The Power of Partnerships - Island Style

by Alison Higgins, Land Stewardship Coordinator, The Nature Conservancy of The Florida Keys

The Setting

The Florida Keys are a string of more than 1,800 limestone and mangrove islands that arc southwest off the southern tip of Florida. These rocky islands support a number of specialized habitats and endemic species. The hardwood hammocks found here support a richer biodiversity of trees than any other forest in the United States – about 120 tree species! Clearly, the Keys lie at a "biological crossroads" between the temperate habitats of North America and the tropical habitats of the West Indies.


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Brandishing a handsaw, Boy Scout Chris Purcell lays waste to a Brazilian pepper.

The uniqueness of these islands was recognized early on and many agencies collaborated to purchase land for conservation. To date, more than 50 percent of the Florida Keys is in public ownership. However, because many subdivision property lines have already been mapped, there are many singular public properties surrounded by private lands and the invasive exotic plants that may reside within them (see map on page 13). This means that, mile for mile, there are many times more adjacent public/private property lines than there is coastline, which adds up to a lot of potential for invasion.

Do Exotics on Private Lands Equal Job Security?

Unfortunately, local public land managers have little time to worry about exotics on private lands. Operating with few resources and staff, some are unable even to address exotics within their own boundaries, much less outside them. If it weren't for funding from the Florida Department of Invasive Plant Management, many areas would be out of control. However, public money cannot be used on private lands, even though they serve as tremendous sources of seed that can be disbursed to adjacent public lands by wind, birds, or mammals. An alternate method is needed to remove these potential seed sources from private lands.

Beyond Boundaries

The Keys biodiversity also attracted The Nature Conservancy (TNC), which helped many public agencies with land acquisition and then turned its sights on land management. With three preserves (Terrestris on Big Pine Key, Torchwood Hammock on Little Torch Key, and the Braft Tract on Lower Sugarloaf Key) in healthy shape, The Nature Conservancy wanted to look beyond its own borders to help the Keys landscape as a whole. To accomplish this, TNC helped form the Florida Keys Invasive Exotic Task Force (FKIETF) in 1996, bringing public and private conservation land managers, the county extension service, road maintenance crews, electrical utility providers, and others to the table to share knowledge, equipment, labor and training opportunities. The Task Force banded together to produce brochures, its own Keys-specific exotic plants list (see next page) and a quick response team to deal with new invading species.

The Nature Conservancy also initiated "Project GreenSweep" in 1999. In response to the Task Force's requests for help, GreenSweep recruits, trains and places volunteers in high-priority exotics control projects. They also conduct community outreach campaigns to

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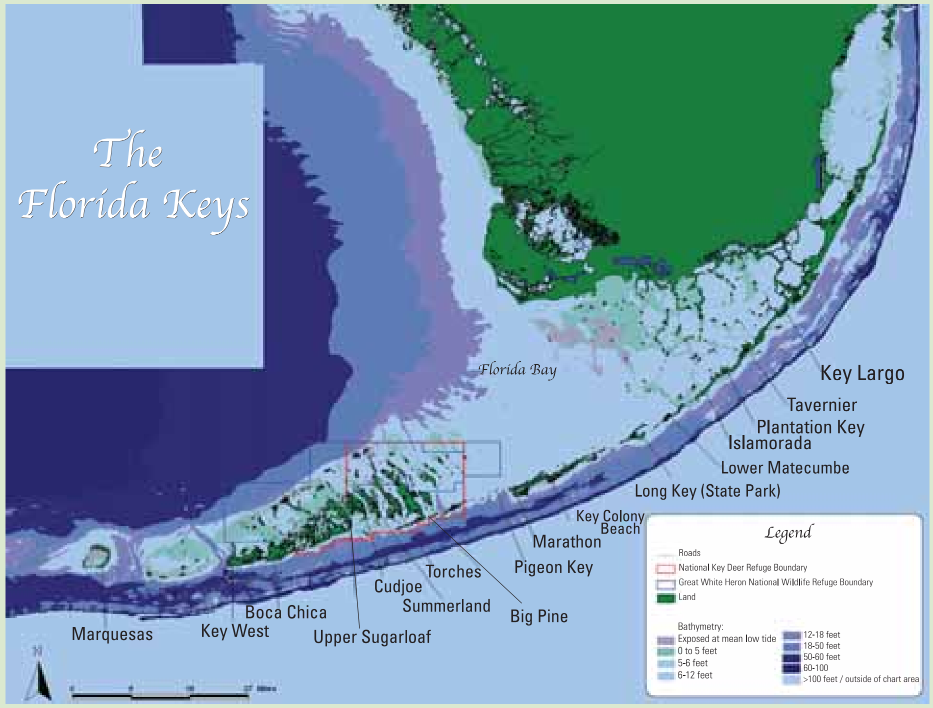
Volunteers help remove Scaevola at Naval Air Station, Key West.

SCIENTIFIC NAME	COMMON NAME	EPPC	KEYS INVASION PATTERN AND COMMENTS	SEEDING (DISPERSAL, SEASON)	ERADICATION RECOMMENDATION
FKIETF CATEGORY I: INVASIVE EXOTICS THAT ARE ALTERING FLORIDA KEYS NATIVE PLANT COMMUNITIES BY DISPLACING NATIVE SPECIES, CHANGING COMMUNITY STRUCTURES OR ECOLOGICAL FUNCTIONS, OR HYBRIDIZING WITH NATIVES					
Casuarina equisetifolia	Australian pine	I	Highly invasive in wetlands and uplands	wind blown, year round	Basal or stump with 10%-30% Garlon 4
Colubrina asiatica	Asiatic colubrina	I	Highly invasive, especially on beaches and coastlines	floating, year round	Foliar with 3% Garlon 4 in cut grid pattern
Ficus microcarpa	Laurel fig	I	Highly invasive in uplands in Upper Keys, epi- and litho-phytic	birds	Basal with 5% Garlon 4
Leucaena leucocephala	Lead tree	II	Invasive mainly on roadways and disturbed edges at present	nearly year round	Basal or stump with 40% Garlon 4
Manilkara zapota	Sapodilla	I	High localized invasion in higher elevation hammocks	heavy fruit, year round	Basal with 10%-25% Garlon 4
Melaleuca quinquenervia	Melaleuca	I	Localized invasion in N. Key Largo, Stock I. and Boca Chica	wind blown, August - December	Hack and squirt with 50% Garlon 3A and 1% Arsenal
Neyraudia reynaudiana	Burma reed	I	Prefers disturbed and ruderal sites but moves into undisturbed hammocks; occurs on all roadsides in Upper Keys; at least one fairly large patch treated on Big Pine Key	seed/rhizome	Foliar with 2% Roundup Pro
Scaevola sericea	Beach naupaka	I	Spreads quickly from landscaping, especially on beaches and coastal edges/causeways	tides/birds/animals, nearly year round	Basal with 10% Garlon 4 or stump with 50% Garlon 3A
Schefflera actinophylla	Queensland umbrella tree	I	Hammock and mangrove margins, disturbed sites and spoil islands in the Upper Keys	birds, summer	Basal with 10% Garlon 4 or stump with 50% Garlon 3A
Schinus terebinthifolius	Brazilian pepper	I	Highly invasive in wetlands and uplands	animals, October - March	Basal or stump with 10%-15% Garlon 4
Thespesia populnea	Seaside mahoe	I	High localized invasion in transitional areas	floating, year round	Stump with 50% Garlon 3A applied immediately
FKIETF CATEGORY II: INVASIVE EXOTICS THAT HAVE INCREASED IN ABUNDANCE OR FREQUENCY BUT HAVE NOT YET ALTERED FLORIDA KEYS PLANT COMMUNITIES TO THE EXTENT SHOWN BY CATEGORY I SPECIES					
Acacia auriculiformis	Earleaf acacia	I	Local problem in Upper Keys; has appeared in Lower Keys	wind blown	Stump with 50% Garlon 3A
Agave sisalana	Sisal hemp	II	Spreads from landscapes and establishes where dumped	tall seed stalks, June-August	Spray with 3% Garlon 4 on center bud
Albizia lebbeck	Woman's tongue	I	Problem in Upper Keys, occurs throughout Keys	wind blown	Basal or stump with 30% Garlon 4
Asparagus densiflorus	Asparagus fern	I	Spreads from landscapes and establishes where dumped	dumping/birds/animals	Foliar with 2% Roundup Pro
Asystasia gangetica	Ganges primrose	II	Spreads from disturbed sites and climbs forest edges	March-August	Foliar with 2% Roundup Pro
Casuarina cunninghamiana	Australian pine	II	Suckering, somewhat cold tolerant, very limited in Keys	wind blown, year round	Basal or stump with 10%-30% Garlon 4
Casuarina glauca	Australian pine	I	Less salt tolerant and less widespread than C. equisetifolia	no seeds - suckers off planted trees	Basal or stump with 10%-30% Garlon 4
Cryptostegia madagascariensis	Madagascar rubber vine	II	Occurs in transitional wetlands, old homesteads in Upper Keys	summer, wind blown	Basal with 10% Garlon 4
Cupaniopsis anacardioides	Carrotwood	I	Recent introduction; has spread from planting in Key West; invades uplands to buttonwood zone	birds/small mammals	Basal with 10% Garlon 4 or stump with 50% Garlon 3A
Dichrostachys cinera	Sickle bush, Marabu	II	Dense thickets in Cuba, Pacific Islands.	mowing, rhizomes	Unknown at this time.
Dioscorea bulbifera	Air Potato	I	Invades variety of habitats: 23 FL counties, Big Pine & Cudjoe	vine, tubers, floats	Manual removal
Epipremnum pinnatum	Pothos (philodendron)	II	Has spread from landscapes, dump sites to hammock		Foliar with 2% Roundup Pro
Furcraea cabuya	Central American sisal	n/a	Spreads from landscapes and establishes where dumped	June–August	Spray with 3% Garlon 4 on center bud
Hibiscus tiliaceus	Sea hibiscus	II	So far largely limited to disturbed sites	drift seed/wrack lines	Stump with 50% Garlon 3A applied immediately
Hylocereus undatus	Night-blooming cereus	n/a	Spreads from landscapes and established where dumped	animals, suckering	Manual removal
Kalenchoe spp.	Life plant	II	Spreads from landscapes and establishes where dumped		Foliar with 2% Roundup Pro
Lantana camara	Lantana	I	Spreads from landscapes to hammock margins and pinelands	bird dispersed, nearly year round	Basal with 5% Garlon 4
Nephrolepis multiflora	Asian sword fern	I	Invades hammocks	seeds spores/rhizome	Foliar with 2% Roundup Pro
Panicum maximum	Guinea grass	II	Present in Keys, but extent of invasion unknown	rhizomes/seeds	Foliar with 2% Roundup Pro
Panicum repens	Torpedograss	I	Present in Keys, but extent of invasion unknown	rhizomes/seeds	Foliar with high concentration of Rodeo
Pennisetum purpureum	Napier grass	I	So far limited to roadsides	spread by mowing, nearly year round	Foliar with 2% Roundup Pro
Pennisetum setacea	Fountain grass	II	Planted for landscaping and is currently spreading on roadsides, medians and disturbed sites; seeds after mowing	spread by mowing, nearly year round	Foliar with 2% Roundup Pro
Psidium spp.	Guava	I	Spreads from neighborhood fruit trees into uplands	mammals/humans	Basal with 10% Garlon 4
Rhoeo spathacea	Oyster plant	I	Spreads from landscaping and establishes where dumped		Foliar with 3% Garlon 4 in water or oil
Sansevieria hyacinthoides	Bowstring hemp	II	Spreads from landscaping and establishes where dumped	seeds/rhizomes	Foliar with 5% Garlon 4 in water or oil
Stachytarpheta urticifolia	Porterweed	n/a	Non Native porter weed that hybridizes with native		
Tecoma stans	Yellow elder	n/a	Moving into hammocks from disturbed edges		

Terminalia catappa	Tropical almond	II	Occasional problem on Keys coastlines and near plantings	drift seed	Basal with 10% Garlon 4 or stump with 50% Garlon 3A
Tribulus cistoides	Puncture weed	II	Moving down the roadside; also on beaches	animals, year round	Foliar with 2% Roundup Pro
Wedelia trilobata	Wedelia	II	Disturbed sites, beaches	year round	Foliar with 2% Roundup Pro
FKIETF CATEGORY III: INVASIVE EXOTICS THAT HAVE NOT YET BECOME A SERIOUS PROBLEM IN THE FLORIDA KEYS BUT ARE TO BE WATCHED (TBW).					
Adenanthera pavonina	Red sandlewood	II	Fast growing and spreading where planted	wind blown	
Ardisia elliptica	Shoebutton ardisia	I	Moving south on Card Sound Road; not yet over bridge	birds, year round	
Bauhinia variegata	Orchid tree	I	Planted here but no escape observed yet		
Broussonetia papyrifera	Paper mulberry	II	One escape in Key Largo, serious problem in Dade		
Bucida bucera	Black Olive	n/a	Copius seeder, may invade canopy gaps near parent		
Bucida bucera B. Spinosa	Black Olive	n/a	Has been found in Key Largo hammocks		
Carica papaya	Papaya	n/a	Found in hammocks and along coastal berms		
Catharanthus roseus	Madagascar periwinkle	n/a	Disturbed sites, beaches		
Clusia rosea	Pitch apple, autograph tree	n/a	Spreading in Key Largo, Dade/Broward, epiphytic, lithophytic	birds, spring-summer	Basal with 10% Garlon 4
Dactyloctenium aegyptium	Crowfoot grass	n/a	So far seems to be limited to disturbed sites or as an early colonizer only at natural sites		
Ficus altissima	False banyan	II	Planted here but no escape observed yet	birds	
Flacourtia indica	Governor's plum	II	Planted here but no escape observed yet	animals	
Jacquinia arbora	Bracelet Wood	n/a	Disturbed sites, Key Largo Geiger Key areas		
Macroptilium atropurpureum	Jumbie bean	n/a	Edge species, moving into coastal berms and dunes	wind blown	
Macroptilium lathyroides	Jumbie bean	n/a	Edge species, moving into coastal berms and dunes	wind blown	
Melia azedarach	Chinaberry	I	Planted as ornamental and has potential to spread	animals	
Merremia tuberosa	Wood rose	II	It's planted in Keys; is a problem in Dade	year round	
Murraya paniculata	Orange-jessamine	II	Planted here but no escape observed yet	animals	
Ochrosia parviflora	Kopsia	n/a	Planted here but no escape observed yet		
Oeceoclades maculata	Ground orchid	n/a	Definitely invades, but does it disrupt? There's some question as to whether it's introduced or naturally arrived		
Phoenix spp.	Date palm	II	Localized problem at Marquesas Keys and Cape Florida EPPC lists *P. reclinata* as Cat. II	rhizomes/seeds	Manual removal
Rhynchelytrum repens	Natal grass	II	Occurs on roadside over the entire Keys; potential pineland problem	year round	Foliar with 2% Roundup Pro
Solanum viarum	Tropical soda apple	I	Invades pastures and upland pines	livestock/mamals/ hay	Glyphosate at a 3% solution
Stenotaphrum secundatum	St. Augustine grass	n/a	Planted here, beginning to invade hammocks from roadsides.	rhizomes, Sep-Nov	
Syzygium cumini	Java Plum	I	One site on Ramrod Key, waiting to see	birds/small mammals	Glyphosate at a 3% solution
Tabebuia sp.	Pink shower tree	n/a	One localized problem known at Upper Sugarloaf Key	wind blown, Mar - Aug	
Tamarindus indicus	Tamarind	n/a	Naturalizing in Key Largo Hammock		
Tradescantia spp.	Wandering Jew	I	Spreads from landscapes and dump sites; localized problem Spreading along some forest edges in the Upper Keys		
Turnera ulmifolia	Yellow alder	?	Disturbed areas may invade beach dunes		
Vitex trifolia	Chastetree	?	Key Largo hammocks and Long Key as a landscape tree	landscapers	
Zoysia japonica	Zoysia grass	n/a	Escaping from park residence at north end of Bahia Honda	rhizomes	Foliar with 2% Roundup Pro

PLANTS THAT MAY HYBRIDIZE WITH NATIVES OR ARE BEING SOLD AS NATIVES

Exotic		hybridize?	Native	
Hamelia patens African	African Fire Bush	?	Fire Bush	*Hamelia patens*
Scaevola sericea Vahl	Beach Napauka	?	Scaevola,ink berry	*Scaevola plumieri*
Stachytarpheta urticifolia	Porterweed	Y	Blue Porterweed	*Stachytarpheta jamaicensis*
Sophora tomentosa var. *occidentalis*	Texas Necklace pod	Y?	Necklace pod	*Sophora tomentosa* var. *truncata*



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spread the word about these spreading problem plants. Through the planning efforts of Conservancy staff, GreenSweep grew into a Keys-wide program with training manuals, a large volunteer network and a method for addressing private land invasives. To date, GreenSweep staff and volunteers have assisted hundreds of private landowners in achieving and maintaining exotics free properties, in turn keeping millions of seeds away from public conservation lands. GreenSweep also gives away thousands of native plants to Keys residents during its annual Native Plant Fair while working with residential neighborhood organizations to encourage the use of non-invasive plants in landscaping.

Finding Agency Partners

While The Nature Conservancy may not be able to help on your site, there are probably other nonprofit organizations that can. Do you have a "friends of" group? A local native plant society chapter? Even if you can't think of anyone right now, there are other things your agency can do to help involve others.

The Nature Conservancy gives away thousands of native plants to the community during its annual Native Plant Fair.

First, don't reinvent the wheel. Florida Keys Conservancy staff members Alison Higgins and Chuck Byrd are happy to supply GreenSweep materials to help you train volunteers, recruit AmeriCorps teams, and obtain permission from private landowners. Locally, Miami-Dade County soon will be utilizing its first AmeriCorps team. Across the water, the Bahamas Environment, Science and Technology Commission is adapting GreenSweep materials to fit the country's local invasive plant control needs.

Second, start making more friends. Talk to people in other agencies in your region. Find out who the crew supervisor is for your local road right-of-ways and utility lines. You may just find an ally you didn't know you had.

The Big Picture

Natural lands don't recognize property lines. Neither do invasive exotic plants. We need all partners to pitch in to address these issues on a landscape scale. With cooperative groups like the Florida Keys Invasive Exotics Task Force, innovative projects such as Project GreenSweep, and strategic private lands involvement through nonprofits like The Nature Conservancy, the threat of invasive species can be fought and won. Unique habitats such as the Florida Keys can be protected, at least in part, and the rich native biodiversity preserved for another generation.

For more information, contact Alison Higgins, Land Stewardship Coordinator, The Nature Conservancy of The Florida Keys, 305/745-8402 ext. 111, ahiggins@tnc.org

A guidebook was prepared by TNC for use by Task Force members and other interested people. *Identification Guide for Invasive Exotic Plants of the Florida Keys* contains photos or line drawings of each plant on the list, together with location, basic identification and control information. The book was prepared by Kate Hadden and Kaita Frank and has just been updated by Chuck Byrd. Copies may be obtained by contacting him at The Nature Conservancy, P.O Box 420237, Summerland Key, FL 33042, 305-745-8402; chuck_byrd@tnc.org