

## **Indian River Lagoon Spoil Island Enhancement Lessons Learned**

The information provided below is aimed at assisting government agencies and conservation groups in conducting spoil island enhancement projects. It is the combined knowledge of the Spoil Island Working Group, based on years of success stories and setbacks. The target audience would be looking to conduct small to medium scale enhancements with a group of dedicated volunteers or island adopters. Before engaging in any enhancement activities, be sure proper authorization has been procured and that all efforts are done in a safe and responsible manner. Also linked on this page are sites in which the working group has on-going or completed enhancement projects.

### **1. Site Selection**

Island selection will be highly dependent on the group's interest, abilities, and jurisdiction. However, there are several factors that should be taken into consideration when deciding on an island to enhance.

**Island Characteristics:** Islands in the Indian River Lagoon are designated as recreation, conservation, or education islands under the 1990 IRL Spoil Island Management Plan. Since data were collected in the late 1980's, the designations may no longer be appropriate. Enhancement projects for recreation islands typically involve addition of picnic tables/fire rings coupled with removal exotics and addition of native plants. Recreation islands often have deep water access and open sand beaches which make them ideal for visitors. Consideration should also be taken for the islands distance from the boat ramp or marina in which the group and volunteers are launching. Only habitat enhancement projects are suitable for conservation islands and should not be undertaken during nesting season. On and off season bird surveys should be conducted of the proposed island to determine if and how many types of birds nest there. Since the island must be observed at a distance during the nesting season, off season surveys on the island can be used to look for evidence of roosting/nesting (droppings, nests, skeletal remains).

The threat of vandalism can be one of the most difficult factors to judge before choosing an island to work on. Heavily trafficked islands have a greater chance for vandalism but can occur anywhere. Accidental or intentional vandalism is something that should be considered during every step of the enhancement process.

**Project Size and Scope:** Whether it be creating a campsite or conducting a complete island exotic removal, it is important to fully grasp the scale of the project being undertaken. This especially goes for exotic removal and native plantings. While a handful of volunteers can easily remove large patches of exotics or plant a large area of natives in a day's work, the long term upkeep of the site when volunteer assistance is not guaranteed can quickly become overwhelming. Exotics like Brazilian pepper and Australian pine are tenacious and opportunistic plants which will require frequent monitoring for resprouts. Introduced native plants will require monitoring and watering as well until they become established. More on these topics will be covered in their respective sections.

## **2. Volunteer Coordination**

Enlisting volunteers to assist in projects greatly reduces labor costs and helps involve and engage those who benefit from enhancement efforts. Local academic institutions can be a great source of volunteers as many students or groups often are required to commit hours to volunteer service. Most schools have an email listserv, either by department or the entire school in which you can request to have your announcement distributed. Many local radio stations, such as NPR, will also air public service announcements for free.

A few days before the scheduled work day, it helps to visit the island to assess what tasks must be accomplished, lay out a work plan, and take “before” pictures. This way once the volunteers arrive, they can quickly be broken up into groups and assigned tasks.

Along with providing the basic equipment, it is also helps to provide volunteers with drinks, sunscreen, and bug spray. This is highly dependent on the group’s budget. If supported by a non-profit CSO, many organizations like Publix, Walmart, and Winn-Dixie can be solicited for gift card donations to benefit volunteers.

## **3. Exotic Removal**

The two most common exotics encountered on spoil islands are Brazilian pepper and Australian pine. Brazilian pepper can range from small shrubs to larger sprawling trees. When dealing with either plant, herbicide is a must as they will quickly coppice from cut stumps or even exposed roots. Indian River Lagoon Aquatic Preserve (IRLAP) staff use Garlon 3A mixed with a surfactant and apply the mixture within a few minutes of cutting. Those applying herbicide should wear rubber gloves and goggles, and be instructed in application before use. Depending on the volunteer’s abilities, they may be tasked to assist with herbicide application. It is often easier for volunteers to use a brush to “paint” herbicide onto cut stumps.

For Brazilian pepper, smaller trees can be cut down with loppers and the stump sprayed. Larger trees will require chainsaws and substantially more herbicide. Pepper trees often seem to begin germinating around cabbage palms, spreading outward into dense thickets. These can be ideal removal goals for volunteers as they are manageable and self contained. Once the pepper is cleared out, the cabbage palm or other native vegetation can provide shade for camping or recreational improvements.

Brazilian pepper is in the same family of plants as poison ivy, and as such, some people experience an allergic reaction to it. Gloves and long sleeve shirts are recommended when working with pepper. It should not be burned with volunteers present.

Australian pines are more hazardous to remove due to their height. When removing these trees, it is important to notify everyone on the island and make sure the intended “fall zone” is

clear. The downed tree can then be cut into logs and placed around camp sites. This should be done the day of cutting. Once the wood dies and dries out, pine stumps become very hard and difficult to cut, even with a chainsaw. Younger trees can be cut with loppers or pulled by hand. For Australian pines with nesting birds in them, girdling may be an option for removal. This involves cutting into the cambium layer of the tree with a chainsaw, then allowing the tree to die in place. In these cases, girdling should be done during the off season when birds are not nesting. The hope being that as the tree dies and loses foliage, the nesting birds will choose another location.

Branches and other debris will accumulate quickly during exotic removal. As mentioned above, much of it can be cut up and left on the island to be used as firewood. However, sometimes it will be necessary to burn the debris, especially if the branches are full of seeds. Depending on the size of the island and number of volunteers, it may be best to return to the island a few days later to conduct the burn. FL Division of Forestry, as well as local authorities should be notified to avoid any unnecessary alarm.

After removal is complete, the island will need to be revisited periodically to check for resprouts. There is likely a large seed source on the ground which will germinate once the canopy is opened.

Both Australian pine and Brazilian pepper can grow up to the water's edge, occupying the role of shoreline vegetation. This presents a catch-22 in terms of exotic removal, as removing these plants may cause further detriment to the island. Replanting with young mangroves or salt marsh grasses will not fully replace the function of the removed exotics. Removal of shoreline exotics should only be done after thorough study of the factors affecting the shoreline and with a plan for stabilization once the exotics are removed.

#### **4. Native Plantings**

Elevation, location, species, and timing are the four main factors when designing a planting layout. Topographic surveys are a valuable tool for determining the appropriate elevation for shoreline and upland plantings. While they may not be feasible for small scale projects, they are essential for larger efforts. A rule of thumb when not using topographic surveys is to mimic the elevation of naturally occurring plants of the same species. This is especially useful for shoreline plantings where planting at a specific elevation is of critical importance and species specific.

For recreational islands, the main goal is often to add natives while providing space for the public. Conservation island enhancement does not require the same considerations for public use so plantings should be denser and cover the entire cleared portion. Planting within the halos of removed exotics has a few advantages. The shade provided by the remaining natives protects the new plants from excessive sun. These areas typically have an accumulation of leaf litter which may provide some nutrients in otherwise barren earth. Because of this, we also sprinkle a small amount of slow release fertilizer into the hole dug before adding the plant.

The recently cleared portions are less likely to have heavy foot traffic and as such, vandalism, accidental or otherwise. A general rule of thumb when placing plants is to keep them away from main thoroughfares or sites of heavy usage. As for timing, we try to add plants towards the end of our spoil island season (February-April). By this time, we have cleared a decent amount of exotics and stopped any resprouts from getting a foot hold. Another advantage to planting later in the season is that the summer rains should (hopefully) be starting by mid-late May, reducing the need for supplemental watering. A plan for watering should be in place for unfavorable weather.

After the initial planting, plants should be photographed and their location noted via GPS. When planting dense patches, individual GPS points may not be feasible. In these circumstances, a polygon can be made using an ArcPad device or taking a single GPS point with a noted abundance of plants. Monitoring should be conducted periodically to observe mortality, note growth, and remove any exotics recruiting into the area.

#### Species type

The following is a list of native species recommended for spoil island enhancement. They have been chosen due to their natural occurrence, habitat preference, and desired ecosystem function. The success of these plants is anecdotal and short term. Results are based on large scale (SL3, IR36, SL15) and small scale (BC44A&B, BC46, BC47) enhancement efforts. IRLAP Staff continue to monitor and reevaluate plantings to determine the most successful species over the long term. Good resources for plant species descriptions:

<http://regionalconservation.org/beta/nfyn/plantlist.asp>

<http://www.floridata.com/index.cfm>

Table 1. Native Plant Species on Spoil Islands with high survivorship

Common Name	Scientific Name	Comments
Seagrape	<i>Cocoloba uvifera</i>	Hardy, slow growing. Does best close to water (above MHW) or under canopy when in uplands. May require trimming for desired growth pattern.
Florida Privet	<i>Florida segregata</i>	Occurs naturally on many islands, good competitor against Brazilian pepper, grows to 6-8ft tall shrubs. Plant in hammocks after pepper removal or as barrier.
Saw Palmetto	<i>Serenoa repens</i>	Slow growing. Plant in tight clumps, ~1 ft apart, plant as barrier.
Gumbo Limbo	<i>Bursera simaruba</i>	Shade tree, plant spread apart, around campsites.
Cabbage Palm	<i>Sabal palmetto</i>	Shade tree, plant spread apart, around

		campsites, slow growing.
Red Cedar	<i>Juniperus virginiana</i>	Hardy, slow growing.
Spanish Stopper	<i>Eugenia foetida</i>	Grows slowly but high survivorship without watering.
White Indigo Berry	<i>Randia aculeata</i>	Grows slowly but high survivorship without watering.
Sweet Acacia	<i>Acacia farnesiana</i>	Shade tree. Grows well without watering. Thorny and uninviting while small.
Dune sunflower	<i>Helianthus debilus</i>	Fast growing ground cover.
Indian blanketflower	<i>Gaillardia pulchella</i>	Aesthetically pleasing, hardy flower.
Sea Oxeye Daisy	<i>Borrchia arborescens</i>	Plant in lower lying ephemeral wetlands or near sheltered shorelines.
Buttonwood	<i>Conocarpus erectus</i>	Does well just above MHW or in upland areas.

Table 2. Native plants with low survivorship on spoil islands.

Common Name	Scientific Name	Comments
Coral Bean	<i>Erythrina herbacea</i>	Why/how did it fail?
Firebush	<i>Hamelia patens</i>	Why/how did it fail?

## 5. Recreational Enhancements

\*Links to blueprints for picnic tables and kiosks\* Will be placed on website.

The most resilient and efficient design for picnic tables is the fixed, two posted, design where two support posts are cemented in the ground. This prevents campers from attempting to move the tables around (or off) the island.

The fire pits we have used are purchased from PRIDE Enterprises, a prison rehabilitation program here in Florida. They offer multiple options in terms of fire rings, raised BBQ grills, and other recreation furniture. We are moving away from using ground level fire rings on spoil islands due to

their improper use. Visitors frequently pile fire wood on top of the movable cooking grill which bows and damages it. We plan on experimenting with a segregation of structures based on use; raised BBQ grills for cooking and coquina rock rings for campfires. The raised BBQ grills are available from PRIDE, easily securable and immovable, and the coquina occurs naturally on most spoil islands.

Kiosks create a medium to educate visitors to the island about the spoil island habitats, reasons behind enhancement efforts, locations of island amenities. It is hoped that educating the visitors will foster appreciation and stewardship of the island, garnering support and reducing vandalism. Reinforcing a "Pack in, Pack out" policy on educational signage is recommended to keep visitors aware of their responsibilities while on the island.

#### Spoil Island References:

Fernald, R., Barnet, B.S., Gilbert, T. 1985. Establishment of native hammock vegetation on spoil islands dominated by Australian pines. Office of Environmental Services, Florida Game and Fresh Water Fish Commission. Vero Beach, FL.

Treasure Coast Regional Planning Council. 1980. Spoil Island Study Indian River County, Florida. Indian River Board of County Commissioners. Stuart, FL.

Florida Department of Natural Resources. 1980. Indian River Lagoon Spoil Island Management Plan. The Bureau of Submerged Lands and Preserves.