



## **DETAILS OF TERREBONNE BIODIVERSITY AND RESILIENCY PROJECTS:**

*Pointe Aux Chenes & Bayou Terrebonne*

### **Short Overview of Projects and Registry**

#### *The Projects*

The Terrebonne Biodiversity and Conservation Projects (The Projects) employ cypress swamp plantings and marsh terrace creation – both proven ecological restoration approaches that improve the quality of lands and waters that support human, animal and marine populations, especially along Louisiana’s fragile, eroding coastline. These transitional projects maintain the values of the ecosystem as larger scale public projects in the state’s coastal master plan come online over time.

Once completed, The Projects will restore 50.58 hectares (125 acres) of wetlands, with an estimated economic value of \$1.2 Million per year, 280 tons of Carbon sequestered per year, and the elimination of up to 265 pounds of phosphorus and 10,600 pounds of nitrogen each year to improve water quality in those areas.

#### *The Registry*

The Projects will be the first two listed in the America’s WETLAND Conservation & Restoration Registry. The Registry is an inventory and reporting of private projects, consistent with Louisiana’s coastal master plan, that have been completed or planned and available for private sponsorship and funding. The Registry will show the depth and breadth of restoration efforts beyond those sponsored by government agencies and can serve as a tool for the state and NGOs to demonstrate the power of private participation in leveraging private funding for restoration. The Registry will be a tangible demonstration of private sector support for restoration and will be formally announced and come online in the fall of 2018.

### **Longer Overview of Projects**

Coastal wetlands are some of the most productive ecosystems in the world and support numerous species from microbes to mammals, providing direct support to the culture and livelihoods of the people in the region.

They are “Biological Supermarkets” that support life cycles of marine and animal species and are ideal for organisms that form the base of the food web. The combination of shallow water, high levels of inorganic matter, and high rates of productivity make wetlands essential to ecosystems and cycles of life. In fact, more than 90% of marine species in the Gulf of Mexico spend all or part of their life cycles in coastal Louisiana wetlands.

A hallmark of AWF’s work has been the fostering of public/private partnerships that move conservation and restoration forward and educate the media and public on the importance and value of solutions for coastal restoration and conservation.

Bald cypress swamp plantings and marsh terrace creation are proven ecological restoration approaches that improve the quality of lands and waters that support human, animal and marine populations, especially along Louisiana's fragile, eroding coastline. AWF is focused on these transitional projects that maintain the values of the ecosystem as larger scale public projects in the state's coastal master plan come online over time. For the two projects in this proposal, maintaining biodiversity is essential in the face of sea level rise and storm events.

Once completed, the Pointe Aux Chenes and Bayou Terrebonne Projects will restore 50.58 hectares (125 acres) of wetlands, with an economic value of \$1.2 Million per year, 280 tons of Carbon sequestration per year, and the elimination of up to 266 pounds of phosphorus and 10,600 pounds of nitrogen each year to improve water quality in those areas.

Since Pointe Aux Chenes and Bayou Terrebonne projects involve volunteer opportunities as well, a further goal is to educate those volunteers about the importance of ecological restoration and the direct and indirect benefits to the long-term survivability of local Louisiana communities. Volunteerism has numerous positive attributes: it expands the story of the need to restore the coast beyond the restoration project and teaches important lessons about natural or green engineering and the role that biodiversity plays in sustaining the environment.

Upon completion, The Projects will result in more secure communities through natural protection in the event of hurricanes, storm surges and rising tides. Biodiversity will be enhanced and a proactive and positive response to the effects of loss of natural sediment, climate events of sea level rise and storm events and subsidence will be demonstrated as valuable social and environmental investment in BHP's communities of operations. Volunteer opportunities will increase local participation in the solution, while raising environmental awareness and providing resiliency education and tools necessary to adapt to changing environmental conditions.

Bald cypress swamps (cypress swamps) are the heart of Louisiana's ecological community. They possess a strong, sustainable, natural capacity to act as a force field to many of nature's greatest threats, including hurricanes, storm surges and flooding.

#### *Community Benefits*

- Hurricanes and Storms: Protection by allowing for the retention of floodwater; cypress swamps are capable of storing large amounts of water over short periods of time.
- Flooding: Reduces storm surge by slowing water as it moves across the landscape.
- Wind: Cypress trees provide protection; strong thick trunks and branches reduce wind as it moves across its treetops.

#### *Biodiversity*

Cypress forests support species that are not found in higher elevation plant communities and are home to some of Louisiana's endangered and threatened species, such as the Louisiana black bear, the bald eagle and the recently rediscovered ivory-billed woodpecker.

Cypress forests support an abundance of life, including:

- Fish nursery and feeding grounds during high water events
- Reptiles and amphibians
- Barred Owls and Red Tailed Hawks
- Wading and songbirds
- Fur bearing animals

- Nutria and muskrat
- Invertebrates the basis of the food chain
- Oligochaete worms, insects and crawfish
- Timber
- Crawfish
- Fish
- Ecotourism

### *Economic Values*

In their seminal research paper, "Restoration and Conservation of Coastal Forested Wetlands in the Gulf of Mexico," Drs. Day and Hunter estimated the value of ecosystem services worldwide and determined that swamps and floodplains have the 2<sup>nd</sup> highest economic value at \$9,350 per acre per year (adjusted for inflation since 2013) - second to only coastal estuaries. If the value of \$9,350 per acre is multiplied by the 845,692 acres of swamp forest in Louisiana, that is an economic value of \$7.9 billion per year.

Based on the swamp forest loss in Louisiana, 232,067 acres, annualized over 50 years, 4,641 acres per year, this yields an estimated *LOSS* value of \$36,777,290 per year or about \$1.8 billion in lost ecosystem services over 50 years.

Marsh terraces provide natural perimeter protection. Marsh terraces provide a terraced marsh edge, non-terraced marsh edge, open water within terraced ponds and open water within non-terraced ponds. They provide calmer water on the downside of the terrace, improve the water quality and allow for the establishment of submerged aquatic vegetation.

### Marsh Terraces:

- Provide nesting, breeding and migratory habitat;
- Create micro-habitats that support the commercially fisheries species;
- Create aesthetically pleasing habitat, creating an area for nature-based tourism;
- Reduce erosion, increase sedimentation and potentially result in land accretion;
- Increase nutrient uptake