

CAERNARVON AT BIG MAR



QUICK FACTS

LOCATION: Caernarvon Freshwater Diversion, Louisiana

DATE: 2010-Present

PROJECT ATTRIBUTES:

- Restoration of fish & wildlife habitat
- Flood and wind reduction
- Land stabilization
- Multiple partners

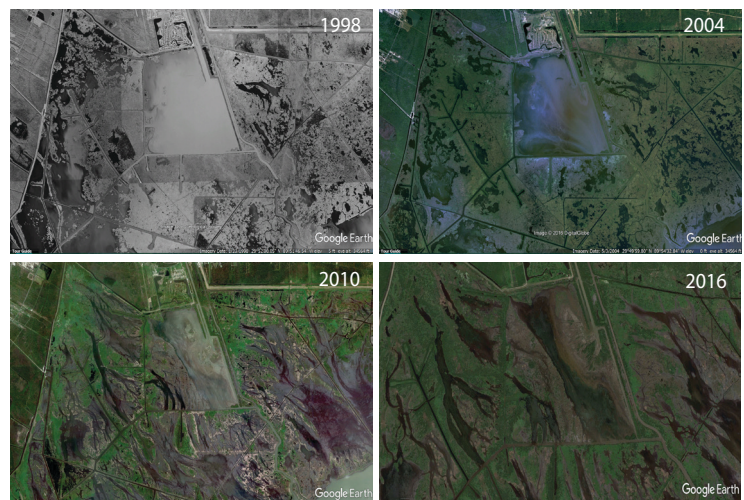
BACKGROUND

The Caernarvon Freshwater Diversion was constructed in 1991 and designed to divert water from the Mississippi River into a local estuary, Big Mar Pond, previously a failed agricultural impoundment. In the years since its construction, the Caernarvon diversion has deposited significant sediment into Big Mar, accumulating and creating emergent wetlands and plant life. Since 2004 there have been significant swaths of land created and recorded annually.

In 2010, Lake Pontchartrain Basin Foundation, Restore the Earth Foundation and the Coalition to Restore Coastal Louisiana partnered to provide critical reforestation to this area to stabilize and effectively establish the newly created land.

PARTNERS

Collaborative partnerships are critical to the success of this project. One of the key components has been the collaboration between Restore the Earth, Lake Pontchartrain Basin Foundation, and Coalition to Restore Coastal Louisiana, each bringing separate, but equally important expertise to the partnership. The relationship with the landowners has been critical to the success of the project and plantings. Approximately 80% of Louisiana is privately owned, meaning that coastal restoration and protection efforts will not be effective without landowner involvement, engagement and buy-in.



LAND BUILDING AT BIG MAR OVER TIME

TREE GROWTH



1 YEAR OLD



2 YEARS OLD



3 YEARS OLD



5 YEARS OLD

Trees were planted at one year old to enhance survivability

Restore the Earth exclusively provides their native EKOgrown® trees which are grown in a local nursery from seed and used for critical coastal restoration. EKOgrown® is a proprietary method of growing trees which promotes faster growth (2-3X) and expedited establishment in dynamic ecosystems. The trees are planted at 1 year old and have a success rate of 80-90% when compared to bare root seedlings.

OUTCOMES

In 2005, Lake Pontchartrain Basin Foundation began monitoring the wetland growth at Big Mar. Since then over 1,148 acres of land have been built.

The Caernarvon diversion has re-established the fresh end of the estuary, creating habitat for species that thrive in fresh environments. Sediment is retained in the system so even if it doesn't directly build land, it is available for redistribution and as borrow for marsh creation projects. The freshwater end of the estuary is ideal for some saltwater species who use freshwater areas as a nursery in juvenile stages of their life cycle.

Swamp forest such as the one reforested and regenerated at Big Mar is effective in reducing storm surge and buffering wind and wave action. The location of this project is doubly useful as it is located adjacent to the levee system, offering additional natural infrastructure to protect the built infrastructure and neighboring communities.

Overall this project shows what is possible in the future with sediment diversions where we should see more land building on a shorter time scale.

Restore the Earth has provided locally grown native trees for the reforestation of Big Mar. Selected species for reforestation include native bald cypress, water tupelo, blackgum and swamp red maple. Planting sites have been chosen by Lake Pontchartrain Basin Foundation based on soil assessments and salinity levels and in consultation with the land managers.

PARTNERS

Restore the Earth Foundation: Donates all native trees and commercial planting services. To date Restore the Earth has donated over 56,000 trees valued at over \$1.9 million.

Lake Pontchartrain Basin Foundation: Science and monitoring, scout sites, tag and measure trees.

Coalition to Restore Coastal Louisiana: Organizes volunteers plantings.

Landowners: Delacroix.

USDA NRCS: Provides Restore the Earth with funding to grow native trees dedicated to restoration and reforestation initiatives in the Gulf Coast.

Since 2011, this project has had an 85-90% survival rate. This rate excludes the 2010 plantings which experienced significant challenges due to unsuitable planting areas. Utilizing adaptive management practices through lessons learned and observations in the field, trees are planted on pre-scouted sites which demonstrate low lying emergent vegetation (grasses, shrubs etc.) on built land. This vegetation helps foster accretion, providing a more protective buffer for the newly planted trees which promotes their establishment and success.

This project complements and is aligned with the State of Louisiana's Multiple Lines of Defense Strategy—creating and utilizing restored delta, wetlands and swamp to enhance hurricane and storm surge protection for nearby communities. Newly created and restored wetlands buffer storm surge with every 2.7 miles of wetlands absorbing up to one foot of storm surge, utilizing natural functions to reduce surge and flooding to improve community resilience ([Wilkins, 4](#)).



AN ALLIGATOR, SPOTTED IN BIG MAR, IS A SIGN OF A HEALTHY ECOSYSTEM.

ECOSYSTEM SERVICES AND CO-BENEFITS

The Caernarvon Diversion has effectively converted what was once brackish, open water in Big Mar to intermediate and freshwater marsh, resulting in an increase in biodiversity and ecosystem services throughout the project area. Intermediate/freshwater marsh provides critical estuarine nursery habitat for a variety of coastal vertebrate and invertebrate species ranging from shrimp, crabs, alligators and fish. The resulting estuarine biodiversity in these freshwater nurseries creates and supports biodiversity further up the foodchain, attracting a variety of reptiles and waterfowl which have been observed by land managers and recreational users in the area.

The fresh habitat created from the diversion has resulted in a thriving alligator population. The return of the alligator population at Big Mar has provided a wide stream of co-benefits from the residual economies providing the State, landowners and surrounding community industries with revenue streams such as I) the sale of alligator tags, II) sale of alligator eggs (~\$20-25/egg), and III) post kill alligator related industries (i.e. skins, taxidermy, meat, etc.)

PROJECT BENEFITS

- Land Creation & Land Stabilization
- Biodiversity & Estuarine Nurseries
- Economic Co-Benefits
 - Hunting Leases
 - Alligator Eggs/Tags

In 2015 the landowners collected over 25,000 alligator eggs, bringing in over \$500,000 from egg sales, in the 2016 season the landowners made over \$800,000 from alligator egg sales.

Restore the Earth Foundation always works to account for the co-benefits and additional environmental, social and economic value created by each project in order to demonstrate and monetize the integrated value of ecosystem restoration as a way of “unlocking” the business case for restoration.

