A Recipe for Success

Exotics Control and Native Plant Restoration on Givney Key, Matlacha Pass NWR, a Satellite of J.N. 'Ding' Darling NWR

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On September 9, 2006, 18 people participated in the restoration of Givney Key, a 0.8 acre island of Matlacha Pass NWR. The island is used by a diverse array of colonial wading and water birds for nesting and loafing activities. During the pre-project site visit in June 2006, it was estimated that the island supported 450 to 700 pairs of nesting white ibis (nests were in varying stages of development) and approximately 250 to 300 loafing magnificent frigate birds. Project participants included the Florida Chapter of the Federation of Fly Fishers (FFF; [8]), the FWS Region 4 Invasive Species Strike Team (R4 ISST; [2]), J.N. 'Ding' Darling NWR staff (3) and volunteers (5). The project was completed in approximately eight hours (144 person hours). All personnel were transported to Givney Key via boats provided by the FWS, FFF or volunteers. Due to the extent and magnitude of exotic plant control and native plant restoration activities, and for overall project efficiency, the smallest and most easily accessible island, Givney Key, was selected for exotic plant control and restoration efforts. The R4 ISST arrived at Givney Key several hours in advance of the main group to clear Hurricane Charley-downed mangroves and other vegetative debris to access upland ridges and prepare sites for native plants. The magnitude of exotic plant infestations and downed and dead debris on the island was absolutely brutal for such a small-scale project. In addition, the heat index was well above 100 degrees for the entire day.

FFF, refuge staff and volunteers planted 153 native plants including ground, shrub and tree (overstory) species common to or representative of coastal island habitats. Ground species (0-1m) planted included ambrosia (*Ambrosia hispida*), bay bean (*Canavalia maritima*), railroad vine (*Ipomoea pes-caprae*), saltwort (*Batis maritima*), bushy sea oxeye daisy (*Borrichia frutescens*), and seacoast marsh elder (*Iva imbricata*). These species were planted on exposed shell or beach ridges above maximum high tide line to avoid exposure to salt water decreasing chances for mortality. Snowberry (*Chiococca alba*) was the only shrub species planted (1-2m), although its branches often extend into the overstory layer. Tree or overstory (>2m) species included bay cedar (*Suriana maritima*), green buttonwood (*Conocarpus erectus*), gumbo limbo (*Bursera simaruba*), Jamaican caper (*Capparis cynophallophora*), Jamaican dogwood (*Piscidia piscipula*), mastic (*Mastichodendron foetidissimum*), red mangrove (*Rhizophora mangle*), red stopper (*Eugenia rhombea*), sea grape (*Coccoloba uvifera*), seven-year apple (*Casasia clusiifolia*), strangler fig (*Ficus aurea*) and wild olive or privet (*Forestiera segregata*). When tree species reach maturity they will provide additional nesting substrate in addition to the red mangroves and other species such as buttonwood and strangler fig that survived Hurricane Charley and remain largely intact.

The R4 ISST treated all exotic plant species using cut stump or groove 'n squirt treatment techniques applying Garlon 4®

In late Fiscal Year (FY) 2005, J.N. 'Ding' Darling National Wildlife Refuge (the Refuge) and the Federation of Fly Fishers (FFF) entered into a Cooperative Agreement to provide funding, personnel and services for exotic plant control activities and native plant restoration on 'satellite nesting islands' of Matlacha Pass and Pine Island NWRs. A grant in the amount of $8,694 was secured through the U.S. Fish and Wildlife Service (FWS) Ecological Service's FY05 Coastal Grant program for habitat restoration. The FFF were to match the funding with in-kind services: administrative coordination and support, and equipment or personnel for exotics removal and/or planting of native plants. The majority of grant money was used to purchase native plants from the Sanibel-Captiva Conservation Foundation (SCCF) native plant nursery for the satellite island project, to secure and grow red mangrove seedlings for the remaining nesting islands which were to be treated by a contractor through the FWS Region 4 Invasive Species Strike Team (R4 ISST) program, with the remainder paying for salary and project oversight of the FFF conservation coordinator.

Project objectives identified in the grant proposal were:

- To preserve and restore the rich natural habitats within the J.N. 'Ding' Darling National Wildlife Refuge Complex (NWR) for support of healthy fish and wildlife populations including improving conditions on satellite islands for wading and water bird nesting activities.
- To remove exotic vegetation from satellite islands within the Refuge complex.
- To engage anglers in management activities that will benefit natural resources, particularly the fish species that provide so much recreational enjoyment.
- To promote awareness among anglers and the general public regarding the impacts of exotic plant species and the application of appropriate management techniques to ensure successful habitat restoration efforts.

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and Stalker® with a hand sprayer to the exposed cambium. In all, 45 stems (1-12 inches in diameter breast height [dbh]) of five different Category 1 state-listed invasive exotic plants were treated. In addition, any other exotic plant species were treated. Species targeted included Brazilian pepper (*Schinus terebinthifolius*) (primary [20]; 0.2 acres); carrotwood *(Cupaniopsis anacardioides)* (2); earleaf acacia (*Acacia auriculiformis*) (5); papaya (*Carica papaya*) (3); seaside mahoe (*Thespesia populnea*) (3); and umbrella tree (*Schefflera actinophylla*) (12). The actual infested area of all exotics treated was 0.4 acres, nearly ½ the gross project area. Exotic plant infestation on Givney Key was visually estimated at nearly 50%, with the northeastern portion containing the greatest concentration. Large Brazilian pepper trees were treated and left standing to provide nesting platforms for wading and water birds until planted tree species reach sufficient height, mass and canopy cover to be suitable for nesting purposes.

Methodology

Numbered aluminum tags were placed on 84 plants (55%) for monitoring purposes. In addition, recorders gathered information on individual plant genus/species, common name, assigned tag number and species classification: ground, shrub or tree (overstory). The information collected will be used for subsequent monitoring purposes and for final data evaluation. A representative sample of ground (40), shrub (5) and tree species (39) were tagged. Survival of native plants will be evaluated after one year, i.e., September 2007.

Native Plant Survival (NPS) will be evaluated using the following formula:

$$NPS = \frac{\text{\# of tagged plants alive}}{\text{total \# of tagged plants}} (\%) \text{ X Total \# of Plants Planted (N = 153)}$$

to determine the estimated total number of native plants of all types that survived.

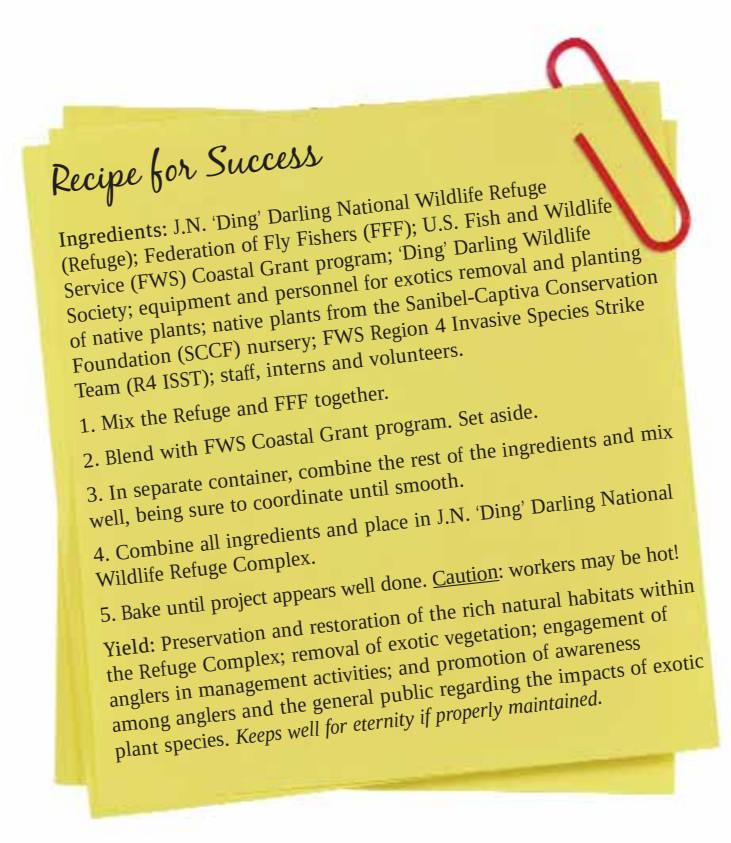
Personnel will determine if plants are 'alive' or 'dead' by using a thumb or fingernail scratch test to expose either the green, soft (alive) cambium or brittle (dead) cambium. Evaluations will be of a qualitative nature. A twig or branch snap test also may be employed to determine whether a plant is alive or dead. Either test should yield the needed information even if an individual plant is in a state of dormancy.

Management Implications

The results of this study have implications on planning future island restoration projects on the remaining coastal islands within satellite refuges of J.N. 'Ding' Darling NWR. Monitoring exotic plant control and native plant restoration activities are key components of island restoration. If planted native species thrive and survive to maturity on this small-scale project, it is likely that the remainder of the similar satellite nesting islands will experience the same benefits from exotic plant control operations and native plant restoration activities barring any extreme environmental conditions such as extended droughts or tropical storms. Island restoration will ultimately help support wading and water bird nesting activities following the extensive damage to existing native plant communities, composition and structure inflicted by Hurricane Charley. Also, re-introduction and establishment of native plants to exposed areas will likely create shade that will aid in surpressing the germination and establishment of exotic and invasive exotic plants thus reducing costs associated with managing infestations of those plants. The success of this project will also reinforce the knowledge that conservation groups and volunteers can assist budget-limited local, state and federal conservation agencies with exotics control and habitat restoration activities. The ultimate goal is to restore the ecological function and integrity of coastal islands through implementation of standard management techniques available for restoration efforts: alternative fund sources, i.e., grants, exotics control, native plant restoration and enlisting the aid of volunteers.

Author Bill Thomas points out a large, treated Brazilian pepper tree.

The event held to restore 0.8 acre Givney Key, Matlacha Pass NWR, was a tremendous success with only a few logistical snags encountered. All invasive exotic plant species were treated by the R4 ISST in Early Detection and Rapid Response (EDRR) fashion, and operations coincided well with native plant tagging, data recording and native planting activities by the FFF, refuge staff and volunteers. The September project date was selected in order to take advantage of the 'rainy' season to optimize native plant establishment and ultimately, plant survival. It was also determined



prior to coordinating the Givney Key restoration project that remaining satellite nesting islands identified in the original grant would be more suitable for completion by employing the services of an experienced exotic plant control/native plant restoration contractor due to the sheer number of islands, overall project coordination involved, and the enormous amount of exotic plant control and native plant restoration work needed. The remaining satellite nesting islands (3 islands; ~13 acres) will be completed using an independent and experienced contractor, Aquatic Vegetation Control, Inc., Riviera Beach, Florida, selected through the R4 ISST program. Funding for remaining island restoration efforts was secured through the R4 ISST FY06 Call/Request for (Exotics) Proposals program (February 2006).

Acknowledgements

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