

THE POST HURRICANE RECOVERY OF CHARLOTTE HARBOR MANGROVES

In late 2007, a group of Mangrove Marauders set out on a quest to restore hurricane-damaged mangroves in northern Charlotte Harbor. The group, funded by FishAmerica Foundation through NOAA and the American Sportfish Association, was made up of volunteers from local boating and angling clubs, marine businesses, university students and scientists from a variety of agencies and organizations. The need for this project stemmed from the lack of recruitment following Hurricane Charley and concern expressed by the angling community regarding the mangrove's slow recovery.

Mangroves reproduce through a process known as vivipary (live bearing) in which embryonic tree structures known as propagules form on the par-

ent tree. At maturity, these propagules fall into the water where winds and tides eventually push them on shore. In the right conditions, the propagules will develop roots and establish themselves in the sediments forming new mangrove recruits.

Understanding that the recovery process would take years, our project sought to jump-start this process by putting red mangrove propagules (embryonic seedlings) along six miles of shoreline in the hardest hit areas - western Charlotte Harbor along the Cape Haze peninsula (west wall) and eastern Charlotte Harbor between Alligator Creek and Pirate Harbor (east wall). Because so much of these fringing shorelines were

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degraded (80% mortality estimated by Tattar & Scott, 2006), few trees were producing propagules in these areas.

Trained volunteers collected 10,000 propagules from healthy areas within the boundaries of the Charlotte Harbor National Estuary Program (Lemon Bay to Estero Bay). Local propagules were used because they have adapted to our growing conditions and decrease the chance of introducing disease vectors from other areas. Collected propagules were introduced to the restoration sites using two restoration techniques, hand insertion and dispersal along the shoreline. In areas designated for hand insertion, student volunteers inserted one propagule every two meters in two rows. In dispersal areas, volunteers tossed propagules into the water along shore at a rate of two propagules per meter. Controls were established where no restoration occurred for comparison. Our project goal was to increase recruitment in the treatment areas by one propagule per two meters square. Our dispersal rate was twice that of the hand insertion because we anticipated a greater degree of failure using this method.

Each treatment was evaluated over the course of a year by counting recruits at fixed monitoring stations located throughout the project area. Twenty monitoring stations were evaluated, each 12 meters by 12 meters in size. At the end of the first year, recruitment in the dispersal treatments was 3.04 propagules per two meters square greater than in the control, and hand insertion was 1.04 propagules per two meters square greater than the control. We also evaluated the degree of recruitment located within three meters of the water's edge and compared to the larger 12 by 12 meter stations. In both the dispersal and the hand insertion areas, 34% of



the recruitment was located within three meters of the water's edge, compared to 17% in the controls.

Although our FishAmerica Foundation project has come to an end, two community groups are committed to continuing the restoration effort using the techniques implemented in 2007. The PGI Fishing Club began their restoration project in the fall of 2008 along the east wall. This fall, the Gulf Cove Fishing Club will take on the west wall. Through their continued stewardship, Charlotte Harbor will recover from Hurricane Charley, "one mangrove at a time".

Betty Staugler is the Marine Extension Agent for Charlotte County UF/IFAS Extension Service. She can be reached at 941.764.4346.



BETTY STAUGLER

Florida Sea Grant Marine Agent
Elizabeth.Staugler@CharlotteFL.com

CHARLOTTE COUNTY UF/IFAS EXTENSION SERVICE

25550 Harbor View Road, Suite 3 - Port Charlotte, Florida 33980
 941.764.4340 - 941.764.4343 (fax) - <http://charlotte.ifas.ufl.edu>