 11 lbs (5 kg) are believed to forage extensively and exploit scarce food resources throughout the river, including aquatic insects (e.g., mayflies and caddis flies), worms (oligochaetes), and bivalve mollusks (Huff 1975, Mason and Clugston 1993). Subadults (age 6 to sexual maturity) and adults (sexually mature) only feed in marine and estuarine habitats and are thought to forage opportunistically (Huff 1975) on primarily benthic (bottom dwelling) invertebrates. Gut content analyses have indicated that the Gulf sturgeon's diet is predominantly amphipods, lancelets, polychaetes, gastropods, shrimp, isopods, mollusks, and crustaceans (Huff 1975, Mason and Clugston 1993, Carr et al. 1996b see <http://www.fws.gov>, Fox et al. 2000 see <http://www.fws.gov>, Fox et al. 2002 see <http://www.fws.gov>).

When river temperatures drop in the fall to about 63 to 72°F (17 to 22°C), Gulf sturgeon return to the coastal shelf areas of the Gulf of Mexico (Carr, Tatman, and Chapman 1996 see <http://www.fws.gov>). Most subadult and adult Gulf sturgeon spend the cooler months (October or November through March or April) in estuarine areas, bays, or the Gulf of Mexico (Odenkirk 1989, Foster 1993, Clugston et al. 1995, Fox et al. 2002 see <http://www.fws.gov>) feeding. Winter habitats used by Gulf sturgeon coincide with the habitats of their prey. Along the Mississippi Sound barrier islands, Gulf sturgeon habitat typically consists of sandy substrates with an average depth of 6.2 to 19.4 ft (1.9 to 5.9 m). Gulf of Mexico near shore (less than 1 mi [1.6 km]) unconsolidated, fine-medium grain sand habitats, including natural inlets and passes from the Gulf to estuaries, support crustaceans such as mole crabs, sand fleas, various amphipod species, and lancelets (Menzel 1971 see <http://www.fws.gov>, Abele and Kim 1986 see <http://www.fws.gov>, American Fisheries Society 1989 see <http://www.fws.gov>, Brim personal communication 2002) where Gulf sturgeon are found. Estuary and bay unvegetated habitats have a preponderance of sandy substrates that support burrowing crustaceans, such as ghost shrimp, small crabs, various polychaete worms, and small bivalve mollusks (Menzel 1971 see <http://www.fws.gov>, Abele and Kim 1986 see <http://www.fws.gov>, American Fisheries Society 1989 see <http://www.fws.gov>, Brim personal communication 2002) which are prey for Gulf sturgeon.

### **Range and Population Dynamics**

Historically, the Gulf sturgeon occurred from the Mississippi River east to Tampa Bay. Its present range extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi, east to the Suwannee River in Florida, with infrequent sightings occurring west of the Mississippi River. In the late 19th century and early 20th century, the Gulf sturgeon supported an important commercial fishery, providing eggs for caviar, flesh for smoked fish, and swim bladders for isinglass, a gelatin used in food products and glues (Huff 1975, Carr 1983). Gulf sturgeon numbers declined due to over fishing throughout most of the 20th century. The decline was exacerbated by habitat loss associated with the construction of water control structures, such as dams and sills (submerged ridges or vertical walls of relatively shallow depth separating two bodies of water), mostly after 1950. In several rivers throughout the species' range, dams have severely restricted sturgeon access to historic migration routes and spawning areas (Boschung 1976, Wooley and Crateau 1985, McDowall 1988).

The majority of recent Gulf sturgeon sightings in the Pearl River drainage have occurred downstream of the Pools Bluff Sill on the Pearl River, near Bogalusa, Louisiana, and downstream of the Bogue Chitto Sill on the Bogue Chitto River in St. Tammany Parish, Louisiana. Between 1992 and 1996, 257 Gulf sturgeon were captured from the Pearl River system (West Middle River, Bogue Chitto River, East Pearl River, and West Pearl River). The subpopulation in that system was estimated at 292 fish, of which only 2 to 3 percent were adults (Morrow et al. 1998b see <http://www.fws.gov>). The annual mortality rate was calculated to be 25 percent.

Preliminary results from captures between 1992 and 2001 suggest a stable subpopulation of 430 fish, with approximately 300 adults (Rogillio et al. 2002 see <http://www.fws.gov>). Morrow et al. (1999 see <http://www.fws.gov>) suggested that the Pearl River Gulf sturgeon population would be self-sustaining if the number of adults was at least 100, recruitment was satisfactory, and annual mortality was less than about 15 percent. Based on those criteria and from data gathered during 2000 and 2001, it appears that the population is at least self-sustaining and may even be recovering. There may be as many as 300 adults. While mortality estimates may be somewhat biased, the rate is probably about half of the 15 percent deemed to be a minimum acceptable benchmark.

### **Management and Protection**

Life history characteristics of Gulf sturgeon may complicate and protract recovery efforts. Gulf sturgeon cannot establish a breeding population rapidly because of the amount of time it takes them to reach sexual maturity. Further, Gulf sturgeon appear to be river-specific spawners, although immature Gulf sturgeon occasionally exhibit plasticity in movement from one river to another. Therefore, natural repopulation by Gulf sturgeon migrating from other rivers may be non-existent or very low.

The take of Gulf sturgeon is prohibited in the state waters of Louisiana, Mississippi, Alabama, and Florida. Section 6(a) of the ESA provides for extended cooperation with states for the purpose of conserving threatened and endangered species. Under that provision, the Departments of the Interior and Commerce may enter into cooperative agreements with a state,

provided that state has an established program for the conservation of a listed species. The agreements authorize the states to implement the authorities and actions of the ESA relative to the listed species recovery. Specifically, the states are authorized: 1) to conduct investigations to determine the status and requirements for survival of resident species of fish and wildlife (this may include candidate species for listing), and 2) to establish programs, including acquisition of land or aquatic habitat or interests for the conservation of fish and wildlife. Federal funding is also provided to states under those agreements to implement the approved programs. All four of the above mentioned states have entered into Section 6 agreements with the USFWS.

#### 4.2.2 Pallid Sturgeon (*Scaphirhynchus albus*)

##### Status

The pallid sturgeon was listed as endangered on October 9, 1990. The reasons for listing were habitat modification, apparent lack of natural reproduction, commercial harvest, and hybridization in parts of its range. Critical habitat has not been proposed or designated for the pallid sturgeon.

##### Species and Habitat Description

Pallid sturgeon evolved from an ancient group of bony fishes, the subclass Paleopterygii. Most species in this subclass became extinct sometime in the Mesozoic Era. The living descendants of this group in North America include paddlefish and eight species of sturgeon.

The pallid sturgeon grows to lengths of over 6 feet, can weigh in excess of 80 pounds, and has a flattened, shovel-shaped snout, a long, slender, and completely armored caudal peduncle, and lacking a spiracle (Smith 1979). As with other sturgeon, the mouth is toothless, protrusible, and ventrally positioned under the snout. The skeletal structure is primarily cartilaginous (Gilbraith et al. 1988).

Forbes and Richardson (1905), Schmulbach et al. (1975), Kallemeyn (1983), and Gilbraith et al. (1988) describe the pallid sturgeon as being well adapted to life on the bottom in swift water of large, turbid, free-flowing rivers. Pallid sturgeon evolved in the diverse environments of the Missouri and Mississippi Rivers. Floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters formed the large-river ecosystem that provided macrohabitat requirements for pallid sturgeon and other native large-river fish, such as paddlefish and other sturgeon. Those habitats were historically in a constant state of change. Mayden and Kuhajda (1997) describe the natural habitat conditions to which pallid sturgeon are adapted as braided channels, irregular flow patterns, flooding of terrestrial habitats, extensive microhabitat diversity, and turbid waters. Those habitat conditions and much of the once naturally functioning ecosystem have been changed by human activities.

Bramblett (1996) noted important aspects of pallid sturgeon habitat use and movements. He also noted that the pallid sturgeon is specific and restrictive in use of macrohabitat selection. According to Bramblett's (1996) study, pallid sturgeon were found most often in sinuous channels with islands or alluvial bars present. Straight channels, and channels with irregular patterns or irregular meanders were only rarely used by pallid sturgeon. The seral stage of islands or bars near pallid sturgeon occurrences was most often subclimax (Bramblett 1996). Bramblett (1996) found macrohabitats used by pallid sturgeon were diverse and dynamic. For example, pallid sturgeon used river reaches with sinuous channel patterns and islands and alluvial bars; those river reaches generally have more diverse depths, current velocities, and substrates than do relatively straight channels without islands or alluvial bars, as well as a high diversity of channel features such as backwaters and side channels. The subclimax riparian vegetational seres in those areas are indicative of a dynamic river channel and riparian zone (Johnson 1993).

In telemetry studies of pallid sturgeon on the middle Mississippi River, Sheehan et al. (1998) found a positive selection for main channel border and downstream islands tips, depositional areas between wing dams, and deep holes off wing dam tips. Sheehan et al. (1998) speculated that areas between wing dams and downstream island tips may be used as velocity refugia and/or feeding stations. Sturgeon were found most often in main channel habitat; however, they exhibited selection against that habitat type. Their occurrence in such habitat was not surprising, considering main channel habitat comprised approximately 65 percent of the available habitat in the study reach (Sheehan et al. 1998).

Constant et al. (1997) reported on radio-tracked sturgeon, and stated that sturgeon were most frequently found in low-slope areas and that such areas were used in proportion to their availability. No sturgeon were observed on extremely steep slopes. Constant et al. (1997) found that sand made up over 80 percent of the substrate in low-slope areas where over 90 percent of pallid sturgeon were located. Those authors stated that the preference for sand substrates in low-slope areas suggests that pallid sturgeon use such areas as current refugia. Sand substrates were found to have lower invertebrate densities than substrates of silt-clay, which were generally located on steep-slope areas that were exposed by swift currents. As such, it would have been energetically costly for pallid sturgeon to remain near those steep-slope areas for extended periods of time. Telemetry observations, however, showed that 55 percent of sturgeon locations occurred within 33 feet of steep slopes, suggesting that pallid sturgeon remained near areas of high food abundance (Constant et al. 1997). Reed and Ewing (1993) found sturgeon occurring in the man-made riprap lined outfall channels of the Old River Control Structure Complex (ORCSC) in Louisiana. Bramblett (1996) found that pallid sturgeon preferred sandy substrates, particularly sand dunes, and avoided substrates of gravel and cobble. Pallid sturgeon have adhesive eggs. Thus, spawning is thought to occur over hard substrates of gravel or cobble with moderate flow (USFWS 2000).

Caution must be used in interpreting the results of habitat preference studies conducted in today's highly altered river environments. The results of studies conducted by Bramblett (1996) under fairly unaltered riverine conditions, however, provide additional information on habitat conditions preferred by this species. Characteristics of microhabitat used by pallid sturgeon have recently been described. Much of the microhabitat research to date has been conducted in significantly altered environments. That research does not necessarily indicate preferred or required habitats; instead it may only indicate which habitats of those presently available the pallid sturgeon uses. Also, capture locations may have conditions representing seasonal habitat preferences. Hurley (1996) found that pallid sturgeon were selecting downstream island tips although the island tips were not abundant within the study area. Constant et al. (1997) found pallid sturgeon in the Atchafalaya and Mississippi Rivers at mean depths of 49.9 feet and observed pallid sturgeon at depths of 23.0 and 68.9 feet with greater frequency than such areas were available. The range of depth used by pallid sturgeon is likely related to the available habitat within the river segment (USFWS 2000).

Pallid sturgeon spawning occurs from March through July depending on location (Forbes and Richardson 1905, Gilbraith et al. 1988). Keenlyne and Jenkins (1993) estimate that spawning probably begins in March in the lower Mississippi and Atchafalaya Rivers; in late April or early

May in the lower Missouri and middle Mississippi Rivers; and in late May or early June in the upper Missouri River.

All sturgeon species spawn in the spring or early summer, are multiple spawners, and release their eggs at intervals. In the wild, the adhesive eggs are released in deep channels or rapids and are left unattended (Gilbraith et al. 1988). The larvae of Acipenserids are generally pelagic, becoming buoyant or active immediately after hatching (Moyle and Cech 1982). Although the behavior of young pallid sturgeon is poorly understood, work by Kynard et al. (1998) indicates that a downstream migration period for larval pallid sturgeon begins at hatching and continues up to day 13. With this information it has been possible to use water velocities to roughly estimate that larval pallid sturgeon may drift in the water column for a distance of 40 to over 400 miles (USFWS 2000).

Although benthic macroinvertebrates, characteristic of river habitats, are important pallid sturgeon dietary components (Modde and Schmulbach 1977, Carlson et al. 1985), the occurrence of lake and terrestrial invertebrates in sturgeon stomachs suggest that drifting invertebrates may also be important forage organisms (Modde and Schmulbach 1977, Constant et al. 1997). Aquatic invertebrates (principally the immature stages of insects) compose most of the diet of shovelnose sturgeon, while adult pallid sturgeon and hybrids consume a greater proportion of fish (mostly cyprinids). Other researchers also reported a higher incidence of fish in the diet of adult pallid sturgeon than in the diet of shovelnose sturgeon (Cross 1967, Held 1969).

### **Range and Population Dynamics**

The pallid sturgeon is endemic to the Yellowstone, Missouri, Middle and Lower Mississippi Rivers, and the lower reaches of their major tributaries. Within Louisiana, the pallid sturgeon is found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the ORCSC); it is possibly found in the Red River as well. The historic range of pallid sturgeon, as described by Bailey and Cross (1954), encompassed the middle and lower Mississippi River, the Missouri River, and the lower reaches of the Platte, Kansas, and Yellowstone Rivers. Duffy et al. (1996) stated that the historic range of pallid sturgeon once included the Mississippi River upstream to Keokuk, Iowa, before the river was converted into a series of locks and dams for commercial navigation (Coker 1930).

The pallid sturgeon appears nearly extirpated from large segments of its former range. In 1991, pallid sturgeon were discovered in the Atchafalaya River in Louisiana (Constant et al. 1997). Today, they are only occasionally found in a few selected areas. Since 1980, reports of most frequent occurrence are from the Missouri River, the Mississippi River, and the Atchafalaya River at the ORCSC (USFWS 1993). Of 872 pallid sturgeon records prior to 1998, 70 percent were reported from the Missouri River. Nine percent of the total records came from the Yellowstone River, 5 percent from the Mississippi River, 14 percent from the Atchafalaya River, and less than 2 percent from the St. Francis, Platte, Ohio, Kansas, and Big Sunflower Rivers (USFWS 2000). Keenlyne (1989) updated previously published and unpublished information on distribution and abundance of pallid sturgeon.

The Missouri River has been modified significantly, with approximately 36 percent of the riverine habitat inundated by reservoirs, 40 percent channelized, and the remaining 24 percent altered due to dam operations (USFWS 1993). Most of the major tributaries of the Missouri and Mississippi Rivers have also been altered to various degrees by dams, water depletions, channelization, and riparian corridor modifications.

Levee construction on the lower Mississippi River from the Ohio River to near the Gulf of Mexico has eliminated the river's major natural floodway and reduced the area of the floodplain connected to the river by more than 90 percent (Fremling et al. 1989). Fremling et al. (1989) also reported that levee construction isolated many floodplain lakes and raised riverbanks. Destruction and alteration of big-river ecologic functions and habitat once provided by the Missouri and Mississippi Rivers is believed to be the primary cause of declines in reproduction, growth, and survival of pallid sturgeon (USFWS 1993). In spite of efforts to constrict and control the Missouri and Mississippi Rivers with reservoirs, stabilized banks, jetties, dikes, levees, and revetments, remnant reaches of the Missouri River and Mississippi River from the Missouri River confluence to the Gulf of Mexico still provide habitat usable by pallid sturgeon for certain life stages.

Since 1988, pallid sturgeon researchers have collaborated on studies to gather information about the species (Keenlyne 1995). Tag and recapture data indicate that 50 to 100 pallid sturgeon remain in the Missouri River above Fort Peck Dam in Montana, and between 200 and 300 pallid sturgeon remain between the Garrison Dam in North Dakota and Fort Peck Dam, including the lower Yellowstone River (USFWS 2000). One to five pallid sturgeon sightings per year have been recorded between the headwaters of Oahe Reservoir in South Dakota to the Garrison Dam and from the riverine reach in the Missouri River above Gavins Dam to Fort Randall Dam, suggesting that perhaps as many as 25 to 50 pallid sturgeon may remain in each of these areas. A small population also exists between Oahe Dam and Big Bend Dam on the Missouri River in South Dakota with perhaps 50 to 100 individuals remaining in that riverine section. There is no evidence that the upper Missouri River system populations are successfully reproducing (Keenlyne 1989, Duffy et al. 1996).

Glen Constant, while conducting research at Louisiana State University, estimated the pallid sturgeon population in the Atchafalaya River to range from 2,750 to 4,100 fish. A high rate of hybridization is occurring in the Atchafalaya and Mississippi Rivers (Keenlyne et al. 1994); that makes estimation of the number of pure pallid sturgeon in those river systems difficult (Duffy et al. 1996).

In recent years, pallid sturgeon populations have been augmented by release of hatchery-reared fish. In 1994, the Missouri Department of Conservation (MDC) released approximately 7,000 fingerlings in the Missouri and Mississippi Rivers, and an additional 3,000 fingerlings were stocked in 1997 (Graham 1997, 1999). Since stocking in 1994, approximately 86 pallid sturgeon returns have been reported, mostly in the Mississippi River downstream of St. Louis (Graham 1999). Thirty-five 12- to 14-inch pallid sturgeon raised at Natchitoches NFH were stocked in the lower Mississippi River in 1998 (Kilpatrick 1999). Also in 1998, 745 hatchery-reared yearling pallid sturgeon were released at three sites in the Missouri River above Fort Peck Reservoir

(Gardner 1999) and another 750 yearling sturgeon were released near the confluence of the Yellowstone and Missouri Rivers (USFWS 2000).

Evidence of successful pallid sturgeon reproduction is rare throughout the range of the species. Recent work in the Atchafalaya River has revealed pallid sturgeon of several age groups, suggesting that some reproduction and recruitment may also occur in the Atchafalaya River. The only physical evidence of reproduction, however, were three gravid females reported by Constant et al. (1997). According to their data, pallid sturgeon collected in the Atchafalaya River and other areas of the Mississippi River have averaged less than 6.6 pounds and length-at-age estimates calculated according to Fogle (1963) indicated that even the smallest fish were over age 6, with the oldest perhaps over age 14. The age of fish in their study indicates the most recent recruitment of pallid sturgeon to be from the 1988-year class (Constant et al. 1997).

### **Management and Protection**

Habitat destruction and alteration is believed to be the primary cause of declines in pallid sturgeon reproduction, growth, and survival. It is unlikely that successfully reproducing pallid sturgeon populations can be recovered without restoring the habitat elements (morphology, hydrology, temperature regime, cover, and sediment/organic matter transport) of the Missouri and Mississippi Rivers necessary for the species' continued survival (USFWS 1993). In spite of efforts to control the Missouri and Mississippi Rivers with reservoirs, stabilized banks, jetties, dikes, levees, and revetments, remnant reaches of the Missouri and Mississippi Rivers still provide habitat believed to be usable by the pallid sturgeon. Those habitat remnants are priority areas for implementation of recovery actions (USFWS 1993).

Mortality of pallid sturgeon occurs from both sport and commercial fishing activities. The states of North Dakota, South Dakota, and Louisiana require the release of all sturgeon whether taken commercially or for sport. Neither Montana nor Kansas allow commercial harvest of sturgeon. Sturgeon continued to be harvested as a bycatch of commercial fishing operations in Nebraska, Iowa, Missouri, Illinois, Kentucky, Tennessee, Arkansas, and Mississippi (USFWS 1993).

Pollution is also a likely threat to the pallid sturgeon over much of its range. Further investigations are needed to identify sources of contaminants in the Missouri and Mississippi Rivers, and to assess the role of contaminants in the decline of pallid sturgeon populations (USFWS 1993).

The pallid sturgeon is known to hybridize with the shovelnose sturgeon (Carlson et al. 1985). Keenlyne et al. (1992) concluded that hybridization might be occurring in half of the river reaches within the pallid sturgeon's range. Hybridization may be related to environmental degradation. Presumably, the loss of habitat diversity caused by human-induced environmental changes inhibits the reproductive isolating mechanisms that naturally occur among fish species. Also, the loss of available spawning habitat forces sharing of suitable habitat areas by similar species, with resultant increased hybridization (USFWS 1993).

## 4.3 MAMMALS

### 4.3.1 Louisiana Black Bear (*Ursus americanus luteolus*)

#### Status

The Louisiana black bear was listed as threatened on January 7, 1992, due to the population decline resulting from extensive habitat loss (USFWS 1995b). Simultaneously, other free-living black bears within the historic range of the Louisiana black bear were listed as threatened due to their similarity of appearance to the Louisiana black bear. The USFWS proposed to designate critical habitat for the Louisiana black bear in December 2, 1993, but no final rule has been issued. Proposed critical habitat included forested habitat within the Tensas River Basin, the Atchafalaya River Basin, and the Lower Iberia-St. Mary Parish area.

#### Species and Habitat Description

The Louisiana black bear is one of 16 subspecies of the American black bear. The black bear is a large, bulky mammal with long black hair and a short, well-haired tail. The facial profile is blunt, the eyes are small and the nose pad is broad with large nostrils. The muzzle is yellowish brown with a white patch sometimes present on the lower throat and chest. Although weight varies considerably throughout their range, adult males weigh more than 600 pounds; adult females generally weigh less than 300 pounds.

Though classified as a carnivore by taxonomists, black bears are not active predators and only prey on vertebrates when the opportunity arises. Most meat eaten by black bears is carrion. Bears are best described as opportunistic feeders, as they eat almost anything that is available; thus, they are typically omnivorous. Their diet varies seasonally, and includes primarily succulent vegetation during spring, fruits and grains in summer, and hard mast such as acorns and pecans during fall. Bears utilize all levels of forest for feeding; they can gather foods from treetops and vines, but also grub in fallen logs for insects. The growth rate, maximum size, breeding age, litter size, and cub survival of black bears are all correlated with nutrition.

Bear activity revolves mainly around the search for food, water, cover, and mates during the breeding season. Home ranges of bears, particularly females, appear to be closely linked to forest cover (Marchinton 1995). Beausoleil (1999) estimated maximum home range for Deltaic bears in the Tensas River Basin to be 1,729 and 1,038 acres for males and females, respectively. Maximum home range estimates for Tensas River NWR bears were 81,396 and 13,072 acres for males and females, respectively (Weaver 1999). Home range estimates for male bears in the inland Atchafalaya River Basin subpopulation may be as high as 80,000 acres, while female home ranges are approximately 8,000 acres (Wagner 1995). Home range estimates for female and male bears in the coastal subpopulation are estimated to be 3,706 and 10,378 acres, respectively (Wagner 1995). Wagner (1995) speculated that the smaller home ranges of coastal bears as compared to inland bears were due to superior habitat quality in the coastal area.

Female black bears become sexually mature at 3 to 5 years of age. Breeding occurs in summer and the gestation period for black bears is 7 to 8 months. Cubs are born in winter dens at the end

of January or the beginning of February. Estimated litter sizes for the three Louisiana subpopulations ranges from 1.73 to 2.43. The normal litter size is two, although litter sizes of three to four cubs do occur. Cubs stay with the sow through summer and fall and den with them the second winter. The young disperse in spring or summer, prior to the female's period of estrus (Pelton 1982).

Louisiana black bears use a variety of den types, including ground nests, hollow trees, and brush piles. Generally, adult males and sub-adults use ground dens with greater frequencies than adult females. Black bears do not truly hibernate, but go through a dormancy period termed "carnivorian lethargy", a period of torpor, which helps them survive food shortages and severe weather during the winter. In warmer climates, such as in Louisiana, bears can remain active all winter (Taylor 1971). Bears may enter dens between October and early January depending on latitude, available food, sex and age, and local weather conditions (Pelton 1982). Adult females generally enter the den first, followed by sub-adults and adult males. Females with cubs generally are the last to leave the den.

The key habitat requirements of black bears are food, water, cover, and denning sites, which are spatially arranged across sufficiently large, relatively remote blocks of land. The remaining populations of Louisiana black bears typically inhabit bottomland hardwood communities; other habitat types may be utilized, including marsh, upland forested areas, forested spoil areas, and agricultural fields. Throughout its range, prime black bear habitat is characterized by relatively inaccessible terrain, thick understory vegetation, and abundant sources of food (Pelton 1982). Other important features of prime black bear habitat include dispersal corridors, protection from human-related disturbances, water, and denning sites. Corridors providing cover may facilitate the movement of bears through agricultural lands, particularly when bears reside in fragmented tracts of forest as observed by Weaver et al. (1992) in the Tensas Basin. According to Marchinton (1995), telemetry locations and visual observations indicated that wooded drainages were important travel corridors for movements among forested tracts.

Bear mortality has been attributed to natural and human causes. Natural causes include disease, cannibalism, drowning, poor maternal care, and climbing accidents. Human-induced mortality includes hunting, trapping, poaching, vehicle collisions, electrocution, depredation/nuisance kills, disturbance (causing den abandonment), and accidents associated with research activity. Road access can increase the chances of people or dogs disturbing maternal dens in winter (Rogers and Allen 1987). Cubs are dependent on the sow for warmth and food; human disturbance of denning females has resulted in cub mortality from abandonment (Elowe and Dodge 1989).

Pace et al. (2000) evaluated known black bear mortality in Louisiana between 1992 and 2000. Vehicular collisions were the most common cause of mortality, accounting for 45 percent of verified losses. Poaching was the second most common cause of death, with at least 12 bears illegally shot. Sixty-five percent of known mortalities occurred in the coastal subpopulation (the majority of which were adult females), 24 percent from Tensas River Basin subpopulation (the majority of which were males) and 11 percent from inland Atchafalaya River Basin subpopulation. Pace et al. (2000) concluded that anthropogenic causes of mortality are taking a relatively large toll on the coastal subpopulation in terms of absolute numbers and because adult

females represent a high proportion of the take. Similarly, female losses in the inland Atchafalaya River Basin are high, relative to estimated population size.

### **Range and Population Dynamics**

The Tensas River Basin subpopulation is 110 miles north of the inland Atchafalaya River Basin subpopulation. Some of the Tensas bears are located on Tensas River NWR and Big Lake Wildlife Management Area (WMA), which are protected from development and managed for bears and other wildlife. The refuge and adjacent WMA provide approximately 130 square miles of forested habitat (Weaver 1999). The nearby Deltic tracts support one of the highest densities of black bears reported for the southeastern coastal plain and the surrounding agriculture is probably the reason for that high density (Beausoleil 1999). Anderson (1997) reported that agricultural crops constituted 49 percent of the diet of Deltic bears; if crops grown on the surrounding lands change from corn and wheat (which are used by bears) to cotton, which is not, the sub-subpopulation would lose a food resource that it prefers. Also, bear density is not distributed evenly among tracts. Beausoleil (1999) reported 8 of 12 females studied had home ranges exclusively within the Bluecat tract, and 2 additional females had home ranges that overlapped the Bluecat tract and smaller adjacent forested areas to the south. The Deltic tracts are in private ownership, and are thus not under management protection and are potentially subject to development pressure. The presence of 4-lane highways and extensive agricultural lands limit bear movements from this subpopulation to Tensas River NWR.

The inland Atchafalaya River Basin subpopulation occupies 175 square miles of predominately private forestland interspersed with agriculture, and is located within and adjacent to the Morganza Floodway and adjoining the Atchafalaya Basin Floodway. The Morganza Floodway and adjoining Atchafalaya Basin Floodway together comprise approximately 1,039 square miles, although much of the land in the middle and lower Atchafalaya Floodway is believed to be currently unsuitable for bear occupancy due to extreme flooding. Through time, however, the swamp and forest floor of the Atchafalaya Basin are expected to rise with each succeeding flood and subsequent deposition of sediment. Those changes will eventually convert most of the basin forests to bottomland hardwoods, with some cypress/tupelo swamps remaining in former aquatic areas (especially in the southeastern portion of the basin). Those changes could expand the suitable habitat for the inland Atchafalaya River Basin and coastal subpopulations, and improve linkage of those populations.

The coastal subpopulation is located approximately 70 miles south of the inland Atchafalaya River Basin subpopulation, in southern Iberia and St. Mary Parishes, Louisiana. Habitat evaluation is underway to determine if suitable linkages between those two subpopulations can be identified. The coastal subpopulation occupies private lands, totaling approximately 218 square miles, and the recently established Bayou Teche NWR (currently 9,040 acres). Bear range expansion in the coastal area is limited by development along U.S. Highway 90 to the north, and by the surrounding coastal marsh, which is believed to be unsuitable for sustaining bear populations. Large blocks of public and private forest land exist to the north of the coastal subpopulation within the Atchafalaya Floodway, but are believed to be uninhabited by bears, and may be unsuitable for bear occupancy due to extent of flooding. Development of the majority of the occupied area is believed to be unlikely because most of the area remains flooded during

most of the year, but some development pressure is expected on the eastern and western limits of the subpopulation. The densest portion of the coastal subpopulation is believed to be on the natural salt domes of Jefferson, Weeks, Avery, and Cote Blanche Islands (USFWS 2001a). Development that increases the number of roads, human presence, or reduces the amount of forest, especially the oak dominated habitat, could severely impact this population. Throughout the coastal subpopulation area, small forest patches on the edges of agriculture fields and developed areas may be at the greatest risk. These patches are protected from flooding by levees constructed to facilitate drainage and most are bottomland hardwood stands with a high proportion of oaks. Future changes to existing drainage systems could also alter coastal bear habitats.

### **Management and Protection**

Black bears have relatively low reproductive potential; therefore, changes that influence reproduction can significantly impact population dynamics, an important management consideration. The most important natural factor regulating black bear populations appears to be variation in food supply and its effect on physiological status and reproduction (Rogers 1976).

Louisiana black bear habitat is believed to be stable to increasing overall as a result of regulatory programs (including Swampbuster and Section 404 of the Clean Water Act), and concerted efforts by Federal, state, and private entities that are currently targeting reforestation projects in bear habitat. Since 1992, approximately 150,000 acres of habitat have been reforested/protected through USDA's Wetland Reserve Program, and more than 50,000 acres of this restoration and protection have directly benefited bears. Nearly all of this effort has occurred in the upper Atchafalaya and Tensas River basins. Additional reforestation has occurred on NWRs, State-owned lands, and other Federal lands in areas where black bears will be benefited. In addition, the USFWS has acquired bear habitat in the coastal area for establishment of Bayou Teche NWR. The USACE has purchased about 50,000 acres in fee title, and is securing easements on 338,000 acres, in the Atchafalaya Basin. There is little opportunity for the establishment of conservation easements in the coastal area, however, due to the current profitability of sugarcane farming.

#### **4.3.2 West Indian Manatee (*Trichechus manatus*)**

##### **Status**

The West Indian manatee was listed as endangered throughout its range for both the Florida and Antillean subspecies in 1967, and received Federal protection with the passage of the ESA in 1973. Critical habitat was designated in 1976, 1994, 1998, 2002, and 2003 for the Florida subspecies.

##### **Species and Habitat Description**

The West Indian manatee is a large gray or brown aquatic mammal. Adults average approximately 10 feet in length and weigh up to 2,200 pounds. They have no hind limbs, and their forelimbs are modified as flippers. Manatee tails are flattened horizontally and rounded.

Their body is covered with sparse hairs and their muzzles with stiff whiskers (USFWS 2001c). The nostrils, located on the upper snout, open and close by means of muscular valves as the animal surfaces and dives (Husar 1977, Hartman 1979). Manatees will consume any aquatic vegetation (i.e., submerged, floating, and emergent) available to them and sometimes even shoreline vegetation. Although primarily herbivorous, they will occasionally feed on fish. Manatees may spend about 5 hours a day feeding, and may consume 4 to 9 percent of their body weight per day.

Observations of mating herds indicate that females mate with a number of males during their 2- to 4-week estrus period, and then they go through a pregnancy estimated to last 12 to 14 months (O'Shea et al. 1992). Births occur during all months of the year with a slight drop during winter months. Manatee cows usually bear a single calf, but 1.5 percent of births are twins. Calves reach sexual maturity at 3 to 6 years of age. Mature females may give birth every 2 to 5 years (USFWS 2001c).

Manatees inhabit both salt and freshwater of sufficient depth (5 feet to usually less than 20 feet) throughout their range. Shallow grassbeds with ready access to deep channels are preferred feeding areas in coastal and riverine habitats (USFWS 2001c). They may also be encountered in canals, rivers, estuarine habitats, saltwater bays, and have been observed as much as 3.7 miles off the Florida Gulf Coast. Between October and April, Florida manatees concentrate in areas of warmer water. Severe cold fronts have been known to kill manatees when the animals did not have access to warm water refuges. During warmer months they appear to choose areas based on an adequate food supply, water depth, and proximity to fresh water. Manatees may not need fresh water, but they are frequently observed drinking water from hoses, sewage outfalls, and culverts.

### **Range and Population Dynamics**

During winter months, the United States' manatee population confines itself to the coastal waters of the southern half of peninsular Florida and to springs and warm water outfalls as far north as southeast Georgia. Power plant and paper mill outfalls create most of the artificial warm water refuges utilized by manatees. During summer months, they migrate as far north as coastal Virginia on the east coast and the Louisiana coast in the Gulf of Mexico.

During summer months, manatees disperse from winter aggregation areas, and are commonly found almost anywhere in Florida where water depths and access channels are greater than 3.3 to 6.6 feet (O'Shea 1988). In the warmer months, manatees usually occur alone or in pairs, although interacting groups of 5 to 10 animals are not unusual (USFWS 2001c). A few individuals have been known to stray as far north as the northern Georgia coast and as far west as the coastal waters of Louisiana.

In the early 1980s, scientists tried to develop procedures for estimating the overall manatee population in the southeastern United States (USFWS 2001c). The best estimate throughout the State of Florida was 1,200 manatees (Reynolds and Wilcox 1987). In the early 1990s, the State of Florida initiated a statewide aerial survey in potential winter habitats during periods of severe

cold weather (Ackerman 1995), and the highest count of 3,276 manatees was recorded in January 2001.

## **Management and Protection**

The most significant problem faced by manatees in Florida is death or injury from boat strikes (USFWS 2001c). Minimum flows and levels for warm water refuges need to be established to ensure their long-term availability for manatees. Their survival will depend on maintaining the ecosystems and habitat sufficient to support a viable manatee population (USFWS 2001c). The focus of recovery is on implementing, monitoring, and addressing the effectiveness of conservation measures to reduce or remove threats that will lead to a healthy and self-sustaining population (USFWS 2001c).

The West Indian manatee is also protected under the Marine Mammal Protection Act (MMPA) of 1972. The MMPA establishes a national policy for the maintenance of health and stability of marine ecosystems and for obtaining and maintaining optimum sustainable populations of marine mammals. It includes a moratorium on the taking of marine mammals. The recovery planning under the ESA includes conservation planning under the MMPA (USFWS 2001c).

## **4.4 REPTILES**

### **4.4.1 Green Sea Turtle (*Chelonia mydas*)**

#### **Status**

The green sea turtle was listed as endangered/threatened on July 28, 1978. The breeding populations off Florida and the Pacific coast of Mexico are listed as endangered while all others are threatened (USFWS 1991, NMFS [www.nmfs.noaa.gov/](http://www.nmfs.noaa.gov/)). This species' current status in Louisiana is unknown (USFWS 1990b).

#### **Species and Habitat Description**

Although green sea turtles are found worldwide in oceans and gulfs with water temperatures greater than 68°F (20°C), their distribution can be correlated to grassbed distribution, location of nesting beaches, and associated ocean currents (Hirth 1971). Long migrations are often made between feeding and nesting grounds (Carr and Hirth 1962). Within Louisiana waters, these turtles probably occur all along the coast and may nest on the Chandeleur Islands (Dundee and Rossman 1989). Population decline has been attributed to heavy fishing pressure and human nest predation (Dundee and Rossman 1989). Historically, green sea turtles were fished off the Louisiana coast (Rebel 1974); exploitation and incidental drowning in shrimp trawls has contributed to the decline of this species and its eventual listing (King 1981). During their first year of life, green sea turtles are primarily carnivorous, feeding mainly on invertebrates. As adults they feed almost exclusively on seagrasses growing in shallow water flats (Fritts et al. 1983), but also feed on invertebrates and carrion (Dundee and Rossman 1989).

Green sea turtles feed in shallow water areas with abundant seagrasses or algae. The turtles migrate from nesting areas to feeding grounds, which are sometimes several thousand miles away. Most turtles migrate along the coasts, but some populations are known to migrate across the ocean from nesting area to feeding grounds. The major nesting beaches are always found in places where the seawater temperature is greater than 77°F (25°C). As a species that migrates long distances, these turtles face special problems associated with differing attitudes toward conservation in different countries.

### **Range and Population Dynamics**

In the southeastern United States, green sea turtles are found around the U.S. Virgin Islands, Puerto Rico, and the continental U.S. from Texas to Massachusetts. Important feeding grounds in Florida include Indian River Lagoon, the Florida Keys, Florida Bay, Homosassa, Crystal River and Cedar Key. The primary nesting sites in U.S. Atlantic waters are along the east coast of Florida, with additional sites in the U.S. Virgin Islands and Puerto Rico.

Green sea turtles are also found throughout the North Pacific, ranging as far north as Eliza Harbor, Admiralty Island, Alaska, and Ucluelet, British Columbia. In the eastern North Pacific, green sea turtles have been sighted from Baja California to southern Alaska. In the central Pacific, green sea turtles can be found at most tropical islands. In U.S. Hawaiian waters, green sea turtles are found around most of the islands in the Hawaiian Archipelago. The primary nesting site is at French Frigate Shoals ([http://www.nmfs.noaa.gov/prot\\_res/species/turtles/green.html](http://www.nmfs.noaa.gov/prot_res/species/turtles/green.html)).

Females deposit up to 7 clutches, and the number of nests has been estimated to be between 350 to 2,300 nests annually. Green sea turtles nest at 2-, 3-, or 4-year intervals. This nesting activity indicates a population of less than 1,000 females in the breeding population of Florida and Mexico.

### **Management and Protection**

Recovery plan objectives consider the delisting of green sea turtles if, over a period of 25 years, the following conditions are met: 1) the level of nesting in Florida has increased to an average of 5,000 nests per year for at least 6 years (nesting data must be based on standardized surveys), 2) at least 25 percent (105 km) of all available nesting beaches (420 km) is in public ownership and encompasses at least 50 percent of the nesting activity, and 3) a reduction in age class mortality is reflected in higher counts of individuals on foraging grounds. The 1995 Biological Assessment (BA) lists degradation of foraging grounds as one of the impediments to population recovery. There is evidence that supports foraging site as well as nesting site fidelity by green sea turtles (Renaud 1995). The recovery plans include prevention of marine pollution of green sea turtle habitat and protection of the nesting sites.

#### 4.4.2 Hawksbill Sea Turtle (*Eretmochelys imbricata*)

##### Status

The hawksbill was listed as an endangered species in June 1970 (USFWS 1991) and its current status in Louisiana is unknown (USFWS 1990).

##### Species and Habitat Description

Only one record of a hawksbill in Louisiana has been reported (Fuller and Tappen 1986). This species is an omnivore, feeding primarily on invertebrates and marine vegetation (Dundee and Rossman 1989). Hawksbill turtles are observed regularly in Florida and Texas. Florida is considered foraging habitat for those turtles, and Texas may be foraging habitat for hatchlings and juveniles (77 observations of small turtles were reported between 1972 and 1984) from the nesting sites in Mexico (NMFS and USFWS 1993).

##### Range and Population Dynamics

The hawksbill occurs in tropical and subtropical seas of the Atlantic, Pacific and Indian Oceans. The species is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf of Mexico (especially Texas); in the Greater and Lesser Antilles; and along the Central American mainland south to Brazil. Within the United States, hawksbills are most common in Puerto Rico and its associated islands, and in the U.S. Virgin Islands. In the continental U.S., the species is recorded from all the Gulf of Mexico states and from along the eastern seaboard as far north as Massachusetts, but sightings north of Florida are rare.

Hawksbills are observed in Florida with some regularity on the reefs off Palm Beach County and in the Florida Keys. Texas is the only other state where hawksbills are sighted with any regularity. Most sightings involve post hatchlings and juveniles, which are believed to originate from nesting beaches in Mexico.

Nesting within the southeastern United States occurs principally in Puerto Rico and the U.S. Virgin Islands. Within the continental United States, nesting is restricted to the southeast coast of Florida and the Florida Keys.

Hawksbill turtles nest at low densities in aggregations of 1 to 100 adults; in contrast, other sea turtles have concentrated nesting sites and aggregations of thousands of adults. The Yucatan Peninsula of Mexico is the most concentrated nesting site, where approximately 178 to 222 adult females nest each year (NMFS and USFWS 1993). Most of the countries in the Caribbean report less than 100 females nesting annually; less than two nests annually have been observed in Florida (NMFS and USFWS 1993) and Texas (<http://www.noaa.gov>).

## Management and Protection

Recovery criteria are directed at nesting beaches with U.S. jurisdiction in the Caribbean Sea, including Mona Island, Puerto Rico, and the Virgin Islands. The hawksbill turtle can be delisted if the adult female population has an increasing trend over 25 years, as evidenced by increases in annual number of nests at five index beaches, including Mona Island. Numbers of turtles of all classes must show an increasing trend on at least five key foraging areas within Puerto Rico, the U.S. Virgin Islands, and Florida to meet recovery criteria. Actions needed to achieve recovery include long-term protection of foraging habitat and nesting beaches, and reduction of illegal exploitation (NMFS and USFWS 1993).

### 4.4.3 Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)

#### Status

On December 2, 1970 the Kemp's ridley sea turtle was designated as endangered across its entire range (USFWS 1991) and has continued to decline in Louisiana (USFWS 1990).

#### Species and Habitat Description

This small sea turtle is believed to be the most frequently encountered (Dundee and Rossman 1989), if not the most abundant sea turtle, off the Louisiana coast (Viosca 1961). Predation on eggs by humans, other mammals, birds, and crabs, in addition to the capture of diurnal nesting females has contributed to the decline of the Kemp's ridley. Recent causes of mortality are fishing activities and accidental capture in shrimp trawls (Fuller 1978, Pritchard and Marquez 1973). These sea turtles are commonly captured by shrimpers off the Texas coast, as well as in heavily trawled areas off the coasts and in the bays of Louisiana and Alabama (Dundee and Rossman 1989, Carr 1980, Pritchard and Marquez 1973). Inshore areas of the Gulf of Mexico appear to be important habitat for Kemp's ridleys, as they tend to concentrate around the mouths of major rivers (Frazier 1980). Members of this genus are characteristically found in waters of low salinity and high turbidity and organic content, where shrimp are abundant (Hughes 1972 as cited in Frazier 1980, Zwinenberg 1977). Kemp's ridleys have been collected in Louisiana from Lake Borgne, Barataria and Terrebonne Bays, and near Calcasieu Pass (Dundee and Rossman 1989). Occurrence of these sea turtles in bays and estuaries along the Louisiana coast would not be unexpected, as many of their primary food items occur there. Stomach analyses of specimens collected in shrimp trawls off Louisiana revealed crabs, gastropods, and clams (Dobie et al. 1961). Although Kemp's ridleys are considered primarily carnivorous benthic feeders (Ernst and Barbour 1972), jellyfish as well as by-catch from shrimp trawlers have been reported as part of their diet (Landry 1986).

Trends in Kemp's ridley sea turtle populations in the Gulf of Mexico are identified through monitoring of their most accessible life stages on the nesting beaches, where hatchling production and the status of adult females can be directly measured. Most Kemp's ridley nesting occurs on a single beach at Rancho Nuevo, Mexico, about 30 kilometers south of the Rio Grande, with sporadic nesting along the Texas coast. Protection and monitoring by Mexico and the United States has occurred on that nesting beach since 1978. Nest production plummeted to

only 742 nests in 1985, but has been steadily increasing since that time. Over 1,500 nests were observed during the 1994 nesting season. The latest data available show that the number of nests increased during 1994 through 2000; in 2000, 5,751 nests were observed. The possibility of Kemp's ridley nesting on the Louisiana coast has been suggested (Viosca 1961), but no documentation exists.

### **Range and Population Dynamics**

The known range of this species includes the Gulf of Mexico and the Atlantic Ocean. The current range for Kemp's ridley in the United States includes marine habitat of the following coastal states: Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas.

### **Management and Protection**

The Recovery Plan for the Kemp's ridley sea turtle (NMFS and USFWS 1992) identified a recovery criterion of 10,000 nesting females in one season as a prerequisite for downlisting to threatened status. Considering that 58 percent of all adult females appear to nest in any 1 year, and each female lays an estimated 2.7 nests, the 5,751 nests documented in the year 2000 represent approximately 3,700 adult female Kemp's ridleys in the entire population; that is about one third of the amount included in the downlisting criteria identified in the Recovery Plan. Continued protection of all life stages of the Kemp's ridley is necessary to increase recruitment to the reproducing population and insure recovery of the species.

#### **4.4.4 Leatherback Sea Turtle (*Dermochelys coriacea*)**

##### **Status**

The leatherback sea turtle was listed as an endangered species throughout its range in June 1970 (USFWS 1991).

##### **Species and Habitat Description**

The leatherback is the largest living turtle, and is so distinctive as to be placed in a separate taxonomic family, *Dermochelyidae*. The carapace is distinguished by a rubber-like texture, about 1.5 in (4 cm) thick, and made primarily of tough, oil-saturated connective tissue. No sharp angle is formed between the carapace and the plastron, resulting in the animal being somewhat barrel-shaped. The average curved carapace length for adult turtles is 5 ft (155 cm) and weight ranges from 440 to 1,543 lbs (200 to 700 kg). Hatchlings are dorsally mostly black and are covered with tiny scales; the flippers are margined in white, and rows of white scales appear as stripes along the length of the back. Hatchlings average 2.4 in (61.3 mm) long and 0.1 lbs (45.8 g) in weight. In the adult, the skin is black and scaleless. The undersurface is mottled pinkish-white and black. The front flippers are proportionally longer than in any other sea turtle, and may span 8.9 ft (270 cm) in an adult. In both adults and hatchlings, the upper jaw bears two tooth-like projections at the premaxillary-maxillary sutures. Age at sexual maturity is unknown ([http://www.nmfs.noaa.gov/prot\\_res/species/turtles/leatherback.html](http://www.nmfs.noaa.gov/prot_res/species/turtles/leatherback.html)).

The leatherback sea turtle occurs mostly in continental shelf waters, but will occasionally enter shallow waters and estuaries. Adults are highly migratory, and are believed to be the most pelagic of all sea turtles (NMFS and USFWS 1992). Habitat requirements for juvenile and post-hatchling leatherbacks are unknown.

Leatherback turtles are omnivorous but feed primarily on jellyfish and other cnidarians, and have been associated with large schools of cabbage head jellyfish (*Stomolophus meleagris*). Fritts et al. (1983) reported that these turtles also ingest plastic, apparently mistaking it for food.

### **Range and Population Dynamics**

The leatherback is found throughout the tropical waters of the Atlantic, Pacific, and Indian Oceans (Ernst and Barbour 1972), the Gulf of Mexico, and the Caribbean (Carr 1952). Critical habitat for the leatherback includes the waters adjacent to Sandy Point, St. Croix, U.S. Virgin Islands, up to and inclusive of the waters from the hundred fathom curve shoreward to the level of mean high tide with boundaries at 17°42'12" N and 64°50'00" W. This turtle exhibits seasonal fluctuations in distribution in response to the Gulf Stream and other warm water features (Fritts et al. 1983, Hirth 1980, Pritchard 1971). During the summer, leatherbacks tend to be found along the east coast of the U.S. from the Gulf of Maine south to mid-Florida.

Nesting occurs from February through July at sites located from Georgia to the U.S. Virgin Islands. Nesting leatherbacks occur along beaches in Florida, Nicaragua, and islands in the West Indies; however, no nesting has been reported in Louisiana (Gunter 1981, Dundee and Rossman 1989). In Louisiana, leatherbacks are believed to occur offshore in deep waters; however, they have been collected from or sighted in Cameron Parish, Atchafalaya Bay, Timbalier Bay, and Chandeleur Sound (Dundee and Rossman 1989).

Leatherbacks are seriously declining at all major nesting beaches throughout the Pacific. The decline is dramatic along the Pacific coasts of Mexico, Costa Rica and Malaysia. Nesting along the Pacific coast of Mexico declined at an annual rate of 22 percent over the last 12 years, and the Malaysian population represents 1 percent of the levels recorded in the 1950s. The collapse of those nesting populations was precipitated by a tremendous over-harvest of eggs, direct harvest of adults, and incidental mortality from fishing. In the Atlantic and Caribbean, the largest nesting assemblages are found in the U.S. Virgin Islands, Puerto Rico, and Florida. Nesting data for these locations have been collected since the early 1980s and indicate that the annual number of nests is likely stable; however, information regarding the status of the entire leatherback population in the Atlantic is lacking. Nesting activity has also declined in French Guiana due to erosion of nesting beaches. The population appears to have shifted to Surinam, where annual numbers of nests rose from less than 100 in 1967 to 5,565 in 1977 and 9,816 in 1987. Current estimates are that 20,000 to 30,000 female leatherbacks exist worldwide.

### **Management and Protection**

Habitat destruction, incidental catch in commercial fisheries, and the harvest of eggs and flesh are the greatest threats to the survival of the leatherback. Recovery plans are directed at all leatherbacks in the U.S. portion of Caribbean, Atlantic, and Gulf of Mexico waters, whether they

are nesting within this area or elsewhere. Stranding data for the United States shores indicate that stranded turtles are adult or near adult size, suggesting that leatherback turtles utilize the United States' coastal waters for foraging as well as nesting (NMFS and USFWS 1992). Leatherbacks begin nesting in February or March; other sea turtles begin nesting in May. Leatherback strandings are highest (84 percent) from October to April. Beach patrols are in place in May in most areas; however, few strandings (16 percent) occur from May to September. Aerial surveys indicate the presence of leatherback turtles in the southeastern U.S. in the winter months (NMFS and USFWS 1992). The recovery plan for the leatherback sea turtle concludes that nesting trends in the United States appear stable, but that the population faces significant threats from incidental take as a result of commercial fishing and marine pollution.

#### **4.4.5 Loggerhead Sea Turtle (*Caretta caretta*)**

##### **Status**

The loggerhead sea turtle was listed as a threatened species in July 1978 (USFWS 1991) and has continued to decline in Louisiana (USFWS 1990).

##### **Species and Habitat Description**

Loggerheads are capable of living in a variety of environments, such as in brackish waters of coastal lagoons and river mouths. During the winter, they may remain dormant, buried in the mud at the bottom of sounds, bays, and estuaries. The major nesting beaches are located in the southeastern United States, primarily along the Atlantic coast of Florida, North Carolina, South Carolina, and Georgia. Only minor and solitary nesting has been recorded along the coasts of the Gulf of Mexico.

The largest of the hard-shell sea turtles, the loggerhead is distributed worldwide in temperate and tropical bays and open oceans. Loggerheads probably range all along the Louisiana coast; however, Dundee and Rossman (1989) reported specimens only from Chandeleur Sound, Barataria Bay, and Cameron Parish. The population decline of loggerheads can be attributed to egg and nestling predation by mammals and birds (Dundee and Rossman 1989).

Nesting on the Gulf Coast occurs between the months of April and August, with 90 percent of the nesting effort occurring on the south-central Gulf Coast of Florida (Hildebrand 1981). Although loggerheads have been documented as nesting on the Chandeleurs in 1962 and Grand Isle in the 1930s, it is doubtful whether this species currently successfully nests on the Louisiana coast (Hildebrand 1981, Dundee and Rossman 1989). The loggerhead's diet includes marine invertebrates such as mollusks, shrimp, crabs, sponges, jellyfish, squid, sea urchins, and basket stars (Caldwell et al. 1955, Hendrickson 1980, Nelson 1986). Landry (1986) suggested that these turtles may also feed on discarded by-catch from shrimp trawling. Adult loggerheads feed in waters less than 50 meters deep, while the primary foraging areas for juveniles appears to be in estuaries and bays (Nelson 1986, Rabalais and Rabalais 1980).

Nesting in the U.S. accounts for about one third of the Federally listed threatened loggerhead worldwide population. Ninety-one percent of nesting occurs in Florida, particularly within the

Archie Carr NWR; the remaining U.S. nesting includes 6.5 percent in South Carolina, 1.5 percent in Georgia, and 1 percent in North Carolina. Nests are constructed from May through September in the United States. According to Gosselink, Coleman, and Stewart (<http://biology.usgs.gov/s+t/SNT/noframe/cg138.htm>), the only loggerhead turtle nesting sites observed in Louisiana were on the Chandeleur Islands. Because of storm processes, the Chandeleur Islands may no longer contain high beach and dune surfaces, i.e., beach structure suitable for nesting. Recent surveys by USFWS Refuge personnel have found no loggerhead nests in the area (James Harris, Southeast Louisiana Refuges, personal communication).

### **Range and Population Dynamics**

Loggerheads are circumglobal, inhabiting continental shelves, bays, estuaries, and lagoons in temperate, subtropical, and tropical waters. In the Atlantic, the loggerhead turtle's range extends from Newfoundland to as far south as Argentina. During the summer, nesting occurs in the lower latitudes. The primary Atlantic nesting sites are along the east coast of Florida, with additional sites in Georgia, and the Carolinas; some nesting also occurs on the Gulf Coast of Florida. In the eastern Pacific, loggerheads are reported as far north as Alaska, and as far south as Chile. Occasional sightings are also reported from the coast of Washington, but most records are of juveniles off the coast of California. Southern Japan is the only known breeding area in the North Pacific (NMFS [http://www.nmfs.noaa.gov/prot\\_res/species/turtles/loggerhead.html](http://www.nmfs.noaa.gov/prot_res/species/turtles/loggerhead.html)).

### **Management and Protection**

The Recovery Plan is currently being revised, but its recovery criteria for delisting loggerhead sea turtles in the U.S. population include: 1) return to pre-listing nesting levels for North Carolina, South Carolina, and Georgia, and 2) demonstration of an increase in the adult female population of Florida (NMFS and USFWS 1993). Nesting trends are stable in Florida, but appear to be declining in Georgia and South Carolina; current trends in North Carolina have not been identified. Recent aerial survey data indicate a current population of 14,150 adult females. Female turtles deposit a mean of 4.1 nests per year, which would be approximately 58,000 nests in the southeastern U.S. That figure is supported by aerial and ground surveys that estimated between 50,000 and 70,000 nests annually in the southeastern U.S. Increasing the hatch success will necessitate improvement of nesting habitat and minimizing mortality from commercial fisheries.

## **5.0 POTENTIAL EFFECTS OF THE LCA ECOSYSTEM RESTORATION PLAN**

Because the LCA Plan is programmatic and conceptual, the specific locations and design of features of the individual restoration measures have not been determined, and/or are subject to change. Hence, the following analyses are also expressed in conceptual terms for each of the major types of restoration measures recommended (e.g., river diversions, dredging, sediment delivery, barrier island restoration, and marsh creation). More specific and in-depth analyses will be completed during individual project-level consultations, once site-specific locations and designs have been developed.

## **5.1 BIRDS**

### **5.1.1 Bald Eagle**

There is suitable bald eagle habitat throughout much of the action area. Potential impacts to bald eagles may occur from construction activities that would disturb nest trees and/or cause noise-related disturbance to mating pairs during the nesting season. Impacts to nest trees can be avoided by circumventing the nest tree and other potential nest trees in the area. Noise disturbance to mating pairs can be avoided by conducting any work activities outside the nesting season and preventing those activities from encroaching within 1,500 feet of a nest during the nesting season (USFWS 1989c). Use of equipment that minimizes such disturbances may also help to minimize impacts to that species.

Bald eagles may also be impacted from contaminants introduced into their food source through water and sediments diverted from the Mississippi River into areas containing foraging and/or nest sites. The Davis Pond Freshwater Diversion Project is similar to diversion projects proposed in the final plan. The USFWS' 1984 Biological Opinion (BO) on the originally proposed Davis Pond project concluded the project was not likely to adversely affect eagles, but did propose implementation of a long-term contaminant sampling plan to monitor the health and population of bald eagles (including potential bald eagle prey items) within the project's ponding area. A study is currently being conducted on the effects of contaminants contained in water diverted from the Mississippi River on the bald eagle as a result of the implementation and operation of the Davis Pond Freshwater Diversion Structure. The USACE has begun implementation of that plan and is currently preparing a report on the result of those contaminant analyses. Furthermore, Mississippi River water quality used for diversions has improved measurably in the last ten years based on comparisons of data from the Caernarvon (Conzelmann et al. 1996) and Davis Pond (Jenkins and Jeske 2003) diversion studies.

Based on what is currently known, any proposed river or sediment delivery diversions would be similar to past projects and any proposed activities would be conducted according to bald eagle management guidelines. Therefore, the proposed action is not likely to adversely affect the bald eagle. In addition, habitat restoration that may occur due to the proposed action may also benefit bald eagles.

### **5.1.2 Brown Pelican**

Suitable brown pelican feeding and/or nesting habitat occurs along the barrier islands, sand spits, and mud lumps along the Louisiana Gulf coast. Pelican nest sites (i.e., Rabbit Island in Calcasieu Lake, Raccoon Point on Isles Dernieres, Queen Bess Island, Plover Island [Baptiste Collette] Wine Island, and islands in the Chandeleur chain) and the birds themselves may be impacted by barrier island restoration activities or noise disturbance from work activities. Impacts to nesting brown pelicans can be avoided by preventing any work activities from encroaching within 2,000 feet of a nesting area during the nesting season. Furthermore, none of the barrier island restoration activities are expected to permanently affect suitable pelican nesting habitat, and are likely to create more nesting habitat and prolong the life of existing nesting habitat.

Noise disturbance to pelicans would be temporary and would be minimized by appropriate construction activity windows during the non-breeding season. Changes or impacts in coastal open water habitats providing suitable feeding and/or loafing areas would be temporary, and there is an abundance of suitable habitat should the birds be temporarily displaced. Changes in hydrology by measures to preserve existing marsh, create additional wetlands, and restore barrier islands would potentially enhance suitable feeding and/or loafing habitat for pelicans by enhancing the stability of those areas and the aquatic life upon which pelicans feed.

### **5.1.3 Piping Plover**

Wintering piping plovers arrive from the breeding grounds as early as late July. Piping plovers are dependent on a mosaic of habitat patches, and move among these patches depending on local weather and tidal conditions. Wintering plovers in Louisiana depart for the breeding grounds during late March and early April. By May, most birds have left the wintering grounds. Potential impacts to piping plovers would be temporary displacement due to construction activities during barrier island restoration projects. To avoid disturbance to piping plovers, projects could be scheduled to occur outside the wintering season, or potentially disturbing activities could be phased to occur along the mainland side of the island.

Potential impacts to piping plover critical habitat may occur during barrier island restoration or enhancement activities, or as a result of activities that change the hydrology and/or dynamics of the barrier island system. The proposed action is expected to enhance and prolong the life of existing barrier islands, as well as create new barriers or structures that would function to protect the barrier islands. Any impacts that would occur to existing designated critical habitat would be temporary, and would only impact a small amount of habitat relative to the available critical habitat along the Gulf coast. No permanent impacts to critical habitat that would change the ecological processes that maintain it are expected as a result of the proposed action.

## **5.2 FISH**

### **5.2.1 Gulf Sturgeon**

Potential impacts to the Gulf sturgeon may result from river and/or sediment delivery diversions from the Mississippi River into the Labranche wetlands (located at the southwest corner of Lake Pontchartrain) and the “Golden Triangle” wetlands (located at the intersection of the Mississippi River Gulf Outlet and the Intracoastal Waterway in Orleans and St. Bernard Parishes). Those wetland complexes would receive fresh water from the river, and the affected brackish marshes could convert to intermediate marsh as a result. The Gulf sturgeon is an anadromous fish and should not be adversely impacted by an increase in intermediate marsh or a decrease in brackish marsh. Gulf sturgeon spawn in freshwater areas before returning to estuarine and marine environments. Because the above-referenced habitat changes would only slightly alter the proportion of intermediate to brackish marsh in those areas, no impacts to Gulf sturgeon critical habitat are expected.

## 5.2.2 Pallid Sturgeon

Potential impacts to the pallid sturgeon may occur due to proposed river diversions of or modifications to the Mississippi River and Atchafalaya River flows. Impacts associated with those proposed activities include but are not limited to increased turbidity, resuspension of contaminants, and physical disturbance associated with dredging or other project construction. A greater impact may result from the long-term habitat changes associated with construction of such projects. However, sturgeon are able to withstand habitat changes, provided that the affected aquatic habitat remains riverine (Gilbraith et al. 1988). The proposed action is not expected to change the hydrology or capacity of either the Mississippi or Atchafalaya Rivers since the diversions would mainly occur during high water levels.

The USACE has consulted with the USFWS on prior dredging activities conducted in 1991, 1992, 1993, 1994, and 1996, along the Mississippi River, and received concurrence that those activities were not likely to adversely affect the pallid sturgeon. Those proposed features involving dredging of sediment from the Mississippi River would be similar to projects conducted in the past. Pallid sturgeon, as well as their prey species, should be able to actively avoid dredging sites. The size and extent of the proposed action are minor in relation to the size of the river system, and many areas of refuge are available to the fish if needed. Currents in the area would quickly disperse suspended dredged material, returning turbidities to ambient levels. Benthic organisms capable of withstanding main channel conditions would quickly recolonize the area (Johnson 1976). Any resuspended contaminants would quickly be dispersed and diluted. Habitat loss in the Mississippi River would be almost negligible because of the minimal area affected. Therefore, no adverse impacts to the pallid sturgeon are expected from dredging activities.

Biological Assessments (BA) were prepared on March 14, 1991, and June 5, 1992, to address the impacts of river engineering works in the Mississippi and Atchafalaya Rivers, respectively, on Gulf and pallid sturgeon. A USACE funded study addressing the habitat, movement, and reproduction status of pallid sturgeon in the Mississippi and Atchafalaya Rivers was completed in January 1997. Pallid sturgeon are bottom dwellers and are not likely to be pulled into freshwater diversion structures, which draw water from the upper portion of the water column. Based on the findings of the BA, the 1997 study, and review of recent sightings data, the proposed action is not expected to impact the pallid sturgeon or its habitat.

## 5.3 MAMMALS

### 5.3.1 Louisiana Black Bear

Portions of the Atchafalaya River Basin and coastal St. Mary and Iberia Parishes are occupied (i.e., inhabited by denning females) by the Louisiana black bear. Potential impacts to black bears may include destruction of den trees from construction activities (e.g., disposal of dredged material, construction of new channels, or diversions) within occupied black bear habitat and disturbance to pregnant females during the denning season. Impacts to den trees could be avoided by preventing the removal of candidate or actual den trees, which are protected under the ESA. Candidate den trees include bald cypress or tupelo gum with visible cavities, having a

diameter-at-breast height of 36 inches or greater, and occurring in or along rivers, lakes, streams, bayous, sloughs, or other water bodies. Within occupied bear habitat, impacts to pregnant females and/or females with cubs could be avoided by preventing construction activities during the denning season.

Bears may also be encountered outside the denning season when construction activities occur within occupied bear habitat. Bears will typically avoid humans; however, sightings of bears may occur with activities that encroach upon occupied habitat. Outside the denning season, disturbance by construction activities would only temporarily displace bears, and there is an abundance of suitable foraging habitat in surrounding areas. Because bears can become attracted and accustomed to human food, keeping work areas clean and providing personnel with appropriate bear-proof trash receptacles would help to minimize the risk of disturbance and/or confrontations. Based on the available information, activities associated with the proposed action are not expected to adversely affect black bears.

### **5.3.2 West Indian Manatee**

Sightings of the West Indian manatee in Louisiana have occurred in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana; however, there is no known population thriving in the State. Should any manatees be encountered during the proposed activities, an on-board observer would notify the proper personnel, and harmful activities (e.g., dredging) would be temporarily suspended until the animal(s) moves to safety. Furthermore, the disturbance to that species would only be temporary during project construction, and would result in temporary displacement. The manatees would likely move to another area for foraging or resting purposes, and there would be an abundance of available areas to which the animals may relocate.

## **5.4 REPTILES**

### **5.4.1 Green Sea Turtle**

Due to the lack of extensive seagrass beds in coastal Louisiana and the low incidence of sightings and strandings, impacts to the green sea turtle population as a result of any potential impacts from the proposed action are not expected.

### **5.4.2 Hawksbill Sea Turtle**

The effects of any proposed action to hawksbill populations are likely to be negligible due to its rarity along the Louisiana coast.

### **5.4.3 Kemp's Ridley Sea Turtle**

Potential impacts are not likely to include adverse effects on Kemp's ridley sea turtle populations. The proposed marsh creation features could provide more suitable inshore habitat (characterized by low salinity, and high turbidity and organic content, where shrimp and blue crabs are abundant) utilized by this species when foraging.

#### **5.4.4 Leatherback Sea Turtle**

Any potential project impact would have no effect on populations of the leatherback sea turtle. This species largely occupies oceanic water more than 50 meters in depth.

#### **5.4.5 Loggerhead Sea Turtle**

The restoration of the Terrebonne and Grand Isle barrier island chains would occur in Subprovinces 2 and 3 with the proposed action. Nesting loggerhead sea turtles have historically used barrier islands; however, it is doubtful that loggerhead sea turtles nest anywhere on the Louisiana coast. The restoration of barrier islands may or may not provide suitable nesting habitat, but suitable nesting habitat is nearly nonexistent due to the current degraded state of those islands. The proposed plans, therefore, would not negatively affect loggerheads, and may provide some benefit to the species by restoring nesting habitat.

### **6.0 SUMMARY OF DETERMINATIONS**

The proposed LCA Plan would not be located within suitable habitat for the gopher tortoise, the inflated heelsplitter mussel, the Louisiana quillwort, the RCW, or the ringed sawback turtle, nor will it indirectly affect areas inhabited by those species. Hence, the proposed plan, would have no effect on those species.

#### **6.1 BIRDS**

Site-specific plans and construction activities could be designed to avoid potential impacts to bald eagles throughout the action area. By adhering to the primary activity exclusion zone and timing restrictions outlined in the Bald Eagle Recovery Plan (USFWS 1989), the USACE can avoid impacts to nest trees and breeding behaviors. Although data is not available at this time regarding effects on bald eagles from contaminants that may be associated with river and sediment diversions, the USACE would reinitiate consultation with the USFWS, if necessary, once those data are made available. Therefore, the proposed action is not likely to adversely affect the bald eagle.

Brown pelicans nest on barrier islands and feed in shallow estuarine waters, using sand pits and offshore sand bars as rest and roost areas. Any pelicans foraging or loafing within the proposed action area during project construction could easily relocate to other foraging areas in the vicinity. Potential impacts to nesting brown pelicans could be avoided by conducting activities outside the nesting season. Should the proposed activities occur during the nesting season, those activities could avoid impacting nesting pelicans by remaining outside 2,000 feet of nesting areas. Therefore, the proposed action is not likely to adversely affect the brown pelican.

Potential impacts to piping plovers could be avoided by conducting proposed construction activities outside the wintering season. If any proposed projects cannot be scheduled to take place outside the wintering season, piping plovers would be able to avoid areas of temporary disturbance as long as there are feeding and/or roosting areas available along the coast. Because any plovers remaining in the action area during construction would be temporarily displaced to

other suitable habitats in the vicinity, the proposed action is not likely to adversely affect the piping plover.

Potential impacts on piping plover critical habitat would be minimal and temporary during projects associated with barrier island enhancement or restoration. Although the proposed action may impact a barrier island designated as critical habitat, only a relatively small amount of habitat will be affected when compared to the amount of critical habitat available. In addition, most of the proposed barrier island restoration projects may possibly create new potentially suitable habitat (beach) for the piping plover on the Gulf side of the islands and prevent/reduce erosion of existing habitat in the vicinity. Therefore, the proposed action is not likely to adversely modify critical habitat for wintering piping plovers.

## **6.2 FISH**

The Gulf sturgeon is an anadromous fish that spawns in fresh water and migrates to estuarine and marine waters. Potential impacts to the Gulf sturgeon would involve relatively slight changes in marsh habitats along the southwestern edge of Lake Pontchartrain and the western edge of Lake Borgne. Those changes would involve creation of more intermediate marsh and a reduction in brackish marsh; however, there is an abundance of brackish marsh in surrounding areas. Therefore, the proposed action is not likely to adversely affect the Gulf sturgeon, its spawning behavior, or its critical habitat.

There are ways, through timing and use of different types of dredges, to minimize impacts to the pallid sturgeon caused by dredging activities. The pallid sturgeon is not likely to be affected by construction or operation of freshwater diversion structures along the Mississippi or Atchafalaya Rivers; the species is a bottom dweller and is not likely to be entrained into diversion structures. Furthermore, the Mississippi and Atchafalaya Rivers are large enough to provide an abundance of refuge areas for the fish during construction activities or operation of any proposed diversion structures. Therefore, the proposed action is not likely to adversely affect the pallid sturgeon.

## **6.3 MAMMALS**

Several proposed activities could potentially occur within occupied bear habitat along the coast of Iberia and St. Mary Parishes; however, developing project plans and construction activities that avoid or minimize work in occupied habitat during the black bear denning season would avoid disturbing pregnant females and/or females with cubs. Outside the denning season, bear sightings may still occur when working in occupied habitat, but maintaining clean work sites and providing bear-proof trash receptacles for construction crews could minimize the risk of bear disturbance and conflicts. If sightings do occur, bears are likely to avoid humans, and would only be temporarily displaced by disturbance from construction activities. Habitat loss should be minimal, if any. Therefore, the proposed action is not likely to adversely affect the Louisiana black bear.

The West Indian manatee is known to occur periodically in the coastal waters of Louisiana. If a manatee were to stray into the project areas, it may be attracted to noise from any proposed activities. Consequently, an on-board observer would be present to alert the proper personnel,

and harmful activities (e.g., dredging) would be temporarily suspended until the animal can move to safety. Should a manatee be sighted within any work areas, the USFWS's Lafayette, Louisiana, Field Office would be contacted immediately. Therefore, the proposed action is not likely to adversely affect the West Indian manatee.

## **6.4 REPTILES**

The proposed action would not disturb sea turtles, and is not likely to adversely affect green, hawksbill, Kemp's ridley, leatherback, or loggerhead sea turtle populations. Most of those species are either rare along the Louisiana Gulf coast or feed in nearby waters.

## 7.0 LITERATURE CITED

- Ackerman, B.B. 1995. Aerial surveys of manatees: a summary and progress report. Pages 13-33 in T.J. O'Shea, B.B. Ackerman, and H.F. Percival (eds.). Population Biology of the Florida Manatee. National Biological Service, Information and Technology Report No. 1. Washington, D.C.
- Anderson, D. R. 1997. Corridor use, feeding ecology, and habitat relationships of black bears in a fragmented landscape in Louisiana. M. S. Thesis, University of Tennessee, Knoxville. 124 pp.
- Bailey, R.M., and F.B. Cross. 1954. River sturgeons of the American genus *Scaphirhynchus*: characters, distribution, and synonymy. Papers of the Michigan Academy of Science, Arts, and Letters 39:169-208.
- Beausoleil, R. A. 1999. Population and spatial ecology of the Louisiana black bear in a fragmented bottomland forest. M. S. Thesis, University of Tennessee, Knoxville. 122 pp.
- Boschung, H (ed.). 1976. Endangered and threatened plants and animals of Alabama. Bulletin Alabama Museum of Natural History. Number 2. University of Alabama. Page 57.
- Bowles, M.L., M.M. DeMauro, N. Pavlovic, and R.D. Hiebert. 1990. Effects of anthropogenic disturbances on endangered and threatened plants at the Indiana Dunes National Lakeshore. Natural Areas Journal 10: 187-200.
- Bramblett, R.G. 1996. Habitat and movements of pallid and shovelnose sturgeon in the Yellowstone and Missouri Rivers, Montana and North Dakota. Ph.D. Dissertation. Montana State University, Bozeman. 210pp.
- Caldwell, D.K.A., A. Carr, and T.R. Heller, Jr. 1955. Natural history notes on the Atlantic loggerhead turtle, *Caretta caretta caretta*. Quart. J. Fla. Acad. Sci. 18(4): 292-302.
- Carlson, D.M., W.L. Pflieger, L. Trial, and P.S. Haverland. 1985. Distribution, biology, and hybridization of *Scaphirhynchus albus* and *Scaphirhynchus platyrhynchus* in the Missouri and Mississippi River. Environmental Biology of Fishes. 14:51-59.
- Carr, A. 1980. Some problems of sea turtle ecology. American Zoologist 20: 489-498.
- Carr, A. 1983. All the way down upon the Suwannee River. Audubon Magazine. Pages 80-101.
- Carr, A.F. 1952. Handbook of turtles – the turtles of the United States, Canada, Baja California. Comstock Publishing Association, New York.
- Carr, A.F. and H. Hirth. 1962. The ecology and migrations of sea turtles, five comparative features of green turtle nesting colonies. Am. Mus. Novitates. 2091: 1-42.
- Clugston, J.P., A.M. Foster, and S.H. Carr. 1995. Gulf sturgeon, *Acipenser oxyrhynchus desotoi*, in the Suwannee River, Florida, USA. Proc. of International Symposium on Sturgeons. Moscow, Russia. Editors: A.D. Gershanovich and T.I.J. Smith. Sept. 6-11, 1993. 370 pp.
- Coker, R.E. 1930. Studies of common fishes of the Mississippi River at Keokuk. U.S. Department of Commerce, Bureau of Fisheries Document 1972:141-225.
- Constant, G.C., W.E. Kelso, D.A. Rutherford, and C.F. Bryan. 1997. Habitat, movement and reproductive status of pallid sturgeon (*Scaphirhynchus albus*) in the Mississippi and Atchafalaya Rivers. Report prepared for the U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana.
- Conzelmann, P.J. and B.T. Vogl. 1996. Caernarvon freshwater diversion contaminants monitoring study, 1990-1994. U. S. Fish and Wildlife Service, Atlanta, GA. LFO-EC-96-02.
- Cross, F.B. 1967. Handbook of fishes of Kansas. Museum of Natural History, University of Kansas, Public Education Series 3, Lawrence. 315pp.
- Cuthbert, F.J., J.L.D. Smith, C.L. Jolls, B. Scholtens, and L. Wemmer. 1998. Conservation of biodiversity in coastal systems of Michigan. Unpublished report. U.S. Forest Service Experiment Station, St. Paul, Minnesota. 28 pp.
- Dobie, J.L., L. H. Ogren, and J.F. Fitzpatrick. 1961. Food notes and records of the Atlantic ridley turtle (*Lepidochelys kempi*) from Louisiana. Copeia 1961: 109-110.
- Duffy, W.G., C.R. Berry, and K.D. Keenlyne. 1996. Biology of the pallid sturgeon with an annotated bibliography through 1994. Cooperative Fish and Wildlife Research Unit, Technical Bulletin 5. South Dakota State University, Brookings.

- Dundee, H.A. and D.A. Rossman. 1989. The Amphibians and Reptiles of Louisiana. Louisiana State University Press, Baton Rouge.
- Elowe, K.D., and W.E. Dodge. 1989. Factors affecting black bear reproductive success and cub survival. *Journal of Wildlife Management* 53(4):962-968.
- Emmons, S. 1990. Personal communication regarding Federally listed endangered species occurrence on Shell Keys NWR. USFWS. November 13.
- Ernst, L.H. and R.W. Barbour. 1972. Turtles of the United States. University Press of Kentucky, Lexington, Kentucky. 347 pp.
- Fogle, N.E. 1963. Report of fisheries investigations during the fifth year of impoundment of Oahe Reservoir, South Dakota. South Dakota Department of Game, Fish, and Parks. D.J. Project F-1-R-12, Job 10-11-12. 35pp.
- Forbes, S.A., and R.E. Richardson. 1905. On a new shovelnose sturgeon from the Mississippi River. *Bulletin of the Illinois State Laboratory of Natural History* 7:37-44.
- Foster, A.M. 1993. Movement of Gulf sturgeon, *Acipenser oxyrhynchus desotoi*, in the Suwannee River, Florida. Master Thesis, University of Florida, Gainesville, Florida. 131 pp.
- Frazier, J.G. 1980. Marine turtles and problems in coastal management. Pp. 2395-2422 in B.L. Edge (ed.). Coastal Zone 80: Proc. of the second symp. on coastal and ocean management. Vol. III. American Society of Civil Engineers, N.Y.
- Fremling, C.R., J.L. Rasmussen, R.E. Sparks, S.P. Cobb, C.F. Bryan, and T.O. Claflin. 1989. Mississippi River fisheries: a case history. Pages 309-351 in D.P. Dodge, editor. Proceedings of the International Large River Symposium. Can. Spec. Publ. Fish. Aquat. Sci. 106pp.
- Fritts, T.H., W. Hoffman, and M.A. McGehee. 1983. The distribution and abundance of marine turtles in the Gulf of Mexico and nearby Atlantic waters. *Journal of Herpetology* 17(4): 327-344.
- Fuller, D.A. 1978. Appendix A: The habitats, distribution, and incidental capture of sea turtles in the Gulf of Mexico. Prepared as a working paper on sea turtles for the Task Force developing the Draft Shrimp Management Plan of the U.S. Gulf of Mexico. Center for Wetland Resources, LSU, Baton Rouge. 32 pp. LSU-CFI-86-28.
- Fuller, D.A. and A.M. Tappan. 1986. The occurrence of sea turtles in Louisiana coastal waters. LSU Center for Wetland Resources, Coastal Fisheries Institute. LSU-CFI-86-28.46 pages.
- Gardner, B. 1999. Pallid sturgeon above Fort Peck Reservoir 1996-1998 in S. Krentz, editor. Pallid Sturgeon Recovery Update, Issue No. 10.
- Gerrard, J. M. and G. Bortolotti. 1988. The bald eagle -- Haunts and Habits of a Wilderness Monarch. Smithsonian Institution Press, Washington and London. 177 pp.
- Gilbraith, D.M., M.J. Schwalbach, and C.R. Berry. 1988. Preliminary report on the status of the pallid sturgeon, *Scaphirhynchus albus*, a candidate endangered species. Department of Wildlife and Fisheries Science, South Dakota State University, Brookings. 76pp.
- Gosselink, J.G., J.M. Coleman, R.E. Stewart, Jr. Coastal Louisiana. In USGS: Status and Trends of the Nation's Biological Resources. 58 pp. Currently available at <http://biology.usgs.gov/s+t/SNT/noframe/cg138.htm>.
- Graham, K. 1997. Missouri Department of Conservation successfully spawns pallid sturgeon in M. Dryer, editor. Pallid Sturgeon Recovery Update, Issue No. 9.
- Graham, K. 1999. Pallid Sturgeon Reintroduction in Missouri in S. Krentz, editor. Pallid Sturgeon Recovery Update, Issue No. 10.
- Guidry, M. 1994. Location map of brown pelican colony on North Grand Gossier Island, Breton NWR, Louisiana. June 17. USFWS, Southeast Louisiana Refuges. Fax to Lorna Patrick, USFWS, Ecological Services, Panama City, Florida.
- Gunter, G. 1981. Status of turtles on the Mississippi Coast. *Gulf Res. Rep.* 7: 89-92.
- Haig, S. M. 1992. Piping plover. Pages 1-18 in Poole, P. Stellingham, and E. Gill, eds. The birds of North America, No. 2. A. The Academy of Natural Sciences. The American Ornithologists' Union, Philadelphia, PA, and Washington, D.C.
- Haig, S. M., and L. W. Oring. 1988. Genetic differentiation of piping plovers across North America. *Auk* 105:260-267.
- Hartman, D.S. 1979. Ecology and behavior of the manatee (*Trichechus manatus*) in Florida. American Society of Mammalogists Special Publication No. 5. 153 pp.
- Held, J.W. 1969. Some early summer foods of the shovelnose sturgeon in the Missouri River. *Transactions of the American Fisheries Society* 98:514-517.

- Hendrickson, J.R. 1980. The ecological strategies of sea turtles. *American Zoologist* 20: 597-608.
- Hess, T. 2001. Brown pelican coastal survey and observations. Louisiana Department of Wildlife and Fisheries, Rockefeller Refuge. 6 pp.
- Hildebrand, H.H. 1981. A historical review of the status of sea turtle populations in the western Gulf of Mexico. Pp. 447-453 in K. A. Bjomdal (ed.) *Biology and Conservation of Sea Turtles*, Washington, D.C.
- Hirth, H.F. 1971. Synopsis of the biological data on the green sea turtle, *Chelonia mydas* (Linnaeus 1758). FAD Fisheries Synopsis No. 85.
- Hirth, H.F. 1980. Some aspects of the nesting behavior and reproductive biology of sea turtles. *American Zoologist* 20: 507-523.
- Huff, J.A. 1975. Life history of the Gulf of Mexico sturgeon, *Acipenser oxyrinchus desotoi*, in Suwannee River, Florida. *Mar. Res. Publ. No.* 16. 32 pp.
- Hughes, G.R. 1972. The olive ridley sea-turtle (*Lepidochelys olivacea*) in south-east Africa. *Biol. Cons.* 4(2): 128-134.
- Hurley, K.L. 1996. Habitat use, selection, and movements of middle Mississippi River pallid sturgeon and validity of pallid sturgeon age estimates from pectoral fin rays. M.S. Thesis. Southern Illinois University at Carbondale. 82pp.
- Husar, S.L. 1977. The West Indian manatee (*Trichechus manatus*). U.S. Fish and Wildlife Service. *Wildlife Resource Report No. 7*: 1-22.
- Jenkins, Jill A. and Clint Jeske. 2003. Unpubl. DRAFT Davis Pond Freshwater Diversion Biomonitoring Study: Interim Final Report on Freshwater Fisheries and Eagles: Prediversion. U.S. Geological Survey, National Wetlands Research Center, Lafayette, Louisiana.
- Johnson, J.H. 1976. Feasibility of using historic disposal areas, upper Mississippi River, to evaluate effects of dredged material disposal in community structure of benthic organisms. Miscellaneous Paper Y-76-3. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Johnson, W.C. 1993. Divergent response of riparian vegetation to flow regulations on the Missouri and Platte Rivers. Pages 426-431 in L.W. Hesse, C.B. Stalnaker, N.G. Benson, and J.R. Zuboy, editors. *Proceedings of the Symposium on Restoration Planning for the Rivers of the Mississippi River Ecosystem*. Biological Report 19. National Biological Survey, USDI, Washington DC.
- Kallemeyn, L.W. 1983. Status of the pallid sturgeon (*Scaphirhynchus albus*). *Fisheries* 8(1): 3-9.
- Keenlyne, K.D. 1989. A report on the pallid sturgeon. U.S. Fish and Wildlife Service, Pierre, South Dakota. 20pp.
- Keenlyne, K.D. 1995. Recent North American studies on pallid sturgeon, *Scaphirhynchus albus* (Forbes and Richardson). Pages 225-234 in A.D. Gershanovich and T.I.J. Smith, editors. *Proceedings of the International Symposium on Sturgeons*, September 6-11, 1993. VNIRO Publ., Moscow, Russia.
- Keenlyne, K.D., and L.G. Jenkins. 1993. Age at sexual maturity of the pallid sturgeon. *Transactions of the American Fisheries Society*. 122:393-396.
- Keenlyne, K.D., L.K. Graham, and B.C. Reed. 1994. Hybridization between the pallid and shovelnose sturgeons. *Proc. South Dakota Academy of Science* 73:59-66.
- Keenlyne, E.M. Grossman, and L.G. Jenkins. 1992. Fecundity of the pallid sturgeon. *Transactions of the American Fisheries Society* 121:139-140.
- Kilpatrick, K. 1999. Pallid sturgeon spawned at Natchitoches NFH, Louisiana, during 1998 in S. Krentz, editor. *Pallid Sturgeon Recovery Update*, Issue No. 10.
- King, F.W. 1981. Historical review of the decline of the green turtle and the hawksbill. Pp. 183-188 in K.A. Bjomdal (ed.) *Biology and Conservation of Sea Turtles*. Washington, D.C.
- Kynard, B., E. Henyey, and M. Horgan. 1998. Studies on pallid sturgeon: Turners Falls, Massachusetts: U.S. Geological Survey, Biological Resource Div., Conte Anadromous Fish Research Center.
- Lambert, A., and B. Ratcliff. 1979. A survey of piping plovers in Michigan. Report submitted to the State of Michigan, Department of Natural Resources, September 1979. 36 pp.

- Landry, A. 1986. Stranding and natural history of sea turtles in the northern Gulf of Mexico. Presented at Seventh Annual Minerals Management Service, Gulf of Mexico OCS Region, Information Transfer Meeting. Session IV. D. Sea turtle problems in the Gulf of Mexico, 5 November, 1986.
- MacIvor, L. H. 1990. Population dynamics, breeding ecology and management of piping plover on outer Cape Cod, Massachusetts. M.S. Thesis, University of Massachusetts, Amherst.
- Marchinton, F.B. 1995. Movement ecology of black bears in a fragmented bottomland hardwood habitat in Louisiana. M.S. Thesis, University of Tennessee, Knoxville. 107 pp.
- Mason, W.T. Jr., and J.P. Clugston. 1993. Foods of the Gulf sturgeon in the Suwannee River, Florida. Transactions of the American Fisheries Society 122: 378-385.
- Mayden, R.L., and B.R. Kuhajda. 1997. Threatened fishes of the world: *Scaphirhynchus albus* (Forbes and Richardson 1905) (Acipenseridae). Environmental Biology of Fishes 48:420-421.
- McDowall, R.M. 1988. Diadromy in fishes migrations between freshwater and marine environments. Truder Press and Croom Helm. 308 pp.
- McNease, L., and T. Joanen. 1984. The brown pelican restocking program in Louisiana. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildlife Agencies 38: 165-173.
- Modde, T.C., and J.C. Schmulbach. 1977. Food and feeding behavior of the shovelnose sturgeon in the unchannelized Missouri River. Transactions of the American Fisheries Society 106(6):602-608.
- Moyle, P.B., and J.J. Cech. 1982. Fishes: An introduction to ichthyology. Prentice-Hall, Englewood Cliffs, New Jersey.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1993. Recovery Plan for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean and Gulf of Mexico. National Marine Fisheries Service, St. Petersburg, FL.
- National Marine Fisheries Service.  
[www.nmfs.noaa.gov/prot\\_res/species/turtles/green.html](http://www.nmfs.noaa.gov/prot_res/species/turtles/green.html)
- Nelson, D.A. 1986. Life history and environmental requirements of loggerhead sea turtles. - Technical Report EL-86-2, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg. 40 pp.
- Odenkirk, J.S. 1989. Movements of Gulf of Mexico sturgeon in the Apalachicola River, Florida. Proc. Annu. Conf. Southeastern Assoc. Fish and Wildlife Agencies 43: 230-238.
- O'Shea, T.J. 1988. The past, present, and future of manatees in the southeastern United States: realities, misunderstandings, and enigmas. Pages 184-204 in Odum, R.R., K.A. Riddleberger, and J.C. Ozier (eds.). Proceedings of the Third Southeastern Nongame and Endangered Wildlife Symposium. Georgia Department of Natural Resources. Social Circle, Georgia.
- O'Shea, T.J., B.B. Ackerman, and H.F. Percival (eds.). 1992. Interim report of the technical workshop on manatee population biology. Manatee Population Research Report No. 10. Florida Cooperative Fish and Wildlife Research Unit. Gainesville, Florida. 83 pp.
- Pace, R. M., III, D. R. Anderson, and S. Shively. 2000. Sources and patterns of black bear mortality in Louisiana. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies. In Press.
- Palmer, R. S. 1967. Piping plover. In Stout, G. D., ed. The shorebirds of North America. Viking Press, New York.
- Parauka, F.M., W.J. Troxel, F.A. Chapman, and L.G. McBay. 1991. Hormone-induced ovulation and artificial spawning of Gulf of Mexico sturgeon, *Acipenser oxyrhynchus desotoi*. Prog. Fish-Culturist 53(2): 113-117.
- Patterson, M. E. 1988. Piping plover breeding biology and reproductive success on Assateague Island. M.S. Thesis. Virginia Polytechnic Institute and State University, Blacksburg, Virginia. 131 pp.
- Pelton, M.R. 1982. Black Bear. Pages 504-514 in J.A. Chapman and G.A. Feldhammer (eds.). Wild Mammals of North America: Biology, Management and Economics. The Johns Hopkins University Press, Baltimore, MD.
- Prater, A.J., J.H. Marchant, and J. Vuorinen. 1977. Guide to identification and aging of holarctic waders. British Trust for Ornithology Guide #17. Maund and Irvine Ltd., Tring, Herts, England. 168 pp.

- Pritchard, P.C.H. 1971. The leatherback or leathery turtle, *Dermochelys coriacea*. IUCN Monograph, Marine Turtle Series (1): 1-39.
- Pritchard, P.C.H. and R. Marquez. 1973. Kemp's ridley turtle or Atlantic ridley. IUCN Monograph No. 2. Marine Turtle Series. 30 pp.
- Rabalais, S.C. and N.N. Rabalais. 1980. The occurrence of sea turtles on the south Texas coast. Contrib. Mar. Sci. 23: 123-129.
- Raithel, C. 1984. The piping plover in Rhode Island. Rhode Island Natural Heritage Program, Providence. Unpublished report, 13 pp.
- Rebel, T.P. 1974. Sea turtles and the turtle industry of the West Indies, Florida, and the Gulf of Mexico. Univ. Miami Press, Coral Gables, Florida. 250 pp.
- Reed, B.C., and M.S. Ewing. 1993. Status and distribution of pallid sturgeon at the Old River Control Complex, Louisiana. Louisiana Dept. of Wildlife and Fisheries, Lake Charles, Louisiana. 54pp + appendices.
- Renaud, M. L. 1995. Movements and submergence patterns of Kemp's ridley turtles (*Lepidochelys kempii*). Journal of Herpetology 79(3): 370-374.
- Reynolds, J.E. III and J.R. Wilcox. 1987. People, power plants, and manatees. Sea Frontiers 33(4):263-269.
- Rogers, L.L. 1976. Effects of mast and berry crop failures on survival, growth, and reproductive success of black bears. Transactions of the North American Wildlife and Natural Resources Conference 41:431-438.
- Rogers, L.L., and A.W. Allen. 1987. Habitat suitability index models: black bear, upper Great Lakes region. Biological Report 82(1.144). U.S. Fish and Wildlife Service. 54 pp.
- Russell, R. 1983. The piping plover in the Great Lakes region. American Birds 37:951-955.
- Schmulbach, J.C., G. Gould, and C.L. Groen. 1975. Relative abundance and distribution of fishes in the Missouri River, Gavins Point Dam to Rulo, Nebraska. Proceedings South Dakota Academy of Science 54:194-222.
- Sheehan, R.J., R.C. Heidinger, K.L. Hurley, P.S. Wills, and M.A. Schmidt. 1998. Middle Mississippi River Pallid Sturgeon Habitat Use Project: Year 3 Annual Progress Report, December 1998. Fisheries Research Laboratory and Department of Zoology, Southern Illinois University at Carbondale, Carbondale, Illinois.
- Smith, P.W. 1979. The fishes of Illinois. University of Illinois Press, Urbana, Illinois. 314pp.
- Strauss, E. 1990. Reproductive success, life history patterns, and behavioral variation in a population of piping plovers subjected to human disturbances. Ph.D. Dissertation. Tufts University, Boston, Massachusetts.
- Taylor, D.F. 1971. A radio-telemetry study of the black bear with notes on its history and present status in Louisiana. M.S. Thesis, Louisiana State University, Baton Rouge, Louisiana. 87 pp.
- U.S. Fish and Wildlife Service. 1985. Determination of endangered and threatened status for the piping plover. Federal Register 50(238): 50720-50734.
- U.S. Fish and Wildlife Service. 1988. Atlantic coast piping plover recovery plan. Newton Corner, Massachusetts.
- U.S. Fish and Wildlife Service. 1989a. Individual species accounts for Federally listed threatened and endangered species. Red Book. Region 4. Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 1989b. Endangered and threatened wildlife and plants. 50 CFR 17.11 and 17.12. 34 pp.
- U.S. Fish and Wildlife Service. 1989c. Southeastern status bald eagle recovery plan. Atlanta, Georgia. 41 pp. with appendices A-J.
- U.S. Fish and Wildlife Service. 1990. Report to Congress: Endangered and threatened species recovery program. U.S. Dept. Interior. Washington, D.C. 406 pp.
- U.S. Fish and Wildlife Service. 1991. Endangered and threatened wildlife and plants. 50CFR 17.11 and 17.12. U.S. Dept. Interior, Washington, D.C. 37 pp.
- U.S. Fish and Wildlife Service. 1993. Pallid sturgeon recovery plan. U.S. Fish and Wildlife service, Bismarck, North Dakota. 55pp.
- U.S. Fish and Wildlife Service. 1995a. Individual species accounts for Federally listed threatened and endangered species. Red Book. Region 4. U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 1995b. Louisiana black bear (*Ursus americanus luteolus*) Recovery Plan. Southeast Region, U.S. Fish and Wildlife Service, Atlanta, Georgia. 52 pp.

- U.S. Fish and Wildlife Service. 1996. Piping plover (*Charadrius melodus*) Atlantic coast population revised recovery plan. U. S. Fish and Wildlife Service, Atlantic Coast Piping Plover Recovery Team, Hadley, Massachusetts. 245 pp.
- U.S. Fish and Wildlife Service. 1997. Recovery plan for Houghton's goldenrod (*Solidago houghtonii* A. Gray). Ft. Snelling, Minnesota. vii+58 pp.
- U.S. Fish and Wildlife Service. 1999a. Federal Register 64: 36454-36464. U.S. Dept. Interior, Washington, D.C. 11pp.
- U.S. Fish and Wildlife Service. 1999b. Piping plover (*Charadrius melodus*), Great Lakes population, Revised Recovery Plan. Ft. Snelling, Minnesota. 99 pp.
- U.S. Fish and Wildlife Service. 2000. Biological opinion on the operation of the Missouri River main stem reservoir system, operation and maintenance of the Missouri River bank stabilization and navigation project, and operation of the Kansas River reservoir system. U.S. Fish and Wildlife Service, Region 6, Denver, Colorado and Region 3, Fort Snelling, Minnesota.
- U.S. Fish and Wildlife Service. 2001a. Draft environmental assessment for the proposal to relocate female Louisiana black bears to the Red River Complex of East-Central Louisiana. U.S. Fish and Wildlife Service, Lafayette, Louisiana. 60 pp.
- U.S. Fish and Wildlife Service. 2001b. Final determination of critical habitat for wintering piping plovers. Federal Register 66(132):36038-36040.
- U.S. Fish and Wildlife Service. 2001c. Florida manatee recovery plan. Southeast Region, U.S. Fish and Wildlife Service, Atlanta, Georgia. 144 pp. + Appendices.
- U.S. Fish and Wildlife Service. 2002. Recovery plan for the Great Lakes piping plover (*Charadrius melodus*). U.S. Fish and Wildlife Service, Fort Snelling, Minnesota. viii+121 pp.
- Viosca, P., Jr. 1961. Turtles, tame and truculent. La. Conserv. 13: 5-8.
- Vladykov, V.D., and J.R. Greely. 1963. Oder Acipenseroidei. In fishes of the western North Atlantic. Memoir Sears Foundation for Marine Research 1(3): 24-58.
- Wagner, R.O. 1995. Movement patterns of black bears in south central Louisiana. M. S. Thesis, Louisiana State University, Baton Rouge.
- Weaver, K.M. 1999. The ecology and management of the Louisiana black bear in the Tensas River Basin of Louisiana. Ph. D. Dissertation, University of Tennessee, Knoxville. 327 pp.
- Weaver, K.M., D.K. Tabberer, L.V. Moore, Jr., G. Chandler, J.C. Posey, and M.R. Pelton. 1992. Bottomland hardwood forest management for black bears in Louisiana. Proceedings of the Southeastern Association of Fish and Wildlife Agencies 44:342-350.
- Wigginton, J. 1990. Memorandum regarding Federally listed endangered species occurrences on Southeast Louisiana Refuges. USFWS. December 10. 7 pp.
- Wilcox, L. E. 1959. A twenty year banding study of the piping plover. Auk 79:129-152.
- Wooley, C.M., and E.J. Crateau. 1985. Movement, microhabitat, exploitation and management of Gulf of Mexico sturgeon, Apalachicola River, Florida. N. Amer. J. Fish. Manage. Pages 590-605.
- Zwinnenberg, A.J. 1977. Kemp's ridley, *Lepidochelys kempi* (Gar-man 1880), undoubtedly the most endangered marine turtle today (with notes on the current status of *Lepidochelys olivacea*). Bull. Maryland Herp.Soc. 13: 170-192.

## **APPENDIX B2**

### **U.S. FISH AND WILDLIFE COORDINATION LETTER FOR THREATENED AND ENDANGERED SPECIES ACT**

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## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.  
Suite 400  
Lafayette, Louisiana 70506  
September 26, 2003

Colonel Peter J. Rowan  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Rowan:

The Corps of Engineers (Corps), in partnership with various other State, local, and Federal agencies and entities, is preparing a Programmatic Environmental Impact Statement (PEIS) on the Louisiana Coastal Area Comprehensive Coastwide Ecosystem Restoration Study (LCA). In response to a September 23, 2003, request from Mr. Bill Klein of your staff, the U.S. Fish and Wildlife Service (Service) is pleased to provide the following information regarding Federally listed threatened and endangered species, their critical habitat, and migratory birds that may be found in or near the LCA study area. This information will facilitate programmatic Section 7 consultation under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). In addition, we have also included information to facilitate compliance with the Migratory Bird Treaty Act (MBTA; 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.).

#### **ESA Information**

Seventeen threatened or endangered species, including the Louisiana black bear, West Indian manatee, bald eagle, brown pelican, piping plover, red-cockaded woodpecker, gopher tortoise, ringed map turtle, 5 species of marine turtles, pallid sturgeon, Gulf sturgeon, inflated heelsplitter, and Louisiana quillwort, occur within the four subprovinces comprising the LCA study area. In addition, the Service has designated critical habitat for the piping plover and the Gulf sturgeon.

Following the conclusion of programmatic consultation on the LCA PEIS, the Service will continue to assist the Corps and other Federal agencies responsible for funding or implementing selected LCA projects and/or plans to ensure they will not jeopardize the continued existence of threatened and endangered species, or adversely modify their designated critical habitat. The required consultations will be accomplished on a project-by-project basis, and will build upon the programmatic consultation.

#### **Louisiana Black Bear**

The threatened Louisiana black bear (*Ursus americanus luteolus*) is primarily associated with forested wetlands; however, it utilizes a variety of habitat types, including marsh, spoil banks, and upland forests. Within forested wetlands, black bear habitat requirements include soft and hard mast for food, thick vegetation for escape cover, vegetated corridors for dispersal, large trees for den sites, and isolated areas for refuge from human disturbance. Remaining Louisiana

black bear populations occur in the Tensas River Basin, the Upper Atchafalaya River Basin, and coastal St. Mary and Iberia Parishes. The primary threats to that species are continued loss of bottomland hardwoods, fragmentation of remaining forested tracts, and human-caused mortality (e.g., illegal killing and accidental collisions with motor vehicles).

Louisiana black bears, particularly pregnant females, normally den from December through April. To further protect denning bears, the Service (through the final listing rule published on January 7, 1992, in Volume 57, No. 4 of the Federal Register) has extended legal protection to candidate or actual den trees. These are defined in the final listing rule as bald cypress (*Taxodium distichum*) and tupelo gum (*Nyssa* sp.) with visible cavities, having a diameter at breast height of 36 inches or greater, and occurring in or along rivers, lakes, streams, bayous, sloughs, or other water bodies. (Please note that additional information can be found at <http://endangered.fws.gov>.)

#### West Indian Manatee

Federally listed as endangered, West Indian manatees (*Trichechus manatus*) occasionally enter Lake Pontchartrain, Lake Maurepas, and their associated coastal waters and streams during the summer months (i.e., June through September). Manatees have also been reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. Should the proposed project involve activities in those areas during summer months, further consultation with this office will be necessary. Manatees have also been occasionally observed elsewhere along the Louisiana Gulf coast. They have declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals.

#### Bald Eagle

Federally listed as threatened, bald eagles (*Haliaeetus leucocephalus*) nest in Louisiana from October through mid-May. Eagles typically nest in bald cypress trees near fresh to intermediate marshes or open water in the southeastern Parishes. Areas with high numbers of nests include the Lake Verret Basin south to Houma, the southern marshes/ridge from Houma to Bayou Vista, the north shore of Lake Pontchartrain, and the Lake Salvador area. Eagles also winter and infrequently nest near large lakes in central and northern Louisiana. Major threats to this species include habitat alteration, human disturbance, and environmental contaminants (i.e., organochlorine pesticides and lead).

#### Brown Pelican

Federally listed as endangered, brown pelicans (*Pelecanus occidentalis*) are currently known to nest on Rabbit Island in Calcasieu Lake, Raccoon Point on Isles Dernieres, as well as Queen Bess Island, Plover Island (Baptiste Collette), Wine Island, and islands in the Chandeleur chain. Pelicans change nesting sites as habitat changes occur. Thus, pelicans may also be found nesting on mud lumps at the mouth of South Pass (Mississippi River Delta) and on small islands in St. Bernard Parish. In winter, spring, and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Brown pelicans feed along the Louisiana coast in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas. Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance.

#### Piping Plover

Federally listed as threatened, the piping plover (*Charadrius melodus*), as well as its designated critical habitat, occur along the Louisiana coast. Piping plovers winter in Louisiana, and may be present for 8 to 10 months, arriving from the breeding grounds as early as late July and remaining until late March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no, or very sparse, emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependant on a mosaic of sites distributed throughout the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change. Their designated critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering, and the physical features necessary for maintaining the natural processes that support those habitat components. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide. Important components (or primary constituent elements) of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

#### Red-cockaded Woodpecker

The endangered red-cockaded woodpecker (RCW, *Picoides borealis*) inhabits open, park-like stands of mature (i.e., greater than 60 years of age) pine trees containing little hardwood understory or midstory. RCWs can tolerate small numbers of overstory hardwoods or large midstory hardwoods at low densities found naturally in many southern pine forests, but they are not tolerant of dense hardwood midstories resulting from fire suppression. RCWs excavate roost and nest cavities in large living pines (i.e., 10 inches or greater in diameter at breast height). The cavity trees and the foraging area within 200 feet of those trees are known as a cluster. Foraging habitat is defined as pine and pine-hardwood (i.e., 50 percent or more of the dominant trees are pine trees) stands over 30 years of age that are located within one-half mile of the cluster.

#### Gopher Tortoise

The threatened gopher tortoise (*Gopherus polyphemus*) is associated with areas that have well-drained, sand or gravel soils appropriate for burrow establishment, ample sunlight for nesting, and understory vegetation suitable for foraging (i.e., grasses and forbs). Gopher tortoises prefer "open" longleaf pine-scrub oak communities that are thinned and burned every few years. They also inhabit existing maintained transmission rights-of-way within Washington, Tangipahoa, and St. Tammany Parishes. The gopher tortoise is the only native tortoise found in the southeastern United States. Habitat degradation (lack of thinning or burning on pine plantations) and conversion to agriculture or urbanization have contributed to the decline of that species. That

habitat decline has concentrated remaining gopher tortoise populations along pipeline and powerline rights-of-way within their range.

#### Ringed Map Turtle

The threatened ringed map (= sawback) turtle (*Graptemys oculifera*) is endemic to the Pearl River system. In Louisiana, it occurs in the Bogue Chitto River south of Franklinton, and the Pearl River north of Louisiana Highway 190 in St. Tammany and Washington Parishes. It is found in riverine habitats with moderate currents, channels wide enough to permit sunlight penetration for several hours each day, numerous logs for basking, and large, sandy banks, that are used for nesting. Habitat loss (loss of exposed sand bars, basking areas) and water quality degradation (which decreases food supply) have contributed to the decline of this species.

#### Sea Turtles

Five species of threatened (T) and endangered (E) sea turtles, including the Kemp's ridley sea turtle (*Lepidochelys kempii*; E), green sea turtle (*Chelonia mydas*; T), hawksbill sea turtle (*Eretmochelys imbricata*; E), leatherback sea turtle (*Dermochelys coriacea*; E), and loggerhead sea turtle (*Caretta caretta*; T), forage in the near-shore waters, bays and sounds of Louisiana. Of those species, the two most commonly encountered are the loggerhead and Kemp's ridley sea turtles. The National Marine Fisheries Service is responsible for aquatic marine threatened or endangered species. Eric Hawk (727/570-5312) in St. Petersburg, Florida, should be contacted for additional information concerning those species.

#### Pallid Sturgeon

The pallid sturgeon (*Scaphirhynchus albus*) is an endangered fish found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical habitats that are in a constant state of change. Detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana. Habitat loss through river channelization and dams has adversely affected this species throughout its range.

#### Gulf Sturgeon

The threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf Coast between the Atchafalaya River and the Suwannee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, the Amite River, rivers and lakes of the Lake Pontchartrain basin, and adjacent estuarine areas. Spawning occurs in coastal rivers between late winter and early spring (i.e., March to May). Adults and sub-adults may be found in those rivers and streams until November, and in estuarine or marine waters during the remainder of the year. Sturgeon less than two years old appear to remain in riverine habitats and estuarine areas throughout the year, rather than migrate to marine waters. Habitat alterations caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

On March 19, 2003, the Fish and Wildlife Service and the National Marine Fisheries Service published a final rule in the Federal Register (Volume 68, No. 53) designating critical habitat for

the Gulf sturgeon in Louisiana, Mississippi, Alabama, and Florida. Portions of the Pearl River system, Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, The Rigolets, Lake St. Catherine, and Lake Borgne within Louisiana were included in that designation. The primary constituent elements essential for the conservation of Gulf sturgeon are those habitat components that support feeding, resting, sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support those habitat components; those elements should be considered when determining potential project impacts. The primary constituent elements for Gulf sturgeon critical habitat include:

- abundant prey items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats for juvenile, subadult, and adult life stages;
- riverine spawning sites with suitable substrates for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
- riverine aggregation areas, also referred to as resting, holding and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during freshwater residency and possibly for osmoregulatory functions;
- a flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging; and necessary for maintaining spawning sites in suitable condition for egg attachment, eggs sheltering, resting, and larvae staging;
- water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;
- sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
- safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., a river unobstructed by a permanent structure, or a dammed river that still allows for passage).

Please be aware that the Fish and Wildlife Service is responsible for ESA consultations regarding the Gulf sturgeon and its critical habitat for activities in riverine units. The National Marine Fisheries Service is responsible for ESA consultation regarding the Gulf sturgeon and its critical habitat for Corps activities within estuarine units, and is responsible for all ESA consultations regarding Gulf sturgeon and its critical habitat for activities in marine units.

#### Inflated Heelsplitter

Federally listed as threatened, the inflated heelsplitter mussel (*Potamilis inflatus*) occurs in the Amite River (Louisiana [with one report in the Pearl River]) and the Tombigbee and Black Warrior Rivers (Alabama). In Louisiana, the mussel occurs between Louisiana Highway 37 and Louisiana Highway 42, with the highest concentrations between Grangeville and Port Vincent. This freshwater mussel is typically found in soft, stable substrates such as sand, mud, silt, and sandy gravel, in slow to moderate currents. Heelsplitter mussels are usually found in depositional pools below sand point bars, and in shallow pools between sandbars and river banks. Major threats to this species in the Amite River are the loss of habitat resulting from sand and gravel dredging, and channel modifications for flood control.

#### Louisiana Quillwort

Federally listed as an endangered plant species, the Louisiana quillwort (*Isoetes louisianensis*) grows on sand and gravel bars on the accreting sides of streams and moist overflow channels within riparian forest communities in Washington and St. Tammany Parishes, Louisiana. The Louisiana quillwort is a small, semi-aquatic, facultative evergreen plant with spirally arranged leaves (sporophylls) arising from a globose, two-lobed corm. The hollow leaves are transversely septate, and measure approximately 0.12 inch wide and up to 16 inches long. Major threats to this species are habitat loss through hydrologic modifications of stream habitat, and land use practices that significantly alter stream quality and hydrology. Apparently, it is dependent on a special hydrologic regime resulting from the presence of small springs scattered at the bases of banks or bluffs.

#### **MBTA Information**

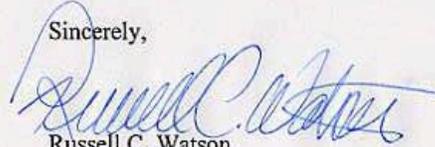
Colonial nesting waterbirds are protected under the MBTA. Colonies that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries may also be present. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect individual proposed project areas for the presence of undocumented nesting colonies during the nesting season. To minimize disturbance to colonial nesting birds, the following restrictions on individual proposed projects should be observed:

1. For colonies containing nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a rookery should be restricted to the non-nesting period (i.e., September 1 through February 15, depending on species present).
2. For colonies containing nesting gulls, terns, and/or black skimmers, all activity occurring within 650 feet of a rookery should be restricted to the non-nesting period (i.e., September 16 through April 1, depending on species present).

In addition, we recommend that on-site contract personnel be informed of the need to identify colonial nesting birds and avoid impacting them during the breeding season.

We appreciate the Corps' continued cooperation in the conservation of threatened and endangered species and migratory birds. If your staff have any questions or need further information, please have them contact Brigette Firmin (337/291-3108) of this office.

Sincerely,



Russell C. Watson  
Acting Supervisor  
Louisiana Field Office

cc: NOAA Fisheries, St. Petersburg, FL  
LDWF, Natural Heritage Program, Baton Rouge, LA

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## **APPENDIX B3**

### **NATIONAL MARINE FISHERIES SERVICE COORDINATION LETTERS FOR THREATENED AND ENDANGERED SPECIES ACT**

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**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office  
9721 Executive Center Dr. N.  
St. Petersburg, FL 33702  
(727) 570-5312, FAX 570-5517  
<http://caldera.sero.nmfs.gov>

SEP 18 2003

F/SER3:EGH

Mr. William P. Klein, Jr., Ed.D.  
U.S. Army Corps of Engineers  
P.O. Box 60267, New Orleans, LA 70160-0267

Dear Dr. Klein:

This responds to your request for comments on the draft threatened and endangered species section for the Louisiana Coastal Assessment (LCA) Preliminary Environmental Impact Statement (PEIS) and the Programmatic Biological Assessment (PBA). On March 14, 2003, NOAA Fisheries' Protected Resources Division (PRD) staff biologist Katie Moore provided initial comments and information for the draft programmatic supplemental EIS for the LCA Comprehensive Coastwide Ecosystem Restoration Feasibility Study (PRD consultation number I/SER/2003/00060). The study objectives were to identify restoration projects that would result in sustaining a coastal ecosystem that supports and protects the environment, economy and culture of southern Louisiana. In e-mail correspondence on August 15, 2003, with David Bernhart of the PRD staff, you requested review of portions of the PBA, specifically, chapters 3 and 5, to ensure that the document clearly states what will be done by the LCA team to meet requirements of the Endangered Species Act (ESA).

NOAA Fisheries PRD concurs with the PAB's assessment that wetlands habitat restoration in coastal Louisiana will ultimately benefit listed species under NOAA Fisheries' purview. The restoration actions/alternatives proposed include combining a series of measures, ultimately aimed at habitat restoration, that would be expected to achieve one or more of the following objectives: minimize and/or control salinity changes, provide continuous re-introduction of fresh water, mimic historic hydrology, maximize Atchafalaya River inflow, build land through delta development, and maximize geomorphic features. Those measures would include projects such as, but not limited to, constructing river and/or sediment delivery diversions, maintaining land bridges, restoring barrier islands, rebuilding historic reefs, installing water control structures, creating marsh, and achieving beneficial use of dredged material. Detailed descriptions of the plan that best meets the objectives (PMBO) and its alternatives are found in Chapters 3 of the PBA (incorporated herein by reference); however, the site-specific locations of each recommended measure have not been identified.

The BA does a good job of discussing the ESA-listed species under NOAA Fisheries' purview that may be present in the action area. The PEIS notes that sea turtles would likely benefit from increases in available coastal wetland habitats, especially barrier island/shoreline habitats, and that Louisiana coastwide restoration would help moderate impacts to this species felt nationwide. The PEIS notes that general direct, indirect, and cumulative impacts would be further developed on a project-by-project basis. The PBA notes that sea turtles may be found in Louisiana coastal shorelines as well as in various coastal water and that the COE has a long history of dredging and dealing with and avoiding adverse impacts to sea turtles during dredging operations. In addition,



the PBA notes that the COE would maintain close coordination with NOAA Fisheries to avoid potential impacts to sea turtles during dredging operations.

Hopper dredging effects on sea turtles are currently considered, and takes authorized, in a 1995 Regional Biological Opinion (RBO) to the New Orleans (and Galveston) COE districts. The 1995 RBO will soon be superseded by a Gulf-wide RBO. The new RBO will consider the effects of hopper dredging and hopper-dredged material disposal on 1) sea turtles and 2) Gulf sturgeon; however, dredging/disposal effects on Gulf sturgeon critical habitat are not part of the RBO.

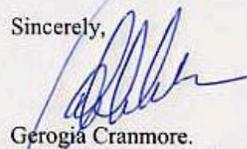
The COE should look closely at the potential effects to Gulf sturgeon and Gulf sturgeon critical habitat of the restoration projects when submitting them individually to PRD for review pursuant to section 7 of the ESA, particularly if dredging is involved. Dredging (hydraulic, hopper, clam shell, sidecast, etc.) may adversely affect Gulf sturgeon and Gulf sturgeon critical habitat. Dredging and/or disposal of dredged materials in Gulf sturgeon critical habitat, may require formal consultation with PRD. PRD notes that Subprovince 1 of the PBMO encompasses the coastal portion of the Pontchartrain Basin, Breton Sound basin, and the eastern half of the Mississippi River Delta; the eastern portion of Lake Pontchartrain is designated Gulf sturgeon critical habitat, and Gulf sturgeon may occur as well in Subprovince 2 encompassing the deltaic plain between the Mississippi River and Bayou Lafourche, including the Batavia Basin and the western half of the Mississippi River Delta.

We note for the record that the Gulf sturgeon is jointly listed by both the U.S. Fish and Wildlife Service; its critical habitat is also jointly designated by both agencies (see page 9 of PBA).

While the PEIS generally considers all restoration projects it proposes as ultimately beneficial to ESA-listed species, and concludes that the actions if implemented are not likely to adversely affect listed species under NOAA Fisheries' purview, the PEIS does not grant approval for the implementation of any particular project at any specific site. Furthermore, PRD cannot evaluate site-specific actions for effects to threatened and endangered species and conclude section 7 consultation on them without knowing where, when, and how the actions will take place. However, since the final restoration projects selected are subject to New Orleans District Corps of Engineers (COE) permitting requirements before being implemented, section 7 consultation between the COE and NOAA Fisheries will be conducted at the time the project is presented to PRD for review.

We look forward to continued cooperation with the COE in conserving our endangered and threatened resources. If you have any questions regarding this ESA consultation, please contact Mr. David Bernhart, fishery biologist, at (727) 570-5779, or by e-mail at David.Bernhart@noaa.gov.

Sincerely,



Gerogia Cranmore.  
Assistant Regional Administrator  
for Protected Resources

Ref: \SER\2003\00060; File: 1514-22 f.1. NOD; O:\section 7\informal\CA-PEIS



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
9721 Executive Center Drive North  
St. Petersburg, FL 33702  
(727) 570-5312, FAX 570-5517  
<http://caldera.sero.nmfs.gov>

MAR 14 2003

F/SER3:KPB

Joy Merino  
Coastal Ecologist  
NOAA Fisheries  
646 Cajundome Boulevard  
Lafayette, LA 70506

Dear Ms. Merino:

We have received the draft documents for the Louisiana Coastal Area Comprehensive Coastwide Ecosystem Restoration Feasibility Study in development by the Army Corps of Engineers (COE) and Louisiana Department of Natural Resources (LA DNR) transmitted electronically on January 28, 2003. You have requested comments on any threatened and endangered species information while the restoration plan is being developed. Please refer to consultation number I/SER/2003/00060 in future correspondence on this project.

A list of federally-protected species under the jurisdiction of NOAA Fisheries for the state of Louisiana and guidelines for preparing a biological assessment are enclosed. Biological information on federally protected sea turtles, marine mammals, fishes, and other listed species can be found at the following website addresses:

- NOAA Fisheries Southeast Regional Office  
(<http://caldera.sero.nmfs.gov/protect/protect.htm>);
- NOAA Fisheries Office of Protected Resources  
([http://www.nmfs.noaa.gov/prot\\_res/prot\\_res.html](http://www.nmfs.noaa.gov/prot_res/prot_res.html));
- U.S. Fish and Wildlife Service  
(<http://noflorida.fws.gov/SeaTurtles/seaturtle-info.htm>);
- the Ocean Conservancy  
(<http://www.ocean.org/main.php3>);
- the Caribbean Conservation Corporation  
(<http://www.cccturtle.org>);
- Florida Fish and Wildlife Conservation Commission  
(<http://floridaconservation.org/psm/turtles/turtle.htm>);
- <http://www.turtles.org>; <http://alabama.fws.gov/gs/>; and
- [http://obis.env.duke.edu/data/sp\\_profiles.php](http://obis.env.duke.edu/data/sp_profiles.php).

In addition, we request that you review the potential for your project to affect candidate species. Candidate species are species that are being considered for possible addition to the threatened and



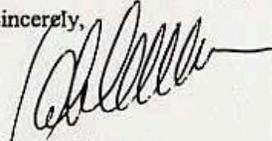
endangered species list. Candidate species currently have no legal protection. The list of candidate species' listings is also enclosed.

Incidental takes of marine mammals are not authorized through the ESA section 7 process. If you believe that bottlenose dolphins may be present in the action area of the proposed project and injury or harassment may result, an incidental take authorization under Marine Mammal Protection Act (MMPA) Section 101 (a)(5) may be necessary. Species descriptions for bottlenose dolphins and any other cetaceans found in the action area of the proposed ecosystem restoration plan should be included in your species description and analysis of effects of the restoration activities on those species.

The action agency is also reminded that, in addition to its protected species/critical habitat consultation requirements with NOAA Fisheries pursuant to section 7 of the ESA, prior to proceeding with the proposed action the action agency must also consult with NOAA Fisheries' Habitat Conservation Division (HCD) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act's requirements for essential fish habitat (EFH) consultation (16 U.S.C. 1855 (b)(2) and 50 CFR 600.905-.930, subpart K). The action agency should also ensure that the applicant understands the ESA and EFH processes; that ESA and EFH consultations are separate, distinct, and guided by different statutes, goals, and time lines for responding to the action agency; and that the action agency will (and the applicant may) receive separate consultation correspondence on NOAA Fisheries letterhead from HCD regarding their concerns and/or finalizing EFH consultation. Consultation is not complete until EFH and ESA concerns have been addressed to NOAA Fisheries' satisfaction.

If you have any questions about EFH consultation for this project, please contact Mr. Richard Hartman, at (225) 389-0508. We look forward to our continuing cooperation. If you have any questions regarding this letter, please contact Kyle Baker, fishery biologist, at the number above or via e-mail at [Kyle.Baker@noaa.gov](mailto:Kyle.Baker@noaa.gov).

Sincerely,



Georgia Cranmore  
Assistant Regional Administrator  
for Protected Resources

cc: F/SER44 - Richard Hartman  
COE - New Orleans District  
File: 1514.22.F.1 LA  
No. I/SER/2003/00060  
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**Louisiana List of Species Under the Jurisdiction of NOAA Fisheries**

<b><u>Listed Species</u></b>	<b><u>Scientific Name</u></b>	<b><u>Status</u></b>	<b><u>Date Listed</u></b>
<b>Marine Mammals</b>			
blue whale	<i>Balaenoptera musculus</i>	Endangered	12/02/70
finback whale	<i>Balaenoptera physalus</i>	Endangered	12/02/70
humpback whale	<i>Megaptera novaeangliae</i>	Endangered	12/02/70
sei whale	<i>Balaenoptera borealis</i>	Endangered	12/02/70
sperm whale	<i>Physeter macrocephalus</i>	Endangered	12/02/70
<b>Turtles</b>			
green sea turtle	<i>Chelonia mydas</i>	Threatened(1)	07/28/78
hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered	06/02/70
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered	12/02/70
leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered	06/02/70
loggerhead sea turtle	<i>Caretta caretta</i>	Threatened	07/28/78
<b>Fish</b>			
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	Threatened	09/30/91

**Species Proposed for Listing**

None

**Designated Critical Habitat**

None

**Proposed Critical Habitat**

Gulf Sturgeon (67 FR 39106)

**Candidate Species(2)**

(64 FR 33466)

<b><u>Candidate Species(2)</u></b>	<b><u>Scientific Name</u></b>
dusky shark	<i>Carcharhinus obscurus</i>
sand tiger shark	<i>Odontaspis taurus</i>
night shark	<i>Carcharhinus signatus</i>
speckled hind	<i>Epinephelus drummondhayi</i>
saltmarsh topminnow	<i>Fundulus jenkinsi</i>
Jewfish	<i>Epinephelus itajara</i>
Warsaw grouper	<i>Epinephelus nigritus</i>

1. Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered.

2. Candidate species are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider these species during project planning so that future listings may be avoided.

NOAA Fisheries  
Recommendations for the Contents of  
Biological Assessments and Biological Evaluations

When preparing a Biological Assessment (BA) or Biological Evaluation (BE), keep in mind that the people who read or review this document may not be familiar with the project area or what is proposed by the project. Therefore your BA or BE should present a clear line of reasoning that explains the proposed project and how you determined the effects of the project on each threatened or endangered species in the project area. Try to avoid technical jargon not readily understandable to people outside your agency or area of expertise. Remember, this is a **public document**. Some things to consider and, if appropriate, to include in your BA or BE follow.

**1. What is the difference between a Biological Evaluation and a Biological Assessment?**

By regulation, a Biological Assessment is prepared for "major construction activities" considered to be Federal actions significantly affecting the quality of the human environment as referred to in the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4332(2)(C)). A BA is required if listed species or critical habitat may be present in the action area. A BA also may be recommended for other activities to ensure the agency's early involvement and increase the chances for resolution during informal consultation. Recommended contents for a BA are described in 50 CFR §402.12(f).

Biological Evaluation is a generic term for all other types of analyses. Although agencies are not required to prepare a Biological Assessment for non-construction activities, if a listed species or critical habitat is likely to be affected, the agency must provide the Service with an evaluation on the likely effects of the action. Often this information is referred to as a BE. The Service uses this documentation along with any other available information to decide if concurrence with the agency's determination is warranted. Recommended contents are the same as for a BA, as referenced above.

The BAs and BEs should not be confused with Environmental Assessments (EA) or Environmental Impact Statements (EIS) which may be required for NEPA projects. These EAs and EISs are designed to provide an analysis of multiple possible alternative actions on a variety of environmental, cultural, and social resources, and often use different definitions or standards.

**2. What are you proposing to do?**

- Describe the project. A project description will vary, depending on the complexity of the project. For example, describing the placement and construction of a new microwave tower may be relatively simple, but describing an alternative for improving range management likely would be more detailed and complex. Include sketches if they will help others understand your proposed action and its relationship with the species' habitat.

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- How are you (or the project proponent) planning on carrying out the project? What tools or methods may be used? How will the site be accessed?
- Describe the project area. Always include a map (topographic maps are particularly helpful). Provide photographs including aerials, if available. Describe the project area (i.e., topography, vegetation, condition/trend).
- Describe current management or activities relevant to the project area. How will your project change the area?
- Supporting documents are very helpful. If you have a mining plan, research proposal, NEPA or other planning document or any other documents regarding the project, attach them to the BA or BE.

### **3. What threatened or endangered species may occur in the project area?**

A request for a species list may be submitted to the Service, or the Federal action agency or its designated representative may develop the list. If you have information to develop your own lists, the Service should be contacted periodically to ensure that changes in species' status or additions/deletions to the list are included. Sources of information include, but are not limited to, the Forest Service or Bureau of Land Management, this office for marine species, members of the public or academic community, and books and various informational booklets. Due to budget constraints and staff shortages, we are only able to provide general, state-wide, or country-wide (territory-wide) species lists.

Use your familiarity with the project area when you develop your species lists. Sometimes a species may occur in the larger regional area near your project, but the habitat necessary to support the species is not in the project area (including areas that may be beyond the immediate project boundaries, but within the area of influence of the project). If, for example, you know that the specific habitat type used by a species does not occur in the project area, it does not need to appear on the species list for the project. However, documentation of your reasoning is helpful for Service biologists or anyone else that may review the document.

### **4. Have you surveyed for species that are known to occur or have potential habitat in the proposed project area?**

The "not known to occur here" approach is a common flaw in many BA/BEs. The operative word here is "known." Unless adequate surveys have been conducted or adequate information sources have been referenced, this statement is difficult to interpret. It begs the questions "Have you looked?" and "How have you looked?" Always reference your information sources.

Include a clear description of your survey methods so the reader can have confidence in your results. Answer such questions as:

- How intensive was the survey? Did you look for suitable habitat or did you look for individuals? Did the survey cover the entire project area or only part of it? Include maps of areas surveyed if appropriate.
- Who did the surveys and when? Was the survey done during the time of year/day when the plant is growing or when the animal can be found (its active period)? Did the survey follow accepted protocols?
- If you are not sure how to do a good survey for the species, the Service recommends contacting species experts. Specialized training is required before you can obtain a permit to survey for some species.
- *Remember that your evaluation of potential impacts from a project does not end if the species is/are not found in the project area. You must still evaluate what effects would be expected to the habitat, even if it is not known to be occupied.*

**5. Provide background information on the threatened or endangered species in the project area.**

Describe the species in terms of overall range and population status. How many populations are known? How many occur in the project area? What part of the population will be affected by this project? Will the population's viability be affected? What is the current habitat condition and population size and status? Describe related items of past management for the species, such as stocking programs, habitat improvements, or loss of habitat or individuals caused by previous projects.

**6. How will the project affect the threatened or endangered species or critical habitat that occurs in the project area?**

- If you believe the project will not affect the species, explain why.
- If you think the project may affect the species, explain what the effects might be. The Endangered Species Act requires you consider all effects when determining if an action funded, permitted, or carried out by a Federal agency may affect listed species. Effects you must consider include direct, indirect, and cumulative effects. Effects include those caused by interrelated and interdependent actions, not just the proposed action. Direct effects are those caused by the action and occur at the same time and place as the action. Indirect effects are caused by the action and are later in time but are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no significant independent utility apart from the action under consideration. Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal actions

subject to consultation.

- Describe measures taken to avoid, reduce, or eliminate adverse effects or enhance beneficial effects to the species. Refer to conversations you had with species experts to achieve these results.
- Consider recovery potential if the project area contains historic range for a species.
- Evaluate designated critical habitat areas by reviewing the physical or biological features essential to the conservation of the species. *Even if no critical habitat has been designated for a species, the evaluation of the project effects must include effects to the habitat, not just the species.*

**7. What is your decision? The Federal action agency must make a determination of effect.**

Quite frequently, effect determinations are not necessarily *wrong*; they simply are not justified in the assessment. The assessment should lead the reviewer through a discussion of effects to a logical, well-supported conclusion. Do not assume that the Service biologist is familiar with the project and/or its location and that there is no need to fully explain the impact the project may have on listed species. If there is little or no connection or rationale provided to lead the reader from the project description to the effect determination, we cannot assume conditions that are not presented in the assessment. Decisions must be justified biologically. The responsibility for making the determination of effect falls on the Federal action agency; however, the Service may ask the agency to revisit its decision or provide more data if the conclusion is not adequately supported by biological information.

You have three choices for each listed species or area of critical habitat:

1. "No effect" means there are absolutely no effects of the project, positive or negative. "No effect" does not include a *small* effect or an effect that is *unlikely* to occur. If effects are insignificant (in size) or discountable (*extremely unlikely*), a "may affect, but not likely to adversely affect" determination is appropriate.
2. "May affect - is not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have concurrent positive effects without any adverse effects to the species or habitat (i.e., there can not be "balancing," wherein the benefits of the project would be expected to outweigh the adverse effects - see #3 below). Insignificant effects relate to the size of the impact (and should not reach the scale where take occurs). Discountable effects are those extremely unlikely to occur. These determinations require **written** concurrence from the Service. Based on best judgement, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

3. "May affect - is likely to adversely affect" means that all adverse effects can not be avoided. A combination of beneficial and adverse effects is still "likely to adversely affect," even if the net effect is neutral or positive. Adverse effects do not qualify as discountable simply because we are not certain they will occur. The probability of occurrence must be extremely small to achieve discountability. Likewise, adverse effects do not meet the definition of insignificant because they are less than major. If the adverse effect can be detected in any way or if it can be meaningfully articulated in a discussion of the results, then it is not insignificant, it is likely to adversely affect. This requires formal consultation with the Service.

A fourth finding is possible for proposed species or proposed critical habitat:

4. "Is likely to jeopardize/adversely modify proposed species/critical habitat" is the appropriate conclusion when the action agency identifies situations in which the proposed action is likely to jeopardize the proposed species, or destroy or adversely modify the proposed critical habitat. If this conclusion is reached, conference is required.

List the species experts you contacted when preparing the BE or BA but avoid statements that place the responsibility for the decision of "may affect" or "no effect" on the shoulders of the species experts. Remember, this decision is made by the Federal action agency.

Provide supporting documentation, especially any agency reports or data that may not be available to the Service. Include a list of literature cited.

Prepared by:  
U.S. Fish and Wildlife Service  
Arizona Ecological Services Field Office  
January 1997

Revised by:  
U.S. Fish and Wildlife Service  
New Mexico Ecological Services Field Office  
2105 Osuña NE  
Albuquerque, New Mexico 87113  
(505) 761-4525  
April 1997

Revised by:  
National Marine Fisheries Service  
Southeast Regional Office  
Protected Resources Division  
9721 Executive Center Dr. N.  
St. Petersburg, FL 33702

(727) 570-5312  
November 1998

**OUTLINE EXAMPLE  
FOR A  
BIOLOGICAL ASSESSMENT OR BIOLOGICAL EVALUATION**

- A. Cover Letter - **VERY IMPORTANT** - Include purpose of consultation, project title, and consultation number (if available). A determination needs to be made for each species. You have three options: 1) a "no effect" determination; 2) requesting concurrence with an "is not likely to adversely affect" determination; 3) a "may affect, is likely to adversely affect" determination, and a request for formal consultation. If proposed species or critical habitat are included, state whether the project is likely to result in jeopardy to proposed species, or the destruction or adverse modification of proposed critical habitat.
- B. Project Description - Describe the proposed action and the project area. Be specific and quantify whenever possible.
- C. For Each Species
  1. Description of affected environment (quantify whenever possible)
  2. Description of species biology
  3. Describe current conditions for each species
    - a. Rangelwide
    - b. In project area
    - c. Cumulative effects of State and private actions in project area
    - d. Other consultations of Federal action agency in area to date
  4. Describe critical habitat (if applicable)
  5. Describe effects of proposed action on each species and/or critical habitat.
    - a. Direct
    - b. Indirect
    - c. Interrelated and interdependent actions
    - d. Incidental take
- D. Conservation Measures (protective measures to minimize effects for each species)
- E. Conclusions (effects determination for each species)

- F. Literature Cited
- G. List of Contacts Made/Preparers
- H. Maps/ Photographs

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# **APPENDIX B4**

## **U.S. FISH AND WILDLIFE COORDINATION ACT REPORT**

### **LCA Comprehensive Study**

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**LOUISIANA COASTAL AREA  
LOUISIANA - COMPREHENSIVE COASTWIDE  
ECOSYSTEM RESTORATION STUDY**

**DRAFT  
FISH AND WILDLIFE COORDINATION ACT REPORT**



**U.S. FISH AND WILDLIFE SERVICE**

**ECOLOGICAL SERVICES**

**LAFAYETTE, LOUISIANA**

**SEPTEMBER 2003**

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**LOUISIANA COASTAL AREA  
LOUISIANA - COMPREHENSIVE COASTWIDE ECOSYSTEM  
RESTORATION STUDY**

**DRAFT  
FISH AND WILDLIFE COORDINATION ACT REPORT**

**PROVIDED TO  
NEW ORLEANS DISTRICT  
U.S. ARMY, CORPS OF ENGINEERS  
NEW ORLEANS, LOUISIANA**

**PREPARED BY  
RONNY PAILLE, SENIOR FIELD BIOLOGIST  
AND  
KEVIN ROY, SENIOR FIELD BIOLOGIST**

**U.S. FISH AND WILDLIFE SERVICE  
ECOLOGICAL SERVICES  
LAFAYETTE, LOUISIANA**

**SEPTEMBER 2003**

## EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service (Service) has prepared the following Draft Fish and Wildlife Coordination Act Report on the alternative plans evaluated in the Draft Louisiana Coastal Area (LCA) Comprehensive Coastwide Ecosystem Restoration Study Report. The purpose of that study is to “. . . to determine the feasibility of sustaining a coastal ecosystem that supports and protects the environment, economy and culture of southern Louisiana and that contributes greatly to the economy and well being of the nation.” The LCA Comprehensive Study is a critically important component of the cooperative Federal-State effort to address the loss of Louisiana’s coastal wetlands.

The study area includes all of Louisiana’s coastal wetlands and supports nationally important fish and wildlife resources. Those wetlands are currently being lost at an average rate of approximately 24 square miles per year due to a variety of causes. Through the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), the Corps, the Service, and other Federal and State agencies have worked together to develop and evaluate plans to protect and restore Louisiana’s rapidly disappearing coastal wetlands. This study is a further development of the Coast 2050 Plan (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998) developed by the above-mentioned agencies to identify comprehensive strategies for addressing the State’s coastal wetland loss problems.

Within each of Louisiana’s four coastal subprovinces, restoration projects were grouped into alternatives that would achieve varying levels of benefits, from reducing the rate of wetland loss to producing net wetland gains. Of the many initial alternatives, seven coastwide plans were selected for additional study. Each of those plans consist of numerous projects, including the introduction of flows from the Mississippi River and, to a lesser extent, the Atchafalaya River.

Under the No Action Plan, approximately 463,000 acres of Louisiana’s coastal wetlands would be lost during the 50-year evaluation period. According to current estimates developed for the LCA study, the implementation of Plan 7002 would yield a net wetland gain of more than 114,000 acres during the same 50-year period. Plan 5610 would essentially achieve no net wetland loss. The remaining action plan alternatives would reduce future wetland losses and, by year 50, would save roughly 365,000 to 430,000 acres, compared to the No Action Plan.

It must be noted that the analyses and findings in the Service’s report are of an interim nature, due to current technical limitations in various habitat models and salinity calculations. The Service will continue working closely with the LCA Modeling Team to further refine those models and reduce the current degree of risk and uncertainty associated with their outputs.

Interim benefits for each of the alternatives were determined for the 10 coastal fish and wildlife species and expressed in average annual habitat units (AAHU). Species which utilize fresh or intermediate marshes during all or part of their lives generally would benefit from implementation of the action plan alternatives compared to the No Action Plan. The American alligator and dabbling ducks would receive the greatest benefits. Habitat quality for mink, river otter, Atlantic croaker, and white shrimp would increase under all the action plan alternatives.

Habitat quality for species which utilize brackish marsh would decrease by varying amounts. For muskrat, Gulf menhaden, and spotted seatrout, habitat values would decrease under all action plan alternatives, except under Plan 7002, where those species would also experience AAHU increases. For brown shrimp, all action plans would result in a net coastwide reduction in habitat quality, with the least impact occurring under Plan 7002.

Many other species of fish and wildlife which utilize Louisiana's coastal wetlands would benefit from the restoration actions proposed under the action plan alternatives. The Service believes that implementation of any of the proposed action plan alternatives would result in major benefits to nationally significant fish and wildlife resources which are threatened by the continuing, severe loss of the Louisiana coastal wetlands. Consequently, the Service would support implementation of any of the proposed action plans.

According to the present interim evaluation results, however, only Plan 7002 would reverse the severe loss of Louisiana's coastal wetlands. It would also provide the greatest level of benefits to Louisiana's nationally significant fish and wildlife resources. Consequently, we currently favor implementation of that plan. However, Plan 7002 includes very expensive and highly complex projects, such as the large-scale diversion of Mississippi River water into the Barataria and Terrebonne Basins known as the "Third Delta;" hence, the benefits associated with that plan may not ultimately be achievable and/or affordable. As Plan 5610 is presently the second-most beneficial plan, we would favor its implementation in lieu of Plan 7002 if the latter is found to be infeasible.

Regardless of the alternative that is ultimately identified for implementation, should the "Third Delta" diversion project not be included, the Service recommends that the Subprovince 3 benefits lost through elimination of that project be replaced to the greatest extent possible through the comprehensive implementation of features and projects designed to maximize Atchafalaya River flows/influence in the Atchafalaya and Terrebonne Basins. The proposed restoration of the reefs extending from Point au Fer Island to the southern end of the Point Chevreuil reef would greatly enhance land-building in the Atchafalaya Delta and increase riverine influences in western Terrebonne Basin marshes. Because that reef restoration project is believed to be one of the most beneficial features of that strategy, the Service recommends that it be made part of any preferred implementation alternative that may be designated in the future. Similarly, the Service recommends the following modifications be incorporated in any plan ultimately selected for implementation:

1. Install a new Calcasieu Lock and use of the old lock for improved management of water levels in the Lakes Subbasin, and for moderating salinity levels in the Calcasieu Basin.
2. Delete the proposed Gulf Intracoastal Lock at the Alkali Ditch, as many of the wetlands intended to be benefitted by that feature have already been lost and others are now protected by other means.
3. Sufficient funding should be provided for full Service participation throughout post-authorization engineering and design studies, and to facilitate fulfillment of its responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act.

4. The Corps should obtain a right-of-way from the Service prior to conducting any work on a National Wildlife Refuge, in conformance with Section 29.21-1, Title 50, Right-of-way Regulations. Issuance of a right-of-way will be contingent on a determination by the Service's Regional Director that the proposed work will be compatible with the purposes for which the Refuge was established.

To ensure that optimum fish and wildlife resource benefits are achieved, the Service plans to remain actively involved throughout the plan implementation process. Our findings and recommendations on the design and operation of projects approved for implementation will be provided under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). This report is provided in accordance with, but does not entirely fulfill the requirements of, Section 2 (b) of that Act.

## INTRODUCTION

The Louisiana Coastal Area, Louisiana - Comprehensive Coastwide Ecosystem Restoration Study Draft Report (DLCAR) has been prepared by the New Orleans District Corps of Engineers, Louisiana Department of Natural Resources, and other State and Federal natural resource agencies, with the assistance of scientists from several institutions. The DLCAR is envisioned as the vehicle for building a comprehensive array of projects to implement the most effective coastal wetland restoration and conservation strategies that were identified in the Coast 2050 Plan, which was prepared by the Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetland Conservation and Restoration Authority. The Louisiana Coastal Area (LCA) study was authorized by Resolutions adopted by the U.S. House of Representatives and Senate Committees on Public Works, on October 19, 1967, and April 19, 1967, respectively, seeking to improve existing hurricane protection features and the “. . . prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and related water resource purposes.”

Louisiana's 3.67 million acres of coastal wetlands and their associated waters are of national importance to fish and wildlife resources. Coastal Louisiana contains an estimated 45 percent of the tidal marshes in the conterminous United States. Those wetlands and associated shallow waters provide essential habitat to a diverse and abundant assemblage of fish and wildlife.

The coastal wetlands of Louisiana produce the largest commercial fish and shellfish harvest in the lower 48 States. More than 1.1 billion pounds of fish and shellfish (including shrimp, crabs, crawfish, and oysters) are harvested annually in coastal Louisiana. That harvest is nearly twice as much as in any other state and was valued at more than \$400 million in 2000 (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2001).

Recreational saltwater anglers spend approximately \$245 million annually to fish for spotted seatrout, red drum, snapper, tuna and other species (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2001). Fresh and low-salinity coastal wetlands also provide important habitat for numerous freshwater sport fishes, the pursuit of which is also an important recreational activity in the coastal areas.

Louisiana's coastal marshes provide winter habitat for more than 50 percent of the duck population of the Mississippi Flyway, an estimated 20 percent of North America's puddle duck population, and large concentrations of diving ducks. Those wetlands are vitally important to the habitat mission of the Gulf Coast Joint Venture, which was established to help achieve the goals of the North American Waterfowl Management Plan. Fresh and intermediate marshes support the greatest concentrations of wintering waterfowl in coastal Louisiana.

Louisiana's coastal marshes, swamps, and associated habitats also support many other migratory birds, such as rails, gallinules, shorebirds, seabirds, wading birds, and numerous songbirds. More than 196 nesting colonies of wading birds, shorebirds, and seabirds (representing 27 species and more than 430,000 nesting pairs) were observed in coastal Louisiana during a 1990 survey conducted by the Louisiana Department of Wildlife and Fisheries. The cheniers and

natural levee forests of coastal Louisiana provide essential stop-over habitat to numerous neotropical migratory passerine birds.

Coastal Louisiana has long been a leading fur-producing area in North America. Common fur-bearers in that area include nutria, mink, muskrat, raccoon, and river otter. Those coastal marshes and swamps also support game animals such as white-tailed deer and swamp rabbit. That area also supports 1.5 million alligators, and closely regulated sport and commercial hunting for that species.

## DESCRIPTION OF THE STUDY AREA

The study area encompasses all of Louisiana's coastal wetlands, which include cypress-tupelo swamp, natural levee forest, fresh marsh, intermediate marsh, brackish marsh, saline marsh, and barrier islands. The study area is divided into four subprovinces, each of which include one or more coastal watersheds having similar hydrologic characteristics. The LCA Subprovinces are very similar to those identified under the Coast 2050 Plan, except that the boundary between Subprovinces 1 and 2 has been relocated from the Mississippi River-Gulf Outlet to the Mississippi River under the LCA.

Subprovince 1 consists of all coastal wetlands east of the Mississippi River (and South Pass) and includes the Pontchartrain and Breton Sound Basins. Subprovince 2 consists of the coastal wetlands located between the Mississippi River and Bayou Lafourche (i.e., the Barataria Basin). Subprovince 3 extends from Bayou Lafourche westward to the Freshwater Bayou Channel and includes the Terrebonne, Atchafalaya, and Teche/Vermilion Basins. Subprovince 4 extends from the Freshwater Bayou Channel westward to the Louisiana State line (i.e., the Sabine River/Sabine Lake) and includes the Mermentau and Calcasieu/Sabine Basins.

## FISH AND WILDLIFE CONCERNS IN THE STUDY AREA

The foremost study-area concern is the rapid deterioration and loss of coastal wetlands. During the 1900s, coastal Louisiana lost approximately 1.2 million acres of its coastal wetlands. Coastwide loss rates were approximately 44 square miles per year during the 1956 to 1978 period, and averaged nearly 24 square miles per year between 1990 and 2000. Large areas of fresh marsh and swamp have either converted to open water or to more brackish wetland types.

To address this serious problem, a number of coastal wetland restoration projects have been constructed and/or authorized for construction throughout coastal Louisiana. Those projects are being funded via the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), and two large freshwater introduction projects (Davis Pond and Caernarvon) have been implemented by the Corps of Engineers under other authorities. Those efforts, though, will address less than one third of the 448,000-acre wetland loss projected to occur by the year 2050. That continuing loss of coastal wetlands and associated habitats threatens the nationally significant fish and wildlife resources that depend on them.

## EVALUATION METHODOLOGY

A team of scientists led by Dr. Robert Twilley of the University of Louisiana at Lafayette (i.e., the LCA Modeling Team) is assisting in the development and evaluation of restoration alternatives for the LCA. That team has developed a comprehensive modeling approach which utilizes numerical modeling and coarser-scale “desktop” modeling to forecast wetland conditions under future without-project (FWOP) and alternative future with-project (FWP) scenarios. Their approach includes the use of hydrodynamic, ecological, and water quality simulation models to predict hydroperiod, salinity, and sediment distribution. The desktop modeling involves the development of a set of modules to convert numerical modeling results into landscape and ecological responses (e.g., acres of wetlands created). Outputs from the numerical models are utilized in the desktop models at different time intervals and spatial scales to predict habitat change, habitat loss, salinity, and a host of other pertinent variables. Desktop modules developed for this study include 1) Land-Building, 2) Habitat Switching, 3) Water Quality, and 4) Habitat Use.

The Habitat Use module provides a methodology for estimating the impacts of restoration alternatives on fish and wildlife resources. That methodology is very similar to the Habitat Evaluation Procedures (HEP) developed by the Service. The LCA Modeling Team selected 12 representative species/species groups of fish, shellfish, and wildlife for evaluation. Those species/species groups include white shrimp, brown shrimp, American oyster, Gulf menhaden, spotted seatrout, Atlantic croaker, largemouth bass, American alligator, muskrat, mink, river otter, and dabbling ducks. The LCA Modeling Team modified the Service’s published Habitat Suitability Index (HSI) models for the fish and shellfish species to include only those variables for which output would be available from numerical or other desktop models. Variables retained for those species included salinity, temperature, water depth, and percent wetland area. Models for the wildlife species were developed with methods similar to those used for the fish and shellfish models. All of the wildlife models utilized three variables, i.e., habitat type, percent wetland area, and water depth.

Originally, the Service intended to use the Habitat Use module outputs (see the LCA draft Report, Appendix A) to determine project-related impacts to fish and wildlife resources in the study area. Several inconsistencies and problems were noted, however, when comparing outputs among the proposed restoration alternatives and across the four coastal Subprovinces. Of particular concern were the projected increases in habitat values for most of the evaluation species under the No Action Plan, and the inverse relationship between wetland-dependent wildlife benefits and increases in their preferred habitats under some scenarios. The Service, therefore, decided to use an interim assessment methodology, until the LCA numerical and desktop models are further refined to more accurately project impacts to fish and wildlife resources. The Service fully intends to continue assisting the LCA Modeling Team and the other involved agencies in the ongoing effort to refine model outputs.

To determine impacts of the FWOP and FWP alternative plans on fish and wildlife resources, the Service used a modification of the HEP. Biologists with the Corps, LDWF, NMFS, and the

Service selected 10 of the 12 evaluation species utilized in the Habitat Use module. The species selected represent fish and wildlife resources which utilize coastal wetland habitats, from swamp to saline marsh. Estuarine-dependent species selected for evaluation include Atlantic croaker, spotted seatrout, Gulf menhaden, brown shrimp, and white shrimp. Wildlife species selected for evaluation include mink, river otter, muskrat, American alligator, and dabbling ducks. The

largemouth bass was not selected as an evaluation species because its HSI model is primarily used for lacustrine and riverine habitats, rather than estuarine habitats. In addition, largemouth bass prefer low-salinity habitats such as fresh and intermediate marsh; thus, impacts to that species could be inferred from impacts to other low-salinity species (e.g., dabbling ducks and American alligator). The American oyster was not selected as an evaluation species because it is not impacted by the quality of emergent wetland habitat. Habitat suitability for each of the selected species is dependent on habitat conditions.

To determine impacts on each evaluation species/species group, the Service incorporated changes in habitat types and wetland acreage projected by the LCA numerical and desktop models; we also incorporated an HSI into the HEP methodology for each species/species group within each wetland type to determine impacts in terms of net Average Annual Habitat Units (AAHUs). To derive AAHUs, a species' HSI for a specific habitat type is multiplied by the acreage of that habitat type to obtain Habitat Units, which are annualized over the evaluation period (i.e., 50 years). Net AAHUs represent the difference in AAHUs between the action plan alternative (i.e., FWP conditions) and the No Action Plan (i.e., FWOP conditions).

Because the models used to project future habitat types assigned a single average salinity value to a very large area or "salinity box," salinities are essentially averaged across those areas. In some cases, this has eliminated actual salinity gradients and caused unrealistic shifts in projected salinities (those shifts appear at target year 10, the first projection). Lacking a better method for projecting future habitat-type changes, however, the Service has decided to use the existing habitat type data until the methodology can be improved. Because the plan evaluation and selection process is continuing, the preliminary benefit estimates presented in this evaluation should therefore be viewed as interim values, subject to a considerable degree of risk, uncertainty, and future refinement.

HSI values for each wetland type were derived for the selected wildlife species using the wetland type-habitat suitability relationships found in the LCA Habitat Use module. For the estuarine-dependent fish and shellfish species, HSI values by wetland type, were provided by the National Marine Fisheries Service, utilizing the published salinity-habitat suitability relationships found in each species' HSI model. Those HSI values for each evaluation species, by wetland type, are displayed in Table 1.

**Table 1. HSI values for each evaluation species by wetland type**

<b>Evaluation Species</b>	<b>Swamp</b>	<b>Fresh Marsh</b>	<b>Intermediate Marsh</b>	<b>Brackish Marsh</b>	<b>Saline Marsh</b>
Atlantic Croaker	0.00	0.40	0.80	1.00	0.60
Spotted Seatrout	0.00	0.10	0.20	0.50	0.90
Gulf Menhaden	0.00	0.20	0.40	0.60	0.90
Brown Shrimp	0.00	0.10	0.30	0.80	1.00
White Shrimp	0.00	0.20	1.00	1.00	0.70
Mink	0.68	0.40	0.29	0.24	0.00
River Otter	0.68	0.39	0.67	1.00	0.00
Muskrat	0.04	0.21	0.11	1.00	0.43
American Alligator	0.26	0.55	1.00	0.55	0.00
Dabbling Ducks	0.66	1.00	0.69	0.66	0.08

## EXISTING FISH AND WILDLIFE RESOURCES

### Description of Habitats

**Forested Wetlands** - Forested wetlands in the study area were divided into two major types; i.e., bottomland hardwood forests and cypress-tupelo swamps. Bottomland hardwood forests found in coastal portions of the project area occur primarily on the natural levees of distributary channels. Dominant vegetation may include sugarberry, water oak, live oak, bitter pecan, black willow, American elm, Drummond red maple, Chinese tallow-tree, boxelder, green ash, baldcypress, and elderberry. Cypress-tupelo swamps are located along the flanks of larger distributary ridges as a transition zone between bottomland hardwoods and lower-elevation marsh or scrub-shrub habitats. Cypress-tupelo swamps exist where there is little or no salinity and usually minimal daily tidal action.

**Scrub-Shrub** - Scrub-shrub habitat is often found along the flanks of distributary ridges. Typically it is bordered by marsh at lower elevations and by developed areas, cypress-tupelo swamp, or bottomland hardwoods at higher elevations. Typical scrub-shrub vegetation includes elderberry, wax myrtle, buttonbush, black willow, Drummond red maple, Chinese tallow-tree, and groundselbush.

**Fresh Marsh** - Fresh marshes occur at the upper ends of interdistributary basins and are often characterized by floating or semi-floating organic soils. Most fresh marshes exhibit minimal daily tidal action; however, fresh marshes in the Atchafalaya River delta and adjacent to Atchafalaya Bay are the exceptions. Vegetation may include maidencane, bulltongue, cattail, California bulrush, pennywort, giant cutgrass, American cupscale, spikerushes, bacopa, and alligatorweed. Associated open water habitats may often support extensive beds of floating-

leafed and submerged aquatic vegetation including water hyacinth, *Salvinia*, duckweeds, American lotus, white water lily, water lettuce, coontail, Eurasian milfoil, hydrilla, pondweeds, naiads, fanwort, wild celery, water stargrass, elodea, and others.

**Intermediate Marsh** - Intermediate marshes are a transitional zone between fresh and brackish marshes and are often characterized by organic, semi-floating soils. Typically, intermediate marshes experience low levels of daily tidal action. Salinities are negligible or low throughout much of the year, with salinity peaks occurring during late summer and fall. Vegetation includes saltmeadow cordgrass, deer pea, three-cornered grass, cattail, bulltongue, California bulrush, seashore paspalum, wild millet, fall panicum, and bacopa. Ponds and lakes within the intermediate marsh zone often support extensive submerged aquatic vegetation including southern naiad, Eurasian milfoil, and wigeongrass.

**Brackish Marsh** - Brackish marshes are characterized by low to moderate daily tidal energy and by soils ranging from firm mineral soils to organic semi-floating soils. Freshwater conditions may prevail for several months during early spring; however, low to moderate salinities occur during much of the year, with peak salinities in the late summer or fall. Vegetation is usually dominated by saltmeadow cordgrass, but also includes saltgrass, three-cornered grass, leafy three-square, and deer pea. Shallow brackish marsh ponds occasionally support abundant beds of wigeongrass.

**Saline Marsh** - Saline marshes occur along the southern fringe of the coastal wetlands. Those marshes usually exhibit fairly firm mineral soils and experience moderate to high daily tidal energy. Vegetation is dominated by saltmarsh cordgrass but may also include saltgrass, saltmeadow cordgrass, black needlerush, and leafy three-square. Submerged aquatic vegetation is rare. Within the study area, intertidal mud flats are most common in saline marshes.

**Ponds and Lakes** - Natural marsh ponds and lakes, interspersed throughout the coastal wetlands, are typically shallow, ranging in depth from 6 inches to more than 2 feet. Typically, the smaller ponds are shallow and the larger lakes are deeper. In fresh and low-salinity areas, ponds and lakes may support varying amounts of submerged and/or floating-leaved aquatic vegetation. Brackish and, much less frequently, saline marsh ponds and lakes may support wigeongrass beds.

**Canals and Bayous** - Canals and larger bayous typically range in depth from 4 or 5 feet, to more than 15 feet. Strong tidal flows may occur at times through those waterways, especially where they provide hydrologic connections to other large waterbodies. Such canals and bayous may have mud or clay bottoms that range from soft to firm. Dead-end canals and small bayous are typically shallow and their bottoms may be filled in to varying degrees with semi-fluid organic material. Erosion due to wave action and boat wakes, together with shading from overhanging woody vegetation, tends to retard the amount of intertidal marsh vegetation growing along the edges of those waterways.

**Developed Areas** - Most developed areas are located on higher elevations of former distributary channels and are typically well drained. They include agricultural lands, and commercial and residential developments.

## **Fishery Resources**

Wetlands throughout the study area abound with small resident fishes and shellfishes such as least killifish, rainwater killifish, sheepshead minnow, mosquitofish, sailfin molly, grass shrimp, and others. Those species are typically found along marsh edges or among submerged aquatic vegetation, and provide forage for a variety of fish and wildlife. Fresh and low-salinity marshes provide habitat for commercially and recreationally important resident freshwater fishes such as largemouth bass, yellow bass, black crappie, bluegill, redear sunfish, warmouth, blue catfish, channel catfish, buffalo, freshwater drum, bowfin, and gar. Freshwater fishes may also utilize low-salinity areas (intermediate marsh zone), provided they have access to fresher areas during periods of high salinity.

The coastal marshes also provide nursery habitat for many estuarine-dependent commercial and recreational fishes and shellfishes. Because of the protection and abundant food afforded by those wetlands, they are critical to the growth and production of species such as blue crab, white shrimp, brown shrimp, Gulf menhaden, Atlantic croaker, red drum, spotted seatrout, black drum, sand seatrout, spot, southern flounder, striped mullet, and others. Those species are generally most abundant in the brackish and saline marshes; however, blue crab, Gulf menhaden, and Atlantic croaker and several other species also utilize fresh and low-salinity marshes.

Because tidal marshes provide essential nursery habitat, commercial shrimp harvests are positively correlated with the area of tidal emergent wetlands, not open water area (Turner 1977 and 1982). Future commercial harvests of shrimp and other fishes and shellfishes could be adversely impacted by the high rates of marsh loss throughout the study area (Turner 1982).

The American oyster occurs throughout much of the brackish and saline marsh zones within the study area. Oyster harvesting constitutes a valuable fishery in the northern portions of that zone, where salinities range from 10 to 15 parts per thousand (ppt).

## **Essential Fish Habitat**

The generic amendment to Gulf of Mexico Fishery Management Plan identifies Essential Fish Habitat in the project area to be intertidal emergent wetlands, submerged aquatic vegetation, estuarine waters, and mud, sand, and shell water bottoms. Habitat Areas of Particular Concern have not been identified for the project area. Under the Magnuson-Stevens Fishery Conservation and Management Act, the Gulf of Mexico Fishery Management Council has determined that project-area habitats are utilized by Federally managed species such as brown shrimp, white shrimp, and red drum. Although those species utilize the project area primarily as nursery habitat, all life stages may occur therein. When they move to offshore waters, blue crabs and other species of fishes and shellfishes which utilize project-area habitats may also provide forage for Federally managed marine fishes such as groupers, snappers, and mackerel.

## **Wildlife Resources**

Numerous species of birds utilize study-area marshes, including large numbers of migratory waterfowl which winter there. Project-area fresh and intermediate marshes provide excellent wintering habitat for migratory waterfowl, especially puddle (dabbling) ducks. Brackish marshes having abundant submerged aquatic vegetation may also support large numbers of puddle ducks. Puddle ducks that occur in the study area include mallard, gadwall, northern pintail, blue-winged teal, green-winged teal, American widgeon, wood duck, and northern shoveler. The resident mottled duck also utilizes project-area coastal marshes for nesting, feeding, and brood-rearing. Diving ducks prefer larger ponds, lakes, and open water areas. Common diving duck species include lesser scaup, ruddy duck, canvasback, redhead, ring-necked duck, red-breasted merganser, and hooded merganser. The lesser snow goose and the white-fronted goose also utilize coastal marshes. Other migratory game birds found in coastal marshes include the king rail, clapper rail, Virginia rail, sora, American coot, common moorhen, and common snipe.

Marshes and associated shallow, open-water areas provide habitat for a number of wading birds, shorebirds, seabirds, and other nongame birds. Common wading birds include the little blue heron, great blue heron, green-backed heron, yellow-crowned night heron, black-crowned night heron, great egret, snowy egret, cattle egret, reddish egret, white-faced ibis, white ibis, and roseate spoonbill. Shorebirds include the killdeer, American avocet, black-necked stilt, common snipe, and various species of plovers and sandpipers. Seabirds include white pelican, brown pelican, black skimmer, herring gull, laughing gull, and several species of terns. More than 190 wading and seabird nesting colonies have been identified within coastal Louisiana during surveys conducted in 1983, 1990, and 2001 (Michot et al. 2003). Other nongame birds such as boat-tailed grackle, red-winged blackbird, seaside sparrow, olivaceous cormorant, northern harrier, belted kingfisher, and sedge wren also utilize coastal-area habitats.

Common mammals occurring in the coastal marshes include nutria, muskrat, mink, river otter, raccoon, swamp rabbit, white-tailed deer, and coyote. Muskrat and river otter prefer brackish marsh. Nutria, mink, swamp rabbit, and white-tailed deer prefer fresh marsh and low salinity habitats. Saline marsh provides very poor habitat for the above listed species. For muskrat, however, saline marsh may provide fair to poor habitat quality.

Reptiles are most abundant in fresh and low-salinity coastal wetlands. Common species include the American alligator, western cottonmouth, water snakes, mud snake, speckled kingsnake, ribbon snakes, rat snakes, red-eared turtle, common snapping turtle, alligator snapping turtle, mud turtles, and softshell turtles. Amphibians commonly found in those areas include the bullfrog, pig frog, bronze frog, leopard frog, cricket frogs, tree frogs, chorus frogs, three-toed amphiuma, sirens, and several species of toads. In brackish and saline marshes, reptiles are limited primarily to the American alligator and the diamond-backed terrapin, respectively.

Forested wetlands and scrub-shrub areas provide habitats for songbirds such as the mockingbird, yellow-billed cuckoo, northern parula, yellow-rumped warbler, prothonotary warbler, white-eyed vireo, Carolina chickadee, and tufted titmouse. Additionally, these areas also provide important resting and feeding areas for songbirds migrating across the Gulf of Mexico. Other avian species

found in forested wetlands include the American woodcock, common flicker, brown thrasher, white-eyed vireo, belted kingfisher, loggerhead shrike, pileated woodpecker, red-headed woodpecker, downy woodpecker, common grackle, common crow, and mockingbird. Numerous other bird species use forested wetlands throughout the study area.

Forested habitats and associated waterbodies also support raptors such as the red-tailed hawk, red-shouldered hawk, osprey, American kestrel, Mississippi kite, northern harrier, screech owl, great horned owl, and barred owl. Wading bird colonies typically occur in cypress swamp and scrub-shrub habitat. Species found in those nesting colonies include anhinga, great egret, great blue heron, black-crowned night heron, tricolored heron, little blue heron, cattle egret, snowy egret, white-faced and glossy ibises, and reddish egret. Waterfowl species found in forested wetlands and adjacent waterbodies in the project area include, but are not limited to, wood duck, mallard, green-winged teal, gadwall, and hooded merganser.

Game mammals associated with forested wetlands include eastern cottontail, swamp rabbit, gray and fox squirrels, and white-tailed deer. Commercially important fur bearers include river otter, muskrat, nutria, mink, and raccoon. Other mammals found in forested wetlands include striped skunk, coyote, Virginia opossum, bobcat, armadillo, gray fox, and red bat. Smaller mammal species serve as forage for both mammalian and avian carnivores and include the cotton rat, marsh rice rat, white-footed mouse, eastern wood rat, harvest mouse, least shrew, and southern flying squirrel.

Reptiles which utilize study area bottomland hardwoods, cypress swamps, and associated shallow waters include the American alligator, ground skink, five-lined skink, broadbanded skink, green anole, Gulf coast ribbon snake, yellow-bellied water snake, speckled kingsnake, southern copperhead, western cottonmouth, pygmy rattlesnake, broad-banded water snake, diamond-backed water snake, spiny softshell turtle, red-eared turtle, southern painted turtle, Mississippi mud turtle, stinkpot, and common and alligator snapping turtle, in addition to numerous other species.

Representative amphibians in study-area forested wetlands include dwarf salamander, three-toed amphiuma, lesser western siren, central newt, Gulf coast toad, eastern narrow-mouthed toad, green treefrog, squirrel treefrog, pigfrog, bullfrog, southern leopard frog, bronze frog, upland chorus frog, southern cricket frog, and spring peeper.

Most developed areas provide low-quality wildlife habitat. Sites developed for agricultural purposes are usually located at elevations slightly higher than the wetlands, or they may have improved drainage. In agricultural areas, wildlife habitat is primarily provided by unmaintained ditch banks and field edges, fallow fields, pasture lands, and/or occasionally flooded fields. Cultivated crops, especially soybeans, provide forage for some wildlife species. Game species that utilize agricultural lands include the white-tailed deer, mourning dove, bobwhite quail, eastern cottontail, and common snipe. Seasonally flooded cropland and fallow fields may also provide important feeding habitat for wintering waterfowl, wading birds, and other waterbirds.

## **Threatened and Endangered Species**

Federally listed threatened and endangered species occurring in coastal Louisiana wetlands and associated habitats include in the Louisiana black bear (threatened), West Indian manatee (endangered), bald eagle (threatened), brown pelican (endangered), piping plover (threatened), several species of sea turtles, Gulf sturgeon (threatened), and the pallid sturgeon (endangered).

The Louisiana black bear is primarily associated with forested wetlands; however, it also utilizes a variety of other habitat types, including marsh, spoil banks, and upland forests. Louisiana black bear populations occur in the Tensas River Basin, the Upper Atchafalaya River Basin, and coastal St. Mary and Iberia Parishes.

The West Indian manatee occasionally enters Lakes Pontchartrain and Maurepas, and associated coastal waters and streams, during the summer months. Manatees have been reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana coast.

Bald eagles nest in Louisiana from October through mid-May. Eagles typically nest in baldcypress trees near fresh to intermediate marshes or open water in the southeastern parishes. Areas with high numbers of nests include the Lake Verret Basin, the marshes/swamp interface from Houma to Bayou Vista, the north shore of Lake Pontchartrain, and the Lake Salvador area.

Brown pelicans are currently known to nest on Rabbit Island (in Calcasieu Lake), Raccoon Point (Isles Dernieres), Queen Bess Island, Plover Island (Baptiste Collette), and islands in the Chandeleur chain. Pelicans change nesting sites as habitat changes occur; thus, they may also be found nesting on mud lumps at the mouth of South Pass (Mississippi River Delta) and on small islands in St. Bernard Parish. In winter, spring, and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Brown pelicans feed in shallow estuarine waters, using sand pits and offshore sand bars as rest and roost areas.

The piping plover winters in Louisiana from late July to March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sandflats, algal flats, and wash-over passes with no or very sparse emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Critical habitat (i.e., specific areas that are essential to the conservation of the species) has been designated within coastal Louisiana, and consists of intertidal beaches and flats (between annual low tide and annual high tide) with no, or very sparse, emergent vegetation, and associated dune systems and flats above annual high tide. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. Those elements should be considered when determining potential project impacts.

Endangered and threatened sea turtles forage in the nearshore waters, bays and sounds of Louisiana. The National Marine Fisheries Service is responsible for aquatic marine threatened or endangered species. Eric Hawk (727/570-5312) in St. Petersburg, Florida, should be contacted for further information, and consultation regarding those species.

The endangered Kemp's ridley sea turtle occurs mainly in the coastal areas of the Gulf of Mexico and northwestern Atlantic. Juveniles and sub-adults occupy shallow, coastal regions and are commonly associated with crab-laden, sandy or muddy water bottoms. Small turtles are generally found nearshore from May through October. Adults may be abundant near the mouth of the Mississippi River in spring and summer. Adults and juveniles move offshore to deeper, warmer water during the winter. Between the East Gulf Coast of Texas and the Mississippi River Delta, Kemp's ridleys use nearshore waters, ocean sides of jetties, small boat passageways through jetties, and dredged and natural channels. They have been observed within both Sabine and Calcasieu Lakes.

Threatened loggerhead sea turtles nest within the continental United States from Louisiana to Virginia, with major nesting concentrations occurring on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida. In Louisiana, loggerheads are known to nest on the Chandeleur Islands. Nesting and hatching dates for the loggerhead in the northern Gulf of Mexico are from May 1 through November 30.

The Gulf sturgeon is an anadromous fish that occurs in many coastal rivers, streams, and estuarine waters from the Atchafalaya River to the Suwanee River, Florida. Adults and sub-adults spend 8 to 9 months in rivers and streams, and 3 to 4 of the cooler months in estuarine or marine waters. Spawning occurs in coastal rivers between late winter and early spring. Sturgeon less than 2 years old appear to remain in riverine habitats and estuarine areas throughout the year, rather than migrate to marine waters. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, rivers and lakes of the Lake Pontchartrain basin, and adjacent estuarine areas.

Critical habitat for the Gulf sturgeon has been designated in Louisiana, Mississippi, Alabama, and Florida. Portions of the Pearl River system, Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, The Rigolets, Lake St. Catherine, and Lake Borgne within Louisiana were included in that designation. The primary constituent elements essential for the conservation of Gulf sturgeon are those habitat components that support feeding, resting, sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support those habitat components; those elements should be considered when determining potential project impacts.

The pallid sturgeon is found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it may occur in the Red River as well. The pallid sturgeon is adapted to riverine conditions that can be described as large, free-flowing, turbid water with a diverse assemblage of physical habitats that are in a constant state of change. Detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana.

### **Refuges and Wildlife Management Areas**

The Service administers 10 National Wildlife Refuges (NWR) encompassing more than 301,700 acres in coastal Louisiana. Those refuges include Sabine, Cameron Prairie, Lacassine, Shell Keys, Bayou Teche, Delta, Breton, Bayou Sauvage, Big Branch Marsh, and Mandalay. The Louisiana Department of Wildlife and Fisheries operates 17 refuges, preserves, and wildlife

management areas in coastal Louisiana, comprising more than 572,000 acres. Coastal wetlands make up the vast majority of those Federal and State wildlife areas.

## FUTURE WITHOUT-PROJECT FISH AND WILDLIFE RESOURCES

Under the No Action Plan, more than 462,000 additional wetland acres would be lost by year 50 (Table 2). Habitat distribution would continue shifting toward more brackish and saline wetlands and open water as more salt-sensitive freshwater vegetation is lost. Because of the current degree of risk and uncertainty associated with the salinity/habitat type projection methodologies, however, the data in Table 2 do not reflect this anticipated trend. Associated with the projected wetland losses, corresponding decreases in habitat values for fish and wildlife that use those wetlands would also occur.

## ALTERNATIVE PLAN DESCRIPTIONS

Within in each Subprovince, individual restoration projects were grouped to provide varying levels of wetland loss reduction. *Reduce* alternatives were developed to reduce existing loss rates by 50 percent. *Maintain* alternatives were developed to achieve no net wetland loss, and *Enhance* alternatives were developed to produce net wetland gains equal to half the annual net wetland loss. Subprovince alternatives were grouped into the coastwide alternative action plans shown in Table 3.

### **Subprovince 1**

Restoration features of the Maintain 2 (M2) Alternative are as follows: 1) install a 5,000 cubic foot per second (cfs) diversion into the Maurepas Swamp at Convent/Blind River; 2) install a 1,000 cfs diversion into the Maurepas Swamp at Hope Canal; 3) install a 10,000 cfs diversion into the Breton Sound Basin at White's Ditch; 4) install a 110,000 cfs diversion with sediment enrichment into the Breton Sound Basin at American/California Bay; 5) install a 12,000 cfs diversion at Bayou Lamoque; and, 6) install the Seabrook salinity control structure.

Restoration features of the Modified Maintain 2 (M2 modified) Alternative are as follows: 1) install a 5,000 cubic foot per second (cfs) diversion into the Maurepas Swamp at Convent/Blind River; 2) install a 1,000 cfs diversion into the Maurepas Swamp at Hope Canal; 3) install a 10,000 cfs diversion into the Breton Sound Basin at White's Ditch; 4) install a 110,000 cfs diversion with sediment enrichment into the Breton Sound Basin at American/California Bay; 5) install a 12,000 cfs diversion at Bayou Lamoque; 6) install the Seabrook salinity control structure; 7) optimize operation of the Caernarvon Freshwater Diversion Project to optimize marsh creation; 8) opportunistically use the Bonnet Carre Spillway to introduce additional Mississippi River flows into the Pontchartrain Basin; 9) gap the Amite River Diversion Canal spoil banks; 9) restore the Labranche wetlands through delivery of Mississippi River sediment; 10) rehabilitate and operate the Violet Siphon; 11) evaluate the potential diversion of fresh water

from the Mississippi River through the Inner Harbor Navigation Canal into St. Bernard Parish wetlands; and, 12) nourish the Lake Pontchartrain land bridge marshes.

**Table 2. Wetland type acreages, under the No Action Plan by Subprovince and coastwide**

Subprovince 1					Subprovince 2			
Wetland Type	TY0 (acres)	TY50 (acres)	Acreage change	Percent change	TY0 (acres)	TY50 (acres)	Acreage change	Percent change
Swamp	353,904	327,350	-26,554	-7.5	294,397	282,291	-12,106	-4.1
Fresh marsh	71,279	207,760	136,481	191.5	180,876	244,994	64,117	35.4
Intermediate marsh	160,752	98,156	-62,596	-38.9	85,267	488	-84,779	-99.4
Brackish marsh	180,441	142,972	-37,469	-20.8	65,338	52,168	-13,170	-20.2
Saline marsh	113,149	54,802	-58,348	-51.6	117,809	0	-117,809	-100.0
Total wetlands	879,525	831,040	-48,486	-5.5	743,687	579,940	-163,747	-22.0
Subprovince 3					Subprovince 4			
Wetland Type	TY0 (acres)	TY50 (acres)	Acreage change	Percent change	TY0 (acres)	TY50 (acres)	Acreage change	Percent change
Swamp	388,811	337,828	-50,983	-13.1	3,674	2,239	-1,435	-39.1
Fresh marsh	341,733	33,294	-308,439	-90.3	346,923	312,800	-34,123	-9.8
Intermediate marsh	193,569	619,079	425,510	219.8	284,702	238,517	-46,184	-16.2
Brackish marsh	201,216	40,046	-161,170	-80.1	137,529	202,292	64,763	47.1
Saline marsh	113,513	5,355	-108,158	-95.3	30,307	0	-30,307	-100.0
Total wetlands	1,238,841	1,035,601	-203,240	-16.4	803,134	755,848	-47,286	-5.9
Coastwide								
Wetland Type	TY0 (acres)	TY50 (acres)	Acreage change	Percent change				
Swamp	1,040,785	949,707	-91,078	-8.8				
Fresh marsh	940,811	798,847	-141,964	-15.1				
Intermediate marsh	724,289	956,240	231,951	32.0				
Brackish marsh	584,524	437,477	-147,046	-25.2				
Saline marsh	374,778	60,157	-314,622	-83.9				
Total wetlands	3,665,188	3,202,429	-462,759	-12.6				

Restoration features of the Enhance 1 (E1) Alternative are as follows: 1) install a 5,000 cubic foot per second (cfs) diversion into the Maurepas Swamp at Convent/Blind River; 2) install a 10,000 cfs diversion into Lake Pontchartrain at the Bonnet Carre Spillway; 3) re-create marshes near the junction of the the Mississippi River Gulf Outlet and the GIWW through delivery of Mississippi River sediment; 4) re-create marsh in the Labranche wetlands through delivery of Mississippi River sediment; 5) re-create marsh adjacent to the Mississippi River Gulf Outlet near Violet Canal through delivery of Mississippi River sediment; 6) install a 10,000 cfs diversion into the Breton Sound Basin at White's Ditch; 7) re-create marsh in the Breton Sound Basin at American/California Bay through delivery of Mississippi River sediment; 8) rebuild marsh in the Quarantine Bay area through delivery of Mississippi River sediment; 9) rebuild marsh in the

Fort St. Phillip area through delivery of Mississippi River sediment; 10) install a 15,000 cfs diversion into the Breton Sound Basin at American/California Bayou; and, 11) install a 15,000 cfs diversion into the Breton Sound Basin at Fort St. Phillip.

**Table 3. Combinations of Subprovince alternatives for the coastwide alternative action plans**

Subprovince Alternatives	Coastwide Alternative Action Plans						
	5110	5610	5410	7610	7410	7002	10130
<b>Subprovince 1</b>							
Maintain 2	X	X	X				
Enhance 1				X	X	X	
Modified Maintain 2							X
<b>Subprovince 2</b>							
Reduce 1	X						
Maintain 1			X		X		
Maintain 3		X		X			
Enhance 3						X	
Modified Reduce 1							X
<b>Subprovince 3</b>							
Reduce 1	X	X	X	X	X		
Maintain 1						X	
Modified Reduce 1							X
<b>Subprovince 4</b>							
Enhance 2	X	X	X	X	X	X	
Modified Enhance 2							X

**Subprovince 2**

Restoration features of the Reduce 1 (R1) Alternative include: 1) install a 5,000 cfs sediment diversion with sediment enrichment at Edgard; 2) install a 5,000 cfs pulsed diversion at Myrtle Grove; 3) install a 60,000 cfs diversion at Fort Jackson; 4) use dredged material to create wetlands near Bayou L’Ours and the area north of Fourchon; and, 5) rebuild the barrier islands to a 3,000-foot-width using material dredged offshore.

Restoration features of the Modified Reduce 1 (R1 modified) Alternative include: 1) install a 1,000 cfs diversion at Des Allemands; 2) install a 1,000 cfs diversion at Donaldsonville; 3) install a 1,000 cfs diversion at Pikes Peak; 4) install a 1,000 cfs diversion at Edgard; 5) install a 5,000 cfs diversion at Myrtle Grove with sediment enrichment; 6) install a 60,000 cfs diversion

at Boothville with sediment enrichment; 7) rebuild the barrier islands to a 3,000-foot-width using material dredged offshore; 8) re-authorize Davis Pond Freshwater Diversion Project operation to flow at 5,000 cfs and build marsh; and, 9) use dredged material to create wetlands near Bayou L'Ours and the area north of Fourchon.

Restoration features of the Maintain 1 (M1) Alternative include: 1) install a 5,000 cfs diversion at Des Allemands with sediment enrichment; 2) rebuild Myrtle Grove area marshes through delivery of Mississippi River sediment; 3) install a 5,000 cfs diversion at Myrtle Grove; 4) rebuild the barrier islands to a 3,000-foot-width using material dredged offshore; 5) install a 60,000 cfs diversion at Fort Jackson; 6) build marsh near Empire through delivery of Mississippi River sediment; 7) build marsh near Bastion Bay through delivery of Mississippi River sediment; 8) build marsh near Head of Passes through delivery of Mississippi River sediment; and, 9) use dredged material to re-create wetlands near Bayou L'Ours and the area north of Fourchon.

Restoration features of the Maintain 3 (M3) Alternative include: 1) install a 1,000 cfs diversion at Des Allemands; 2) install a 1,000 cfs diversion at Donaldsonville; 3) install a 1,000 cfs diversion at Pikes Peak; 4) install a 1,000 cfs diversion at Edgard; 5) install a 75,000 cfs pulsed diversion at Myrtle Grove with sediment enrichment; 6) install a 60,000 cfs diversion at Fort Jackson; and, 7) rebuild the barrier islands to a 3,000-foot-width using material dredged offshore.

Restoration features of the Enhance 3 (E3) Alternative include: 1) install a 5,000 cfs diversion at Des Allemands with sediment enrichment; 2) use dredged material to rebuild wetlands near Bayou L'Ours and the area north of Fourchon; 3) install a 120,000 cfs diversion at Bayou Lafourche (Mississippi River Third Delta); 4) install a 90,000 cfs diversion at Fort Jackson with sediment enrichment; 5) relocate the Deep Draft Navigation Channel from Southwest Pass; and, 6) rebuild the barrier islands to a 3,000-foot-width using material dredged offshore.

### **Subprovince 3**

Features of the Reduce 1 (R1) Alternative are as follows: 1) install a 1,000 cfs pump at Bayou Lafourche to deliver additional Mississippi River inflows; 2) implement features to convey additional Atchafalaya River water to the eastern Terrebonne Basin marshes; 3) increase Atchafalaya River inflows into tidal marshes via Blue Hammock Bayou; 4) increase freshwater flows to marshes south of Lake DeCade; 5) implement the Penchant Basin Hydrologic Restoration Plan; 6) relocate the Atchafalaya Bay navigation channel to Shell Island Pass; 7) increase sediment transport down the Wax Lake Outlet for delta-building purposes; 8) modify the Old River Control Structure operational scheme to increase downstream sediment transport for improved building and maintenance of coastal wetlands; 9) implement multi-purpose operation of the Houma Navigation Canal Lock to better distribute freshwater inflows; 10) rebuild the historic reef from Pointe au Fer Island to Eugene Island; and, 11) maintain the landbridge between Bayou Dularge and Bayou Grand Caillou.

Features of the Modified Reduce 1 (R1 modified) Alternative include: 1) install a 1,000 cfs pump at Bayou Lafourche to deliver additional Mississippi River inflows; 2) implement features to convey additional Atchafalaya River water to the eastern Terrebonne Basin marshes; 3) increase Atchafalaya River inflows into tidal marshes via Blue Hammock Bayou; 4) implement the

Penchant Basin Hydrologic Restoration Plan; 5) relocate the Atchafalaya Bay navigation channel to Shell Island Pass; 6) increase sediment transport down the Wax Lake Outlet for delta-building purposes; 7) modify the Old River Control Structure operational scheme to increase downstream sediment transport for improved building and maintenance of coastal wetlands; 8) implement multi-purpose operation of the Houma Navigation Canal Lock to better distribute freshwater inflows; 9) maintain the northern shoreline of East Cote Blanche Bay; 10) restore the Pointe Chevreuil reef; 11) restore the Isle Dernieres-Timbalier Island complex; 12) restore and maintain the landbridge between Caillou Lake and the Gulf; 13) armor the Gulf shoreline at Pointe au Fer Island; and, 14) maintain the landbridge between Bayou Dularge and Bayou Grand Caillou.

Features of the Maintain 1 (M1) Alternative are as follows: 1) implement the Mississippi River Third Delta (120,000 cfs diversion); 2) install a 1,000 cfs pump at Bayou Lafourche to deliver additional Mississippi River inflows; 3) implement features to convey additional Atchafalaya River water to the eastern Terrebonne Basin marshes; 4) increase Atchafalaya River inflows into tidal marshes via Blue Hammock Bayou; 5) implement the Penchant Basin Hydrologic Restoration Plan; 6) relocate the Atchafalaya Bay navigation channel to Shell Island Pass; 7) increase sediment transport down the Wax Lake Outlet for delta-building purposes; 8) modify the Old River Control Structure operational scheme to increase downstream sediment transport for improved building and maintenance of coastal wetlands; 9) implement a multi-purpose operation of the Houma Navigation Canal Lock to better distribute freshwater inflows; 10) maintain the northern shoreline of East Cote Blanche Bay; 11) restore the Pointe Chevreuil reef; 12) restore the Isle Dernieres-Timbalier Island complex; 13) restore and maintain the landbridge between Caillou Lake and the Gulf; 14) armor the Gulf shoreline at Pointe au Fer Island; 15) maintain the landbridge between Bayou Dularge and Bayou Grand Caillou; 16) rebuild the historic reef from Pointe au Fer Island to Eugene Island; 17) construct a segmented reef/breakwater from Eugene Island to Marsh Island; 18) increase Atchafalaya River inflows into marshes south of Lake DeCade; 19) stabilize the banks of Southwest Pass; 20) rehabilitate the northern shorelines of Terrebonne/Timbalier Bays; 21) backfill pipeline canals south of Catfish Lake; and, 22) maintain the Timbalier land bridge in the upper salt marsh zone.

#### **Subprovince 4**

Features of the Enhance 2 (E2) Alternative include: 1) install salinity control structures at Oyster Bayou, Long Point Bayou, Black Lake Bayou, Alkali Ditch, Black Bayou, and the Highway 82 Causeway; 2) modify the existing Cameron-Creole Watershed Project structures to improve water-level and salinity management; 3) implement the East Sabine Lake Hydrologic Restoration Project; 4) introduce fresh water from the Lakes Subbasin at Pecan Island, Rollover Bayou, Highway 82, Little Pecan Bayou, and South Grand Chenier; 5) install shoreline stabilization measures along the Gulf at Rockefeller Refuge; 6) beneficially use dredged material along the Calcasieu Ship Channel; 7) install a new lock in the GIWW east of the Alkali Ditch; and, 8) conduct dedicated dredging for marsh restoration.

Features of the Modified Enhance 2 (E2 modified) Alternative include: 1) install salinity control structures at Oyster Bayou, Long Point Bayou, Black Lake Bayou, Alkali Ditch, Black Bayou, and the Highway 82 Causeway; 2) modify the existing Cameron-Creole Watershed Project structures to improve water-level and salinity management; 3) implement the East Sabine Lake

Hydrologic Restoration Project; 4) introduce fresh water from the Lakes Subbasin at Pecan Island, Rollover Bayou, Highway 82, Little Pecan Bayou, and South Grand Chenier; 5) install shoreline stabilization measures along the Gulf shoreline at Rockefeller Refuge; 6) beneficially use dredged material along the Calcasieu Ship Channel; and, 7) implement the Black Bayou Bypass Culverts Project.

## EVALUATION OF ALTERNATIVE PLANS

### **Subprovince 1**

Under the No Action Plan, wetland loss in Subprovince 1 would continue, with more than -48,000 acres being lost by year 50 (Table 2). Compared to the present total wetland acreage (879,525 acres), each of the alternative action plans would produce net wetland acreage gains throughout the 50-year evaluation period (Table 4). Compared to the No Action Plan, Plan 10130 would result in the greatest wetland gain, i.e., nearly 167,000 acres over 50 years. The least gain (75,000 acres) would occur under Plans 7002, 7410, and 7610. Plans 5110, 5410, and 5610, would result in gains of 102,000 acres over 50 years when compared to the No Action Plan. Freshwater diversions (i.e., introduction of Mississippi River water) associated with each action alternative would increase fresh and intermediate marsh acreages, compared to the No Action Plan under which the acreage of all habitat types would decrease between years 10 and 50. The proposed river diversions into brackish and/or saline marsh areas (at White’s Ditch, American/California Bay, and Bayou Lamoque) would result in greater amounts of fresh and intermediate marsh at the expense of brackish and saline marsh, compared to the No Action Plan.

The above-referenced habitat type acreage projections will likely change as the locations, designs, and operation of project features are refined during the post-authorization planning and design process. Projected habitat acreages may also change as current habitat-change methodologies (and their associated the levels of risk and uncertainty) are refined in the future.

**Table 4. Wetland acres at year 50, by type, for alternative plans in Subprovince 1**

Wetland Type	No Action (acres)	Plan 5110 (acres)	Plan 5410 (acres)	Plan 5610 (acres)	Plan 7002 (acres)	Plan 7410 (acres)	Plan 7610 (acres)	Plan 10130 (acres)
Swamp	327,350	329,188	329,188	329,188	334,919	334,919	334,919	315,646
Fresh marsh	207,760	261,793	261,793	261,793	239,772	239,772	239,772	300,482
Intermediate marsh	98,156	225,541	225,541	225,541	117,269	117,269	117,269	269,920
Brackish marsh	142,972	62,772	62,772	62,772	104,187	104,187	104,187	60,190
Saline marsh	54,802	53,770	53,770	53,770	110,133	110,133	110,133	51,558
<b>Total wetlands</b>	<b>831,040</b>	<b>933,064</b>	<b>933,064</b>	<b>933,064</b>	<b>906,280</b>	<b>906,280</b>	<b>906,280</b>	<b>997,796</b>

**Table 5. Wetland type difference (percent) at year 50, between the No Action Plan and alternative action plans in Subprovince 1**

Wetland Type	No Action (% diff)	Plan 5110 (% diff)	Plan 5410 (% diff)	Plan 5610 (% diff)	Plan 7002 (% diff)	Plan 7410 (% diff)	Plan 7610 (% diff)	Plan 10130 (% diff)
Swamp	0.0	0.6	0.6	0.6	2.3	2.3	2.3	-3.6
Fresh marsh	0.0	26.0	26.0	26.0	15.4	15.4	15.4	44.6
Intermediate marsh	0.0	129.8	129.8	129.8	19.5	19.5	19.5	175.0
Brackish marsh	0.0	-56.1	-56.1	-56.1	-27.1	-27.1	-27.1	-57.9
Saline marsh	0.0	-1.9	-1.9	-1.9	101.0	101.0	101.0	-5.9
<b>Total wetlands</b>	<b>0.0</b>	<b>12.3</b>	<b>12.3</b>	<b>12.3</b>	<b>9.1</b>	<b>9.1</b>	<b>9.1</b>	<b>20.1</b>

Of the five wildlife species evaluated, mink, American alligator, and dabbling ducks would benefit from each of the proposed action alternatives (Table 6). Benefits to American alligator and dabbling ducks, which prefer fresh and intermediate marsh habitats, would be greatest under Plan 10130 (with 22.2 and 11.7 percent AAHU increases, respectively). Mink, which prefer swamp, fresh marsh and intermediate marsh, would receive benefits ranging from a 1.7 to 5.7 percent AAHU increase, depending on the action plan implemented. The river otter prefers brackish marsh, but swamp, fresh marsh, and intermediate marsh also provide desirable habitat for that species. The negative effects of the projected decreases in brackish marsh acreage under all the action plans would, in some cases, be offset by projected increases in swamp, fresh, and intermediate marshes. Consequently, habitat value for river otters would increase 2.5 percent for Plans 5110, 5410, and 5610, and 5.5 percent for Plan 10130; however, river otter habitat value would be slightly reduced (-0.8 percent) under Plans 7002, 7410, and 7610. Brackish marsh is considered the muskrat's preferred habitat and has a much higher habitat value for that species than do fresh and intermediate marshes. Due to the anticipated decline in brackish marsh acreage, a net decrease in muskrat AAHUs ranging from -12.6 to -21.3 percent is projected under FWP conditions, depending on the alternative.

Over the 50-year analysis period, all five fish and shellfish species evaluated would be adversely affected by every action plan (Table 6), except for a slight white shrimp habitat value increase (0.1 percent) under Plan 10130. Atlantic croaker and white shrimp, which typically utilize low-salinity habitats as juveniles and more brackish habitats as subadults and adults, would experience the least impacts to habitat value under the action plans (-0.2 to -9.1 percent). Gulf menhaden also utilize low-salinity habitats, but they would experience a moderate habitat value (AAHU) decrease ranging from -15.8 to -20.3 percent, compared to the No Action Plan. In response to the reduced acreage of their preferred brackish habitats under the FWP alternatives, spotted seatrout and brown shrimp would experience habitat value decreases ranging from -18.3 to -29.5 percent, over the 50 year period.

**Table 6. Comparison of year 50 net AAHU differences (percent) between the No Action Plan and action alternatives for selected fish and wildlife species in Subprovince 1**

Evaluation Species	Plan 5110	Plan 5410	Plan 5610	Plan 7002	Plan 7410	Plan 7610	Plan 10130
Mink	4.3	4.3	4.3	1.7	1.7	1.7	5.7
Otter	2.5	2.5	2.5	-0.8	-0.8	-0.8	5.5
Muskrat	-21.3	-21.3	-21.3	-12.6	-12.6	-12.6	-19.7
Alligator	14.5	14.5	14.5	2.2	2.2	2.2	22.2
Ducks	6.7	6.7	6.7	1.4	1.4	1.4	11.7
Croaker	-5.9	-5.9	-5.9	-8.4	-8.4	-8.4	-0.2
Menhaden	-20.3	-20.3	-20.3	-15.8	-15.8	-15.8	-16.8
Spotted seatrout	-29.5	-29.5	-29.5	-20.0	-20.0	-20.0	-27.6
White shrimp	-5.8	-5.8	-5.8	-9.1	-9.1	-9.1	0.1
Brown shrimp	-26.7	-26.7	-26.7	-18.3	-18.3	-18.3	-24.7

## **Subprovince 2**

Under the No Action Plan, more than -163,000 acres of wetlands would be lost in Subprovince 2 over the 50-year planning horizon (Table 2). Action Plans 5610, 7002, and 7610 would result in more total wetland acres, after 50 years, than the present Subprovince 2 total of 743,687 acres (Table 7). Compared to the present wetland acreage, Plan 7002 would produce the greatest net wetland gain, i.e., nearly 44,000 acres (over 50 years). Similarly, Plans 5410 and 7410 would reduce the future wetland losses to approximately -13,000 acres over 50 years, and Plans 5110 and 10130 would reduce future wetland losses to -59,000 acres at the end of the 50-year evaluation period. At year 50, the action plan alternatives would produce net wetland increases ranging from 104,000 to 207,000 acres when compared to the No Action Plan.

The No Action Plan used for this analysis does not include the Davis Pond Freshwater Diversion Project, which is now being operated in an interim manner following construction completion in early 2002. The Service believes that the current LCA modeling analysis for the No Action Plan, which included the Davis Pond Diversion, does not currently project the likely distribution of wetland types in Subprovince 2 under No Action conditions with a reasonable degree of accuracy or confidence.

Proposed action plan features to introduce fresh water from the Mississippi River would shift habitat types toward lower-salinity conditions in Subprovince 2, compared to the No Action Plan. River diversions at Myrtle Grove and Fort Jackson would produce greater amounts of fresh and intermediate marsh, at the expense of brackish marsh and open water acreage. Those diversions, with their associated sediment enrichment, would also restore/establish several thousand acres of wetlands. The Service is not confident that the current habitat change projections, which indicate that brackish and saline marsh would not exist beyond year 10 under some action plans, are accurate. Future refinement of the habitat change model and associated methodologies will likely result in revisions to those habitat acreage projections.

**Table 7. Wetland acres at year 50, by type, for alternative plans in Subprovince 2**

Wetland Type	No Action (acres)	Plan 5110 (acres)	Plan 5410 (acres)	Plan 5610 (acres)	Plan 7002 (acres)	Plan 7410 (acres)	Plan 7610 (acres)	Plan 10130 (acres)
Swamp	282,291	270,386	265,991	249,174	231,943	265,991	249,174	270,386
Fresh marsh	244,994	352,130	396,585	513,345	487,736	396,585	513,345	352,130
Intermediate marsh	488	61,949	68,156	19,283	67,973	68,156	19,283	61,949
Brackish marsh	52,168	0	0	0	0	0	0	0
Saline marsh	0	0	0	0	0	0	0	0
<b>Total wetlands</b>	<b>579,940</b>	<b>684,465</b>	<b>730,732</b>	<b>781,801</b>	<b>787,652</b>	<b>730,732</b>	<b>781,801</b>	<b>684,465</b>

**Table 8. Wetland type difference (percent) at year 50, between the No Action Plan and alternative action plans in Subprovince 2**

Wetland Type	No Action (% diff)	Plan 5110 (% diff)	Plan 5410 (% diff)	Plan 5610 (% diff)	Plan 7002 (% diff)	Plan 7410 (% diff)	Plan 7610 (% diff)	Plan 10130 (% diff)
Swamp	0.0	-4.2	-5.8	-11.7	-17.8	-5.8	-11.7	-4.2
Fresh marsh	0.0	43.7	61.9	109.5	99.1	61.9	109.5	43.7
Intermediate marsh	0.0	12,606.2	13,879.3	3,855.0	13,841.8	13,879.3	3,855.0	12,606.2
Brackish marsh	0.0	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0
Saline marsh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>All wetlands</b>	<b>0.0</b>	<b>18.0</b>	<b>26.0</b>	<b>34.8</b>	<b>35.8</b>	<b>26.0</b>	<b>34.8</b>	<b>18.0</b>

Except for muskrat, each of the wildlife species evaluated would benefit from implementation of the proposed plans (Table 9). Because of large increases in their preferred fresh and intermediate marsh habitats, the American alligator and dabbling ducks would benefit the most, with over 20 percent increases in habitat value (AAHUs) under several of the proposed plans. Mink, which prefer swamp and fresh marsh, would also benefit from the projected increase in those wetland types, experiencing a 4.4 to 8.2 percent increase in habitat value. The river otter prefers brackish marsh, but swamp, fresh marsh, and intermediate marsh also provide desirable habitat for that species. Although brackish marsh habitats are projected to be lost under the action alternatives, the projected increase in swamp and fresh and intermediate marshes would offset the decline of the otter's preferred habitat. Brackish marsh is preferred muskrat habitat and has a much higher value for that species than do fresh and intermediate marshes. The projected loss of brackish marsh under the action alternatives, compared to the No Action Plan, would result in a -7.9 percent decrease in muskrat habitat value under Plans 5110 and 10130, and a -4.6 percent decrease under Plans 5410 and 7410. Plans 5610, 7002, and 7610 would provide small increases in muskrat habitat value over the 50-year period.

The proposed action plans would generally increase habitat value for the fish and shellfish species evaluated (Table 9). However, brown shrimp, which prefer brackish marshes, would experience small AAHU decreases of -2.2 to -4.4 percent under the various action plans. Spotted seatrout, which also prefer more saline habitats, would experience slight habitat value decreases under Plans 5110 and 10130. Atlantic croaker, Gulf menhaden, and white shrimp, which typically utilize low-salinity habitats as juveniles and more-brackish habitats as subadults and adults, would receive the greatest benefits (AAHU increases of 22.6 percent, 14.5 percent, and 23.4 percent, respectively) under Plan 7002.

**Table 9. Comparison of year 50 net AAHU differences (percent) between the No Action Plan and action alternatives for selected fish and wildlife species in Subprovince 2**

Evaluation Species	Plan 5110	Plan 5410	Plan 5610	Plan 7002	Plan 7410	Plan 7610	Plan 10130
Mink	4.4	6.3	8.2	6.6	6.3	8.2	4.4
Otter	3.0	5.5	5.7	7.1	5.5	5.7	3.0
Muskrat	-7.9	-4.6	1.7	1.4	-4.6	1.7	-7.9
Alligator	16.2	21.6	23.6	29.1	21.6	23.6	16.2
Ducks	11.0	15.7	23.1	22.8	15.7	23.1	11.0
Croaker	9.1	14.3	16.0	22.6	14.3	16.0	9.1
Menhaden	4.8	8.6	9.8	14.5	8.6	9.8	4.8
Spotted seatrout	-1.6	1.3	2.3	6.0	1.3	2.3	-1.6
White shrimp	10.8	15.8	15.4	23.4	15.8	15.4	10.8
Brown shrimp	-4.4	-2.2	-3.2	1.0	-2.2	-3.2	-4.4

### **Subprovince 3**

At year 50, wetland losses under the No Action Plan (more than -203,000 acres) would be greater in Subprovince 3 than in any other Subprovince (Table 2). Of the proposed action plans, only Plan 7002 would reverse wetland loss in that Subprovince and provide a net wetland gain (compared to current wetland acreage) of nearly 52,000 acres (Table 10). The remaining plans would reduce future wetland losses to approximately -84,000 acres over the 50-year analysis period, and compared to the year 50 total wetland acreage under the No Action Plan, they would save more than 119,000 wetland acres.

According to model projections, the action plans would save substantially more fresh marsh than would the No Action Plan. This would be achieved through enhancing marsh-building processes in the Atchafalaya and Wax Lake Deltas by relocation of the navigation channel and by sediment enrichment of the Wax Lake Outlet. The Penchant Basin Restoration Plan would improve the health and productivity of floating freshwater marshes in the western Terrebonne Basin, and would deliver greater volumes of fresh water, sediments, and nutrients to the marshes south of the Penchant Basin. Increased conveyance of Atchafalaya River flows to the eastern Terrebonne Basin would improve productivity and reduce marsh loss in areas where marine processes are advancing inland. Compared to the No Action Plan at year 50, all the action plans, except Plan 7002, would result in nearly a 20 percent reduction in brackish marsh acreage; however, Plan 7002 would result in nearly a 400 percent increase in brackish marsh. Similarly, saline marsh would be increased by more than 200 percent (except under Plan 7002 in which all saline marsh would be converted to other habitat types), and swamp would decrease by nearly -4 percent (Table 11).

**Table 10. Wetland acres at year 50, by type, for alternative plans in Subprovince 3**

Wetland Type	No Action (acres)	Plan 5110 (acres)	Plan 5410 (acres)	Plan 5610 (acres)	Plan 7002 (acres)	Plan 7410 (acres)	Plan 7610 (acres)	Plan 10130 (acres)
Swamp	337,828	325,335	325,335	325,335	321,614	325,335	325,335	325,335
Fresh marsh	33,294	175,592	175,592	175,592	240,836	175,592	175,592	175,592
Intermediate marsh	619,079	605,659	605,659	605,659	531,250	605,659	605,659	605,659
Brackish marsh	40,046	32,088	32,088	32,088	197,028	32,088	32,088	32,088
Saline marsh	5,355	16,490	16,490	16,490	0	16,490	16,490	16,490
<b>Total wetlands</b>	<b>1,035,601</b>	<b>1,155,164</b>	<b>1,155,164</b>	<b>1,155,164</b>	<b>1,290,729</b>	<b>1,155,164</b>	<b>1,155,164</b>	<b>1,155,164</b>

**Table 11. Wetland type difference (percent) at year 50, between the No Action Plan and alternative action plans in Subprovince 3**

Wetland Type	No Action (% diff)	Plan 5110 (% diff)	Plan 5410 (% diff)	Plan 5610 (% diff)	Plan 7002 (% diff)	Plan 7410 (% diff)	Plan 7610 (% diff)	Plan 10130 (% diff)
Swamp	0.0	-3.7	-3.7	-3.7	-4.8	-3.7	-3.7	-3.7
Fresh marsh	0.0	427.4	427.4	427.4	623.4	427.4	427.4	427.4
Intermediate marsh	0.0	-2.2	-2.2	-2.2	-14.2	-2.2	-2.2	-2.2
Brackish marsh	0.0	-19.9	-19.9	-19.9	392.0	-19.9	-19.9	-19.9
Saline marsh	0.0	207.9	207.9	207.9	-100.0	207.9	207.9	207.9
<b>Total wetlands</b>	<b>0.0</b>	<b>11.5</b>	<b>11.5</b>	<b>11.5</b>	<b>24.6</b>	<b>11.5</b>	<b>11.5</b>	<b>11.5</b>

Each of the five wildlife species evaluated would benefit from implementation of the proposed action plans (Table 12). Benefits to wildlife species evaluated are identical across all action plans, except Plan 7002. Compared to the No Action Plan, Plan 7002 would provide the greatest habitat value increases for all evaluation species than would the other action plans. Among all five plans, otter would be benefitted the least and American alligator and dabbling ducks would be benefitted the most.

Each of the five fish/shellfish species evaluated would benefit from implementation of the proposed action plans (Table 12). Benefits to the fish/shellfish species evaluated are identical across all action plans, except for Plan 7002. As with the evaluated wildlife species, Plan 7002 would also provide much greater habitat value increases among the fisheries species than would the other action plans. Spotted seatrout, white shrimp, and brown shrimp, would benefit the most under Plan 7002, with 17.5 percent, 17.5 percent, and 18.9 percent AAHU increases, respectively.

**Table 12. Comparison of year 50 net AAHU differences (percent) between the No Action Plan and action alternatives for selected fish and wildlife species in Subprovince 3**

Evaluation Species	Plan 5110	Plan 5410	Plan 5610	Plan 7002	Plan 7410	Plan 7610	Plan 10130
Mink	3.2	3.2	3.2	6.6	3.2	3.2	3.2
Otter	2.1	2.1	2.1	11.5	2.1	2.1	2.1
Muskrat	4.9	4.9	4.9	37.3	4.9	4.9	4.9
Alligator	4.9	4.9	4.9	37.3	4.9	4.9	4.9
Ducks	7.4	7.4	7.4	14.8	7.4	7.4	7.4
Croaker	4.0	4.0	4.0	14.7	4.0	4.0	4.0
Menhaden	4.2	4.2	4.2	14.4	4.2	4.2	4.2
Spotted seatrout	4.0	4.0	4.0	17.5	4.0	4.0	4.0
White shrimp	4.0	4.0	4.0	17.5	4.0	4.0	4.0
Brown shrimp	2.5	2.5	2.5	18.9	2.5	2.5	2.5

#### **Subprovince 4**

Under the No Action Plan, Subprovince 4 would lose more than -47,000 acres over the 50-year evaluation period (Table 2). Each of the action plans would produce the same result, reducing those future losses to slightly more than -8,000 acres, and at year 50, and they would save more than 39,000 acres compared to the No Action Plan (Table 13).

The action plans, which utilize perimeter (structural) salinity control and small freshwater introduction measures, would reduce the encroachment of marine processes and protect fresh and intermediate marshes throughout Subprovince 4. Under those plans, fresh and intermediate marsh acreage would experience a net increase, while brackish marsh would decrease (Table 14).

**Table 13. Wetland acres at year 50, by type, for alternative plans in Subprovince 4**

Wetland Type	No Action (acres)	Plan 5110 (acres)	Plan 5410 (acres)	Plan 5610 (acres)	Plan 7002 (acres)	Plan 7410 (acres)	Plan 7610 (acres)	Plan 10130 (acres)
Swamp	2,239	2,311	2,311	2,311	2,311	2,311	2,311	2,311
Fresh marsh	312,800	326,685	326,685	326,685	326,685	326,685	326,685	326,685
Intermediate marsh	238,517	310,088	310,088	310,088	310,088	310,088	310,088	310,088
Brackish marsh	202,292	155,884	155,884	155,884	155,884	155,884	155,884	155,884
Saline marsh	0	0	0	0	0	0	0	0
<b>Total wetlands</b>	<b>755,848</b>	<b>794,968</b>						

**Table 14. Wetland type difference (percent) at year 50, between the No Action Plan and alternative action plans in Subprovince 4**

Wetland Type	No Action (% diff)	Plan 5110 (% diff)	Plan 5410 (% diff)	Plan 5610 (% diff)	Plan 7002 (% diff)	Plan 7410 (% diff)	Plan 7610 (% diff)	Plan 10130 (% diff)
Swamp	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Fresh marsh	0.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Intermediate marsh	0.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Brackish marsh	0.0	-22.9	-22.9	-22.9	-22.9	-22.9	-22.9	-22.9
Saline marsh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total wetlands</b>	<b>0.0</b>	<b>5.2</b>						

Compared to the No Action Plan, each of the action plans would produce the same results in terms of impacts to evaluated wildlife species. Mink and American alligator would receive the greatest benefits, experiencing AAHU increases of 3.0 percent, and 4.9 percent, respectively (Table 15). River otter would receive only a 0.7 percent AAHU increase compared to the No Action Plan. Because of anticipated plan-induced decreases in its preferred brackish marsh habitat, muskrat would experience a -6.4 percent AAHU decrease.

Each action plan would have the same effect on the evaluated fishery species (Table 15). Gulf menhaden would receive the negligible benefit of a 0.6 percent AAHU increase under the action plans. Of the evaluated species, Atlantic croaker and white shrimp would receive the greatest benefits, with AAHU increases of 1.5 percent and 2.6 percent, respectively (Table 15). Those benefits are largely attributable to increases in fresh and intermediate marsh under this alternative. Gains in fresh and intermediate marsh would not compensate for the loss of preferred brackish marsh habitat used by species such as spotted seatrout and brown shrimp; thus, those species would experience small decreases in AAHUs of -2.0 percent and -2.7 percent, respectively, over the 50-year analysis period.

**Table 15. Comparison of year 50 net AAHU differences (percent) between the No Action Plan and action alternatives for selected fish and wildlife species in Subprovince 4**

Evaluation Species	Plan 5110	Plan 5410	Plan 5610	Plan 7002	Plan 7410	Plan 7610	Plan 10130
Mink	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Otter	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Muskrat	-6.4	-6.4	-6.4	-6.4	-6.4	-6.4	-6.4
Alligator	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Ducks	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Croaker	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Menhaden	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Spotted seatrout	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
White shrimp	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Brown shrimp	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7

## Coastwide Benefits Summary

Under the No Action Plan, a net loss of -463,000 acres would occur by year 50, even with projected gains in the Atchafalaya River Delta (Table 2). When the alternative action plans are compared against the No Action Plan at year 50, they would provide a net wetlands saving ranging from 365,000 acres under Plan 5110, to over 577,000 acres under Plan 7002 (Table 16). Compared to the today's coastwide wetland acreage of 3,665,188, however, only Plan 7002 would produce a net wetland gain, and Plan 5610 would roughly maintain the present wetland acreage over the 50-year evaluation period. Compared to the No Action Plan, the action plans would, over 50 years, also result in a substantial percentage increase in fresh marsh, a moderate increase in intermediate marsh, a substantial reduction in brackish marsh, a small gain in saline marsh, and a slight decrease in swamp (Table 17).

**Table 16. Coastwide wetland acreage at year 50, by type, for alternative plans**

Wetland Type	No Action (acres)	Plan 5110 (acres)	Plan 5410 (acres)	Plan 5610 (acres)	Plan 7002 (acres)	Plan 7410 (acres)	Plan 7610 (acres)	Plan 10130 (acres)
Swamp	949,707	927,220	922,826	906,008	890,787	928,557	911,739	913,678
Fresh marsh	798,847	1,116,200	1,160,655	1,277,415	1,295,029	1,138,634	1,255,393	1,154,889
Intermediate marsh	956,240	1,203,237	1,209,444	1,160,571	1,026,580	1,101,172	1,052,299	1,247,616
Brackish marsh	437,477	250,744	250,744	250,744	457,099	292,159	292,159	368,413
Saline marsh	60,157	70,259	70,259	70,259	110,133	126,623	126,623	68,047
<b>Total wetlands</b>	<b>3,202,429</b>	<b>3,567,661</b>	<b>3,613,928</b>	<b>3,664,997</b>	<b>3,779,628</b>	<b>3,600,099</b>	<b>3,638,213</b>	<b>3,632,392</b>

**Table 17. Coastwide wetland type difference (percent) at year 50, between the No Action Plan and alternative action plans**

Wetland Type	No Action (% diff)	Plan 5110 (% diff)	Plan 5410 (% diff)	Plan 5610 (% diff)	Plan 7002 (% diff)	Plan 7410 (% diff)	Plan 7610 (% diff)	Plan 10130 (% diff)
Swamp	0	-2	-3	-5	-6	-2	-4	-4
Fresh marsh	0	40	45	60	62	43	57	45
Intermediate marsh	0	26	26	21	7	15	10	30
Brackish marsh	0	-43	-43	-43	4	-33	-33	-16
Saline marsh	0	17	17	17	83	110	110	13
<b>Total wetlands</b>	<b>0</b>	<b>11</b>	<b>13</b>	<b>14</b>	<b>18</b>	<b>12</b>	<b>14</b>	<b>13</b>

The above habitat type projections are interim values (subject to a considerable degree of risk and uncertainty) and likely will be modified with future improvements in the salinity and/or habitat modeling methodologies. They will likely also be changed to reflect the anticipated phased implementation of the various action plan features over a long period of time.

Coastwide effects on the fish and wildlife evaluation species reflect the acreage changes for the various wetland types. Due to the large increase in their preferred fresh and intermediate marsh habitats, the American alligator and dabbling ducks would be most benefitted (Table 18). Other fish and wildlife species that utilize low-salinity habitats, such as white shrimp, Atlantic croaker, and mink, would also benefit, but to a lesser degree. Gulf menhaden, which utilize low-salinity habitats as juveniles, are projected to experience a coastwide reduction in habitat quality due to

the substantial impacts of the alternative action plans on that species in Subprovince 1. Consistent with the projected decreases in brackish marsh acreage, species which prefer brackish habitats (such as brown shrimp, spotted seatrout, and muskrat), would experience coastwide habitat value decreases.

**Table 18. Coastwide comparison of year 50 AAHU differences (percent) between the No Action Plan and alternative action plans for selected wildlife and fish species**

Evaluation Species	Plan 5110	Plan 5410	Plan 5610	Plan 7002	Plan 7410	Plan 7610	Plan 10130
Mink	14.9	16.8	18.7	17.9	14.2	16.1	16.3
Otter	8.3	10.8	11.0	18.6	7.5	7.7	11.3
Muskrat	-30.6	-27.3	-21.0	19.7	-18.6	-12.4	-29.1
Alligator	40.5	45.9	47.9	73.5	33.6	35.6	48.2
Ducks	27.7	32.4	39.8	41.6	27.2	34.5	32.7
Croaker	8.7	13.8	15.6	30.4	11.4	13.1	14.4
Menhaden	-10.7	-6.9	-5.7	13.7	-2.4	-1.1	-7.1
Spotted seatrout	-29.1	-26.2	-25.2	1.5	-16.7	-15.7	-27.2
White shrimp	11.6	16.6	16.2	34.4	13.4	12.9	17.5
Brown shrimp	-31.3	-29.0	-30.1	-1.1	-20.7	-21.7	-29.3

Plan 7002 is the only action plan alternative of those evaluated that would produce net wetland gains (relative to present baseline wetland acreage); it would also produce the greatest fish and wildlife benefits (in AAHUs), and it would avoid project-related adverse impacts to species of fish and wildlife that prefer brackish marsh. Based solely on fish and wildlife considerations, it is obviously the most beneficial of the evaluated action alternatives. All the action alternatives would, however, to varying degrees restore marsh-building and marsh-maintenance processes through freshwater and sediment inputs, and would substantially reduce or nearly halt (Plan 5610) coastal wetland loss. Hence, implementing any of the proposed action plans would be preferable to the continued loss and degradation of coastal wetlands under the No Action Plan.

Current projections suggest that fish and wildlife species which prefer brackish and saline marsh habitats might be negatively impacted by the freshwater/sediment diversion features included in the proposed action plan alternatives. However, given the rapid loss and likely future collapse of brackish and salt marshes systems under the No Action Plan, we believe that, over the long term, the action plan alternatives would provide a substantial net benefit to those species. Additionally, the Service anticipates that refinements in model-based habitat and salinity projections will ultimately reveal that projected impacts to those brackish marsh fish and wildlife species will be substantially less than presently estimated. Additionally, the Service will recommend, through involvement in subsequent planning and design, that design and operational measures be incorporated into project features to increase their benefits to wetland-associated fish and wildlife and to minimize adverse effects on those resources.

Because of the interim nature (i.e., their current degree of risk and uncertainty) of some habitat change estimates, and because many details regarding the design, operation, and associated effects of the action plans are not yet available, nor has a preferred plan yet been identified, we

cannot complete our evaluation of the preferred plan's effects on fish and wildlife resources, nor can we entirely fulfill our reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act. Therefore, extensive additional Service involvement during subsequent detailed planning, engineering, and design of specific project measures, along with more-definitive project information that will be available during that plan implementation phase, will be required so that we can fulfill our responsibilities under that Act.

The National Wildlife Refuge System Improvement Act of 1997 mandates that no new or expanded use of a NWR may be allowed unless it is first determined to be compatible with the objectives for which that NWR was established and managed. A compatibility determination is a written determination, indicating that a proposed or existing use of a NWR is, or is not, a compatible use. Compatible uses are defined as proposed or existing wildlife-dependent recreational uses or any other uses of a NWR that, based on sound professional judgement, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the NWR. A compatibility determination is only required when the Service has jurisdiction over the use. Prior to initiating implementation of a project that would affect any NWR, the Corps of Engineers should contact the Refuge Manager to determine if the proposed project constitutes a "refuge use" subject to a compatibility determination. To determine the anticipated impacts of any proposed use, the Corps may be required to provide sufficient data and information sources to document any short-term, long-term, direct, indirect or cumulative impacts on refuge resources. Compatibility determinations will include a public review and comment period before issuance of a final decision by the appropriate Refuge Manager.

## FUTURE SERVICE INVOLVEMENT

Because of the LCA's large scope, complexity, and programmatic nature, extensive funding will be required by the Service for full participation throughout future detailed planning and post-authorization engineering and design studies, and to facilitate fulfillment of our reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act. Accordingly, the Service plans to work closely with the Corps and the State of Louisiana to formulate detailed funding estimates to support our continuing and extensive involvement in the LCA.

Under provisions of Section 7 of the Endangered Species Act of 1973, as amended, the Service will also assist the Corps and any other Federal agencies responsible for funding or implementing selected projects and/or plans to ensure that they will not jeopardize the continued existence of threatened and endangered species, or adversely modify any designated critical habitat. The required consultations will be accomplished on a project-by-project basis, and will build upon the programmatic consultation contained in the Programmatic Environmental Impact Statement for the LCA study.

## SUMMARY AND SERVICE POSITION

The Service has actively participated in the formulation and evaluation of the seven action plan alternatives. Given the severe future impacts to coastal wetlands and their associated fish and wildlife resources under the No Action Plan, we would support implementation of any one of the proposed action plans. According to the present interim evaluation results, however, only Plan 7002 would reverse the severe loss of Louisiana's coastal wetlands. It would also provide the greatest level of benefits to Louisiana's nationally significant fish and wildlife resources. Consequently, we currently favor implementation of that plan. However, Plan 7002 includes very expensive and highly complex projects, such as the large-scale diversion of Mississippi River water into the Barataria and Terrebonne Basins known as the "Third Delta;" hence, the benefits associated with that plan may not ultimately be achievable and/or affordable. As Plan 5610 is presently the second-most beneficial plan, we would favor its implementation in lieu of Plan 7002 if the latter is found to be infeasible.

Regardless of the alternative that is ultimately identified for implementation, should the "Third Delta" diversion project not be included, the Service recommends that the Subprovince 3 benefits lost through elimination of that project be replaced to the greatest extent possible through the comprehensive implementation of features and projects designed to maximize Atchafalaya River flows/influence in the Atchafalaya and Terrebonne Basins. The proposed restoration of the reefs extending from Point au Fer Island to the southern end of the Point Chevreuil reef would greatly enhance land-building in the Atchafalaya Delta and increase riverine influences in western Terrebonne Basin marshes. Because that reef restoration project is believed to be one of the most beneficial features of that strategy, the Service recommends that it be made part of any preferred implementation alternative that may be designated in the future. Similarly, the Service recommends the following modifications be incorporated in any plan ultimately selected for implementation:

1. Install a new Calcasieu Lock and use of the old lock for improved management of water levels in the Lakes Subbasin, and for moderating salinity levels in the Calcasieu Basin.
2. Delete the proposed Gulf Intracoastal Lock at the Alkali Ditch, as many of the wetlands intended to be benefitted by that feature have already been lost and others are now protected by other means.
3. Sufficient funding should be provided for full Service participation throughout post-authorization engineering and design studies, and to facilitate fulfillment of its responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act.
4. The Corps should obtain a right-of-way from the Service prior to conducting any work on a National Wildlife Refuge, in conformance with Section 29.21-1, Title 50, Right-of-way Regulations. Issuance of a right-of-way will be contingent on a determination by the Service's Regional Director that the proposed work will be compatible with the purposes for which the Refuge was established.

To ensure that optimum fish and wildlife resource benefits are achieved, the Service plans to remain actively involved throughout the plan implementation process. Our findings and recommendations on the design and operation of projects approved for implementation will be provided under the authority of the Fish and Wildlife Coordination Act.

## LITERATURE CITED

- Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1998. *Coast 2050: toward a sustainable coastal Louisiana*. Baton Rouge, Louisiana. Louisiana Department of Natural Resources. 161pp.
- Louisiana Coastal Wetlands Conservation and Restoration Task Force. 2001. *The 2000 evaluation report to the U.S. Congress on the effectiveness of Louisiana coastal wetland restoration projects*. Baton Rouge, LA. Louisiana Department of Natural Resources. 85 pp.
- Michot, T.C., C.W. Jeske, J.C. Mazourek, W.G. Vermillion, and R.S. Kemmerer. 2003. Final draft. *Atlas and census of wading bird and seabird nesting colonies in south Louisiana, 2001*. BTNEP Publication.
- Turner, R.E. 1977. Intertidal vegetation and commercial yields of penaeid shrimp. *Trans. Am. Fish. Soc.* 106:411-416.
- Turner, R.E. 1982. Wetland losses and coastal fisheries: an enigmatic and economically significant dependency. Pages 112 - 120 *in* Boesch, D.F., ed. 1982. *Proceedings of the conference on coastal erosion and wetland modification in Louisiana: causes, consequences, and options*. U.S. Fish and Wildlife Service, Biological Service Program, Washington, D.C. FWS/OBS-82/59. 256 pp.

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# **APPENDIX B5**

## **Draft U.S. FISH AND WILDLIFE COORDINATION ACT REPORT**

### **LCA Near-Term Plan**

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## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.  
Suite 400  
Lafayette, Louisiana 70506

May 28, 2004

Colonel Peter J. Rowan  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Rowan:

Enclosed is the Draft Fish and Wildlife Coordination Act Report on the Near-Term Ecosystem Restoration Plan for the Louisiana Coastal Area, Louisiana Coastwide Ecosystem Restoration Feasibility Study. Copies of that revised draft report have been provided to the National Oceanographic and Atmospheric Administration - Fisheries and the Louisiana Department of Wildlife and Fisheries for their review. Their comments will be forwarded to you upon receipt, and will be fully addressed in our final report for the study. The enclosed document does not constitute the final report of the Secretary of the Interior, as required by Section 2(b) Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

Should your staff have any questions regarding the enclosed report, please have them contact Ms. Catherine Grouchy (504/862-2689) of this office.

Sincerely,

Russell Watson  
Supervisor  
Louisiana Field Office

cc: LA Dept. of Wildlife and Fisheries, Baton Rouge, LA  
LA Dept. of Natural Resources (CRD & CMD), Baton Rouge, LA  
National Oceanographic and Atmospheric Adm. - Fisheries, Baton Rouge, LA  
Fish and Wildlife Service, Atlanta, GA (AES)  
Environmental Protection Agency, Baton Rouge, LA  
Natural Resources Conservation Service, Alexandria, LA

**NEAR-TERM ECOSYSTEM RESTORATION PLAN FOR  
THE LOUISIANA COASTAL AREA**

**FISH AND WILDLIFE COORDINATION ACT REPORT**



**U.S. FISH AND WILDLIFE SERVICE  
ECOLOGICAL SERVICES  
LAFAYETTE, LOUISIANA**

**MAY 2004**

**NEAR-TERM ECOSYSTEM RESTORATION PLAN FOR THE  
LOUISIANA COASTAL AREA**

**FISH AND WILDLIFE COORDINATION ACT REPORT**

**PROVIDED TO  
NEW ORLEANS DISTRICT  
U.S. ARMY CORPS OF ENGINEERS  
NEW ORLEANS, LOUISIANA**

**PREPARED BY  
CATHERINE GROUCHY, FISH AND WILDLIFE BIOLOGIST  
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**U.S. FISH AND WILDLIFE SERVICE  
ECOLOGICAL SERVICES  
LAFAYETTE, LOUISIANA**

**MAY 2004**

## EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service (Service) has prepared the following Fish and Wildlife Coordination Act Report for inclusion in the forthcoming draft Near-term Ecosystem Restoration Plan (NTP) for the Louisiana Coastal Area (LCA), Louisiana Coastwide Ecosystem Restoration Feasibility Study. The purpose of that study is ". . . to determine the feasibility of sustaining a coastal ecosystem that supports and protects the environment, economy and culture of southern Louisiana and that contributes greatly to the economy and well being of the nation." Although the NTP is largely programmatic, it is a critically important component of the continuing cooperative Federal-State effort to address the loss of Louisiana's coastal wetlands. The NTP, together with its supporting documentation (including this report), will be the basis upon which the Corps will request further authorization and funding from Congress to address that issue.

The study area includes all of Louisiana's coastal wetlands. Those wetlands, which support nationally important fish and wildlife resources, are being lost at an average rate of approximately 24 square miles per year due to a variety of causes. The NTP, developed by the Corps, the State of Louisiana, and the other cooperating Federal agencies, identifies the first 10-year increment of highly effective restoration features targeting critical ecological need areas—those areas of the coast plagued by the greatest ecosystem degradation, and those with the greatest potential for ecosystem recovery and infrastructure protection, as well as large-scale, long-term restoration features.

Each of the three major NTP action alternatives would, to varying degrees, reduce coastal wetland loss. Hence, implementing any of the proposed action plans would be preferable to the continued loss and degradation of coastal wetlands under the no-action scenario. The Tentatively Selected Plan (TSP) encompasses a variety of restoration strategies such as freshwater and sediment diversions, interior shoreline protection, barrier island and barrier headland protection, and dredged material/marsh restoration. The Service believes that the TSP, which focuses on preventing future land loss, restoring deltaic processes, restoring critical geomorphic structures, and protecting vital socio-economic resources, would provide the greatest fish and wildlife benefits, and would best achieve long-term sustainability of Louisiana's coastal wetland ecosystem.

Coastwide, the TSP would restore marsh-building and marsh-maintenance processes through freshwater and sediment inputs. The TSP would increase coastal wetland acreage compared to taking no action; thus, it would have a major positive impact on most, if not all, of the fish and wildlife resources that utilize those wetlands. The project-related conversion of some brackish and saline marshes to fresh and low-salinity marshes would displace brown shrimp, spotted seatrout, and other fishes and shellfishes which prefer more saline habitats. Those displacement impacts would be partially compensated for by project-induced increases in the productivity of remaining high salinity habitats, and by the improved sustainability of those habitats, compared to taking no action. Additionally, the abundance and productivity of white shrimp, Gulf menhaden, and other fishes and shellfishes which utilize low-salinity habitats would likely be increased under the preferred plan. Given the continued rapid loss and likely future collapse of brackish

and salt marsh systems with no action, the TSP may also provide a long-term net benefit to species utilizing those areas. Accordingly, the Service recommends that, during future planning iterations, design and operational measures be incorporated into project features to minimize adverse effects on those resources and to increase benefits to other fish and wildlife species, to the greatest extent practical.

Because of the uncertainties regarding some of the currently proposed habitat prediction methodologies, and because many details regarding the design, operation, and associated effects of the TSP are not yet available at the current programmatic level of planning, we cannot complete our evaluation of the TSP's effects on fish and wildlife resources, nor can we entirely fulfill our reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). Therefore, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction of specific project measures, along with more-definitive project information that will be available during those planning phases, will be required so that we can fulfill our responsibilities under that Act. Additionally, improvements in the hydrologic and desktop models will be needed to predict environmental impacts and benefits of plan features, as indicated in our previous draft Fish and Wildlife Coordination Act Report (Paille, R. and K. Roy, September 2003b) for the LCA Comprehensive Study.

The Service has actively participated throughout the formulation and evaluation of the LCA coastwide alternatives and the selection of near-term restoration features, as well as the large-scale studies and the demonstration projects that comprise the NTP. Given the substantial adverse future impacts to coastal wetlands and their associated fish and wildlife resources under future without-project conditions, we strongly support authorization and implementation of the near-term TSP for the NTP, as it would provide the greatest level of benefits to Louisiana's nationally significant fish and wildlife resources. Accordingly, the Service also provides the following procedural recommendations for future authorization and implementation of the NTP:

1. In accordance with the January 2003 Partnership Agreement for Water Resources and Fish and Wildlife between the Service and the Corps, sufficient continuous funding should be provided to the Service to fulfill our responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act throughout post-authorization engineering and design studies (for demonstration projects and NTP projects) and the long-term project feasibility studies.
2. The Corps should obtain a right-of-way from the Service prior to conducting any work on a National Wildlife Refuge, in conformance with Section 29.21-1, Title 50, Right-of-way Regulations. Issuance of a right-of-way will be contingent on a determination by the Service's Regional Director that the proposed work will be compatible with the purposes for which the refuge was established.

To ensure that optimum fish and wildlife resource benefits are achieved, the Service plans to remain actively involved throughout the plan implementation process. Our findings and recommendations for each of the projects ultimately approved for implementation will be provided as supplements to this report under the authority of the Fish and Wildlife Coordination Act.

## INTRODUCTION

The Near-term Ecosystem Restoration Plan (NTP) for the Louisiana Coastal Area (LCA), Louisiana Coastwide Ecosystem Restoration Feasibility Study has been prepared by the New Orleans District Corps of Engineers (Corps), Louisiana Department of Natural Resources, and other State and Federal natural resource agencies, with the assistance of scientists from several institutions. The LCA study was originally authorized by Resolutions adopted by the U.S. House of Representatives and Senate Committees on Public Works, on October 19, 1967, and April 19, 1967, respectively. Those resolutions sought to improve existing hurricane protection features and the ". . . prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and related water resource purposes."

As currently formulated, the LCA is envisioned as the mechanism for developing and implementing a program to achieve system-wide sustainable restoration of Louisiana's coastal wetlands. That program would maximize use of restoration strategies that promote the reintroduction of riverine fresh water, nutrients, and sediments, and that would maintain the structural integrity of the estuarine basins. The program's near-term component would also include a process to develop better techniques for meeting the critical needs of the ecosystem and to advance our understanding of the coastal ecosystem. To put the scope and significance of the LCA in proper perspective, it is important to understand the magnitude of the problems to which it will respond, as well as the unprecedented level of coordinated efforts that have already been undertaken to address those problems.

In 1990, passage of the Coastal Wetlands Planning, Protection and Restoration Act, (PL-101-646, Title III, CWPPRA), provided authorization and funding for the Louisiana Coastal Wetlands Conservation and Restoration Task Force to begin actions to curtail the annual loss of approximately 24 square miles per year Louisiana's coastal wetlands. In 1998, after extensive studies and construction of a number of coastal restoration projects had been accomplished under CWPPRA, the State of Louisiana and the Federal agencies charged with restoring and protecting the remainder of Louisiana's valuable coastal wetlands developed the "Coast 2050: Toward a Sustainable Coastal Louisiana" report, popularly known as the *Coast 2050 Plan*. In recognition of the national significance of Louisiana's coastal wetlands, that plan proposes ecosystem restoration strategies and efforts larger in scale than any previously implemented, including restoration of the natural processes that built and maintained coastal Louisiana.

In 2000, the Corps used the *Coast 2050 Plan* as the basis for a section 905(b) reconnaissance report intended to gain approval for a coastwide feasibility study, the purpose of which would be to obtain Water Resources Development Act authorization of, and funding for, a comprehensive coastal wetlands restoration plan to include projects larger in scope than those implemented under CWPPRA. In 2000, it was envisioned that a series of feasibility reports would be prepared over a 10-year period. The first of those feasibility efforts focused on the Barataria Basin and involved marsh creation and barrier shoreline restoration.

By Fiscal Year (FY) 2002, however, it had become widely recognized that, despite the excellent progress of other programs, a much more comprehensive approach - one that could be submitted to Congress as a blueprint for future restoration efforts - would be needed to effectively address Louisiana's coastal wetland loss. As a result, the Corps and the State of Louisiana initiated the LCA Comprehensive Coastwide Ecosystem Restoration Study (LCA Comprehensive Study), an interagency planning effort to develop a comprehensive plan to restore Louisiana's coastal ecosystem. Although they were not publically released, a preliminary Draft LCA Comprehensive Study Report and preliminary Draft Programmatic Environmental Impact Statement (PEIS) were subsequently prepared. Associated with those documents, the Service provided a Draft Fish and Wildlife Coordination Act Report (Paille, R. and K. Roy, August 2003a). Immediately thereafter, the Corps and the local sponsor revised those documents to describe seven action alternatives, although a preferred alternative was not identified. Subsequently, the Service prepared a revised Draft Fish and Wildlife Coordination Act Report (Paille, R. and K. Roy, September 2003b). Following review by the Office of Management and Budget and the Council on Environmental Quality, public release of that draft LCA Comprehensive Study Report was deferred pending revisions to satisfy FY 2005 administrative budget guidance. Key elements of that guidance included requirements to: 1) identify the most critical ecological needs of the coastal area, 2) identify projects to address these needs that provide a very high return in net benefits (non-monetary and monetary) per dollar of cost, 3) present and evaluate alternatives for meeting those needs, 4) identify the key long-term scientific uncertainties and engineering challenges facing the effort to protect and restore the ecosystem, and 5) propose a strategy for resolving the identified challenges.

In a coordinated response to that guidance, the Corps, the State of Louisiana, and the other cooperating Federal agencies (including the Service), re-focused the larger comprehensive ecosystem restoration plan into the current NTP. The NTP identifies the first 10-year increment of highly effective restoration features targeting critical ecological need areas—those areas of the coast plagued by the greatest ecosystem degradation, and those with the greatest potential for ecosystem recovery and infrastructure protection, as well as large-scale, long-term restoration features. The balance of this report documents the Service's programmatic assessment of the NTP and provides our recommendations for future planning and implementation of the NTP and its features.

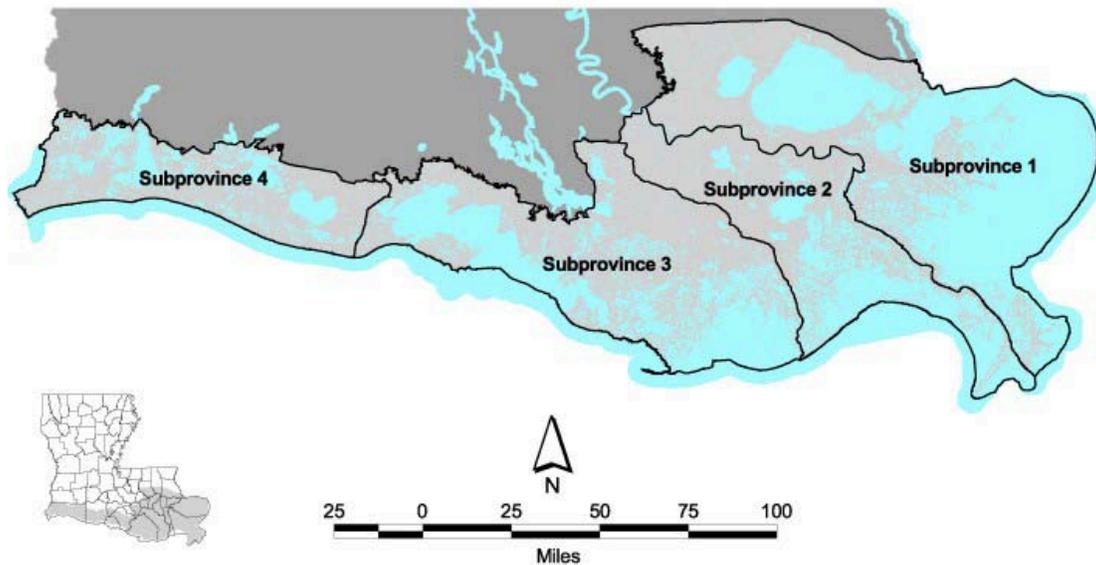
## **DESCRIPTION OF THE STUDY AREA**

The study area encompasses all of Louisiana's coastal wetlands, which include natural levee forest, swamp, fresh marsh, intermediate marsh, brackish marsh, saline marsh, and barrier islands. The study area is divided into four subprovinces (Figure 1), each of which includes one or more coastal watersheds. The LCA subprovinces are very similar to those identified under the Coast 2050 Plan (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority

1998), except that the boundary between Subprovinces 1 and 2 has been relocated from the Mississippi River-Gulf Outlet to the Mississippi River under the LCA.

Subprovince 1 consists of all coastal wetlands east of the Mississippi River (and South Pass) and includes the Pontchartrain and Breton Sound Basins. Subprovince 2 consists of the coastal wetlands between the Mississippi River and Bayou Lafourche (i.e., the Barataria Basin). Subprovince 3 extends from Bayou Lafourche westward to the Freshwater Bayou Canal and includes the Terrebonne, Atchafalaya, and Teche/Vermilion Basins. Subprovince 4 extends from the Freshwater Bayou Canal westward to the Louisiana State line (i.e. the Sabine River/Sabine Lake) and includes the Mermentau and Calcasieu/Sabine Basins.

**Figure 1. LCA Near-Term Ecosystem Recreation Plan Study Area.**



## **EXISTING FISH AND WILDLIFE RESOURCES**

### Description of Habitats

**Forested Wetlands** - Forested wetlands in the study area consist primarily of bottomland hardwood forests and cypress-tupelo swamps. Bottomland hardwood forests found in coastal portions of the project area occur primarily on the natural levees of distributary channels. Dominant vegetation may include sugarberry, water oak, live oak, bitter pecan, black willow, American elm, Drummond red maple, Chinese tallow-tree, boxelder, green ash, baldcypress, and elderberry. Cypress-tupelo swamps are located along the flanks of larger distributary ridges as a transition zone between bottomland hardwoods and lower-elevation marsh or scrub-shrub habitats. Cypress-tupelo swamps exist where there is little or no salinity and (usually) minimal daily tidal action.

**Scrub-Shrub** - Scrub-shrub habitat is often found along the flanks of distributary ridges. Typically, it is bordered by marsh at lower elevations and by developed areas, cypress-tupelo swamp, or bottomland hardwoods at higher elevations. Typical scrub-shrub vegetation includes elderberry, wax myrtle, buttonbush, black willow, Drummond red maple, Chinese tallow-tree, and groundselbush.

**Fresh Marsh** - Fresh marshes occur at the upper ends of interdistributary basins and are often characterized by floating or semi-floating organic soils. Most fresh marshes exhibit minimal daily tidal action; however, fresh marshes in the Atchafalaya River delta and adjacent to Atchafalaya Bay are the exceptions. Vegetation may include maidencane, bulltongue, cattail, California bulrush, pennywort, giant cutgrass, American cupscale, spikerushes, bacopa, and alligatorweed. Associated open-water habitats may often support extensive beds of floating-leaved and submerged aquatic vegetation including water hyacinth, Salvinia, duckweeds, American lotus, white water lily, water lettuce, coontail, Eurasian milfoil, hydrilla, pondweeds, naiads, fanwort, wild celery, water stargrass, elodea, and others.

**Intermediate Marsh** - Intermediate marshes are a transitional zone between fresh and brackish marshes, and are often characterized by organic, semi-floating soils. Typically, intermediate marshes experience low levels of daily tidal action. Salinities are negligible or low throughout much of the year, with salinity peaks occurring during late summer and fall. Vegetation includes saltmeadow cordgrass, deer pea, three-cornered grass, cattail, bulltongue, California bulrush, seashore paspalum, wild millet, fall panicum, and bacopa. Ponds and lakes within the intermediate marsh zone often support extensive submerged aquatic vegetation including southern naiad, Eurasian milfoil, and wigeongrass.

**Brackish Marsh** - Brackish marshes are characterized by low-to-moderate daily tidal energy and by soils ranging from firm mineral soils to organic semi-floating soils. Freshwater conditions may prevail for several months during early spring; however, low-to-moderate salinities occur during much of the year, with peak salinities in the late summer to fall. Vegetation is usually dominated by saltmeadow cordgrass, but also includes saltgrass, three-cornered grass, leafy three-square, and deer pea. Shallow brackish marsh ponds occasionally support abundant beds of wigeongrass.

**Saline Marsh** - Saline marshes occur along the southern fringe of the coastal wetlands. Those marshes usually exhibit fairly firm mineral soils and experience moderate to high daily tidal energy. Vegetation is dominated by saltmarsh cordgrass, but may also include saltgrass, saltmeadow cordgrass, black needlerush, and leafy three-square. Submerged aquatic vegetation is rare. Within the study area, intertidal mud flats are most common in saline marshes.

**Ponds and Lakes** - Natural marsh ponds and lakes, interspersed throughout the coastal wetlands, are typically shallow, ranging in depth from 6 inches to more than 2 feet. The smaller ponds are typically shallow and the larger lakes are deeper. In fresh and low-salinity areas, ponds and lakes may support varying amounts of submerged and/or

floating-leaved aquatic vegetation. Brackish and, much less frequently, saline marsh ponds and lakes may support wigeongrass beds.

**Canals and Bayous** - Canals and larger bayous typically range in depth from 4 or 5 feet, to more than 15 feet. Strong tidal flows may occur at times through those waterways, especially where they provide hydrologic connections to other large waterbodies. Such canals and bayous may have mud or clay bottoms that range from soft to firm. Dead-end canals and small bayous are typically shallow and their bottoms may be filled to varying degrees with semi-fluid organic material. Erosion, due to wave action and boat wakes, together with shading from overhanging woody vegetation, may retard the amount of intertidal marsh vegetation growing along the edges of those waterways.

**Navigation Channels** - A number of large (300 feet wide or wider) navigation channels have been dredged across the coastal zone. Such channels include the Sabine-Neches Waterway, the Calcasieu Ship Channel, the Freshwater Bayou Channel, the Houma Navigation Canal, the Barataria Waterway, and the Mississippi River Gulf Outlet. Such channels may range in depth from 15 feet to over 40 feet, and often cut through natural distributary ridges and disrupted local hydrology by increasing tidal exchange, saltwater intrusion, and freshwater discharge rates. The Gulf Intracoastal Waterway traverses the coastal zone from east to west and has also caused hydrologic disruptions. Boat wakes and water displacement surges from the passage of large vessels has also resulted in severe erosion of adjoining marshes in some locations.

**Developed Areas** - Most developed areas are located on higher elevations of former distributary channels and are typically well drained. They include agricultural lands, and commercial and residential developments.

### Fishery Resources

Wetlands throughout the study area abound with small resident fishes and shellfishes such as least killifish, rainwater killifish, sheepshead minnow, mosquitofish, sailfin molly, grass shrimp, and others. Those species are typically found along marsh edges or among submerged aquatic vegetation, and provide forage for a variety of fish and wildlife. Fresh and low-salinity marshes provide habitat for commercially and recreationally important resident freshwater fishes such as largemouth bass, yellow bass, black crappie, bluegill, redear sunfish, warmouth, blue catfish, channel catfish, buffalo, freshwater drum, bowfin, and gar. Freshwater fishes may also utilize low-salinity areas (intermediate marsh zone), provided they have access to fresher areas during periods of high salinity.

Louisiana's coastal marshes also provide nursery habitat for many estuarine-dependent commercial and recreational fishes and shellfishes. Because of the protection and abundant food afforded by those wetlands, they are critical to the growth and production of species such as blue crab, white shrimp, brown shrimp, Gulf menhaden, Atlantic croaker, red drum, spotted seatrout, black drum, sand seatrout, spot, southern flounder, striped mullet, and others. Those species are generally most abundant in the brackish and

saline marshes; however, blue crab, Gulf menhaden, Atlantic croaker, and several other species also utilize fresh and low-salinity marshes.

Because tidal marshes provide essential nursery habitat, commercial shrimp harvests are positively correlated with the area of tidal emergent wetlands, but not open-water areas (Turner 1977 and 1982). Future commercial harvests of shrimp and other fishes and shellfishes could be adversely impacted by the high rates of marsh loss throughout the study area (Turner 1982).

The American oyster also occurs throughout much of the brackish and saline marsh zones within the study area. Oyster harvesting constitutes a valuable fishery in the northern portions of that zone, where salinities range from 10 to 15 parts per thousand (ppt).

### Essential Fish Habitat

The generic amendment to Gulf of Mexico Fishery Management Plan identifies Essential Fish Habitat in the project area to be intertidal emergent wetlands, submerged aquatic vegetation, estuarine waters, and mud, sand, and shell water bottoms. Habitat Areas of Particular Concern have not been identified for the project area. Under the Magnuson-Stevens Fishery Conservation and Management Act, the Gulf of Mexico Fishery Management Council has determined that project-area habitats are utilized by federally managed species such as brown shrimp, white shrimp, and red drum. Although those species utilize the project area primarily as nursery habitat, all life stages may occur therein. When they move to offshore waters, blue crabs and other species of fishes and shellfishes that utilize project-area estuarine habitats may also provide forage for Federally managed marine fishes such as groupers, snappers, and mackerel.

### Wildlife Resources

Numerous species of birds utilize the study-area marshes, including large numbers of migratory waterfowl. Project-area fresh and intermediate marshes provide excellent wintering habitat for migratory waterfowl, especially puddle (dabbling) ducks. Brackish marshes with abundant submerged aquatic vegetation may also support large numbers of puddle ducks. Puddle ducks that commonly migrate to, or through, the study area include mallard, gadwall, northern pintail, blue-winged teal, green-winged teal, American wigeon, wood duck, and northern shoveler. The resident mottled duck and wood duck also utilize project-area coastal marshes for nesting, feeding, and brood-rearing. Diving ducks prefer larger ponds, lakes, and open-water areas. Common diving duck species include lesser scaup, ruddy duck, canvasback, redhead, ringnecked duck, red-breasted merganser, and hooded merganser. The lesser snow goose and the white-fronted goose also utilize coastal marshes as wintering habitat. Other migratory game birds found in Louisiana's coastal marshes include the king rail, clapper rail, Virginia rail, sora, American coot, common moorhen, and common snipe.

Marshes and associated shallow, open-water areas also provide habitat for a number of wading birds, shorebirds, seabirds, and other nongame birds. Common wading birds

include the little blue heron, great blue heron, green-backed heron, yellow-crowned night heron, black-crowned night heron, great egret, snowy egret, cattle egret, reddish egret, white-faced ibis, white ibis, and roseate spoonbill. Shorebirds include the killdeer, American avocet, black-necked stilt, common snipe, and various species of plovers and sandpipers. Seabirds include white pelican, endangered brown pelican, black skimmer, herring gull, laughing gull, and several species of terns. More than 190 wading and seabird nesting colonies have been identified within coastal Louisiana during surveys conducted in 1983, 1990, and 2001 (Michot et al. 2003). Other nongame birds, such as boat-tailed grackle, red-winged blackbird, seaside sparrow, olivaceous cormorant, northern harrier, belted kingfisher, and sedge wren, also utilize coastal-area habitats.

Common mammals occurring in the coastal marshes include nutria, muskrat, mink, river otter, raccoon, swamp rabbit, white-tailed deer, and coyote. Muskrat and river otter prefer brackish marsh. Nutria, mink, swamp rabbit, and white-tailed deer prefer fresh marsh and low salinity habitats. Saline marsh provides very poor habitat for the above listed species. For muskrat, however, saline marsh may provide fair-to-poor habitat quality.

Reptiles are most abundant in fresh and low-salinity coastal wetlands. Common species include the American alligator, western cottonmouth, water snakes, mud snake, speckled kingsnake, ribbon snakes, rat snakes, red-eared turtle, common snapping turtle, alligator snapping turtle, mud turtles, and softshell turtles. Amphibians commonly found in those areas include the bullfrog, pig frog, bronze frog, leopard frog, cricket frogs, tree frogs, chorus frogs, three-toed amphiuma, sirens, and several species of toads. In brackish and saline marshes, reptiles are limited primarily to the American alligator and the diamond-backed terrapin, respectively.

Coastal forested and scrub-shrub wetlands provide key habitats for songbirds such as the mockingbird, yellow-billed cuckoo, northern parula, yellow-rumped warbler, prothonotary warbler, white-eyed vireo, Carolina chickadee, and tufted titmouse. Those areas also provide vitally important resting and feeding areas for songbirds migrating across the Gulf of Mexico. Other avian species found in forested wetlands include the American woodcock, common flicker, brown thrasher, white-eyed vireo, belted kingfisher, loggerhead shrike, pileated woodpecker, red-headed woodpecker, downy woodpecker, common grackle, common crow, and mockingbird.

Forested habitats and associated waterbodies also support raptors such as the red-tailed hawk, red-shouldered hawk, osprey, American kestrel, Mississippi kite, northern harrier, screech owl, great horned owl, and barred owl. Wading bird colonies typically occur in cypress swamp and scrub-shrub habitats. Species found in those nesting colonies include anhinga, great egret, great blue heron, black-crowned night heron, tricolored heron, little blue heron, cattle egret, snowy egret, white-faced and glossy ibises, and reddish egret. Resident and migratory waterfowl species found in forested wetlands and adjacent waterbodies in the project area include, but are not limited to, wood duck, mallard, green-winged teal, gadwall, and hooded merganser.

Game mammals associated with coastal forested wetlands include eastern cottontail, swamp rabbit, gray and fox squirrels, and white-tailed deer. Commercially important furbearers include river otter, muskrat, nutria, mink, and raccoon. Other mammals found in forested wetlands include striped skunk, coyote, Virginia opossum, bobcat, armadillo, gray fox, and red bat. Smaller mammal species serve as forage for both mammalian and avian carnivores and include the cotton rat, marsh rice rat, white-footed mouse, eastern wood rat, harvest mouse, least shrew, and southern flying squirrel.

Reptiles, which utilize study area bottomland hardwoods, cypress swamps, and associated shallow waters, include the American alligator, ground skink, five-lined skink, broadbanded skink, green anole, Gulf coast ribbon snake, yellow-bellied water snake, speckled kingsnake, southern copperhead, western cottonmouth, pygmy rattlesnake, broad-banded water snake, diamond-backed water snake, spiny softshell turtle, red-eared turtle, southern painted turtle, Mississippi mud turtle, stinkpot, and common and alligator snapping turtle, in addition to numerous other species.

Representative amphibians in study-area forested wetlands include dwarf salamander, three-toed amphiuma, lesser western siren, central newt, Gulf coast toad, eastern narrow-mouthed toad, green treefrog, squirrel treefrog, pigfrog, bullfrog, southern leopard frog, bronze frog, upland chorus frog, southern cricket frog, and spring peeper.

Most developed areas provide low-quality wildlife habitat. Sites developed for agricultural purposes are usually located at elevations slightly higher than the wetlands, or they may have improved drainage. In agricultural areas, wildlife habitat is primarily provided by unmaintained ditch banks and field edges, fallow fields, pasture lands, and/or occasionally flooded fields. Cultivated crops, especially soybeans, provide forage for some wildlife species. Game species that utilize agricultural lands include the white-tailed deer, mourning dove, bobwhite quail, eastern cottontail, and common snipe. Seasonally flooded cropland and fallow fields may also provide important feeding habitat for wintering waterfowl, wading birds, and other waterbirds.

### Threatened and Endangered Species

As a cooperating agency, the Service provided a September 26, 2003, letter to the Corps detailing Federally listed threatened and endangered species, their critical habitat, and migratory birds that may be found in or near the study area for the draft LCA Comprehensive Study (Appendix A). That information, and the draft Biological Assessment which Service staff also helped to prepare, remain applicable to the NTP alternatives, and should be used to facilitate programmatic Section 7 consultation under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and compliance with the Migratory Bird Treaty Act (MBTA; 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.). In keeping with the consultation requirements of the ESA, informal and formal (if needed) consultation must be completed before the Record of Decision for the NTP and PEIS can be signed. Accordingly, the Service will continue to work closely with the Corps through the consultation period.

## Fish and Wildlife Summary

Coastal Louisiana contains an estimated 45 percent of the tidal marshes in the conterminous United States. Louisiana's 3.67 million acres of coastal wetlands and their associated waters support nationally important fish and wildlife resources, and sustain the largest commercial fish and shellfish harvest in the lower 48 States. More than 1.1 billion pounds of fish and shellfish (including shrimp, crabs, crawfish, and oysters) are harvested annually in coastal Louisiana. That harvest is nearly twice that of any other State, and was valued at more than \$400 million in 2000 (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2001).

Recreational saltwater anglers spend approximately \$245 million annually to fish for spotted seatrout, red drum, snapper, tuna and other species (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2001). Fresh and low-salinity coastal wetlands also provide important habitat for numerous freshwater sport fishes, the pursuit of which is also an important recreational activity in those coastal areas.

Louisiana's coastal marshes provide winter habitat for more than 50 percent of the duck population of the Mississippi Flyway. Fresh and intermediate marshes support the greatest concentrations of wintering waterfowl in coastal Louisiana. Those wetlands are vitally important to the mission of the Gulf Coast Joint Venture, which was established to help achieve the goals of the North American Waterfowl Management Plan.

Louisiana's coastal marshes, swamps, and associated habitats also support many other migratory birds, such as rails, gallinules, shorebirds, seabirds, wading birds, and numerous songbirds. One hundred ninety-seven colonies of wading birds and seabirds (representing 215,249 pairs of nesting birds) were observed in coastal Louisiana during a 2001 survey (Michot 2003). The cheniers and natural levee forests of coastal Louisiana provide essential stopover habitat to numerous neotropical migratory passerine birds.

Coastal Louisiana has long been a leading fur-producing area in North America. Common furbearers include nutria, mink, muskrat, raccoon, and river otter. Those coastal marshes and swamps also support game animals such as the white-tailed deer and swamp rabbit. The area also supports 1.5 million alligators for which sport and commercial hunting is closely regulated.

## Refuges and Wildlife Management Areas

The Service administers 10 National Wildlife Refuges (NWR) encompassing more than 301,700 acres in coastal Louisiana. They include Sabine, Cameron Prairie, Lacassine, Shell Keys, Bayou Teche, Delta, Breton, Bayou Sauvage, Big Branch Marsh, and Mandalay NWRs. The Louisiana Department of Wildlife and Fisheries operates 17 refuges, preserves, and wildlife management areas in coastal Louisiana, comprising more than 572,000 acres. Coastal wetlands make up the vast majority of those Federal and State wildlife areas.

## **FISH AND WILDLIFE CONCERNS IN THE STUDY AREA**

The foremost study-area concern, particularly from a fish and wildlife resource standpoint, is the rapid deterioration and loss of coastal wetlands. During the 1900s, Louisiana lost approximately 1.2 million acres of its coastal wetlands. Coastwide loss rates peaked at approximately 42 square miles per year during 1950s and 1960s. Currently, Louisiana's coastal wetland loss rate is approximately 24 square miles per year. Additionally, large areas of fresh marsh and low-salinity wetlands have converted to deteriorated brackish and saline marshes, or open water.

To address this serious problem, a number of coastal wetland restoration projects have been constructed and/or authorized for construction throughout coastal Louisiana. More than 140 projects are funded and authorized via the CWPPRA of 1990. Two large freshwater introduction projects (Davis Pond and Caernarvon) have been implemented by the Corps under other authorities. Despite their success, those efforts will, together, address less than one third of the 448,000-acre wetland loss projected to occur by the year 2050 in Louisiana. The continuing loss of coastal wetlands and their associated habitat values are the principal threats to the nationally significant fish and wildlife resources that depend on them.

## **PLAN FORMULATION AND EVALUATION METHODOLOGY**

Individual restoration projects previously identified during development of the October 2003 Draft LCA Comprehensive Study Report were evaluated for inclusion in the NTP by applying 3 "sorting" criteria and 4 "critical need" criteria to each project identified. Sorting criteria were used to classify individual features into the major NTP components (i.e., Near-term restoration features, Large-scale studies, and Demonstration projects). The four critical need criteria (preventing future land loss, restoring fundamentally impaired deltaic processes, restoring critical geomorphic structures, and protecting vital socio-economic resources) were developed to assess the potential for project features to address critical needs. Those sorting and critical needs criteria include:

Sorting Criterion #1 - Engineering and design completed, and construction started within 10 years.

This criterion would require the completion of feasibility studies including further modeling to optimize expected environmental outcome, full analysis of National Economic Development (NED) benefits, real estate acquisition, etc. in time to initiate construction in 10 years or less. It also includes completion of necessary NEPA documentation, pre-construction engineering & design, and receipt of construction authorization and commencement of construction during that period. A candidate restoration feature not deemed to meet this criterion would not be included in the NTP; however, it might be a candidate for the large-scale, long-range study component of the NTP.

Sorting Criterion #2 - Based upon sufficient scientific and engineering understanding of processes.

To satisfy this criterion, individual project features must have a sound basis in science, technology, and the engineering principles specific to those features must have been applied within coastal Louisiana to successfully achieve the desired ecosystem response. Individual features that do not meet this criterion were not included as potential near-term projects. The scientific and/or engineering uncertainties associated with those restoration features may, however, provide a basis for potential demonstration projects, and for review and analysis through the Science and Technology component of the NTP.

Sorting Criterion #3 - Construction is independent of, and does not eliminate, other near-term opportunities; construction is not dependent on the completion of another project and/or restoration feature.

If a feature is dependent on one or more other restoration features, that feature may be combined and reassessed to determine if the composite meets the other sorting criteria. If so, the composite project is then classified appropriately. If the evaluated individual feature might preclude the later implementation of another restoration feature, then it is not included in the NTP, but might become a candidate for long-range study.

Individual features that met all of the above sorting criteria were then evaluated against the below listed “critical need” criteria to determine if they should be included in the NTP. When the criteria were applied, the reasoning for the subsequent decisions was recorded so that the study team could make relative comparisons and refine the overall application of the “critical needs” criteria. Those criteria are as follows:

Critical Need Criterion #1 - Prevent future land loss where predicted to occur, and restore past land loss.

Future ecosystem condition should be based upon future patterns of land and water. According to the U.S. Geological Survey open file report 03-334 “Historical and Predicted Coastal Louisiana Land Changes: 1978-2050,” proposed restoration features should prevent or reduce future predicted land loss or cypress swamp degradation in areas with existing fragmented marsh or degraded cypress swamp.

Critical Need Criterion #2 - (Sustainability) Restore fundamentally impaired deltaic processes through river reintroductions, or mimic deltaic processes.

This criterion refers to features that would restore or mimic natural connections between the river and the basins (or estuaries) and includes river diversions, crevasses, and over-bank flows. Mechanical marsh creation with river sediment

is also viewed as mimicking the deltaic function of sediment introduction, if supported by sustainable freshwater and nutrient reintroduction.

Critical Need Criterion #3 - (Sustainability) Restore endangered or critical geomorphic structure.

This criterion pertains to project features that would restore or maintain natural geomorphic features such as barrier islands, distributary ridges, cheniers, land bridges, and beach and lake rims that are essential to maintaining the integrity of coastal ecosystems.

Critical Need Criterion #4 - Protect vital local, regional, and national socio-economic resources.

This criterion would be met by project features which protect key local, regional, and national resources of social, economic, and cultural significance, such as cultural features and points of interest, communities, infrastructure, and businesses and industries.

Modeling to quantify wetland changes and associated impacts/benefits to fish and wildlife resources of the selected NTP features was not conducted, due to the short time frame to complete the NTP and because that plan is of a highly programmatic nature at present. Instead, the results of modeling conducted during the earlier LCA Comprehensive Study were used as a basis for estimating benefits to fish and wildlife resources, despite the known problems and uncertainties associated with those assessment methods. Beyond this programmatic level evaluation, when individual project features are undergoing further engineering and design, more rigorous assessments will be required to quantify fish and wildlife benefits and impacts, complete NEPA documentation, meet various water development planning policies, and to enable the Service to fulfill its Fish and Wildlife Coordination Act mandates.

### **FUTURE WITHOUT-PROJECT FISH AND WILDLIFE RESOURCES**

Within coastal Louisiana under future with no action conditions, more than 462,000 additional wetland acres would be lost by year 50 (Table 1). Habitat types would continue shifting toward more brackish and saline wetlands, and open water, with the continual loss of more salt-sensitive freshwater vegetation. Because of the current degree of risk and uncertainty associated with the salinity/habitat type projection methodologies, however, the data in Table 1 do not reflect this anticipated trend. Nonetheless, corresponding decreases in habitat values for fish and wildlife that use those wetlands would also occur in association with the projected wetland losses.

Table 1. Coastwide wetland type acreages under the No Action Plan

Wetland Type	TY0 (acres)	TY50 (acres)	Acreage change	Percent change
Swamp	1,040,785	949,707	-91,078	-8.8
Fresh marsh	940,811	798,847	-141,964	-15.1
Intermediate Marsh	724,289	956,240	231,951	32.0
Brackish marsh	584,524	437,477	-147,046	-25.2
Saline marsh	374,778	60,157	-314,622	-83.9
Total wetlands	3,665,188	3,202,429	-462,759	-12.6

## RESTORATION OPPORTUNITY DESCRIPTIONS

As detailed above, application of the sorting criteria and critical needs criteria were the basis for selecting the NTP restoration features, large-scale studies, and candidate science and technology demonstration projects. The following paragraphs describe those restoration opportunities in greater detail.

### Near-Term Restoration Features

Of the 78 features that the sorting criteria were applied to, those features that met all three sorting criteria were considered as possible NTP features. Alternative combinations of those features were developed by applying each of the critical needs criteria individually or in various combinations. Application of the critical needs criteria yielded 15 possible alternatives. While that analysis indicated some similarity between alternatives, distinct alternatives were identified that were focused on critical needs criterion #2 only (Restoration Opportunity 1), critical needs criterion #3 only (Restoration Opportunity 2), and all four critical needs criteria combined (the Tentatively Selected Plan or TSP).

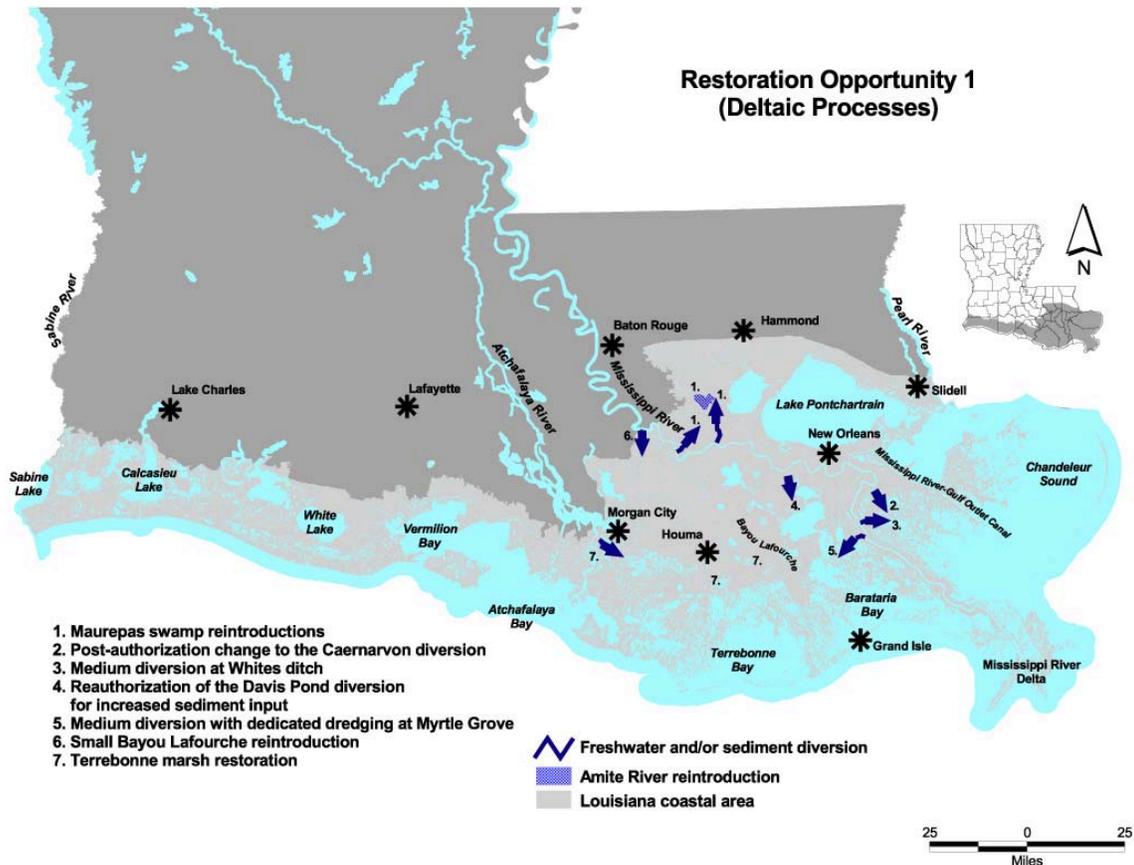
Restoration Opportunity 1 focuses on restoration of deltaic processes and includes seven near-term restoration features (Figure 2). Those features and their respective subprovinces (SP) are as follows:

- 1) Maurepas Swamp Reintroductions (SP 1)
  - a. Small Diversion at Hope Canal (CWPPRA River Reintroduction to Maurepas Swamp)
  - b. Small Diversion at Convent/Blind River
  - c. Increase Amite River Influence by Gapping Spoil Banks
- 2) Post-authorization Change to the Caernarvon Diversion (SP1)
- 3) Medium Diversion at Whites Ditch (SP1)

- 4) Reauthorization of the Davis Pond Diversion for Increased Sediment Input (SP2)
- 5) Medium Diversion with Dedicated Dredging at Myrtle Grove (SP 2)
- 6) Small Bayou Lafourche Reintroduction (SP 3);
- 7) Terrebonne Marsh Restoration Opportunities (SP 3)
  - a. Multi-purpose Operation of Houma Navigation Canal (HNC) Lock
  - b. Convey Atchafalaya River Water to Terrebonne Marshes via a Small Diversion in the Avoca Island Levee, Repair Eroding Banks of the GIWW, Enlarge Constrictions in the GIWW below Gibson and in Houma, and Construct/Enlarge Lake Boudreaux and Grand Bayou Conveyance Channel.

Diversion features range from 1,000 cfs to 5,000 cfs for small diversions, 5,001 cfs to 15,000 cfs for medium diversions, and greater than 15,000 cfs for large diversions.

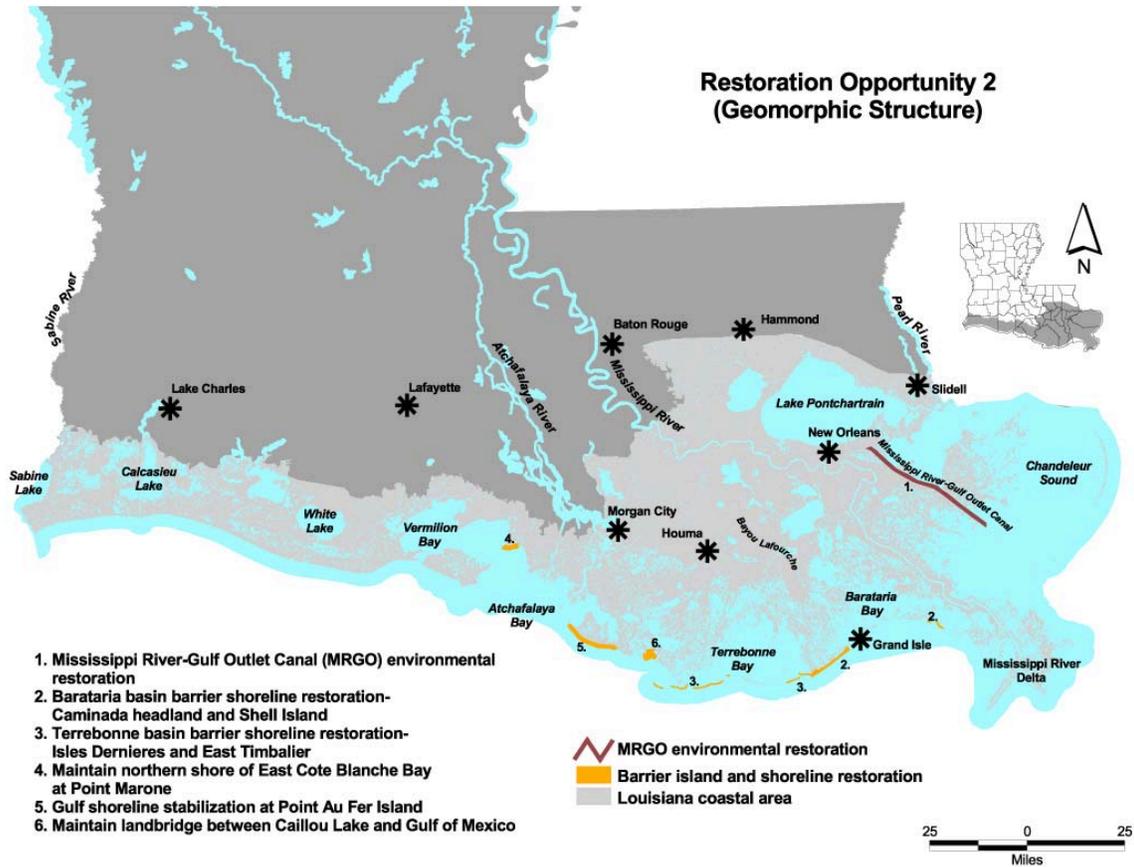
**Figure 2. LCA Near-Term Ecosystem Restoration Plan Restoration Opportunity 1 - Restoration of Deltaic Processes.**



Restoration Opportunity 2 is the alternative that focuses on restoration of geomorphic structure. It consists of six restoration opportunities which include shoreline protection, barrier island restoration, and marsh-creation features (Figure 3). The restoration features of this alternative and their respective subprovinces (SP) are as follows:

- 1) Mississippi River Gulf Outlet Environmental Restoration (SP 1)
- 2) Barataria Basin Barrier Shoreline Restoration-Caminada Headland and Shell Island (SP 2)
- 3) Terrebonne Basin Barrier Shoreline Restoration-Isles Dernieres and East Timbalier (SP3)
- 4) Maintain Northern Shore of East Cote Blanche Bay at Point Marone (SP3)
- 5) Gulf Shoreline Stabilization at Pt. Au Fer Island (SP 3)
- 6) Maintain Land Bridge Between Caillou Lake and Gulf of Mexico (SP3)

**Figure 3. LCA Near-Term Ecosystem Restoration Plan Restoration Opportunity 2 - Restoration of Geomorphic Structure.**



The third alternative restoration opportunity, or the TSP, encompasses all four critical needs criteria, and includes 12 potential restoration features including freshwater and sediment diversions, interior shoreline protection, barrier island and barrier headland protection, and dredged material/marsh creation (Figure 4). The restoration features of this alternative and their respective subprovinces (SP) are as follows:

- 1) Maurepas Swamp Reintroductions (SP 1)
  - a. Small Diversion at Hope Canal (CWPPRA River Reintroduction into Maurepas Swamp)
  - b. Small Diversion at Convent/Blind River

- c. Increase Amite River Influence by Gapping Spoil Banks
- 2) MRGO Environmental Restoration (SP 1)
- 3) Post-authorization Change to the Caernarvon Diversion (SP1)
- 4) Medium Diversion at Whites Ditch (SP1)
- 5) Reauthorization of the Davis Pond Diversion for Increased Sediment Input (SP2)
- 6) Medium Diversion with Dedicated Dredging at Myrtle Grove (SP 2)
- 7) Barataria Basin Barrier Shoreline Restoration-Caminada Headland and Shell Island (SP 2)
- 8) Terrebonne Basin Barrier Shoreline Restoration-Isles Dernieres and East Timbalier (SP3)
- 9) Small Bayou Lafourche Reintroduction (SP 3)
- 10) Gulf Shoreline Stabilization at Point Au Fer Island (SP 3)
- 11) Terrebonne Marsh Restoration Opportunities (SP 3)
  - a. Multi-purpose Operation of Houma Navigation Canal (HNC) Lock
  - b. Convey Atchafalaya River Water to Terrebonne Marshes via a Small Diversion in the Avoca Island Levee, Repair Eroding Banks of the GIWW, Enlarge Constrictions in the GIWW below Gibson and in Houma, and Construct/Enlarge Lake Boudreaux and Grand Bayou Conveyance Channel
- 12) Maintain Land Bridge between Caillou Lake and Gulf of Mexico (SP 3)

More detailed descriptions of the above-listed features are found in Appendix B.

### Large-scale Studies

The NTP also recommends five feasibility studies of large-scale restoration concepts which have a high level of complexity and/or uncertainty associated with them. Those conceptual projects would affect (both positively and negatively) significant ecological and economic resources, but could potentially contribute to a more sustainable coastal Louisiana. However, the feasibility of undertaking those large-scale restoration concepts is not, at this time, fully known. In addition, it is unlikely that the requisite detailed investigations and the resolution of issues (e.g., land acquisition) associated with implementation could be completed in time to begin construction within the next 10 years. The large-scale, long-term initiatives selected for detailed study (and their respective subprovinces) are as follows:

1. Mississippi River Hydrodynamic Study
  - a. Mississippi River Delta Management Study (SP 1 and 2)
  - b. Third Delta (SP 2 and 3)
2. Post-authorization Change for Diversion of Water Through Inner-Harbor Navigation Canal (IHNC) Lock (SP 1)
3. Upper Atchafalaya Basin Study including Evaluation of Modified Operational Scheme of Old River Control Structure Conducted under Mississippi River and Tributaries (SP 3)
4. Point Chevreuil Reef Restoration (SP3)
5. Chenier Plain Freshwater Management and Allocation Reassessment (SP 4).

**Figure 4. LCA Near-Term Ecosystem Restoration Plan - Tentatively Selected Plan**



**The Mississippi River Delta Management Study** would require extensive investigations to maximize the use of riverine freshwater and sediments for wetland restoration without adversely impacting navigation. Sediments, nutrients, and freshwater would be re-directed to restore the quality and sustainability of the Mississippi River Deltaic Plain, its coastal wetland complex, and the Gulf of Mexico. The study would investigate potential modifications to existing navigation channel alignments and associated maintenance procedures and requirements.

**The Third Delta** feature consists of a control structure in the vicinity of Donaldsonville that would divert approximately 240,000 cfs at maximum river stage. Flows would be diverted into a newly constructed conveyance channel (parallel to Bayou Lafourche) extending approximately 55 miles from the initial point of diversion to the eventual point of discharge. The diverted flow would be divided equally at a point north of the GIWW to enable the creation of a delta lobe within the Terrebonne and Barataria Basins. Sediment enrichment of this diversion, using a 30-inch dredge for three months yielding 6,293, 000 yd<sup>3</sup> each year, would also be considered. Significant feasibility-level

investigation would be required to determine its effects on flood control, drainage, navigation, and environmental impacts.

**Post-authorization change for diversion of water through IHNC Lock** calls for a post-authorization modification of the Inner Harbor Navigation Canal Lock. Modifications would incorporate culverts and controls to divert freshwater through the IHNC to the wetlands downstream of that structure. The proposed modifications would reduce salinities and increase nutrient supply to the affected intermediate and brackish marshes.

**Upper Atchafalaya Basin Study, including evaluation of modified operational scheme of Old River Control Structure (ORCS)** would alter that structure's operational plan to increase the sediment load transported down the Atchafalaya River. Detailed studies would determine impacts (beneficial and adverse) to the interior of the Atchafalaya Basin, the distribution of the additional flow and sediment, and the increased costs of maintaining the flood control, navigation, and environmental features along the Lower Mississippi, Red, and Atchafalaya Rivers.

**The Point Chevreuil Reef Restoration Study** provides for rebuilding the historic shell reefs that were removed by shell dredging at the historic Point Chevreuil Reef (which formerly extended toward Marsh Island) and rehabilitating the Bayou Sale natural levee between Point Chevreuil and the Gulf of Mexico. The natural levee would be rebuilt in the form of a shallow sub-aqueous platform, small islands, and/or reefs. This feature would be designed to restore a semblance of the historic hydrologic conditions in the Teche/Vermilion Basin.

**The Chenier Plain Freshwater Management and Allocation Reassessment** would require detailed investigations involving water allocation needs and trade-off analyses in the eastern Chenier Plain, including the Teche/Vermillion Basin, to provide for wetland restoration, and support continued agriculture and navigation in the region. A series of navigation and salinity control structures are currently authorized and operated in the eastern portion of the Chenier Plain. Those structures maintain a freshwater source for agricultural applications and prevent salinity intrusion in the area. Tidal stages often exceed stages within the managed area, creating an inundation problem for the fresh and intermediate marshes in the area. In addition, the natural ridges that define this area continue to be impacted by erosion, which threatened to reduce continued management and sustainability of the interior marshes. That study must address water management and allocation issues including salinity control, drainage, and fisheries accessibility.

#### Science and Technology Plan

Although the NTP is based upon the best available science and takes advantage of over 25 years of experience gained through previous Louisiana coastal wetland restoration efforts via CWPPRA and other programs, there remain substantial scientific and engineering uncertainties associated with some of the proposed LCA restoration features.

Accordingly, the Corps and the State of Louisiana propose to develop and implement a Science and Technology Plan to ensure the LCA restoration effort continues to be supported by the best available science, and to resolve scientific and engineering uncertainties associated with the ecological processes of the ecosystem and their response(s) to restoration projects. Potential methods for resolving scientific and engineering uncertainties include the development and implementation of demonstration projects and adaptive management and monitoring.

### Demonstration Projects

An integral component of the LCA Science and Technology Plan is the development and implementation of demonstration projects that will further develop engineering techniques, improve understanding of the ecological processes within coastal Louisiana, and provide insights on ecosystem responses associated with proposed restoration projects and features. Proposed demonstration projects are intended to: 1) reduce scientific and engineering uncertainties regarding the effectiveness of particular restoration techniques; 2) test new, innovative technologies and engineering techniques; and, 3) test ecosystem responses to engineering techniques and operational schedules. The proposed demonstration projects include: 1) a small marsh creation project to evaluate the application of saltwater sediments to support long-term sustainable marsh; 2) barrier island restoration to evaluate the effects of different wave environments, and optimize different island dimensions and shoreline protection measures; 3) pipeline conveyance of sediments to maintain land bridges; 4) chenier unit marsh creation; and, 5) Gulf shoreline stabilization near Rockefeller Refuge.

### Beneficial-Use of Dredged Material Program

In addition to the above-listed features, the NTP would also seek from Congress programmatic authority and increased funding for the Corps' Beneficial-use of Dredged Material Program. The New Orleans District Corps annually dredges approximately 71,000,000 cubic yards (yd<sup>3</sup>) of material from key navigation channels and waterways in coastal Louisiana. Approximately 42 percent of those dredged sediments, or approximately 30,000,000 yd<sup>3</sup>, are used to restore, protect, and/or create aquatic and wetland habitats. Funding limits on that program, however, preclude using the remaining dredged material for ecosystem restoration. By obtaining Congressional authorization and funding for a comprehensive beneficial use of dredged material program under the NTP, a significant increase in the quantity of dredged sediments could be made available for use in coastal restoration efforts.

## **EVALUATION OF THE TENTATIVELY SELECTED PLAN**

Under no action conditions, a net coastal wetland loss of nearly 463,000 acres would occur by year 50, even with projected gains in the Atchafalaya River Delta (Table 1). Each of the NTP action alternatives would, to varying degrees, reduce that acreage of coastal wetland loss, if implemented. Hence, implementing any of the proposed

alternative plans would be preferable to the continued loss and degradation of coastal wetlands under the no-action scenario. Restoration Opportunity 2 (which focuses on restoring geomorphic structures) would have little, if any, effect on habitat type distribution, compared to the No-action Alternative. The river diversion features included in the other two restoration opportunities would likely result in greater amounts of fresh and intermediate marsh, compared to the No-action Alternative. The Service believes that, while both of the Restoration Opportunities 1 (which focuses on restoring deltaic processes) and 2 would have significant environmental benefits, the TSP (which focuses on preventing future land loss, restoring deltaic processes, restoring critical geomorphic structures, and protecting vital socio-economic resources) would provide the greatest fish and wildlife benefits. The TSP would likely best achieve long-term coastal wetland sustainability, because the restored geomorphic structures would help to protect and enhance the diversion feature influence areas from erosive coastal wave action and storm surge. Because sediment diversions are connected to the river resource and continually nourish receiving areas with sediments and nutrients, those features would more effectively achieve a sustainable ecosystem. Based solely on fish and wildlife considerations, those measures would likely be the most beneficial of the three evaluated alternative restoration plans currently under consideration in the NTP.

Proposed TSP features to introduce fresh water from the Mississippi River into the Maurepas Swamp, Upper Breton Sound, and the Mid-Barataria Basin would shift habitat types toward lower-salinity conditions in Subprovinces 1 and 2, compared to taking no action. Those diversions, along with marsh creation, beneficial use of dredged material, and barrier island restoration, would also restore/establish several thousands of acres of wetlands.

At year 50, wetland losses under the No-action Alternative (more than 203,000 acres) would be greater in Subprovince 3 than in any other Subprovince (Table 1). The TSP includes projects to address losses in that area. Gulf shoreline stabilization at Point Au Fer Island and increased conveyance of Atchafalaya River flows to central and eastern portions of the Terrebonne Basin would improve wetland productivity and reduce marsh loss in those areas where marine processes are advancing inland.

The TSP would have a positive effect on wildlife resources by increasing riverine and sediment inputs from the Mississippi River within Subprovinces 1 through 3, in concert with marsh creation in key areas. In combination, those features would help sustain and rejuvenate existing wetland habitats, promote significant landbuilding, and restore fresh and low salinity habitats. Marshes and swamps would be more productive and would provide improved habitat conditions for several species of wildlife.

Coastwide, the TSP would restore marsh-building and marsh-maintenance processes through freshwater and sediment inputs. The TSP would increase coastal wetland acreage compared to taking no action; thus, it would have a major positive impact on most, if not all, of the fish and wildlife resources that utilize those wetlands. The project-related conversion of brackish and saline marshes to fresh and low-salinity marshes would displace brown shrimp, spotted seatrout, and other fishes and shellfishes which

prefer more saline habitats. Those displacement impacts would be partially compensated for by project-induced increases in the productivity of remaining high salinity habitats, and by the improved sustainability of those habitats, compared to the No-action Alternative. Additionally, the abundance and productivity of white shrimp, Gulf menhaden, and other fishes and shellfishes which utilize low-salinity habitats may be increased under the preferred plan. Given the continued rapid loss and likely future collapse of brackish and salt marsh systems with no action, however, the TSP may also provide a long-term net benefit to species utilizing those areas. The Service will later recommend specific design and operational measures for incorporation into project features to minimize adverse effects on those resources and increase benefits to other fish and wildlife species, to the greatest extent practical.

Because of the uncertainties regarding some of the currently proposed habitat prediction methodologies, and because many details regarding the design, operation, and associated effects of the TSP are not yet available at the current programmatic level of planning, we cannot complete our evaluation of the TSP's effects on fish and wildlife resources, nor can we entirely fulfill our reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act. Therefore, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction of specific project measures, along with more-definitive project information that will be available during those planning implementation phases, will be required so that we can fulfill our responsibilities under that Act. Additionally, improvements in the hydrologic and desktop models will be needed to predict environmental impacts and benefits of plan features, as indicated in our previous draft Fish and Wildlife Coordination Act Report (Paille, R. and K. Roy, September 2003b) for the LCA Comprehensive Study.

### **FUTURE SERVICE INVOLVEMENT**

Because of the LCA's large scope, complexity, and programmatic nature, extensive and continuing funding will be required by the Service to enable our full participation throughout future detailed planning and post-authorization engineering and design studies, and to facilitate fulfillment of our reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act. Accordingly, the Service plans to work closely with the Corps and the State of Louisiana to formulate detailed funding estimates to support our future involvement in the LCA, as provided for in the January 2003 Partnership Agreement for Water Resources and Fish and Wildlife between the Corps and the Service. Given its scope, duration, and significance, the Service will, in cooperation with the New Orleans Corps District, draft and execute an LCA-specific set of operating guidelines for negotiating transfer funds (similar to those used for the Comprehensive Everglades Restoration Plan) to facilitate and expedite our future involvement.

Under provisions of Section 7 of the ESA of 1973, as amended, the Service will also assist the Corps and any other Federal agencies responsible for funding or implementing selected projects and/or plans to ensure that they will neither jeopardize the continued

existence of threatened and endangered species, nor adversely modify any designated critical habitat. The required consultations will be accomplished on a project-by-project basis, and will tier from the current programmatic consultation, details of which will be contained in the Programmatic Environmental Impact Statement (PEIS) for the NTP. In keeping with the consultation requirements of the ESA, informal and formal (if needed) consultation must be completed before the Record of Decision for the NTP and PEIS can be signed. Accordingly, the Service will continue to work closely with the Corps through the consultation period.

The National Wildlife Refuge System Improvement Act of 1997 mandates that no new or expanded use of a NWR may be allowed unless it is first determined to be compatible with the objectives for which that NWR was established. A compatibility determination is a written determination, indicating that a proposed or existing use of a NWR is, or is not, a compatible use. Compatible uses are defined as proposed or existing wildlife-dependent recreational uses or any other uses of a NWR that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the NWR. A compatibility determination is only required when the Service has jurisdiction over the use. Prior to initiating implementation of an LCA project that would affect any NWR, the Corps should, therefore, contact the appropriate Refuge Manager to determine if the proposed project constitutes a "refuge use" subject to a compatibility determination. To determine the anticipated impacts of any proposed use, the Corps may be required to provide sufficient data and information to document any short-term, long-term, direct, indirect or cumulative impacts on refuge resources. Compatibility determinations will include a public review and comment period before issuance of a final decision by the appropriate Refuge Manager. To facilitate such contacts, the Louisiana Field Office may be contacted at (337) 291-3100.

## **SUMMARY AND SERVICE POSITION**

The Service has actively participated throughout the formulation and evaluation of the LCA coastwide alternatives and the selection of near-term restoration features, the large-scale studies, and the potential demonstration projects that comprise the NTP. Service involvement and input includes the preparation of two previous Draft Fish and Wildlife Coordination Act Reports (Paille, R., and K. Roy, 2003a and 2003b), a letter listing threatened and endangered species within coastal parishes (Appendix A), Service assistance in preparation of the draft Biological Assessment for Comprehensive Plan effects on threatened and endangered species, and a (May 11, 2004) letter affirming our continued participation as a Cooperating Agency in accordance with the implementing regulations of the National Environmental Policy Act of 1969. Those documents are incorporated herein by reference, and should be considered as integral components of the administrative record for the forthcoming PEIS and NTP Report.

Given the substantial adverse future impacts to coastal wetlands and their associated fish and wildlife resources that are expected to occur under future without-project conditions,

we strongly support authorization and implementation of the near-term TSP for the NTP, as it would provide the greatest level of sustainable benefits to Louisiana's nationally significant coastal fish and wildlife resources. Accordingly, the Service provides the following procedural recommendations for authorization and implementation of the NTP:

1. In accordance with the January 2003 Partnership Agreement for Water Resources and Fish and Wildlife between the Service and the Corps, sufficient continuous funding should be provided to the Service to fulfill our responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act. Funding should cover Service participation in post-authorization engineering and design studies (for demonstration projects and NTP projects) and in the long-term project feasibility studies.
2. The Corps should obtain a right-of-way from the Service prior to conducting any work on a National Wildlife Refuge, in conformance with Section 29.21-1, Title 50, Right-of-way Regulations. Issuance of a right-of-way will be contingent on a determination by the Service's Regional Director that the proposed work will be compatible with the purposes for which the refuge was established.

To ensure that optimum fish and wildlife resource benefits are achieved, the Service plans to remain actively involved throughout the plan implementation process. Our findings and recommendations for each of the projects ultimately approved for implementation will be provided as supplements to this report under the authority of the Fish and Wildlife Coordination Act.

## LITERATURE CITED

- Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1998. *Coast 2050: toward a sustainable coastal Louisiana*. Baton Rouge, Louisiana. Louisiana Department of Natural Resources. 161pp.
- Louisiana Coastal Wetlands Conservation and Restoration Task Force. 2001. *The 2000 evaluation report to the U.S. Congress on the effectiveness of Louisiana coastal wetland restoration projects*. Baton Rouge, La. Louisiana Department of Natural Resources. 85pp.
- Michot, T.C., C.W. Jeske, J.C. Mazourek, W.G. Vermillion, and R.S. Kemmerer. 2003. Final draft. *Atlas and census of wading bird and seabird nesting colonies in south Louisiana, 2001*. BTNEP Publication.
- Paille, R. and K. Roy. September 2003a. *Louisiana Coastal Area Louisiana – Comprehensive Coastwide Ecosystem Restoration Study Report (recommending a TSP)*. Draft Fish and Wildlife Coordination Act Report. 25pp. Unpublished.
- Paille, R. and K. Roy. September 2003b. *Louisiana Coastal Area Louisiana – Comprehensive Coastwide Ecosystem Restoration Study Report (identifying 7 alternative action plans)*. Draft Fish and Wildlife Coordination Act Report. 30pp. Unpublished.
- Turner, R.E. 1977. Intertidal vegetation and commercial yields of penaeid shrimp. *Trans. Am. Fish. Soc.* 106:411-416.
- Turner, R.E. 1982. Wetland losses and coastal fisheries: an enigmatic and economically significant dependency. Pages 112 - 120 *in* Boesch, D.F., ed. 1982. *Proceedings of the conference on coastal erosion and wetland modification in Louisiana: causes, consequences, and options*. U.S. Fish and Wildlife Service, Biological Service Program, Washington, D.D. FWS/OBS-82/59. 256pp.
- U.S. Army Corps of Engineers. 2003. *Louisiana Coastal Area, LA – Ecosystem Restoration*. Draft LCA Main Report. 312pp. Unpublished.

## **APPENDIX A**

**September 26, 2003, U.S. Fish and Wildlife Service letter identifying  
Federally listed threatened and endangered species within coastal  
parishes of Louisiana**



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

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September 26, 2003

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New Orleans, Louisiana 70160-0267

Dear Colonel Rowan:

The Corps of Engineers (Corps), in partnership with various other State, local, and Federal agencies and entities, is preparing a Programmatic Environmental Impact Statement (PEIS) on the Louisiana Coastal Area Comprehensive Coastwide Ecosystem Restoration Study (LCA). In response to a September 23, 2003, request from Mr. Bill Klein of your staff, the U.S. Fish and Wildlife Service (Service) is pleased to provide the following information regarding Federally listed threatened and endangered species, their critical habitat, and migratory birds that may be found in or near the LCA study area. This information will facilitate programmatic Section 7 consultation under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). In addition, we have also included information to facilitate compliance with the Migratory Bird Treaty Act (MBTA; 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.).

#### **ESA Information**

Seventeen threatened or endangered species, including the Louisiana black bear, West Indian manatee, bald eagle, brown pelican, piping plover, red-cockaded woodpecker, gopher tortoise, ringed map turtle, 5 species of marine turtles, pallid sturgeon, Gulf sturgeon, inflated heelsplitter, and Louisiana quillwort, occur within the four subprovinces comprising the LCA study area. In addition, the Service has designated critical habitat for the piping plover and the Gulf sturgeon.

Following the conclusion of programmatic consultation on the LCA PEIS, the Service will continue to assist the Corps and other Federal agencies responsible for funding or implementing selected LCA projects and/or plans to ensure they will not jeopardize the continued existence of threatened and endangered species, or adversely modify their designated critical habitat. The required consultations will be accomplished on a project-by-project basis, and will build upon the programmatic consultation.

#### Louisiana Black Bear

The threatened Louisiana black bear (*Ursus americanus luteolus*) is primarily associated with forested wetlands; however, it utilizes a variety of habitat types, including marsh, spoil banks, and upland forests. Within forested wetlands, black bear habitat requirements include soft and hard mast for food, thick vegetation for escape cover, vegetated corridors for dispersal, large trees for den sites, and isolated areas for refuge from human disturbance. Remaining Louisiana

black bear populations occur in the Tensas River Basin, the Upper Atchafalaya River Basin, and coastal St. Mary and Iberia Parishes. The primary threats to that species are continued loss of bottomland hardwoods, fragmentation of remaining forested tracts, and human-caused mortality (e.g., illegal killing and accidental collisions with motor vehicles).

Louisiana black bears, particularly pregnant females, normally den from December through April. To further protect denning bears, the Service (through the final listing rule published on January 7, 1992, in Volume 57, No. 4 of the Federal Register) has extended legal protection to candidate or actual den trees. These are defined in the final listing rule as bald cypress (*Taxodium distichum*) and tupelo gum (*Nyssa* sp.) with visible cavities, having a diameter at breast height of 36 inches or greater, and occurring in or along rivers, lakes, streams, bayous, sloughs, or other water bodies. (Please note that additional information can be found at <http://endangered.fws.gov>.)

#### West Indian Manatee

Federally listed as endangered, West Indian manatees (*Trichechus manatus*) occasionally enter Lake Pontchartrain, Lake Maurepas, and their associated coastal waters and streams during the summer months (i.e., June through September). Manatees have also been reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. Should the proposed project involve activities in those areas during summer months, further consultation with this office will be necessary. Manatees have also been occasionally observed elsewhere along the Louisiana Gulf coast. They have declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals.

#### Bald Eagle

Federally listed as threatened, bald eagles (*Haliaeetus leucocephalus*) nest in Louisiana from October through mid-May. Eagles typically nest in bald cypress trees near fresh to intermediate marshes or open water in the southeastern Parishes. Areas with high numbers of nests include the Lake Verret Basin south to Houma, the southern marshes/ridge from Houma to Bayou Vista, the north shore of Lake Pontchartrain, and the Lake Salvador area. Eagles also winter and infrequently nest near large lakes in central and northern Louisiana. Major threats to this species include habitat alteration, human disturbance, and environmental contaminants (i.e., organochlorine pesticides and lead).

#### Brown Pelican

Federally listed as endangered, brown pelicans (*Pelecanus occidentalis*) are currently known to nest on Rabbit Island in Calcasieu Lake, Raccoon Point on Isles Dernieres, as well as Queen Bess Island, Plover Island (Baptiste Collette), Wine Island, and islands in the Chandeleur chain. Pelicans change nesting sites as habitat changes occur. Thus, pelicans may also be found nesting on mud lumps at the mouth of South Pass (Mississippi River Delta) and on small islands in St. Bernard Parish. In winter, spring, and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Brown pelicans feed along the Louisiana coast in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas. Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance.

#### Piping Plover

Federally listed as threatened, the piping plover (*Charadrius melodus*), as well as its designated critical habitat, occur along the Louisiana coast. Piping plovers winter in Louisiana, and may be present for 8 to 10 months, arriving from the breeding grounds as early as late July and remaining until late March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no, or very sparse, emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependant on a mosaic of sites distributed throughout the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change. Their designated critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering, and the physical features necessary for maintaining the natural processes that support those habitat components. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide. Important components (or primary constituent elements) of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

#### Red-cockaded Woodpecker

The endangered red-cockaded woodpecker (RCW, *Picoides borealis*) inhabits open, park-like stands of mature (i.e., greater than 60 years of age) pine trees containing little hardwood understory or midstory. RCWs can tolerate small numbers of overstory hardwoods or large midstory hardwoods at low densities found naturally in many southern pine forests, but they are not tolerant of dense hardwood midstories resulting from fire suppression. RCWs excavate roost and nest cavities in large living pines (i.e., 10 inches or greater in diameter at breast height). The cavity trees and the foraging area within 200 feet of those trees are known as a cluster. Foraging habitat is defined as pine and pine-hardwood (i.e., 50 percent or more of the dominant trees are pine trees) stands over 30 years of age that are located within one-half mile of the cluster.

#### Gopher Tortoise

The threatened gopher tortoise (*Gopherus polyphemus*) is associated with areas that have well-drained, sand or gravel soils appropriate for burrow establishment, ample sunlight for nesting, and understory vegetation suitable for foraging (i.e., grasses and forbs). Gopher tortoises prefer "open" longleaf pine-scrub oak communities that are thinned and burned every few years. They also inhabit existing maintained transmission rights-of-way within Washington, Tangipahoa, and St. Tammany Parishes. The gopher tortoise is the only native tortoise found in the southeastern United States. Habitat degradation (lack of thinning or burning on pine plantations) and conversion to agriculture or urbanization have contributed to the decline of that species. That

habitat decline has concentrated remaining gopher tortoise populations along pipeline and powerline rights-of-way within their range.

#### Ringed Map Turtle

The threatened ringed map (= sawback) turtle (*Graptemys oculifera*) is endemic to the Pearl River system. In Louisiana, it occurs in the Bogue Chitto River south of Franklinton, and the Pearl River north of Louisiana Highway 190 in St. Tammany and Washington Parishes. It is found in riverine habitats with moderate currents, channels wide enough to permit sunlight penetration for several hours each day, numerous logs for basking, and large, sandy banks, that are used for nesting. Habitat loss (loss of exposed sand bars, basking areas) and water quality degradation (which decreases food supply) have contributed to the decline of this species.

#### Sea Turtles

Five species of threatened (T) and endangered (E) sea turtles, including the Kemp's ridley sea turtle (*Lepidochelys kempii*; E), green sea turtle (*Chelonia mydas*; T), hawksbill sea turtle (*Eretmochelys imbricata*; E), leatherback sea turtle (*Dermochelys coriacea*; E), and loggerhead sea turtle (*Caretta caretta*; T), forage in the near-shore waters, bays and sounds of Louisiana. Of those species, the two most commonly encountered are the loggerhead and Kemp's ridley sea turtles. The National Marine Fisheries Service is responsible for aquatic marine threatened or endangered species. Eric Hawk (727/570-5312) in St. Petersburg, Florida, should be contacted for additional information concerning those species.

#### Pallid Sturgeon

The pallid sturgeon (*Scaphirhynchus albus*) is an endangered fish found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical habitats that are in a constant state of change. Detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana. Habitat loss through river channelization and dams has adversely affected this species throughout its range.

#### Gulf Sturgeon

The threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf Coast between the Atchafalaya River and the Suwannee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, the Amite River, rivers and lakes of the Lake Pontchartrain basin, and adjacent estuarine areas. Spawning occurs in coastal rivers between late winter and early spring (i.e., March to May). Adults and sub-adults may be found in those rivers and streams until November, and in estuarine or marine waters during the remainder of the year. Sturgeon less than two years old appear to remain in riverine habitats and estuarine areas throughout the year, rather than migrate to marine waters. Habitat alterations caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

On March 19, 2003, the Fish and Wildlife Service and the National Marine Fisheries Service published a final rule in the Federal Register (Volume 68, No. 53) designating critical habitat for

the Gulf sturgeon in Louisiana, Mississippi, Alabama, and Florida. Portions of the Pearl River system, Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, The Rigolets, Lake St. Catherine, and Lake Borgne within Louisiana were included in that designation. The primary constituent elements essential for the conservation of Gulf sturgeon are those habitat components that support feeding, resting, sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support those habitat components; those elements should be considered when determining potential project impacts. The primary constituent elements for Gulf sturgeon critical habitat include:

- abundant prey items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats for juvenile, subadult, and adult life stages;
- riverine spawning sites with suitable substrates for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
- riverine aggregation areas, also referred to as resting, holding and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during freshwater residency and possibly for osmoregulatory functions;
- a flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging; and necessary for maintaining spawning sites in suitable condition for egg attachment, eggs sheltering, resting, and larvae staging;
- water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;
- sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
- safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., a river unobstructed by a permanent structure, or a dammed river that still allows for passage).

Please be aware that the Fish and Wildlife Service is responsible for ESA consultations regarding the Gulf sturgeon and its critical habitat for activities in riverine units. The National Marine Fisheries Service is responsible for ESA consultation regarding the Gulf sturgeon and its critical habitat for Corps activities within estuarine units, and is responsible for all ESA consultations regarding Gulf sturgeon and its critical habitat for activities in marine units.

#### Inflated Heelsplitter

Federally listed as threatened, the inflated heelsplitter mussel (*Potamilis inflatus*) occurs in the Amite River (Louisiana [with one report in the Pearl River]) and the Tombigbee and Black Warrior Rivers (Alabama). In Louisiana, the mussel occurs between Louisiana Highway 37 and Louisiana Highway 42, with the highest concentrations between Grangeville and Port Vincent. This freshwater mussel is typically found in soft, stable substrates such as sand, mud, silt, and sandy gravel, in slow to moderate currents. Heelsplitter mussels are usually found in depositional pools below sand point bars, and in shallow pools between sandbars and river banks. Major threats to this species in the Amite River are the loss of habitat resulting from sand and gravel dredging, and channel modifications for flood control.

#### Louisiana Quillwort

Federally listed as an endangered plant species, the Louisiana quillwort (*Isoetes louisianensis*) grows on sand and gravel bars on the accreting sides of streams and moist overflow channels within riparian forest communities in Washington and St. Tammany Parishes, Louisiana. The Louisiana quillwort is a small, semi-aquatic, facultative evergreen plant with spirally arranged leaves (sporophylls) arising from a globose, two-lobed corm. The hollow leaves are transversely septate, and measure approximately 0.12 inch wide and up to 16 inches long. Major threats to this species are habitat loss through hydrologic modifications of stream habitat, and land use practices that significantly alter stream quality and hydrology. Apparently, it is dependent on a special hydrologic regime resulting from the presence of small springs scattered at the bases of banks or bluffs.

#### **MBTA Information**

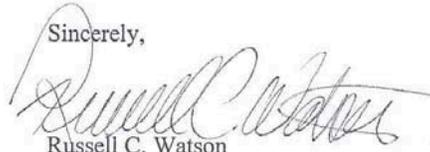
Colonial nesting waterbirds are protected under the MBTA. Colonies that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries may also be present. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect individual proposed project areas for the presence of undocumented nesting colonies during the nesting season. To minimize disturbance to colonial nesting birds, the following restrictions on individual proposed projects should be observed:

1. For colonies containing nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a rookery should be restricted to the non-nesting period (i.e., September 1 through February 15, depending on species present).
2. For colonies containing nesting gulls, terns, and/or black skimmers, all activity occurring within 650 feet of a rookery should be restricted to the non-nesting period (i.e., September 16 through April 1, depending on species present).

In addition, we recommend that on-site contract personnel be informed of the need to identify colonial nesting birds and avoid impacting them during the breeding season.

We appreciate the Corps' continued cooperation in the conservation of threatened and endangered species and migratory birds. If your staff have any questions or need further information, please have them contact Brigette Firmin (337/291-3108) of this office.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell C. Watson". The signature is fluid and cursive, with a long horizontal stroke at the end.

Russell C. Watson  
Acting Supervisor  
Louisiana Field Office

cc: NOAA Fisheries, St. Petersburg, FL  
LDWF, Natural Heritage Program, Baton Rouge, LA

## **APPENDIX B**

### **Descriptions of the Near-Term Restoration Project Concepts**

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*Small Diversion at Hope Canal* consists of a small freshwater diversion through a newly constructed control structure at Hope Canal. The objective is to introduce sediments and nutrients into Maurepas Swamp south of Lake Maurepas. The introduction of additional freshwater via the proposed diversion would facilitate organic deposition, improve biological productivity, and prevent further deterioration of the swamp.

*Small Diversion at Convent/Blind River* consists of a small freshwater diversion into Blind River through a new control structure. The objective of this feature is to introduce sediments and nutrients into the southeast portion of Maurepas Swamp. This feature would operate in conjunction with the Hope Canal freshwater diversion to facilitate organic deposition in the swamp, improve biological productivity, and prevent further swamp deterioration.

*Increase Amite River Influence by Gapping Spoil Banks* consists of gapping the existing spoil banks of the Amite River Diversion Canal. The objective of this project is to introduce additional nutrients and sediment into western Maurepas Swamp primarily during flood events and localized rainfall events. This feature would provide nutrients and sediment to facilitate organic deposition in the swamp, improve biological productivity, and prevent further swamp deterioration.

*MRGO Environmental Restoration* involves the implementation of the environmental restoration features under consideration by the MRGO Environmental Restoration Study. In response to public concerns, past environmental effects, and national economic development considerations, an ongoing study is re-evaluating the viability of operation and maintenance of this feature. Since the construction of the MRGO, saltwater intrusion has degraded large expanses of freshwater marshes and accelerated habitat switching from freshwater marshes to brackish and intermediate marshes in the Biloxi marshes, the Central Wetlands, and the Golden Triangle wetlands. This study will evaluate the stabilization of the MRGO banks and various environmental restoration projects that would reduce saltwater intrusion into Lake Pontchartrain, the Biloxi marshes, the Central Wetlands, and the Golden Triangle marshes. Implementation should result in hydrologic restoration via implementation of environmental mitigations recommended in the Mississippi River Gulf Outlet (MRGO) Study.

*The Caernarvon Diversion*, constructed in 1992 near the Breton Sound marshes, has been operated to manage salinities in the central Breton Sound estuary through the introduction of freshwater at rates ranging between 1,000 cubic feet per second (cfs) and 8,000 cfs. This restoration project would seek a post-authorization change to the original project purpose to include wetland creation and restoration via increasing freshwater introduction rates, up to perhaps 5,000 cfs on average, to provide greater wetland-building function. The introduction of additional freshwater would facilitate organic and sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

*Medium Diversion at Whites Ditch*, located at White's Ditch downstream of the Caernarvon diversion structure, would implement a medium diversion into central River aux Chene area through the construction and operation of a new water control structure. The objective of this project is to provide additional freshwater, nutrients, and fine sediments to the area between the

Mississippi River and River aux Chene ridge which is currently isolated from the beneficial effects of the Caernarvon freshwater diversion. The introduction of additional freshwater would facilitate organic sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

*Reauthorization of the Davis Pond Diversion for increased sediment input.* The Davis Pond Freshwater Diversion structure, constructed in 2002 in the upper Barataria Basin, has been operated as to control central basin salinities through freshwater introductions ranging between 1,000 cfs to 10,000 cfs. This restoration feature would seek a re-authorization of the original project purpose to include wetland creation. To achieve this goal, the freshwater introduction rate would be increased up to perhaps 5,000 cfs on average, to accelerate wetland-building functions. The introduction of additional freshwater would facilitate organic and sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

*Medium Diversion with Dedicated Dredging at Myrtle Grove* consists of a medium freshwater diversion near Myrtle Grove through a new control structure. The diversion would provide additional sediment and nutrients to nourish highly degraded existing fresh to brackish wetlands and shallow, open-water areas. This would ensure the long-term sustainability of these marshes by increasing vegetative productivity and preventing future loss. The introduction of sediment to this area would also promote the infilling of shallow, open-water areas through both deposition and marsh expansion. This diversion would be complimented by dedicated dredging of sediment mined from the Mississippi River. The objective of the component is to create 1,500 acres of additional wetlands by placing dredged sediments in the shallow, open-waters within the fragmented marsh.

*Barataria Basin Barrier Shoreline Restoration-Caminada Headland and Shell Island* consists of mining offshore sediments to re-create eroded barrier islands. Based on designs developed in the LCA Barrier Island Restoration Study, a 3,000-foot-wide island footprint would be restored.

*Terrebonne Basin Barrier Shoreline Restoration-Isles Derniere and East Timbalier* consists of restoring some of the Timbalier and Dernieres barrier island chains. This restoration would simulate historical conditions by reducing the current number of breaches, and enlarging the width and dune crest of the Isles Dernieres (East Island, Trinity Island, and Whiskey Island) and East Timbalier Island.

*Small Bayou Lafourche Reintroduction* would reintroduce flow from the Mississippi River into Bayou Lafourche. The proposed year-round flows would provide water supply benefits and reduce marsh-loss rates for the wetlands south of the GIWW, between Bayous Lafourche and Terrebonne.

*Gulf Shoreline Stabilization at Point au Fer Island* would stabilize the Gulf shoreline of Point au Fer Island to prevent direct connections from forming between the Gulf and interior water bodies as that shoreline erodes. In addition to Gulf shoreline protection, this feature would reduce marine influence on fresher Atchafalaya Bay water, protecting the adjacent wetland habitats from saltwater impacts.

*Multi-purpose Operation of Houma Navigation Canal (HNC) Lock* consists of operation of the proposed Houma Navigation Canal Lock located at the southern end of the HNC, for multiple purposes, rather than for navigation only. The Corps' Morganza to the Gulf Hurricane Protection Study includes construction of the lock, but does not include the multi-purpose operation of the lock. This restoration feature would reduce saltwater intrusion, modify water circulation in the HNC to increase the distribution of Atchafalaya River water within Terrebonne Basin wetlands, especially within the Lake Boudreaux area wetlands to the north; the Lake Decade wetlands to the west; and the Grand Bayou wetlands to the east.

*Convey Atchafalaya River Water to Terrebonne marshes* includes a number of features to improve the distribution and supply of freshwater to deteriorated Terrebonne Basin marshes via the Gulf Intracoastal Waterway (GIWW). Construction of new channels and enlargement of existing channels would increase seasonal flows of Atchafalaya River water to central (Lake Boudreaux) and eastern (Grand Bayou) Terrebonne marshes. All channel alternatives would include a gated control structure to restrict saltwater intrusion during low river stages. Project features to increase the supply of Atchafalaya River within the GIWW include repairing banks along the GIWW, enlarging constrictions in the GIWW, and diverting additional freshwater from Bayou Shaffer into Avoca Island Lake. Those conveyance features would increase suspended sediment supply to Bayou Penchant and other wetlands receiving the Atchafalaya River water via the GIWW.

*Maintain Land Bridge between Caillou Lake and Gulf of Mexico* by installing shore protection along deteriorated portions of Grand Bayou DuLarge to prevent establishment of a major new hydrologic connection between the Gulf and Sister Lake. Some shore armoring would likely be needed to protect these features from erosion on the Gulf shoreline. A more systemic and comprehensive solution would involve a much greater amount of Gulf shoreline armoring, especially toward the west where shoreline retreat and loss of shoreline oyster reefs has allowed for increased water exchange between the Gulf and the interior waterbodies (i.e., between Bay Junop and Caillou Lake). Some of the newly opened channels would be closed to restore the historic cross-sections of exchange points. By reducing marine influences in these interior areas, these features might also allow increased riverine influences from Four League Bay to benefit area marshes.

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# **APPENDIX B6**

## **Final U.S. FISH AND WILDLIFE COORDINATION ACT REPORT**

### **LCA Near-Term Plan**



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.  
Suite 400  
Lafayette, Louisiana 70506

October 6, 2004

Colonel Peter J. Rowan  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Rowan:

Enclosed is our programmatic Fish and Wildlife Coordination Act Report on the Near-Term Ecosystem Restoration Plan for the Louisiana Coastal Area (LCA), Louisiana, Feasibility Study. Comments received from the National Oceanographic and Atmospheric Administration – National Marine Fisheries Service and the Louisiana Department of Wildlife and Fisheries on our May 2004 Draft Fish and Wildlife Coordination Report are included in the enclosed report which constitutes the final programmatic-level report of the Secretary of the Interior, as required by Section 2(b) Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). This report should be appended to, and its recommendations addressed in, your forthcoming main report on the LCA study.

Should your staff have any questions regarding the enclosed report, please have them contact Ms. Catherine Grouchy (504/862-2689) of this office.

Sincerely,

Russell C. Watson  
Supervisor  
Louisiana Field Office

Enclosure

cc: Fish and Wildlife Service, Atlanta, GA (AES)  
National Marine Fisheries Service, Baton Rouge, LA  
Environmental Protection Agency, Baton Rouge, LA  
Natural Resources Conservation Service, Alexandria, LA  
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA  
LA Dept. of Natural Resources (CRD & CMD), Baton Rouge, LA

**NEAR-TERM ECOSYSTEM RESTORATION PLAN FOR  
THE LOUISIANA COASTAL AREA**

**FISH AND WILDLIFE COORDINATION ACT REPORT**



**U.S. FISH AND WILDLIFE SERVICE  
ECOLOGICAL SERVICES  
LAFAYETTE, LOUISIANA**

**OCTOBER 2004**

**NEAR-TERM ECOSYSTEM RESTORATION PLAN FOR THE  
LOUISIANA COASTAL AREA**

**FISH AND WILDLIFE COORDINATION ACT REPORT**

**PROVIDED TO  
NEW ORLEANS DISTRICT  
U.S. ARMY CORPS OF ENGINEERS  
NEW ORLEANS, LOUISIANA**

**PREPARED BY  
CATHERINE GROUCHY, FISH AND WILDLIFE BIOLOGIST  
AND  
RONNY PAILLE, SENIOR FIELD BIOLOGIST**

**U.S. FISH AND WILDLIFE SERVICE  
ECOLOGICAL SERVICES  
LAFAYETTE, LOUISIANA**

**OCTOBER 2004**

## EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service (Service) has prepared the following programmatic Fish and Wildlife Coordination Act Report for inclusion in the U.S. Army Corps of Engineers' (Corps) forthcoming final Near-term Ecosystem Restoration Plan (NTP) for the Louisiana Coastal Area (LCA), Louisiana, Ecosystem Restoration Feasibility Study. The purpose of that study is to determine the feasibility of sustaining a coastal ecosystem that supports and protects the environment, economy, and culture of southern Louisiana, and that contributes greatly to the economy and well-being of the nation. Although the NTP is largely programmatic, it is a critically important component of continuing cooperative Federal-State efforts to address the continued loss of Louisiana's coastal wetlands. The NTP, together with its supporting documentation (including this report), will be the basis upon which the Corps will request further authorization and funding from Congress to more comprehensively and sustainably address that issue.

The study area includes all of Louisiana's coastal wetlands. Those wetlands, which support nationally important fish and wildlife resources, are being lost at an average rate of approximately 24 square miles per year due to a variety of causes. The NTP, developed by the Corps, the State of Louisiana, and the other cooperating Federal agencies, identifies the first 10-year increment of highly effective restoration features targeting critical ecological need areas - those areas of the coast plagued by the greatest ecosystem degradation, and those with the greatest potential for ecosystem recovery and infrastructure protection, as well as large-scale, long-term restoration features.

Each of the three major NTP action alternatives would, to varying degrees, reduce coastal wetland loss. Hence, implementing any of the proposed action plans would be preferable to the continued loss and degradation of coastal wetlands under the no-action scenario. The Tentatively Selected Plan (TSP) encompasses a variety of restoration strategies such as freshwater and sediment diversions, interior shoreline protection, barrier island and barrier headland protection, and beneficial use of dredged material/marsh restoration. The Service believes that the TSP - which focuses on preventing future land loss, restoring deltaic processes, restoring critical geomorphic structures, and protecting vital socio-economic resources - would provide the greatest fish and wildlife benefits, and would best achieve long-term sustainability of Louisiana's coastal wetland ecosystem.

Coastwide, the TSP would restore marsh-building and marsh-maintenance processes through freshwater and sediment inputs. The TSP would increase coastal wetland acreage compared to taking no action; thus, it would have a major positive impact on most, if not all, of the fish and wildlife resources that utilize those wetlands. The project-related conversion of some brackish and saline marshes to fresh and low-salinity marshes would displace brown shrimp, spotted seatrout, and other fishes and shellfishes which prefer more saline habitats. Additionally, the abundance and productivity of white shrimp, Gulf menhaden, and other fishes and shellfishes which utilize low-salinity habitats would likely be increased under the preferred plan. Given the continued rapid loss and likely future collapse of brackish and salt marsh systems with no action, the TSP may also provide a long-term net benefit to species utilizing those areas. Accordingly,

the Service recommends that, to the greatest extent practicable during future planning iterations, design and operational measures be refined and incorporated into project features to minimize adverse effects on those resources and to increase benefits to other fish and wildlife species.

Because of the uncertainties regarding some of the currently proposed habitat prediction methodologies, and because many details regarding the design, operation, and associated effects of the TSP are not yet available at the current programmatic level of planning, we cannot complete our evaluation of the individual TSP features' effects on fish and wildlife resources, nor can we entirely fulfill our reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) for each of those features. Therefore, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction of specific project measures, along with more-definitive project information that will be available during those planning phases, will be required so that we can fulfill our responsibilities under that Act. Additionally, improvements in the hydrologic and desktop models will be needed to predict environmental impacts and benefits of individual plan features, as indicated in our previous draft Fish and Wildlife Coordination Act Reports (Paille and Roy 2003b, Grouchy and Paille 2004).

The Service has actively participated throughout the formulation and evaluation of the LCA coastwide alternatives and the selection of near-term restoration features, as well as the large-scale studies and the demonstration projects that comprise the TSP. Given the substantial adverse future impacts to coastal wetlands and their associated fish and wildlife resources under future without-project conditions, we strongly support programmatic authorization and implementation of the TSP, as it would provide the greatest level of benefits to Louisiana's nationally significant fish and wildlife resources.

To expedite construction of restoration measures, the TSP proposes the programmatic authorization of five projects, including the Small Bayou Lafourche Diversion Project. The coastal wetland restoration benefits of that project would be synergistically enhanced within eastern Terrebonne Basin critical needs areas by simultaneously constructing the Grand Bayou area features of the Convey Atchafalaya River Water to Northern Terrebonne Basin Project. Accordingly, post-authorization studies for the Bayou Lafourche Project should, to the maximum extent practicable, incorporate those potentially synergistic features.

In support of the TSP, and to expedite its implementation, the Service provides the following technical and procedural recommendations for future authorization and implementation of the TSP:

1. In accordance with the January 2003 Partnership Agreement for Water Resources and Fish and Wildlife between the Service and the Corps, sufficient continuous funding should be provided to the Service to fulfill our responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act throughout post-

authorization engineering and design studies for demonstration projects, participation in the Science and Technology Program, NTP projects, and planning and evaluation for long-term project feasibility studies. To facilitate that level of cooperation, the Service intends to negotiate an LCA-specific Memorandum of Agreement with the Corps (similar to that used for Florida's Everglades Restoration study) soon after the NTP is authorized.

2. The Corps should coordinate closely with individual refuge managers prior to conducting any work on a National Wildlife Refuge, in conformance with the National Wildlife Refuge System Improvement Act of 1997. Such coordination will be essential to the timely completion of the Service's determination that the proposed work will/will not be compatible with the purposes for which those refuges were established, and to secure any appropriate permits that may be required. Likewise, LCA activities occurring on State-administered Wildlife Management Areas or refuges should also be fully coordinated with the Louisiana Department of Wildlife and Fisheries.
3. The proposed Science and Technology Program should give high priority to refining the land gain/loss and habitat change models to enable determination of and evaluation of project-level effects and facilitate completion of FWCA reporting.
4. For purposes of maximizing synergistic wetland restoration benefits within the eastern Terrebonne Basin critical needs area, the post-authorization studies for the proposed Small Bayou Lafourche Diversion Project should, to the maximum extent possible, incorporate key Grand Bayou-area features of the Convey Atchafalaya River Water to Northern Terrebonne Basin Project.

To ensure that optimum fish and wildlife resource benefits are achieved, the Service plans to remain actively involved throughout the plan implementation process. Our findings and recommendations for each of the projects ultimately approved for implementation will be provided in draft and final supplements to this programmatic report under the authority of the Fish and Wildlife Coordination Act.

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## INTRODUCTION

The Near-term Ecosystem Restoration Plan (NTP) for the Louisiana Coastal Area (LCA), Louisiana, Ecosystem Restoration Feasibility Study has been prepared by the New Orleans District Corps of Engineers (Corps), Louisiana Department of Natural Resources, and other State and Federal natural resource agencies, with the assistance of scientists from several institutions. The LCA study was originally authorized by Resolutions adopted by the U.S. House of Representatives and Senate Committees on Public Works, on October 19, 1967, and April 19, 1967, respectively. Those resolutions sought to improve existing hurricane protection features and the ". . . prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and related water resource purposes."

As currently formulated, the LCA is envisioned as the mechanism for developing and implementing a program to achieve system-wide sustainable restoration of Louisiana's coastal wetlands. That program would maximize use of restoration strategies that promote the reintroduction of riverine fresh water, nutrients, and sediments, and that would maintain the structural integrity of the estuarine basins. The program's near-term component would also include a process to develop better techniques for meeting the critical needs of the ecosystem and to advance our understanding of the coastal ecosystem. To put the scope and significance of the LCA in proper perspective, it is important to understand the magnitude of the problems to which it will respond, as well as the unprecedented level of cooperative efforts that have already been undertaken to address those problems.

In 1990, passage of the Coastal Wetlands Planning, Protection and Restoration Act, (PL-101-646, Title III, CWPPRA) provided authorization and funding for the Louisiana Coastal Wetlands Conservation and Restoration Task Force to initiate actions to curtail the annual loss of approximately 24 square miles per year of Louisiana's coastal wetlands. In 1998, after extensive studies and construction of a number of coastal restoration projects had been accomplished under CWPPRA, the State of Louisiana and the Federal agencies charged with restoring and protecting the remainder of Louisiana's valuable coastal wetlands developed the "Coast 2050: Toward a Sustainable Coastal Louisiana" report, popularly known as the *Coast 2050 Plan*. In recognition of the national significance of Louisiana's coastal wetlands, that plan proposed ecosystem restoration strategies and efforts larger in scale than any previously implemented, including restoration of the natural processes that built and maintained coastal Louisiana.

In 2000, the Corps used the *Coast 2050 Plan* as the basis for a section 905(b) reconnaissance report intended to gain approval for a coastwide feasibility study, the purpose of which would be to obtain Water Resources Development Act authorization of, and funding for, a comprehensive coastal wetlands restoration plan to include projects larger in scope than any implemented under CWPPRA. In 2000, it was envisioned that a series of feasibility reports would be prepared over a 10-year period. The first of those feasibility efforts focused on the Barataria Basin and involved marsh creation and barrier shoreline restoration.

By Fiscal Year (FY) 2002, however, it had become widely recognized that, despite the excellent progress of other programs, a much more comprehensive approach - one that could be submitted to Congress as a blueprint for future restoration efforts - would be needed to effectively address Louisiana's coastal wetland loss. As a result, the Corps and the State of Louisiana initiated the LCA Comprehensive Coastwide Ecosystem Restoration Study (LCA Comprehensive Study), an interagency planning effort to develop a comprehensive plan to restore Louisiana's coastal ecosystem. Although they were not publicly released, a preliminary Draft LCA Comprehensive Study Report and preliminary Draft Programmatic Environmental Impact Statement (PEIS) were subsequently prepared. Associated with those documents, the Service provided a Draft Fish and Wildlife Coordination Act Report (Paille and Roy 2003a). Immediately thereafter, the Corps and the local sponsor revised those documents to describe seven action alternatives, although a preferred alternative was not identified. Subsequently, the Service prepared a revised Draft Fish and Wildlife Coordination Act Report (Paille and Roy 2003b). Following review by the Office of Management and Budget and the Council on Environmental Quality, public release of that draft LCA Comprehensive Study Report was deferred pending revisions to satisfy FY 2005 administrative budget guidance. Key elements of that guidance included requirements to: 1) identify the most critical ecological needs of the coastal area; 2) identify projects to address these needs that provide a very high return in net benefits (non-monetary and monetary) per dollar of cost; 3) present and evaluate alternatives for meeting those needs; 4) identify the key long-term scientific uncertainties and engineering challenges facing the effort to protect and restore the ecosystem; and, 5) propose a strategy for resolving the identified challenges.

In a coordinated response to that guidance, the Corps, the State of Louisiana, and the other cooperating Federal agencies (including the Service), re-focused the previous draft comprehensive ecosystem restoration plan into the current NTP. The NTP identifies the first 10-year increment of highly effective restoration features targeting critical ecological need areas—those areas of the coast plagued by the greatest ecosystem degradation, and those with the greatest potential for ecosystem recovery and infrastructure protection, as well as a science and technology (S&T) program, potential demonstration projects, programmatic authority for the beneficial use of dredged material, programmatic authority to initiate studies of modifications to existing water control structures, and large-scale, long-term restoration features. The balance of this report [originally released in draft (Grouchy and Paille 2004)] documents the Service's programmatic assessment of the NTP and provides our position on, and recommendations for future planning and implementation of the NTP and its features.

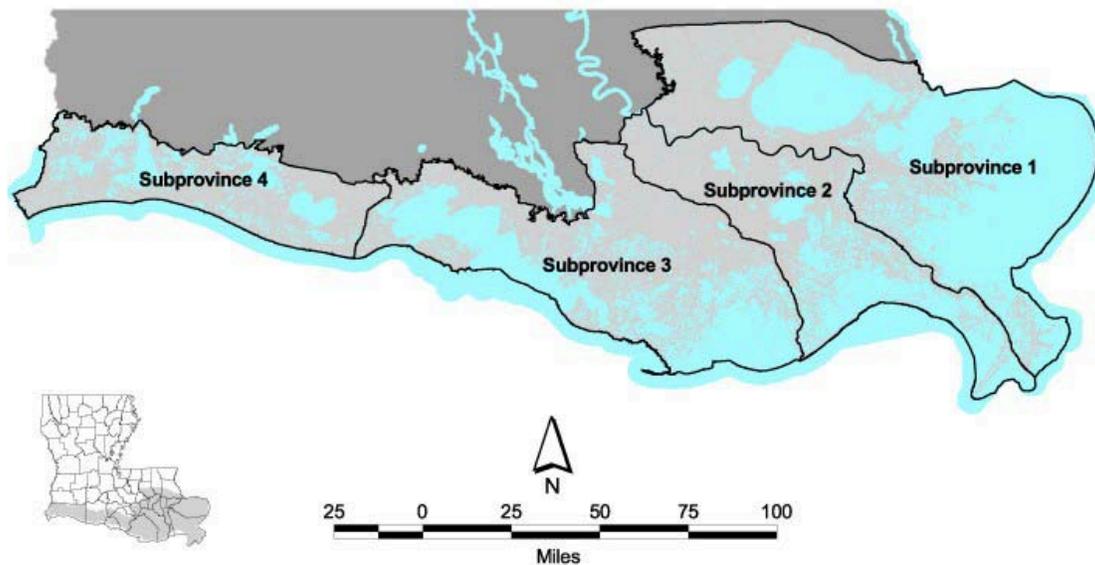
## **DESCRIPTION OF THE STUDY AREA**

The study area encompasses all of Louisiana's coastal wetlands, which include natural levee forest, swamp, fresh marsh, intermediate marsh, brackish marsh, saline marsh, and barrier islands. The study area is divided into four subprovinces (Figure 1), each of

which includes one or more coastal watersheds. The LCA subprovinces are very similar to those identified under the *Coast 2050 Plan* (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998), except that the boundary between Subprovinces 1 and 2 has been relocated from the Mississippi River-Gulf Outlet to the Mississippi River under the LCA.

Subprovince 1 consists of all coastal wetlands east of the Mississippi River (and South Pass) and includes the Pontchartrain and Breton Sound Basins. Subprovince 2 consists of the coastal wetlands between the Mississippi River and Bayou Lafourche (i.e., the Barataria Basin). Subprovince 3 extends from Bayou Lafourche westward to the Freshwater Bayou Canal and includes the Terrebonne, Atchafalaya, and Teche/Vermilion Basins. Subprovince 4 extends from the Freshwater Bayou Canal westward to the Louisiana State line (i.e. the Sabine River/Sabine Lake) and includes the Mermentau and Calcasieu/Sabine Basins.

**Figure 1. LCA Near-term Ecosystem Restoration Plan Study Area.**



## EXISTING FISH AND WILDLIFE RESOURCES

### Description of Habitats

**Forested Wetlands** - Forested wetlands in the study area consist primarily of bottomland hardwood forests and cypress-tupelo swamps. Bottomland hardwood forests found in coastal portions of the project area occur primarily on the natural levees of distributary channels. Dominant vegetation may include sugarberry, water oak, live oak, bitter pecan, black willow, American elm, Drummond red maple, Chinese tallow-tree, boxelder, green ash, baldcypress, and elderberry. Cypress-tupelo swamps are located along the flanks of larger distributary ridges as a transition zone between bottomland hardwoods and lower-

elevation marsh or scrub-shrub habitats. Cypress-tupelo swamps exist where there is little or no salinity and (usually) minimal daily tidal action.

**Scrub-Shrub** - Scrub-shrub habitat is often found along the flanks of distributary ridges. Typically, it is bordered by marsh at lower elevations and by developed areas, cypress-tupelo swamp, or bottomland hardwoods at higher elevations. Typical scrub-shrub vegetation includes elderberry, wax myrtle, buttonbush, black willow, Drummond red maple, Chinese tallow-tree, and groundselbush.

**Fresh Marsh** - Fresh marshes occur at the upper ends of interdistributary basins and are often characterized by floating or semi-floating organic soils. Most fresh marshes exhibit minimal daily tidal action; however, fresh marshes in the Mississippi and Atchafalaya River deltas and adjacent to Atchafalaya Bay are the exceptions. Vegetation may include maidencane, bulltongue, cattail, California bulrush, pennywort, giant cutgrass, American cupscale, spikerushes, bacopa, and alligatorweed. Associated open-water habitats may often support extensive beds of floating-leaved and submerged aquatic vegetation including water hyacinth, Salvinia, duckweeds, American lotus, white water lily, water lettuce, coontail, Eurasian milfoil, hydrilla, pondweeds, naiads, fanwort, wild celery, water stargrass, elodea, and others.

**Intermediate Marsh** - Intermediate marshes are a transitional zone between fresh and brackish marshes, and are often characterized by organic, semi-floating soils. Typically, intermediate marshes experience low levels of daily tidal action. Salinities are negligible or low throughout much of the year, with salinity peaks occurring during late summer and fall. Vegetation includes saltmeadow cordgrass, deer pea, three-cornered grass, cattail, bulltongue, California bulrush, seashore paspalum, wild millet, fall panicum, and bacopa. Ponds and lakes within the intermediate marsh zone often support extensive submerged aquatic vegetation including southern naiad, Eurasian milfoil, and wigeongrass.

**Brackish Marsh** - Brackish marshes are characterized by low-to-moderate daily tidal energy and by soils ranging from firm mineral soils to organic semi-floating soils. Freshwater conditions may prevail for several months during early spring; however, low-to-moderate salinities occur during much of the year, with peak salinities in the late summer to fall. Vegetation is usually dominated by saltmeadow cordgrass, but also includes saltgrass, three-cornered grass, leafy three-square, and deer pea. Shallow brackish marsh ponds occasionally support abundant beds of wigeongrass.

**Saline Marsh** - Saline marshes occur along the southern fringe of the coastal wetlands. Those marshes usually exhibit fairly firm mineral soils and experience moderate to high daily tidal energy. Vegetation is dominated by saltmarsh cordgrass, but may also include saltgrass, saltmeadow cordgrass, black needlerush, and leafy three-square. Submerged aquatic vegetation is rare. Within the study area, intertidal mud flats are most common in saline marshes.

**Ponds and Lakes** - Natural marsh ponds and lakes interspersed throughout the coastal wetlands are typically shallow, ranging in depth from 6 inches to more than 2 feet. The smaller ponds are typically shallow and the larger lakes are deeper. In fresh and low-salinity areas, ponds and lakes may support varying amounts of submerged and/or floating-leaved aquatic vegetation. Brackish and, much less frequently, saline marsh ponds and lakes may support wigeongrass beds.

**Canals and Bayous** - Canals and larger bayous typically range in depth from 4 or 5 feet, to more than 15 feet. Strong tidal flows may occur at times through those waterways, especially where they provide hydrologic connections to other large waterbodies. Such canals and bayous may have mud or clay bottoms that range from soft to firm. Dead-end canals and small bayous are typically shallow and their bottoms may be filled to varying degrees with semi-fluid organic material. Erosion, due to wave action and boat wakes, together with shading from overhanging woody vegetation, may retard the amount of intertidal marsh vegetation growing along the edges of those waterways.

**Navigation Channels** - A number of large (300-foot-wide or more) navigation channels have been dredged across Louisiana's coastal zone. Such channels include the Sabine-Neches Waterway, the Calcasieu Ship Channel, the Freshwater Bayou Channel, the Houma Navigation Canal, the Barataria Waterway, and the Mississippi River Gulf Outlet. Such channels may range in depth from 15 feet to over 40 feet, and often cut through natural distributary ridges and disrupt local hydrology by increasing tidal exchange, saltwater intrusion, and freshwater discharge rates. The Gulf Intracoastal Waterway traverses the coastal zone from east to west and has also caused hydrologic disruptions. Boat wakes and water displacement surges from the passage of large vessels have resulted in severe erosion of adjoining marshes in some locations.

**Developed Areas** - Most developed areas are located on higher elevations of former distributary channels and are typically well-drained. They include agricultural lands, and commercial and residential developments.

### Fishery Resources

Wetlands throughout the study area abound with small resident fishes and shellfishes such as least killifish, rainwater killifish, sheepshead minnow, mosquitofish, sailfin molly, grass shrimp, and others. Those species are typically found along marsh edges or among submerged aquatic vegetation, and provide forage for a variety of fish and wildlife. Fresh and low-salinity marshes provide habitat for commercially and recreationally important resident freshwater fishes such as largemouth bass, yellow bass, black crappie, bluegill, redear sunfish, warmouth, blue catfish, channel catfish, buffalo, freshwater drum, bowfin, and gar. Freshwater fishes may also utilize low-salinity areas (intermediate marsh zone), provided they have access to fresher areas during periods of high salinity.

Louisiana's coastal marshes also provide nursery habitat for many estuarine-dependent commercial and recreational fishes and shellfishes. Because of the protection and

abundant food afforded by those wetlands, they are critical to the growth and production of species such as blue crab, white shrimp, brown shrimp, Gulf menhaden, Atlantic croaker, red drum, spotted seatrout, black drum, sand seatrout, spot, southern flounder, striped mullet, and others. Those species are generally most abundant in the brackish and saline marshes; however, blue crab, Gulf menhaden, Atlantic croaker, and several other species also utilize fresh and low-salinity marshes.

Because tidal marshes provide essential nursery habitat, commercial shrimp harvests are positively correlated with the area of tidal emergent wetlands, but not open-water areas (Turner 1977 and 1982). Future commercial harvests of shrimp and other fishes and shellfishes could be adversely impacted by the high rates of marsh loss throughout the study area (Turner 1982).

The American oyster also occurs throughout much of the brackish and saline marsh zones within the study area. Oyster harvesting constitutes a valuable fishery in the northern portions of that zone, where salinities range from 10 to 15 parts per thousand (ppt).

#### Essential Fish Habitat

The generic amendment to Gulf of Mexico Fishery Management Plans identifies Essential Fish Habitat in the project area to be intertidal emergent wetlands, submerged aquatic vegetation, estuarine waters, and mud, sand, and shell water bottoms. Habitat Areas of Particular Concern have not been identified for the project area. Under the Magnuson-Stevens Fishery Conservation and Management Act, the Gulf of Mexico Fishery Management Council has determined that project-area habitats are utilized by federally managed species such as brown shrimp, white shrimp, red drum, red snapper, Spanish mackerel, and bluefish. Although those species utilize the project area primarily as nursery habitat, all life stages may occur therein. When they move to offshore waters, blue crabs and other species of fishes and shellfishes that utilize project-area estuarine habitats may also provide forage for Federally managed marine fishes such as groupers, snappers, mackerel and highly migratory species (e.g., billfishes and sharks) managed by the NOAA - National Marine Fisheries Service.

#### Wildlife Resources

Numerous species of birds utilize the study-area marshes, including large numbers of migratory waterfowl. Project-area fresh and intermediate marshes provide excellent wintering habitat for migratory waterfowl, especially puddle (dabbling) ducks. Brackish marshes with abundant submerged aquatic vegetation may also support large numbers of puddle ducks. Puddle ducks that commonly migrate to, or through, the study area include mallard, gadwall, northern pintail, blue-winged teal, green-winged teal, American wigeon, wood duck, and northern shoveler. The resident mottled duck and wood duck also utilize project-area coastal marshes for nesting, feeding, and brood-rearing. Diving ducks prefer larger ponds, lakes, and open-water areas. Common diving duck species include lesser scaup, ruddy duck, canvasback, redhead, ringnecked duck, red-breasted merganser, and hooded merganser. The lesser snow goose and the white-fronted goose

also utilize coastal marshes as wintering habitat. Other migratory game birds found in Louisiana's coastal marshes include the king rail, clapper rail, Virginia rail, sora, American coot, common moorhen, and common snipe.

Marshes and associated shallow, open-water areas also provide habitat for a number of wading birds, shorebirds, seabirds, and other nongame birds. Common wading birds include the little blue heron, great blue heron, green-backed heron, yellow-crowned night heron, black-crowned night heron, great egret, snowy egret, cattle egret, reddish egret, white-faced ibis, white ibis, and roseate spoonbill. Shorebirds include the killdeer, American avocet, black-necked stilt, common snipe, and various species of plovers and sandpipers. Seabirds include white pelican, endangered brown pelican, black skimmer, herring gull, laughing gull, and several species of terns. More than 190 wading and seabird nesting colonies have been identified within coastal Louisiana during surveys conducted in 1983, 1990, and 2001 (Michot et al. 2003). Other nongame birds, such as boat-tailed grackle, red-winged blackbird, seaside sparrow, olivaceous cormorant, northern harrier, belted kingfisher, and sedge wren, also utilize coastal-area habitats.

Common mammals occurring in the coastal marshes include nutria, muskrat, mink, river otter, raccoon, swamp rabbit, white-tailed deer, and coyote. Muskrat and river otter prefer brackish marsh. Nutria, mink, swamp rabbit, and white-tailed deer prefer fresh marsh and low salinity habitats. Saline marsh provides very poor habitat for the above listed species. For muskrat, however, saline marsh may provide fair-to-poor habitat quality.

Reptiles are most abundant in fresh and low-salinity coastal wetlands. Common species include the American alligator, western cottonmouth, water snakes, mud snake, speckled kingsnake, ribbon snakes, rat snakes, red-eared turtle, common snapping turtle, alligator snapping turtle, mud turtles, and softshell turtles. Amphibians commonly found in those areas include the bullfrog, pig frog, bronze frog, leopard frog, cricket frogs, tree frogs, chorus frogs, three-toed amphiuma, sirens, and several species of toads. In brackish and saline marshes, reptiles are limited primarily to the American alligator and the diamond-backed terrapin, respectively.

Coastal forested and scrub-shrub wetlands provide key habitats for songbirds such as the mockingbird, yellow-billed cuckoo, northern parula, yellow-rumped warbler, prothonotary warbler, white-eyed vireo, Carolina chickadee, and tufted titmouse. Those areas also provide vitally important resting and feeding areas for songbirds migrating across the Gulf of Mexico. Other avian species found in forested wetlands include the American woodcock, common flicker, brown thrasher, white-eyed vireo, belted kingfisher, loggerhead shrike, pileated woodpecker, red-headed woodpecker, downy woodpecker, common grackle, common crow, and mockingbird.

Forested habitats and associated waterbodies also support raptors such as the red-tailed hawk, red-shouldered hawk, osprey, American kestrel, Mississippi kite, northern harrier, screech owl, great horned owl, and barred owl. Wading bird colonies typically occur in cypress swamp and scrub-shrub habitats. Species found in those nesting colonies include

anhinga, great egret, great blue heron, black-crowned night heron, tricolored heron, little blue heron, cattle egret, snowy egret, white-faced and glossy ibises, and reddish egret. Resident and migratory waterfowl species found in forested wetlands and adjacent waterbodies in the project area include, but are not limited to, wood duck, mallard, green-winged teal, gadwall, and hooded merganser.

Game mammals associated with coastal forested wetlands include eastern cottontail, swamp rabbit, gray and fox squirrels, and white-tailed deer. Commercially important furbearers include river otter, muskrat, nutria, mink, and raccoon. Other mammals found in forested wetlands include striped skunk, coyote, Virginia opossum, bobcat, armadillo, gray fox, and red bat. Smaller mammal species serve as forage for both mammalian and avian carnivores and include the cotton rat, marsh rice rat, white-footed mouse, eastern wood rat, harvest mouse, least shrew, and southern flying squirrel.

Reptiles, which utilize study area bottomland hardwoods, cypress swamps, and associated shallow waters, include the American alligator, ground skink, five-lined skink, broadbanded skink, green anole, Gulf coast ribbon snake, yellow-bellied water snake, speckled kingsnake, southern copperhead, western cottonmouth, pygmy rattlesnake, broad-banded water snake, diamond-backed water snake, spiny softshell turtle, red-eared turtle, southern painted turtle, Mississippi mud turtle, stinkpot, and common and alligator snapping turtle, in addition to numerous other species.

Representative amphibians in study-area forested wetlands include dwarf salamander, three-toed amphiuma, lesser western siren, central newt, Gulf coast toad, eastern narrow-mouthed toad, green treefrog, squirrel treefrog, pigfrog, bullfrog, southern leopard frog, bronze frog, upland chorus frog, southern cricket frog, and spring peeper.

Most developed areas provide low-quality wildlife habitat. Sites developed for agricultural purposes are usually located at elevations slightly higher than the wetlands, or they may have improved drainage. In agricultural areas, wildlife habitat is primarily provided by unmaintained ditch banks and field edges, fallow fields, pasture lands, and/or occasionally flooded fields. Cultivated crops, especially soybeans, provide forage for some wildlife species. Game species that utilize agricultural lands include the white-tailed deer, mourning dove, bobwhite quail, eastern cottontail, and common snipe. Seasonally flooded cropland and fallow fields may also provide important feeding habitat for wintering waterfowl, wading birds, and other waterbirds.

### Threatened and Endangered Species

As a cooperating agency, the Service provided a September 26, 2003, letter to the Corps detailing Federally listed threatened and endangered species, their critical habitat, and migratory birds that may be found in or near the study area for the draft LCA Comprehensive Study (Appendix A). That information, and the draft Biological Assessment which Service staff also helped to prepare, remain applicable to the NTP alternatives, and were used to facilitate programmatic Section 7 consultation under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et

seq.) and compliance with the Migratory Bird Treaty Act (MBTA; 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.). In keeping with the consultation requirements of the ESA, informal and formal (if needed) consultation must be completed before the Record of Decision for the NTP and PEIS can be signed. The Service has, via the Department of Interior's August 23, 2004, letter, concurred with the Corps' programmatic "not likely to adversely affect determination" for the TSP.

Consultations such as this one, involving a Federal agency proposal to adopt or approve a management plan or strategy that would be used to guide the development and implementation of future projects, are termed "programmatic consultations." Several courts have ruled that the decision to adopt plans or strategies that guide the implementation of future individual actions, as well as each future individual action itself, must fulfill the requirements for consultation under Section 7 of the ESA. Accordingly, while potential impacts associated with the proposed Louisiana Coastal Area Ecosystem Restoration Study TSP have been addressed at the programmatic level, an additional Biological Assessment/Biological Evaluation should be prepared when individual projects that tier off that plan/PEIS may affect a Federally listed threatened or endangered species and/or adversely affect designated critical habitats.

### Fish and Wildlife Summary

Coastal Louisiana contains an estimated 45 percent of the tidal marshes in the conterminous United States but sustains approximately 80 percent of the nation-wide loss of those habitats. Louisiana's 3.67 million acres of coastal wetlands and their associated waters support nationally important fish and wildlife resources, and sustain the largest commercial fish and shellfish harvest in the lower 48 States. More than 1.1 billion pounds of fish and shellfish (including shrimp, crabs, crawfish, and oysters) are harvested annually in coastal Louisiana. That harvest is nearly twice that of any other State, and was valued at more than \$400 million in 2000 (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2001).

Recreational saltwater anglers spend approximately \$245 million annually to fish for spotted seatrout, red drum, snapper, tuna and other species (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2001). Fresh and low-salinity coastal wetlands also provide important habitat for numerous freshwater sport fishes, the pursuit of which is also an important recreational activity in those coastal areas.

Louisiana's coastal marshes provide winter habitat for more than 50 percent of the duck population of the Mississippi Flyway. Fresh and intermediate marshes support the greatest concentrations of wintering waterfowl in coastal Louisiana. Those wetlands are vitally important to the mission of the Gulf Coast Joint Venture, which was established to help achieve the goals of the North American Waterfowl Management Plan.

Louisiana's coastal marshes, swamps, and associated habitats also support many other migratory birds, such as rails, gallinules, shorebirds, seabirds, wading birds, and

numerous songbirds. One hundred ninety-seven colonies of wading birds and seabirds (representing 215,249 pairs of nesting birds) were observed in coastal Louisiana during a 2001 survey (Michot 2003). The cheniers and natural levee forests of coastal Louisiana provide essential stopover habitat to numerous neotropical migratory passerine birds.

Coastal Louisiana has long been a leading fur-producing area in North America. Common furbearers include nutria, mink, muskrat, raccoon, and river otter. Those coastal marshes and swamps also support game animals such as the white-tailed deer and swamp rabbit. The area also supports 1.5 million alligators for which sport and commercial hunting is closely regulated.

### Refuges and Wildlife Management Areas

The Service administers 10 National Wildlife Refuges (NWR) encompassing more than 301,700 acres in coastal Louisiana. They include Sabine, Cameron Prairie, Lacassine, Shell Keys, Bayou Teche, Delta, Breton, Bayou Sauvage, Big Branch Marsh, and Mandalay NWRs. Additional information on each of those NWRs can be found on the Service's web page ([www.fws.gov](http://www.fws.gov)). The Louisiana Department of Wildlife and Fisheries also operates 17 refuges, preserves, and wildlife management areas in coastal Louisiana, comprising more than 572,000 acres ([www.wlf.state.la.us](http://www.wlf.state.la.us)). Where threatened by significant losses, future LCA investments may be needed to protect and restore those public lands. Such public lands may also provide highly cost-effective and secure sites for future LCA demonstration and research projects.

## **FISH AND WILDLIFE CONCERNS IN THE STUDY AREA**

The foremost study-area concern, particularly from a fish and wildlife resource standpoint, is the rapid deterioration and loss of coastal wetlands. During the 1900s, Louisiana lost approximately 1.2 million acres of its coastal wetlands. Coastwide loss rates peaked at approximately 42 square miles per year during the 1950s and 1960s. Currently, Louisiana's coastal wetland loss rate is approximately 24 square miles per year. Additionally, large areas of fresh marsh and low-salinity wetlands have converted to deteriorated brackish and saline marshes, or open water.

To address this serious problem, a number of coastal wetland restoration projects have been constructed and/or authorized for construction throughout coastal Louisiana. More than 140 projects are funded and authorized via CWPPRA. Two large freshwater introduction projects (Davis Pond and Caernarvon) have been implemented by the Corps under other authorities. Despite their success, those efforts will, together, address less than one-third of the 462,000-acre wetland loss projected to occur by the year 2050 in Louisiana. Thus, the past and continuing loss of coastal wetlands and their associated habitat values during the future without-project are the principal threat to the nationally significant fish and wildlife resources that depend on them.

## **PLAN FORMULATION AND EVALUATION METHODOLOGY**

Individual restoration projects previously identified during development of the October 2003 Draft LCA Comprehensive Study Report were evaluated for inclusion in the NTP by applying 3 “sorting” criteria and 4 “critical need” criteria to each project identified. Sorting criteria were used to classify individual features into the major NTP components (i.e., near-term restoration features, large-scale studies, and demonstration projects). The four critical need criteria (preventing future land loss, restoring fundamentally impaired deltaic processes, restoring critical geomorphic structures, and protecting vital socio-economic resources) were developed to assess the potential for project features to address critical needs. Those sorting and critical needs criteria include:

Sorting Criterion #1 - Engineering and design completed, and construction started within 5 to 10 years.

This criterion would require the completion of feasibility studies including further modeling to optimize expected environmental outcome, full analysis of National Economic Development (NED) benefits, real estate acquisition, etc. in time to initiate construction in 10 years or less. It also includes completion of necessary NEPA documentation, pre-construction engineering & design, and receipt of construction authorization and commencement of construction during that period. A candidate restoration feature not deemed to meet this criterion would not be included in the NTP; however, it might be a candidate for the large-scale, long-range study component of the NTP.

Sorting Criterion #2 - Based upon sufficient scientific and engineering understanding of processes.

To satisfy this criterion, individual project features must have a sound basis in science, technology, and the engineering principles specific to those features must have been applied within coastal Louisiana to successfully achieve the desired ecosystem response. Individual features that do not meet this criterion were not included as potential near-term projects. The scientific and/or engineering uncertainties associated with those restoration features may, however, provide a basis for potential demonstration projects, and for review and analysis through the Science and Technology component of the NTP.

Sorting Criterion #3 - Implementation is independent of and does not require another restoration feature to be implemented first.

If a feature is dependent on one or more other restoration features, that feature may be combined and reassessed to determine if the composite meets the other sorting criteria. If so, the composite project is then classified appropriately. If the evaluated individual feature might preclude the later implementation of another

restoration feature, then it is not included in the NTP, but might become a candidate for long-range study.

Individual features that met all of the above sorting criteria were then evaluated against the below listed “critical need” criteria to determine if they should be included in the NTP. When the criteria were applied, the reasoning for the subsequent decisions was recorded so that the study team could make relative comparisons and refine the overall application of the “critical needs” criteria. Those criteria are as follows:

Critical Need Criterion #1 - Prevent future land loss where predicted to occur.

One of the most fundamental drivers of ecosystem degradation in coastal Louisiana has been the conversion of land (mostly emergent vegetated wetland habitat) to open water. One of the most fundamental critical needs is to stem this loss. Thus, the projection of the future condition of the ecosystem must be based upon the determination of future patterns of land and water. Future patterns of land loss were based on the USGS open file report 03-334 “Historical and Predicted Coastal Louisiana Land Changes: 1978-2050.” This also applies to future predicted conversion of cypress swamp in areas with existing fragmenting marsh.

Critical Need Criterion #2 - (Sustainability) Restore fundamentally impaired deltaic processes through river reintroductions, or mimic deltaic processes.

This criterion refers to features that would restore or mimic natural connections between the river and the basins (or estuaries) and includes river diversions, crevasses, and over-bank flows. Mechanical marsh creation with river sediment is also viewed as mimicking the deltaic function of sediment introduction, if supported by sustainable freshwater and nutrient reintroduction.

Critical Need Criterion #3 - (Sustainability) Restore endangered or critical geomorphic structure.

This criterion pertains to project features that would restore or maintain natural geomorphic features such as barrier islands, distributary ridges, cheniers, land bridges, and beach and lake rims that are essential to maintaining the integrity of coastal ecosystems.

Critical Need Criterion #4 - Protect vital socio-economic resources.

This criterion would be met by project features which protect key local, regional, and national resources of social, economic, and cultural significance, such as cultural features and points of interest, communities, infrastructure, and businesses and industries.

Modeling to compare impacts/benefits to fish and wildlife resources of alternative plans was not conducted, due to the short time frame to complete the NTP and because those plans are of a highly programmatic nature at present. Instead, the results of modeling conducted during the earlier LCA Comprehensive Study were used as the basis for estimating NTP benefits to fish and wildlife resources. Although those assessment methods are adequate for a coastwide programmatic-level evaluation, when individual project features are undergoing further engineering and design, more rigorous assessments will be required to quantify fish and wildlife benefits and impacts, complete NEPA documentation, meet various water development planning policies, and to enable the Service to fulfill its Fish and Wildlife Coordination Act mandates.

### **FUTURE WITHOUT-PROJECT FISH AND WILDLIFE RESOURCES**

Under future with no-action conditions, more than 462,000 additional wetland acres would be lost by year 50 (Table 1). Habitat types would continue shifting toward more brackish and saline wetlands and open water, with the continual loss of more salt-sensitive freshwater vegetation. Because of the current degree of risk and uncertainty associated with the salinity/habitat type projection methodologies, however, the data in Table 1 do not reflect this anticipated trend. Nonetheless, corresponding decreases in habitat values for fish and wildlife that use those wetlands would also occur in association with the projected wetland losses.

Wetland Type	TY0 (acres)	TY50 (acres)	Acreage change	Percent change
Swamp	1,040,785	949,707	-91,078	-8.8
Fresh marsh	940,811	798,847	-141,964	-15.1
Intermediate marsh	724,289	956,240	231,951	32.0
Brackish marsh	584,524	437,477	-147,046	-25.2
Saline marsh	374,778	60,157	-314,622	-83.9
Total wetlands	3,665,188	3,202,428	-462,760	-12.6

## RESTORATION OPPORTUNITY DESCRIPTIONS

As detailed above, application of the sorting criteria and critical needs criteria were the basis for selecting the NTP restoration features, large-scale studies, and candidate science and technology demonstration projects. The following paragraphs describe those restoration opportunities in greater detail.

### Near-Term Restoration Features

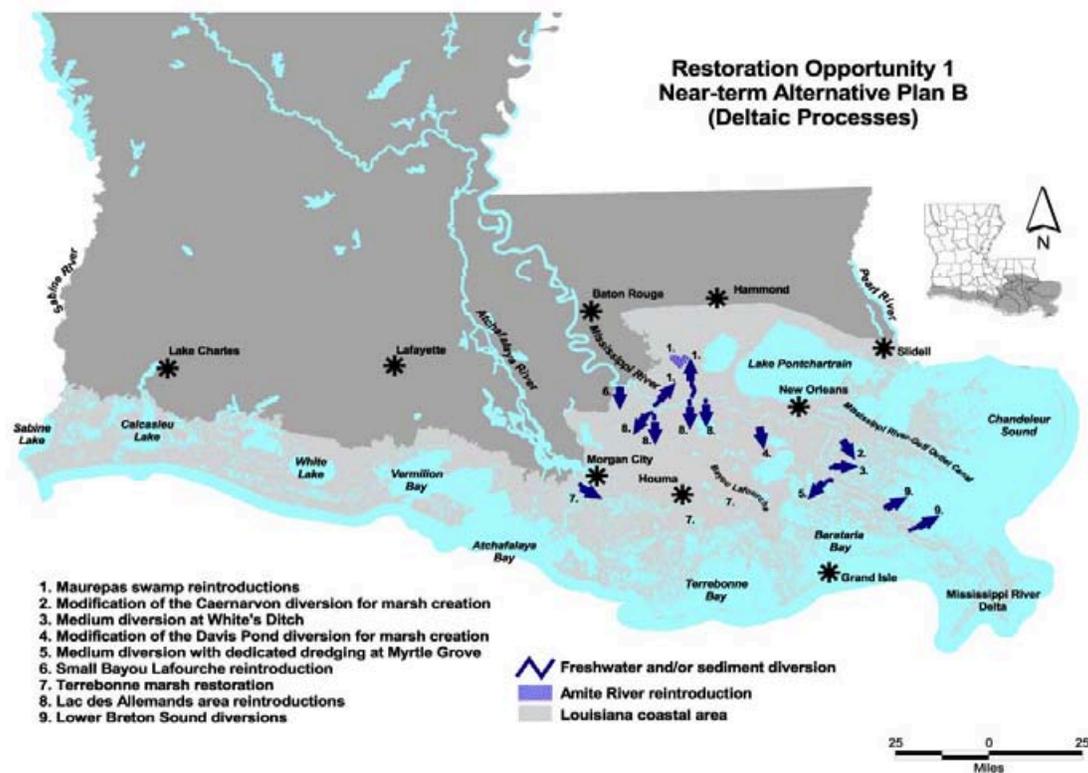
Of the 78 features that the sorting criteria were applied to, those features that met all three sorting criteria were considered as possible NTP features. Alternative combinations of those features were developed by applying each of the critical needs criteria individually or in various combinations. Application of the critical needs criteria yielded 15 possible alternatives. While that analysis indicated some similarity between alternatives, distinct alternatives were identified that were focused on critical needs criterion #2 only (Restoration Opportunity 1), critical needs criterion #3 only (Restoration Opportunity 2), and all four critical needs criteria combined (the Tentatively Selected Plan or TSP).

Restoration Opportunity 1 focuses on restoration of deltaic processes and includes nine near-term restoration features (Figure 2). This plan exhibits some shortcomings because it does not address critical geomorphic structures. Those features and their respective subprovinces (SP) are as follows:

- 1) Maurepas Swamp Reintroductions (SP 1)
  - a. Small Diversion at Hope Canal (CWPPRA River Reintroduction to Maurepas Swamp)
  - b. Small Diversion at Convent/Blind River
  - c. Increase Amite River Influence by Gapping Spoil Banks
- 2) Modification of the Caernarvon Diversion for Marsh Creation (SP1)
- 3) Medium Diversion at Whites Ditch (SP1)
- 4) Modification of the Davis Pond Diversion for Marsh Creation (SP2)
- 5) Medium Diversion with Dedicated Dredging at Myrtle Grove (SP 2)
- 6) Small Bayou Lafourche Reintroduction (SP 3);
- 7) Terrebonne Marsh Restoration Opportunities (SP 3)
  - a. Optimize Flows and Atchafalaya River Influence in Penchant Basin
  - b. Multi-purpose Operation of Houma Navigation Canal (HNC) Lock
  - c. Convey Atchafalaya River Water to Terrebonne Marshes
- 8) Lac Des Allemands Area Reintroductions
  - a. Small Diversion at Lac Des Allemands
  - b. Small Diversion at Donaldsonville
  - c. Small Diversion at Pikes Peak
  - d. Small Diversion at Edgard
- 9) Lower Breton Sound Diversions

Diversion features range from 1,000 cfs to 5,000 cfs for small diversions, 5,001 cfs to 15,000 cfs for medium diversions, and greater than 15,000 cfs for large diversions.

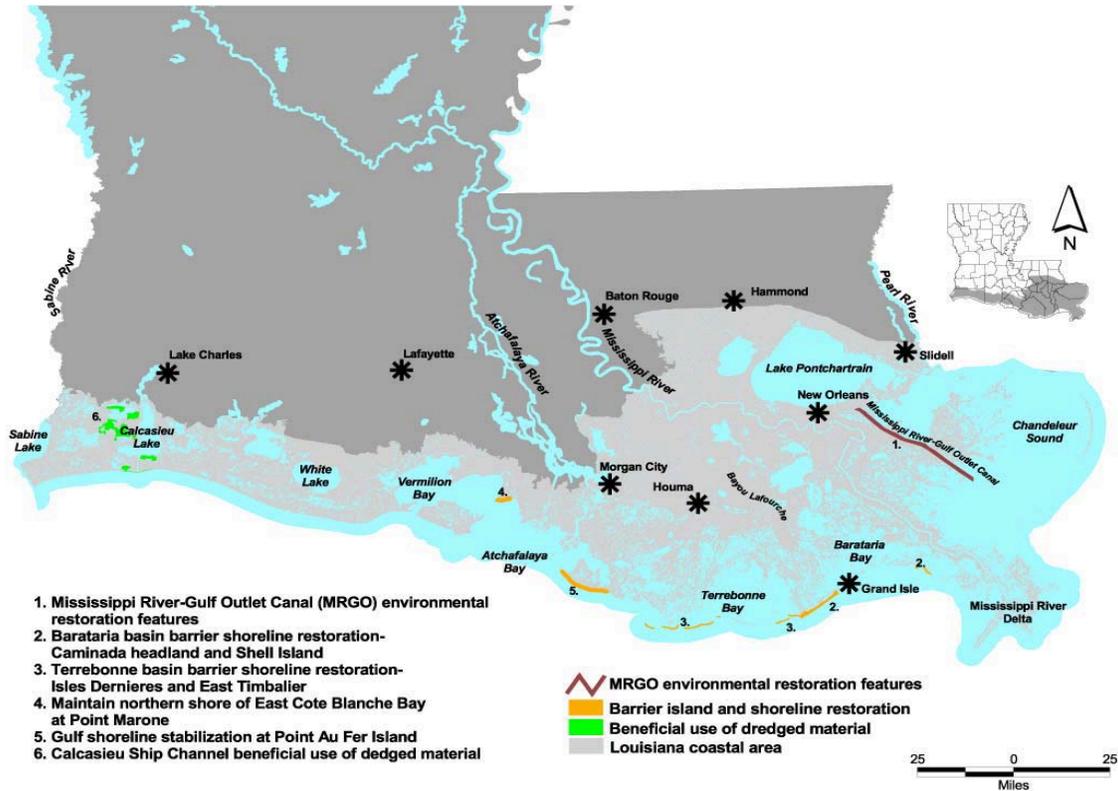
**Figure 2. LCA Near-term Ecosystem Restoration Plan Restoration Opportunity 1 - Restoration of Deltaic Processes.**



Restoration Opportunity 2 focuses on restoration of geomorphic structure. It consists of six restoration opportunities which include shoreline protection, barrier island restoration, and marsh-creation features (Figure 3). This plan exhibits some shortcomings because it does not address the river reintroductions. Features of this alternative and their respective SPs are as follows:

- 1) Mississippi River Gulf Outlet Environmental Restoration (SP 1)
- 2) Barataria Basin Barrier Shoreline Restoration-Caminada Headland and Shell Island (SP 2)
- 3) Terrebonne Basin Barrier Shoreline Restoration-Isles Dernieres and East Timbalier (SP3)
- 4) Gulf Shoreline Stabilization at Pt. Au Fer Island (SP 3)
- 5) Maintain Land Bridge Between Caillou Lake and Gulf of Mexico (SP3)
- 6) Calcasieu Ship Channel Beneficial Use of Dredged Material (SP4)

**Figure 3. LCA Near-term Ecosystem Restoration Plan Restoration Opportunity 2 - Restoration of Geomorphic Structure.**



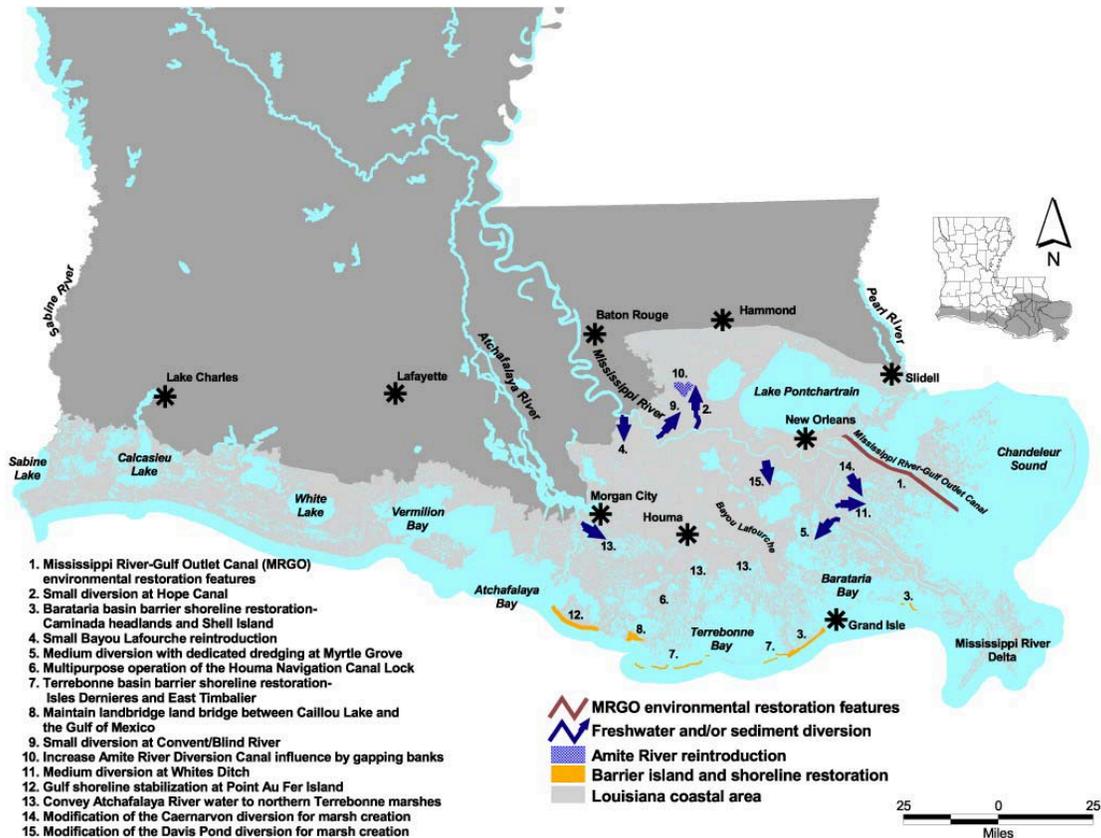
The third alternative restoration opportunity, or the TSP, encompasses all 4 critical needs criteria, and includes 15 potential restoration features including freshwater and sediment diversions, interior shoreline protection, barrier island and barrier headland protection, and dredged material/marsh creation (Figure 4). The restoration features of this alternative and their respective SPs are as follows:

- 1) Mississippi River-Gulf Outlet Canal (MRGO) Environmental Restoration (SP 1)
- 2) Small Diversion at Hope Canal (CWPPRA River Reintroduction into Maurepas Swamp)
- 3) Barataria Basin Barrier Shoreline Restoration-Caminada Headland and Shell Island (SP 2)
- 4) Small Bayou Lafourche Reintroduction (SP 3)
- 5) Medium Diversion with Dedicated Dredging at Myrtle Grove (SP 2)
- 6) Multi-purpose Operation of Houma Navigation Canal (HNC) Lock
- 7) Terrebonne Basin Barrier Shoreline Restoration-Isles Dernieres and East Timbalier (SP3)
- 8) Maintain Land Bridge between Caillou Lake and Gulf of Mexico (SP 3)
- 9) Small Diversion at Convent/Blind River
- 10) Increase Amite River Influence by Gapping Spoil Banks
- 11) Medium Diversion at Whites Ditch (SP1)

- 12) Gulf Shoreline Stabilization at Point Au Fer Island (SP 3)
- 13) Convey Atchafalaya River Water to Terrebonne Marshes
- 14) Modification of the Caernarvon Diversion for Marsh Creation (SP1)
- 15) Modification of the Davis Pond Diversion for Marsh Creation (SP2)

More detailed descriptions of the above-listed features are found in Appendix B.

**Figure 4. LCA Near-term Ecosystem Restoration Plan – Tentatively Selected Plan**



### COMPONENTS OF THE TENTATIVELY SELECTED PLAN

Of the three alternative plans selected for further comparison, the TSP best meets the programmatic planning objectives and the critical needs criteria. This plan addresses the immediate and critical needs of the ecosystem in terms of attaining the study objectives. The rehabilitation of the coastal ecosystem by promoting the distribution of riverine freshwater, nutrients, and sediments using natural processes and ensuring the structural integrity of the estuarine basins is the key to this sustainable solution.

Significant technical and scientific uncertainties underscore the need for strong and continued science and technology (S&T) development supported by demonstration projects. In addition, existing water resource projects could potentially be modified to

advance sustainable restoration. To better achieve completeness and effectiveness, these two additional programmatic plan components were incorporated into the TSP to provide the most effective near-term approach to address coastal ecosystem degradation in Louisiana. The LCA program will depend on Congressional approval of the TSP as a framework for programmatic and future authorization actions. Components of the TSP are summarized in Tables 2a and 2b at the end of this section, and include:

- Programmatic authorization of initial Near-term Critical Restoration Features;
- Programmatic authorization of S&T Program;
- Programmatic authorization of S&T Program Demonstration Projects;
- Programmatic authorization for the Beneficial Use of Dredged Material, and
- Programmatic authorization to Initiate Studies of Modifications to Existing Water Control Structures;
- Future Congressional authorization required for the remaining components of the TSP in subsequent WRDAs; and
- Feasibility studies for the continued development of long-term and large-scale restoration concepts.

#### Initial Near-term Critical Restoration Features

The TSP includes 15 near-term critical restoration features (Figure 4 and Table 2a and 2b), 5 of which are recommended for implementation through programmatic authorization. Implementation of these five restoration features would be subject to subsequent completion of NED/National Ecosystem Restoration (NER) analyses, NEPA, ESA, and FWCA compliance, and appropriate feasibility-level decision documents. Those feasibility-level decision documents would be developed pursuant to current policies and guidelines, and would be subject to review and approval by the Secretary of the Army. The five near-term critical restoration features are:

- MRGO Environmental Restoration Features
- Small Diversion at Hope Canal
- Barataria Basin Barrier Shoreline Restoration, Caminada Headland, Shell Island
- Small Bayou Lafourche Reintroduction
- Medium Diversion at Myrtle Grove with Dedicated Dredging

#### Science and Technology Plan

Although the TSP is based upon the best available science and takes advantage of over 25 years of experience gained through previous Louisiana coastal wetland restoration efforts via CWPPRA and other programs, there remain substantial scientific and engineering uncertainties associated with some of the proposed LCA restoration features. Accordingly, the Corps and the State of Louisiana propose to develop and implement a Science and Technology Plan to ensure the LCA restoration effort continues to be supported by the best available science,

and to resolve scientific and engineering uncertainties associated with coastal ecological processes and their response(s) to restoration projects. Methods for resolving scientific and engineering uncertainties may include the implementation of demonstration projects, adaptive management, and monitoring.

### Demonstration Projects

An integral component of the LCA Science and Technology Plan is the development and implementation of demonstration projects that will further develop engineering techniques, improve understanding of the ecological processes within coastal Louisiana, and provide insights on ecosystem responses associated with proposed restoration projects and features. Proposed demonstration projects are intended to: 1) reduce scientific and engineering uncertainties regarding the effectiveness of particular restoration techniques; 2) test new, innovative technologies and engineering techniques; and, 3) test ecosystem responses to engineering techniques and operational schedules. The TSP proposed demonstration projects include (see Appendix B for description):

- Wetland Creation in Vicinity of Barataria Chenier Unit;
- Pipeline Conveyance of Sediments to Maintain Land Bridges;
- Pipeline Canal Restoration (various methods and locations);
- Shoreline Erosion Protection Test Sections in or near Rockefeller Refuge; and
- Barrier Island Sediment Sources Demo in the Vicinity of Terrebonne Barrier Islands.

### Programmatic Authority for the Beneficial Use of Dredged Material

In addition to the above-listed features, the TSP seeks from Congress programmatic authority and increased funding for the Corps' Beneficial-use of Dredged Material Program. The New Orleans District Corps annually dredges approximately 71,000,000 cubic yards (yd<sup>3</sup>) of material from key navigation channels and waterways in coastal Louisiana. Approximately 42 percent of those dredged sediments, or approximately 30,000,000 yd<sup>3</sup>, are used to restore, protect, and/or create aquatic and wetland habitats. Funding limits on that program, however, preclude using the remaining dredged material for ecosystem restoration. By obtaining Congressional authorization and funding for a comprehensive beneficial use of dredged material program under the TSP, the quantity of dredged sediments available for use in coastal restoration efforts could be substantially increased.

### Programmatic Authority to Initiate Studies of Modifications to Existing Water Control Structures

The TSP recommends programmatic authorization to plan and evaluate potential modifications of existing water control structures and/or their operation/management plans for the purpose of contributing to the attainment of LCA ecosystem restoration objectives.

## Standard Authorization of Other Near-Term Critical Restoration Features

In addition to the five programmatically authorized critical near-term restoration features discussed above, the other ten TSP features are recommended for approval under the Corps' (i.e., WRDA) standard authorization process. The 10 features include:

- Multi-purpose operation of the Houma Canal Lock;
- Terrebonne Basin barrier-shoreline restoration, East Timbalier, Isle Dernieres;
- Maintain land bridge between Caillou Lake and Gulf of Mexico;
- Small diversion at Convent/Blind River;
- Increase Amite River diversion canal influence by gapping banks;
- Medium diversion at White's Ditch;
- Stabilize gulf shoreline at Pointe Au Fer Island;
- Convey Atchafalaya River water to northern Terrebonne marshes;
- Re-Authorization of Caernarvon diversion – optimize for marsh creation; and,
- Re-Authorization of Davis Pond diversion – optimize for marsh creation.

## Large-scale Studies

The TSP also recommends feasibility studies of large-scale restoration concepts which have a high level of complexity and/or uncertainty associated with them. Those conceptual projects would affect (both positively and negatively) significant ecological and economic resources, but could potentially contribute to a more sustainable coastal Louisiana. The feasibility of implementing such large-scale restoration concepts is not fully known, nor is it likely that the requisite detailed investigations and the resolution of issues (e.g., land acquisition) associated with implementation could be completed in time to begin construction within the next 10 years. The large-scale, long-term initiatives selected for initiation under the TSP are as follows (see Appendix B for description):

- 1) Mississippi River Hydrodynamic Study
  - a. Mississippi River Delta Management Study (SP 1 and 2)
  - b. Third Delta (SP 2 and 3)
  - c. Upper Atchafalaya Basin Study including Evaluation of Modified Operational Scheme of Old River Control Structure Conducted under Mississippi River and Tributaries (SP 3)
- 2) Acadiana Bay Estuarine Restoration Study (SP3)
- 3) Chenier Plain Freshwater Management and Allocation Reassessment (SP 4).

<b>Table 2a. Components of the LCA Tentatively Selected Plan Recommended for Programmatic Authorization</b>	
1.	<u>Near-term Critical Restoration Features</u> <ul style="list-style-type: none"> <li>• (1) MRGO Environmental Restoration features</li> <li>• (2) Small Diversion at Hope Canal</li> <li>• (3) Barataria Basin Barrier shoreline restoration, Caminada Headland, Shell Island</li> <li>• (4) Small Bayou Lafourche Reintroduction</li> <li>• (5) Medium Diversion at Myrtle Grove with Dedicated Dredging</li> </ul>
2.	<u>S&amp;T Program</u>
3.	<u>Initial S&amp;T Program Demonstration Projects</u> <ul style="list-style-type: none"> <li>• Wetland Creation in Vicinity of Barataria Chenier Unit (freshwater chenier restoration)</li> <li>• Pipeline Conveyance of Sediment to Maintain Land Bridge</li> <li>• Pipeline Canal Restoration (various methods and locations)</li> <li>• Shoreline Erosion Protection Test Sections in the Vicinity of Rockefeller Refuge</li> <li>• Barrier Island Sediment Sources Demo in Vicinity of Terrebonne Barrier Islands</li> </ul>
4.	<u>Programmatic Authority for the Beneficial Use of Dredged Material</u>
5.	<u>Programmatic Authority to Initiate Studies of Modifications to Existing Water Control Structures</u>

<b>Table 2b. Components of the LCA Tentatively Selected Plan Recommended for Approval With Future Authorization</b>	
6.	<u>Other Near-term Critical Restoration Features</u> <ul style="list-style-type: none"> <li>• (6) Multi-purpose Operation of the Houma Navigation Canal Lock</li> <li>• (7) Terrebonne Basin Barrier-shoreline Restoration, E. Timbalier, Isles Dernieres</li> <li>• (8) Maintain Land Bridge between Caillou Lake and Gulf of Mexico</li> <li>• (9) Small Diversion at Convent / Blind River</li> <li>• (10) Increase Amite River Diversion Canal Influence by gapping banks</li> <li>• (11) Medium Diversion at White's Ditch</li> <li>• (12) Stabilize Gulf Shoreline at Pointe Au Fer Island</li> <li>• (13) Convey Atchafalaya River water to Northern Terrebonne Marshes</li> <li>• (14) Re-authorization of Caernarvon Diversion – optimize for marsh creation</li> <li>• (15) Re-authorization of Davis Pond – optimize for marsh creation</li> </ul>
7.	<u>Large-scale and Long-term Concepts Requiring Detailed Study</u> <ul style="list-style-type: none"> <li>• Mississippi River Hydrodynamic Model <ul style="list-style-type: none"> <li>▪ Mississippi River Delta Management Study</li> <li>▪ Third Delta Study</li> <li>▪ Upper Atchafalaya Basin Study including evaluation of alternative operational schemes of Old River Control Structure <i>funded under MR&amp;T</i></li> </ul> </li> <li>• Chenier Plain Freshwater Management and Allocation Reassessment Study</li> <li>• Acadiana Bay Estuarine Restoration Study</li> </ul>

## EVALUATION OF THE TENTATIVELY SELECTED PLAN

Under no-action conditions, a net coastal wetland loss of nearly 463,000 acres would occur by year 50, even with projected gains in the Atchafalaya River Delta (Table 1). Each of the NTP action alternatives would, to varying degrees, reduce that acreage of

coastal wetland loss, if implemented. Hence, implementing any of the proposed alternative plans would be preferable to the continued loss and degradation of coastal wetlands under the no-action scenario. Restoration Opportunity 2 (which focuses on restoring geomorphic structures) would have little, if any, effect on habitat type distribution, compared to the No-action Alternative. The river diversion features included in the other two restoration opportunities would likely result in greater amounts of fresh and intermediate marsh, compared to the No-action Alternative. The Service believes that, while both Restoration Opportunities 1 (which focuses on restoring deltaic processes) and 2 would have significant environmental benefits, the TSP (which focuses on preventing future land loss, restoring deltaic processes, restoring critical geomorphic structures, and protecting vital socio-economic resources) would provide the greatest fish and wildlife benefits. The TSP would likely best achieve long-term coastal wetland sustainability, because the restored geomorphic structures would help to protect and enhance the diversion-feature influence areas from erosive coastal wave action and storm surge. Because sediment diversions are connected to the river and continually nourish receiving areas with sediments and nutrients, those features would more effectively achieve a sustainable coastal wetland ecosystem. Based solely on fish and wildlife considerations, those TSP measures would likely be the most beneficial of the three evaluated alternative restoration plans in the NTP.

Although initial modeling estimates indicate that implementation of the TSP would save over 280,000 wetland acres, compared to the year 50 no-action condition (Table 3), the TSP features, alone, would not fully offset the 462,700 acres (Table 1) expected to be lost over 50 years under the no-action condition.

Wetland Type	Year 50 No Action (acres)	Year 50 TSP (acres)	Difference (percent)
Swamp	949,707	937,673	-1.3
Fresh marsh	798,847	1,010,518	26.5
Intermediate marsh	956,240	1,033,688	8.1
Brackish marsh	437,477	438,328	0.2
Saline marsh	60,157	71,689	19.2
Total Wetlands	3,202,428	3,491,895	9.0

Proposed TSP features to introduce fresh water from the Mississippi River into the Maurepas Swamp, Upper Breton Sound, and the Mid-Barataria Basin would shift habitat

types toward lower-salinity conditions in Subprovinces 1 and 2, compared to taking no action. Those diversions, along with marsh creation, beneficial use of dredged material, and barrier island restoration, would also restore/establish several thousands of acres of wetlands.

At year 50, wetland losses under the No-action Alternative (more than 203,000 acres) would be greater in Subprovince 3 than in any other Subprovince. The TSP includes projects to address losses in that area. Gulf shoreline stabilization at Point Au Fer Island and increased conveyance of Atchafalaya River fresh water to central and eastern portions of the Terrebonne Basin would improve wetland productivity and reduce the already critical rates of marsh loss in those areas where marine processes are advancing inland. Those wetland restoration benefits could be significantly increased if the Small Bayou Lafourche project is synergistically modified to incorporate key Grand Bayou-area features of the Convey Atchafalaya River Water to Northern Terrebonne Basin Project.

The TSP would have a positive effect on wildlife resources by increasing riverine and sediment inputs from the Mississippi River within Subprovinces 1 through 3, in concert with marsh creation in key areas. In combination, those features would help sustain and rejuvenate existing wetland habitats, promote significant landbuilding, and restore fresh and low salinity habitats. Marshes and swamps would be more productive and would provide improved habitat conditions for several species of wildlife.

Coastwide, the TSP would restore marsh-building and marsh-maintenance processes through freshwater and sediment inputs. The TSP would increase coastal wetland acreage compared to taking no action; thus, it would have a major positive impact on most, if not all, of the fish and wildlife resources that utilize those wetlands. The project-related conversion of brackish and saline marshes to fresh and low-salinity marshes would displace brown shrimp, spotted seatrout, and other fishes and shellfishes which prefer more saline habitats. Additionally, the abundance and productivity of white shrimp, Gulf menhaden, and other fishes and shellfishes which utilize low-salinity habitats may be increased under the preferred plan. Given the continued rapid loss and likely future collapse of brackish and salt marsh systems with no action, however, the TSP may also provide a long-term net benefit to species utilizing those areas. The Service will later recommend specific design and operational measures for incorporation into TSP project features to minimize adverse effects on those resources and increase benefits to other fish and wildlife species, to the greatest extent practical.

Because of the uncertainties regarding some of the currently proposed habitat prediction methodologies, and because many specific details regarding the design, operation, and associated effects of the TSP are not yet available at the current programmatic level of planning, we cannot complete our evaluation of individual TSP feature effects on fish and wildlife resources, nor can we entirely fulfill our reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act. Therefore, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction of specific TSP project measures, along with more-definitive project information that will be available during those planning and implementation phases, will be required so that we

can fulfill our responsibilities under that Act. Additionally, improvements in the hydrologic and desktop models will be needed to predict environmental impacts and benefits of specific plan features, as indicated in our previous draft Fish and Wildlife Coordination Act Report (Paille and Roy 2003b, Grouchy and Paille 2004) for the LCA Comprehensive and NTP Studies.

## **FUTURE SERVICE INVOLVEMENT**

Because of the LCA's large scope, complexity, and programmatic nature, extensive and continuing funding will be required by the Service to enable our full participation throughout future detailed planning and post-authorization engineering and design studies, and to fulfill our reporting responsibilities for the TSP component features under Section 2(b) of the Fish and Wildlife Coordination Act. Accordingly, the Service will continue to work closely with the Corps and the State of Louisiana to formulate detailed funding estimates to support our future involvement in the LCA, as provided for in the January 2003 Partnership Agreement for Water Resources and Fish and Wildlife between the Corps and the Service. Given its scope, duration, and significance, the Service will, in cooperation with the New Orleans Corps District, draft and execute an LCA-specific Memorandum of Agreement that details operating guidelines for negotiating transfer funds (similar to those used for the Comprehensive Everglades Restoration Plan) to facilitate and expedite our future involvement.

Under provisions of Section 7 of the ESA of 1973, as amended, the Service will also assist the Corps and any other Federal agencies responsible for funding or implementing selected projects and/or plans to ensure that they will neither jeopardize the continued existence of threatened and endangered species, nor adversely modify any designated critical habitat. The required consultations will be accomplished on a project-by-project basis, and will tier from the current programmatic consultation, details of which are contained in the Programmatic Environmental Impact Statement (PEIS) for the NTP. In keeping with the consultation requirements of the ESA, informal and formal (if needed) consultation must be completed before the Record of Decision for the NTP and PEIS can be signed. The Service (via the Department of the Interior's August 2004 letter) has concurred with the Corps' determination that the TSP is not likely to adversely effect any currently listed threatened or endangered species or designated critical habitat for which the Service has consultative jurisdiction.

The National Wildlife Refuge System Improvement Act of 1997 mandates that no new or expanded use of a NWR may be allowed unless it is first determined to be compatible with the objectives for which that NWR was established. A compatibility determination is a written determination, indicating that a proposed or existing use of a NWR is, or is not, a compatible use. Compatible uses are defined as proposed or existing wildlife-dependent recreational uses or any other uses of a NWR that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the NWR. A compatibility determination is only required when the Service has jurisdiction over the

use. Prior to initiating implementation of an LCA project that would affect any NWR, the Corps should, therefore, contact the appropriate Refuge Manager to determine if the proposed project constitutes a "refuge use" subject to a compatibility determination. To determine the anticipated impacts of any proposed use, the Corps may be required to provide sufficient data and information to document any short-term, long-term, direct, indirect, or cumulative impacts on NWR resources. Compatibility determinations will include a public review and comment period before issuance of a final decision by the Service. To facilitate such contacts, the Louisiana Field Office may be contacted at (337) 291-3100.

## **SUMMARY AND SERVICE POSITION**

Because of the uncertainties regarding some of the currently proposed habitat prediction methodologies, and because many details regarding the design, operation, and associated effects of the TSP are not yet available at the current programmatic level of planning, we cannot complete our evaluation of the individual TSP features' effects on fish and wildlife resources, nor can we entirely fulfill our reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) for each of those features. Therefore, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction of specific project measures, along with more-definitive project information that will be available during those planning phases, will be required so that we can fulfill our responsibilities under that Act. Additionally, improvements in the hydrologic and desktop models will be needed to predict environmental impacts and benefits of individual plan features, as indicated in our previous draft Fish and Wildlife Coordination Act Reports (Paille and Roy 2003, Grouchy and Paille 2004).

The Service has actively participated throughout the formulation and evaluation of the LCA coastwide alternatives and the selection of near-term restoration features, the large-scale studies, and the potential demonstration projects that comprise the TSP. Service involvement and input includes the preparation of three previous draft Fish and Wildlife Coordination Act Reports (Paille and Roy 2003a, and 2003b, and Grouchy and Paille 2004), a letter listing threatened and endangered species within coastal parishes (Appendix A), assistance in preparation of the draft Biological Assessment for Comprehensive Plan effects on threatened and endangered species, a May 11, 2004, letter affirming our continued participation as a Cooperating Agency in accordance with the implementing regulations of the National Environmental Policy Act of 1969, and concurrence with the Corps' programmatic "not likely to adversely affect" threatened and endangered species determinations (via an August 23, 2004, Department of the Interior letter). Those documents are incorporated herein by reference, and should be considered as integral components of the administrative record for the forthcoming final PEIS and NTP Report.

Given the substantial adverse future impacts to coastal wetlands and their associated fish and wildlife resources that are expected to occur under future without-project conditions,

the Service strongly supports authorization and implementation of the TSP, as it would provide the greatest level of sustainable benefits to Louisiana's nationally significant coastal fish and wildlife resources.

To expedite construction of restoration measures, the TSP proposes the programmatic authorization of five projects, including the Small Bayou Lafourche Diversion Project. The benefits of that project would be synergistically enhanced within eastern Terrebonne Basin critical needs areas by simultaneously constructing the Grand Bayou-area features of the Convey Atchafalaya River Water to Northern Terrebonne Basin Project. Accordingly, future post-authorization studies for the Bayou Lafourche Project should, to the maximum extent practicable, incorporate those potentially synergistic features. Given the rapid wetland loss within the Grand Bayou area, the substantial synergistic effects of those features, and the ease of landrights acquisition and construction, if those features cannot be included as integral components of the Bayou Lafourche Project, they should be implemented as soon as possible to achieve maximum wetland benefits in critical wetland loss areas of the eastern Terrebonne Basin.

In support of the TSP, and to expedite its implementation, the Service also provides the following technical and procedural recommendations for future authorization and implementation of the TSP:

1. In accordance with the January 2003 Partnership Agreement for Water Resources and Fish and Wildlife between the Service and the Corps, sufficient continuous funding should be provided to the Service to fulfill our responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act throughout post-authorization engineering and design studies for demonstration projects, participation in the Science and Technology Program, NTP projects, and planning and evaluation for long-term project feasibility studies. To facilitate that level of cooperation, the Service intends to negotiate an LCA-specific Memorandum of Agreement with the Corps (similar to that used for Florida's Everglades Restoration study) soon after the NTP is authorized.
2. The Corps should coordinate closely with individual refuge managers prior to conducting any work on a National Wildlife Refuge, in conformance with the National Wildlife Refuge System Improvement Act of 1997. Such coordination will be essential to the timely completion of the Service's determination that the proposed work will/will not be compatible with the purposes for which those refuges were established, and to secure any appropriate permits that may be required. Likewise, LCA activities occurring on State-administered Wildlife Management Areas or refuges should also be fully coordinated with the Louisiana Department of Wildlife and Fisheries.
3. The proposed Science and Technology Program should give high priority to refining the land gain/loss and habitat change models to enable determination of and evaluation of project-level effects and facilitate completion of FWCA reporting.

4. For purposes of maximizing synergistic wetland restoration benefits within the eastern Terrebonne Basin critical needs area, the post-authorization studies for the proposed Small Bayou Lafourche Diversion Project should, to the maximum extent possible, incorporate key Grand Bayou-area features of the Convey Atchafalaya River Water to Northern Terrebonne Basin Project.

To ensure that optimum fish and wildlife resource benefits are achieved, the Service plans to remain actively involved throughout the plan implementation process. Our findings and recommendations for each of the projects ultimately approved for implementation will be provided in draft and final supplements to this programmatic report under the authority of the Fish and Wildlife Coordination Act.

## LITERATURE CITED

- Grouchy, C. and R. Paille. May 2004. Near-Term Ecosystem Restoration Plan for the Louisiana Coastal Area Report (recommending a TSP). Draft Fish and Wildlife Coordination Act Report. 24pp.
- Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1998. Coast 2050: toward a sustainable coastal Louisiana. Baton Rouge, Louisiana. Louisiana Department of Natural Resources. 161pp.
- Louisiana Coastal Wetlands Conservation and Restoration Task Force. 2001. The 2000 evaluation report to the U.S. Congress on the effectiveness of Louisiana coastal wetland restoration projects. Baton Rouge, La. Louisiana Department of Natural Resources. 85pp.
- Michot, T.C., C.W. Jeske, J.C. Mazourek, W.G. Vermillion, and R.S. Kemmerer. 2003. Final draft. Atlas and census of wading bird and seabird nesting colonies in south Louisiana, 2001. BTNEP Publication.
- Paille, R. and K. Roy. 2003a. Louisiana Coastal Area Louisiana – Comprehensive Coastwide Ecosystem Restoration Study Report (recommending a TSP). Draft Fish and Wildlife Coordination Act Report. 25pp.
- Paille, R. and K. Roy. 2003b. Louisiana Coastal Area Louisiana – Comprehensive Coastwide Ecosystem Restoration Study Report (identifying 7 alternative action plans). Draft Fish and Wildlife Coordination Act Report. 30pp.
- Turner, R.E. 1977. Intertidal vegetation and commercial yields of penaeid shrimp. *Trans. Am. Fish. Soc.* 106:411-416.
- Turner, R.E. 1982. Wetland losses and coastal fisheries: an enigmatic and economically significant dependency. Pages 112 - 120 *in* Boesch, D.F., ed. 1982. Proceedings of the conference on coastal erosion and wetland modification in Louisiana: causes, consequences, and options. U.S. Fish and Wildlife Service, Biological Service Program, Washington, D.D. FWS/OBS-82/59. 256pp.
- U.S. Army Corps of Engineers. 2003. Louisiana Coastal Area, LA – Ecosystem Restoration. Draft LCA Main Report. 312pp. Unpublished.

## **APPENDIX A**

### **September 26, 2003, U.S. Fish and Wildlife Service Letter Identifying Federally Listed Threatened and Endangered Species within Coastal Parishes of Louisiana**



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.  
Suite 400  
Lafayette, Louisiana 70506  
September 26, 2003

Colonel Peter J. Rowan  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Rowan:

The Corps of Engineers (Corps), in partnership with various other State, local, and Federal agencies and entities, is preparing a Programmatic Environmental Impact Statement (PEIS) on the Louisiana Coastal Area Comprehensive Coastwide Ecosystem Restoration Study (LCA). In response to a September 23, 2003, request from Mr. Bill Klein of your staff, the U.S. Fish and Wildlife Service (Service) is pleased to provide the following information regarding Federally listed threatened and endangered species, their critical habitat, and migratory birds that may be found in or near the LCA study area. This information will facilitate programmatic Section 7 consultation under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). In addition, we have also included information to facilitate compliance with the Migratory Bird Treaty Act (MBTA; 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.).

#### **ESA Information**

Seventeen threatened or endangered species, including the Louisiana black bear, West Indian manatee, bald eagle, brown pelican, piping plover, red-cockaded woodpecker, gopher tortoise, ringed map turtle, 5 species of marine turtles, pallid sturgeon, Gulf sturgeon, inflated heelsplitter, and Louisiana quillwort, occur within the four subprovinces comprising the LCA study area. In addition, the Service has designated critical habitat for the piping plover and the Gulf sturgeon.

Following the conclusion of programmatic consultation on the LCA PEIS, the Service will continue to assist the Corps and other Federal agencies responsible for funding or implementing selected LCA projects and/or plans to ensure they will not jeopardize the continued existence of threatened and endangered species, or adversely modify their designated critical habitat. The required consultations will be accomplished on a project-by-project basis, and will build upon the programmatic consultation.

#### Louisiana Black Bear

The threatened Louisiana black bear (*Ursus americanus luteolus*) is primarily associated with forested wetlands; however, it utilizes a variety of habitat types, including marsh, spoil banks, and upland forests. Within forested wetlands, black bear habitat requirements include soft and hard mast for food, thick vegetation for escape cover, vegetated corridors for dispersal, large trees for den sites, and isolated areas for refuge from human disturbance. Remaining Louisiana

black bear populations occur in the Tensas River Basin, the Upper Atchafalaya River Basin, and coastal St. Mary and Iberia Parishes. The primary threats to that species are continued loss of bottomland hardwoods, fragmentation of remaining forested tracts, and human-caused mortality (e.g., illegal killing and accidental collisions with motor vehicles).

Louisiana black bears, particularly pregnant females, normally den from December through April. To further protect denning bears, the Service (through the final listing rule published on January 7, 1992, in Volume 57, No. 4 of the Federal Register) has extended legal protection to candidate or actual den trees. These are defined in the final listing rule as bald cypress (*Taxodium distichum*) and tupelo gum (*Nyssa* sp.) with visible cavities, having a diameter at breast height of 36 inches or greater, and occurring in or along rivers, lakes, streams, bayous, sloughs, or other water bodies. (Please note that additional information can be found at <http://endangered.fws.gov>.)

#### West Indian Manatee

Federally listed as endangered, West Indian manatees (*Trichechus manatus*) occasionally enter Lake Pontchartrain, Lake Maurepas, and their associated coastal waters and streams during the summer months (i.e., June through September). Manatees have also been reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. Should the proposed project involve activities in those areas during summer months, further consultation with this office will be necessary. Manatees have also been occasionally observed elsewhere along the Louisiana Gulf coast. They have declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals.

#### Bald Eagle

Federally listed as threatened, bald eagles (*Haliaeetus leucocephalus*) nest in Louisiana from October through mid-May. Eagles typically nest in bald cypress trees near fresh to intermediate marshes or open water in the southeastern Parishes. Areas with high numbers of nests include the Lake Verret Basin south to Houma, the southern marshes/ridge from Houma to Bayou Vista, the north shore of Lake Pontchartrain, and the Lake Salvador area. Eagles also winter and infrequently nest near large lakes in central and northern Louisiana. Major threats to this species include habitat alteration, human disturbance, and environmental contaminants (i.e., organochlorine pesticides and lead).

#### Brown Pelican

Federally listed as endangered, brown pelicans (*Pelecanus occidentalis*) are currently known to nest on Rabbit Island in Calcasieu Lake, Raccoon Point on Isles Dernieres, as well as Queen Bess Island, Plover Island (Baptiste Collette), Wine Island, and islands in the Chandeleur chain. Pelicans change nesting sites as habitat changes occur. Thus, pelicans may also be found nesting on mud lumps at the mouth of South Pass (Mississippi River Delta) and on small islands in St. Bernard Parish. In winter, spring, and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Brown pelicans feed along the Louisiana coast in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas. Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance.

#### Piping Plover

Federally listed as threatened, the piping plover (*Charadrius melodus*), as well as its designated critical habitat, occur along the Louisiana coast. Piping plovers winter in Louisiana, and may be present for 8 to 10 months, arriving from the breeding grounds as early as late July and remaining until late March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no, or very sparse, emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependant on a mosaic of sites distributed throughout the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change. Their designated critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering, and the physical features necessary for maintaining the natural processes that support those habitat components. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide. Important components (or primary constituent elements) of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

#### Red-cockaded Woodpecker

The endangered red-cockaded woodpecker (RCW, *Picoides borealis*) inhabits open, park-like stands of mature (i.e., greater than 60 years of age) pine trees containing little hardwood understory or midstory. RCWs can tolerate small numbers of overstory hardwoods or large midstory hardwoods at low densities found naturally in many southern pine forests, but they are not tolerant of dense hardwood midstories resulting from fire suppression. RCWs excavate roost and nest cavities in large living pines (i.e., 10 inches or greater in diameter at breast height). The cavity trees and the foraging area within 200 feet of those trees are known as a cluster. Foraging habitat is defined as pine and pine-hardwood (i.e., 50 percent or more of the dominant trees are pine trees) stands over 30 years of age that are located within one-half mile of the cluster.

#### Gopher Tortoise

The threatened gopher tortoise (*Gopherus polyphemus*) is associated with areas that have well-drained, sand or gravel soils appropriate for burrow establishment, ample sunlight for nesting, and understory vegetation suitable for foraging (i.e., grasses and forbs). Gopher tortoises prefer "open" longleaf pine-scrub oak communities that are thinned and burned every few years. They also inhabit existing maintained transmission rights-of-way within Washington, Tangipahoa, and St. Tammany Parishes. The gopher tortoise is the only native tortoise found in the southeastern United States. Habitat degradation (lack of thinning or burning on pine plantations) and conversion to agriculture or urbanization have contributed to the decline of that species. That

habitat decline has concentrated remaining gopher tortoise populations along pipeline and powerline rights-of-way within their range.

#### Ringed Map Turtle

The threatened ringed map (= sawback) turtle (*Graptemys oculifera*) is endemic to the Pearl River system. In Louisiana, it occurs in the Bogue Chitto River south of Franklinton, and the Pearl River north of Louisiana Highway 190 in St. Tammany and Washington Parishes. It is found in riverine habitats with moderate currents, channels wide enough to permit sunlight penetration for several hours each day, numerous logs for basking, and large, sandy banks, that are used for nesting. Habitat loss (loss of exposed sand bars, basking areas) and water quality degradation (which decreases food supply) have contributed to the decline of this species.

#### Sea Turtles

Five species of threatened (T) and endangered (E) sea turtles, including the Kemp's ridley sea turtle (*Lepidochelys kempii*; E), green sea turtle (*Chelonia mydas*; T), hawksbill sea turtle (*Eretmochelys imbricata*; E), leatherback sea turtle (*Dermochelys coriacea*; E), and loggerhead sea turtle (*Caretta caretta*; T), forage in the near-shore waters, bays and sounds of Louisiana. Of those species, the two most commonly encountered are the loggerhead and Kemp's ridley sea turtles. The National Marine Fisheries Service is responsible for aquatic marine threatened or endangered species. Eric Hawk (727/570-5312) in St. Petersburg, Florida, should be contacted for additional information concerning those species.

#### Pallid Sturgeon

The pallid sturgeon (*Scaphirhynchus albus*) is an endangered fish found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical habitats that are in a constant state of change. Detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana. Habitat loss through river channelization and dams has adversely affected this species throughout its range.

#### Gulf Sturgeon

The threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf Coast between the Atchafalaya River and the Suwannee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, the Amite River, rivers and lakes of the Lake Pontchartrain basin, and adjacent estuarine areas. Spawning occurs in coastal rivers between late winter and early spring (i.e., March to May). Adults and sub-adults may be found in those rivers and streams until November, and in estuarine or marine waters during the remainder of the year. Sturgeon less than two years old appear to remain in riverine habitats and estuarine areas throughout the year, rather than migrate to marine waters. Habitat alterations caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

On March 19, 2003, the Fish and Wildlife Service and the National Marine Fisheries Service published a final rule in the Federal Register (Volume 68, No. 53) designating critical habitat for

the Gulf sturgeon in Louisiana, Mississippi, Alabama, and Florida. Portions of the Pearl River system, Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, The Rigolets, Lake St. Catherine, and Lake Borgne within Louisiana were included in that designation. The primary constituent elements essential for the conservation of Gulf sturgeon are those habitat components that support feeding, resting, sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support those habitat components; those elements should be considered when determining potential project impacts. The primary constituent elements for Gulf sturgeon critical habitat include:

- abundant prey items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats for juvenile, subadult, and adult life stages;
- riverine spawning sites with suitable substrates for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
- riverine aggregation areas, also referred to as resting, holding and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during freshwater residency and possibly for osmoregulatory functions;
- a flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging; and necessary for maintaining spawning sites in suitable condition for egg attachment, eggs sheltering, resting, and larvae staging;
- water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;
- sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
- safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., a river unobstructed by a permanent structure, or a dammed river that still allows for passage).

Please be aware that the Fish and Wildlife Service is responsible for ESA consultations regarding the Gulf sturgeon and its critical habitat for activities in riverine units. The National Marine Fisheries Service is responsible for ESA consultation regarding the Gulf sturgeon and its critical habitat for Corps activities within estuarine units, and is responsible for all ESA consultations regarding Gulf sturgeon and its critical habitat for activities in marine units.

#### Inflated Heelsplitter

Federally listed as threatened, the inflated heelsplitter mussel (*Potamilis inflatus*) occurs in the Amite River (Louisiana [with one report in the Pearl River]) and the Tombigbee and Black Warrior Rivers (Alabama). In Louisiana, the mussel occurs between Louisiana Highway 37 and Louisiana Highway 42, with the highest concentrations between Grangeville and Port Vincent. This freshwater mussel is typically found in soft, stable substrates such as sand, mud, silt, and sandy gravel, in slow to moderate currents. Heelsplitter mussels are usually found in depositional pools below sand point bars, and in shallow pools between sandbars and river banks. Major threats to this species in the Amite River are the loss of habitat resulting from sand and gravel dredging, and channel modifications for flood control.

#### Louisiana Quillwort

Federally listed as an endangered plant species, the Louisiana quillwort (*Isoetes louisianensis*) grows on sand and gravel bars on the accreting sides of streams and moist overflow channels within riparian forest communities in Washington and St. Tammany Parishes, Louisiana. The Louisiana quillwort is a small, semi-aquatic, facultative evergreen plant with spirally arranged leaves (sporophylls) arising from a globose, two-lobed corm. The hollow leaves are transversely septate, and measure approximately 0.12 inch wide and up to 16 inches long. Major threats to this species are habitat loss through hydrologic modifications of stream habitat, and land use practices that significantly alter stream quality and hydrology. Apparently, it is dependent on a special hydrologic regime resulting from the presence of small springs scattered at the bases of banks or bluffs.

#### **MBTA Information**

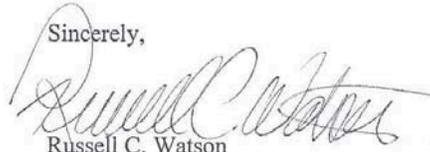
Colonial nesting waterbirds are protected under the MBTA. Colonies that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries may also be present. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect individual proposed project areas for the presence of undocumented nesting colonies during the nesting season. To minimize disturbance to colonial nesting birds, the following restrictions on individual proposed projects should be observed:

1. For colonies containing nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a rookery should be restricted to the non-nesting period (i.e., September 1 through February 15, depending on species present).
2. For colonies containing nesting gulls, terns, and/or black skimmers, all activity occurring within 650 feet of a rookery should be restricted to the non-nesting period (i.e., September 16 through April 1, depending on species present).

In addition, we recommend that on-site contract personnel be informed of the need to identify colonial nesting birds and avoid impacting them during the breeding season.

We appreciate the Corps' continued cooperation in the conservation of threatened and endangered species and migratory birds. If your staff have any questions or need further information, please have them contact Brigette Firmin (337/291-3108) of this office.

Sincerely,

A handwritten signature in cursive script, appearing to read "Russell C. Watson".

Russell C. Watson  
Acting Supervisor  
Louisiana Field Office

cc: NOAA Fisheries, St. Petersburg, FL  
LDWF, Natural Heritage Program, Baton Rouge, LA

## **APPENDIX B**

### **Descriptions of the Restoration Project Concepts**

## NEAR-TERM PROJECT CONCEPTS

*Small Diversion at Hope Canal* consists of a small freshwater diversion through a newly constructed control structure at Hope Canal. The objective is to introduce Mississippi River sediments and nutrients into the Maurepas Swamp south of Lake Maurepas. The introduction of additional freshwater via the proposed diversion would facilitate organic deposition, improve biological productivity, and prevent further deterioration of the swamp.

*Small Diversion at Convent/Blind River* consists of a small freshwater diversion into Blind River through a new control structure. The objective of this feature is to introduce Mississippi River sediments and nutrients into the southeast portion of Maurepas Swamp. This feature would operate in conjunction with the Hope Canal freshwater diversion to facilitate organic deposition in the swamp, improve biological productivity, and prevent further swamp deterioration.

*Increase Amite River Influence by Gapping Spoil Banks* consists of gapping the existing spoil banks of the Amite River Diversion Canal. The objective of this project is to introduce additional nutrients and sediments into portions of the western Maurepas Swamp primarily during flood events and localized rainfall events. This would facilitate organic deposition in the swamp, improve biological productivity, and prevent further swamp deterioration.

*MRGO Environmental Restoration* involves the implementation of the environmental restoration features under consideration by the MRGO Environmental Restoration Study. In response to public concerns, past environmental effects, and national economic development considerations, an ongoing study is re-evaluating the viability of operation and maintenance of the MRGO. Since the construction of the MRGO, saltwater intrusion has degraded large expanses of freshwater marshes and accelerated habitat switching from freshwater marshes to brackish and intermediate marshes in the Biloxi marshes, the Central Wetlands, and the Golden Triangle wetlands. This study will evaluate the stabilization of the MRGO banks and various environmental restoration projects that would reduce saltwater intrusion into Lake Pontchartrain, the Biloxi marshes, the Central Wetlands, and the Golden Triangle marshes. Implementation should result in hydrologic restoration via implementation of environmental mitigation recommended in the Mississippi River Gulf Outlet (MRGO) Study.

*The Caernarvon Diversion*, constructed in 1992 near the Breton Sound marshes, has been operated to manage salinities in the central Breton Sound estuary through the introduction of fresh water at rates ranging between 1,000 cubic feet per second (cfs) and 8,000 cfs. This restoration project would seek a post-authorization change of the original project purpose to include wetland creation and restoration via increasing freshwater introduction rates, up to perhaps 5,000 cfs on average, to provide greater wetland-building. The introduction of additional fresh water would facilitate organic and sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

*Medium Diversion at Whites Ditch*, located at White's Ditch downstream of the Caernarvon diversion structure, would implement a medium-sized diversion into the central River aux Chene area through the construction and operation of a new water control structure. The objective of this project is to provide additional fresh water, nutrients, and fine sediments to the area between the Mississippi River and River aux Chene ridge, an area which is currently isolated from the beneficial effects of the Caernarvon freshwater diversion. The introduction of additional fresh water would facilitate organic sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

*Reauthorization of the Davis Pond Diversion for increased sediment input.* The Davis Pond Freshwater Diversion structure, constructed in 2002 in the upper Barataria Basin, has been operated to control central basin salinities through freshwater introductions ranging between 1,000 cfs and 10,000 cfs. This restoration feature would seek re-authorization of the original project purpose to include wetland creation. To achieve this goal, the freshwater introduction rate would be increased up to perhaps 5,000 cfs on average, to accelerate wetland-building. The introduction of additional fresh water would facilitate organic and sediment deposition, improve biological productivity, and prevent further deterioration of the marshes.

*Medium-sized Diversion with Dedicated Dredging at Myrtle Grove* consists of a medium-sized freshwater diversion near Myrtle Grove through a new control structure. The diversion would provide additional sediments and nutrients to nourish highly degraded existing fresh to brackish wetlands and shallow, open-water areas. This would ensure the long-term sustainability of these marshes by increasing vegetative productivity and preventing future loss. The introduction of sediment to this area would also promote the infilling of shallow, open-water areas through both deposition and marsh expansion. This diversion would be complimented by dedicated dredging of sediment mined from the Mississippi River. The objective of this component is to create 1,500 acres of additional wetlands by placing dredged sediments in the shallow, open-waters within the fragmented marsh.

*Barataria Basin Barrier Shoreline Restoration-Caminada Headland and Shell Island* consists of mining offshore sediments to re-create eroded barrier islands. Based on designs developed in the LCA Barrier Island Restoration Study, a 3,000-foot-wide island footprint would be restored.

*Terrebonne Basin Barrier Shoreline Restoration-Isles Derniere and East Timbalier* consists of restoring some of the Timbalier and Isle Dernieres barrier island chains. This restoration would simulate historical conditions by reducing the current number of breaches, and enlarging the width and dune crest of the Isles Dernieres (East Island, Trinity Island, and Whiskey Island) and East Timbalier Island.

*Small Bayou Lafourche Reintroduction* would reintroduce flow from the Mississippi River into Bayou Lafourche. The proposed year-round flows would provide water

supply benefits and reduce marsh-loss rates for the wetlands south of the GIWW, between Bayous Lafourche and Terrebonne.

*Gulf Shoreline Stabilization at Point au Fer Island* would stabilize the Gulf shoreline of Point au Fer Island to prevent direct connections from forming between the Gulf and interior water bodies as that shoreline erodes. In addition to Gulf shoreline protection, this feature would reduce marine influence on fresher Atchafalaya Bay water, protecting the adjacent wetland habitats from saltwater impacts.

*Multi-purpose Operation of Houma Navigation Canal (HNC) Lock* consists of operating the proposed Houma Navigation Canal Lock located at the southern end of the HNC, for multiple purposes, rather than for navigation only. The Corps' Morganza to the Gulf Hurricane Protection Study includes construction of the lock, but does not include the multi-purpose operation of the lock. This restoration feature would reduce saltwater intrusion, modify water circulation in the HNC to increase the distribution of Atchafalaya River water within Terrebonne Basin wetlands, especially within the Lake Boudreaux area wetlands to the north; the Lake Decade wetlands to the west; and the Grand Bayou wetlands to the east.

*Convey Atchafalaya River Water to Terrebonne marshes* includes a number of features to improve the distribution of freshwater to deteriorated Terrebonne Basin marshes via the Gulf Intracoastal Waterway (GIWW). Construction of new channels and enlargement of existing channels would increase seasonal flows of Atchafalaya River water to central (Lake Boudreaux) and eastern (Grand Bayou) Terrebonne marshes. All channel alternatives would include a gated control structure to restrict saltwater intrusion during low river stages. The project also includes features to increase the supply of Atchafalaya River within the GIWW include repairing banks along the GIWW, enlarging constrictions in the GIWW, and possibly diverting additional freshwater from Bayou Shaffer into Avoca Island Lake provided there are no negative impacts to Penchant Basin marshes. Those features would increase suspended sediment supply to Bayou Penchant and other wetlands receiving the Atchafalaya River water via the GIWW.

*Maintain Land Bridge between Caillou Lake and Gulf of Mexico* by installing shore protection along deteriorated portions of Grand Bayou DuLarge to prevent establishment of a major new hydrologic connection between the Gulf and Sister Lake. Some shore armoring would likely be needed to protect these features from erosion on the Gulf shoreline. A more systemic and comprehensive solution would involve a much greater amount of Gulf shoreline armoring, especially toward the west where shoreline retreat and loss of shoreline oyster reefs has allowed for increased water exchange between the Gulf and the interior waterbodies (i.e., between Bay Junop and Caillou Lake). Some of the newly opened channels would be closed to restore the historic cross-sections of exchange points. By reducing marine influences in these interior areas, these features might also allow increased riverine influences from Four League Bay to benefit area marshes.

## POTENTIAL DEMONSTRATION PROJECTS

*Wetland Creation in Vicinity of the Barataria Chenier Unit* would address the uncertainty involved in selecting sources of material for marsh creation, restoration of maritime forests, and restoration of freshwater cheniers. There is uncertainty regarding the efficacy of using saline mineral sediments to support freshwater habitats. Uncertainties exist regarding the time required for salts to leach out of those sediments and other processes to occur that would make the soils more suitable for the establishment of freshwater vegetation. Those uncertainties would need to be resolved prior to using this technique on a large scale.

This demonstration project would be located in southwestern Barataria Basin, just north of Port Fourchon, in the “Chenier Unit.” This project would be constructed in four 200-acre cells, each using different methods for placement of thin sediment layers using techniques such as spray deposition and unconfined/semi-confined traditional hydraulic techniques. The demonstration project would be monitored to determine plant mortality, landform stability, borrow area impacts, and effects on the local ecosystem.

*Pipeline Conveyance of Sediments to Maintain Land Bridges* would address the uncertainty involved in land bridge restoration through long distance conveyance of sediments via pipeline. Concerns about the cost effectiveness of using conventional dredging techniques to transport large quantities of sediments long distances need to be addressed. Conventional dredging equipment typically requires large pipelines for transport of sediments. However, there are uncertainties about how the material can be effectively transported efficiently over long distances and distributed. Variability in the sections of the land bridge would facilitate monitoring to determine optimal final grade vs. design grade, dewatering periods, and potential water quality effects of transported materials. Tests should also be conducted to apply a two-tiered approach whereby large pipeline systems are used to convey high volumes of material but smaller dredges could be used to then disperse the material into final locations. This demonstration project would be located along the degrading land bridge between Bayous Dularge and Grand Caillou in the lower Terrebonne Basin.

*Pipeline canal restoration using different methods* would address uncertainties involved in the restoration of pipeline canals. Pipeline canals have been cut throughout the coastal marshes and have resulted in fragmentation and accelerated erosion of many marshes. There has been considerable uncertainty and debate about the most effective approach to restoring existing and future pipeline canals. There are also uncertainties about the viability of restoration efforts and the timing of restoration. Different approaches to restoration should be examined and monitored including: 1) backfill with a small hydraulic dredge; 2) mechanical backfill; 3) gap spoil banks to restore natural hydrology; and 4) install canal plugs to reduce erosion within the canal. If backfilling is used, impacts related to the acquisition of borrow material and its effect on the local ecosystem must be addressed. This demonstration project would be constructed in locations in both the Barataria and Terrebonne basins, with planned closure of twenty different canal sections via the methods described above.

*Shoreline erosion prevention using different methods* would address uncertainties involved in restoration of eroding shorelines throughout the coastal area. Erosion along open bays and channels has led to wetland losses across the coast. Different approaches to impede future erosion would be examined and monitored for long-term effectiveness and sustainability. Project monitoring would include the settlement of the various erosion protection/foreshore features. This demonstration project would be implemented through construction and monitoring of erosion protection/foreshore protection features in a variety of foundation conditions. The project would consist of fifteen different one-mile treatments along the rapidly eroding Gulf of Mexico shoreline at Rockefeller Refuge.

*Barrier island restoration using offshore sources of sediments* would address uncertainties involved in restoration of barrier islands with offshore sources of sand. Two sand sources already identified are Ship Shoal and the Lower Mississippi River. Issues related to Ship Shoal include the quantity of available material and the cost-effectiveness of using this source relative to other sources. The sources of sands must be quantified and different transport mechanisms tested to determine a cost-effective approach to transport the material. The demonstration project test sections would also vary in the types of sediment (percentage of sand/silt/clay) used for barrier islands and back barrier marsh creation. Monitoring would focus on vegetation growth and island stability. This demonstration project would be constructed along sections of the Terrebonne barrier islands.

## **LARGE-SCALE STUDIES**

*The Mississippi River Delta Management Study* would require extensive investigations to maximize the use of riverine freshwater and sediments for wetland restoration without adversely impacting navigation. Sediments, nutrients, and fresh water would be re-directed to restore the quality and sustainability of coastal wetlands, and to improve Gulf of Mexico water quality. The study would investigate potential modifications to existing navigation channel alignments and associated maintenance procedures and requirements.

*The Third Delta* feature consists of a control structure in the vicinity of Donaldsonville that would divert approximately 240,000 cfs at maximum river stage. Flows would be diverted into a newly constructed conveyance channel (parallel to Bayou Lafourche) extending approximately 55 miles from the initial point of diversion to the eventual point of discharge. The diverted flow would be divided equally at a point north of the GIWW to enable the creation of a delta lobe within the Terrebonne and Barataria Basins. Sediment enrichment of this diversion, using a 30-inch dredge for three months yielding 6,293, 000 yd<sup>3</sup> each year, would also be considered. Significant feasibility-level investigation would be required to determine its effects on flood control, drainage, navigation, and environmental impacts.

*Upper Atchafalaya Basin Study, including evaluation of modified operational scheme of Old River Control Structure (ORCS)* would alter that structure's operational plan to increase the sediment load transported down the Atchafalaya River. Detailed studies

would determine impacts (beneficial and adverse) to the interior of the Atchafalaya Basin, the distribution of the additional flow and sediment, and the increased costs of maintaining the flood control, navigation, and environmental features along the Lower Mississippi, Red, and Atchafalaya Rivers.

*Acadiana Bay Estuarine Restoration Study* provides for rebuilding the Point Chevreuil Reef (which formerly extended toward Marsh Island) and rehabilitating the Bayou Sale natural levee between Point Chevreuil and the Gulf of Mexico. The natural levee would be rebuilt in the form of a shallow sub-aqueous platform, small islands, and/or reefs. This feature would be designed to restore a semblance of the historic hydrologic conditions in the Teche/Vermilion Basin.

*The Chenier Plain Freshwater Management and Allocation Reassessment* would require detailed investigations involving water allocation needs and trade-off analyses in the eastern Chenier Plain, including the Teche/Vermilion Basin, to provide for wetland restoration, and support continued agriculture and navigation in the region. A series of navigation and salinity control structures are currently authorized and operated in the eastern portion of the Chenier Plain. Those structures maintain a freshwater source for agriculture and prevent salinity intrusion in the area. Tidal stages outside the managed area often exceed stages within the managed area, creating an inundation problem for the fresh and intermediate marshes in the area. In addition, the natural ridges that define this area continue to be impacted by erosion, which threaten the management and sustainability of the interior marshes. This study would address water management and allocation issues including salinity control, drainage, and fisheries accessibility.

## **APPENDIX C**

### **Resource Agency Comment Letters on the May 2004 Draft Fish and Wildlife Coordination Act Report**



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
 NATIONAL MARINE FISHERIES SERVICE  
 Southeast Regional Office  
 9721 Executive Center Drive North  
 St. Petersburg, Florida 33702

July 19, 2004

F/SER44/BH:jk  
 225/389-0508



Mr. Russell C. Watson, Supervisor  
 Louisiana Field Office  
 U.S. Fish and Wildlife Service  
 646 Cajundome Blvd., Suite 400  
 Lafayette, Louisiana 70506

Dear Mr. Watson:

The National Marine Fisheries Service (NOAA Fisheries) has received the draft Fish and Wildlife Coordination Act Report (Report) titled "Near-Term Ecosystem Restoration Plan for the Louisiana Coastal Area" transmitted by your letter dated May 28, 2004. The Report discusses the potential impacts of implementing a near-term plan (NTP) designed to achieve system-wide sustainable restoration of Louisiana's coastal wetlands and develop better techniques for meeting the critical needs and advancing our understanding of the coastal ecosystem.

We have reviewed the Report and find it to be well written. However, we have the following comments regarding information provided within the Report.

**EXISTING FISH AND WILDLIFE RESOURCES**  
Essential Fish Habitat

Page 6, paragraph 3. The word "Plan" should be changed to "Plans" in the first sentence.

Some features of the NTP involve mining offshore sediments for the restoration of barrier islands and headlands (e.g., Barataria Basin Barrier Shoreline Restoration-Caminada Headland and Shell Island). As such, the following species should be added to the third sentence of this paragraph: red snapper, Spanish mackerel, and bluefish. Additionally, the wording "and highly migratory species managed by NOAA Fisheries (e.g., billfishes and sharks)" should be added at the end of the final sentence of the paragraph.

We appreciate the opportunity to review and comment on this Report. If you wish to discuss our recommendations, please contact Bren Haase at (225) 389-0508.

Sincerely,

for Miles M. Croom  
 Assistant Regional Administrator  
 Habitat Conservation Division

c:  
 NOD, Planning Division - Constance  
 LDNR, CRD - Duffy  
 EPA, Dallas - McQuiddy  
 NRCS, Lafayette - Paul  
 SER4  
 Files





KATHLEEN BABINEAUX BLANCO  
GOVERNOR

State of Louisiana  
DEPARTMENT OF WILDLIFE AND FISHERIES  
OFFICE OF SECRETARY

DWIGHT LANDRENEAU  
SECRETARY

June 28, 2004



Mr. Russell Watson  
Supervisor  
Louisiana Field Office  
U.S. Fish and Wildlife Service  
646 Cajundome Blvd., Suite 400  
Lafayette, LA 70506

RE: Draft Fish and Wildlife Coordination Act Report for the Near-Term Ecosystem Restoration Plan, Louisiana Coastal Area, Louisiana Coastwide Ecosystem Restoration Feasibility Study

Dear Mr. Watson:

Louisiana Department of Wildlife and Fisheries staff have reviewed the captioned draft report. As the report points out, the LCA Near-Term report is in an early programmatic stage. It is impossible at this stage, to make very detailed predictions or recommendations regarding the proposed habitat changes, and their impacts on fish and wildlife resources. The "Plan that Best Meets the Objective" (PBMO) provides a list of projects that will rehabilitate portions of the coast. The Department concurs with the US Fish and Wildlife Service (USFWS) that the PBMO will provide the greatest fish and wildlife benefits and potentially provide for long term sustainability of the newly created or rehabilitated coastal landforms.

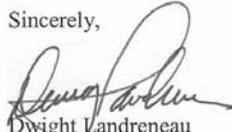
It is clear, however, that coastal and estuarine habitats will change significantly as a result of the projects in the PBMO. Changes in salinity resulting from freshwater and sediment diversions will displace estuarine fish and wildlife resources, and the degree to which increases in marsh productivity will compensate for those displacements is not at all clear. We strongly recommend that future planning efforts emphasize the importance of estuarine environments and their connections to coastal wetland habitats. We concur with the USFWS conclusion that improvements and refinements in the hydrologic and desktop models will be needed to predict impacts of proposed projects, in both coastal wetlands and estuarine habitats. In addition, as part of the socio-economic analyses performed under this study, we strongly recommend that there be a clear discussion of the impacts of these landscape changes, both long-term and short-term, on Louisiana's important fish and wildlife resources and their users.

Mr. Russell Watson  
Page 2  
June 28, 2004

We also concur with the USFWS report as to the importance of continued participation by fish and wildlife agencies in the LCA study. The Louisiana Department of Wildlife and Fisheries participated in the early planning phases of the LCA study as much as possible and we intend to play a more substantive role in future planning efforts for coastal and estuarine restoration. In addition, we give notice that any activities occurring on state administered Wildlife Management Areas or refuges must be pursued through the Department.

We welcome the opportunity to work with the USFWS under the Fish and Wildlife Coordination Act to improve coastal habitats for our jointly-held trust resources.

Sincerely,



Dwight Landreneau  
Secretary

jhwf