Wildland Weeds

WINTER 2001

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Wildland Weeds

WINTER 2001, Volume 4, Number 4

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Wildland Weeds (ISSN 1524-9786) is a quarterly publication of the Florida Exotic Pest Plant Council (EPPC)

Wildland Weeds is published to provide a focus for the issues and concerns regarding exotic pest plant biology, distribution and control. To become a member of the Florida EPPC and receive the Council newsletter and *Wildland Weeds* Magazine, contact the Treasurer.

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Cover: The Loggerhead Key U.S. Coast Guard Lighthouse (c. 1856) drew people to this remote island and increased the likelihood of plant introductions and habitat modifications. Photo courtesy the National Park Service.

Florida EPPC 2001 Symposium - "Weeds in La Florida"

The date was September 11, 2001. No symposium has ever gotten off to a more ominous start (and hopefully never will again) — and tenuous conclusion. Meeting during the peak of hurricane season caused tension, but the events of the day quickly overshadowed any concerns over weather.

With trepidation, the decision was made to go on with our Symposium. With an Invocation that remembered those in NYC and Washington D.C. and gave thanks that we were all together safely, the Florida Exotic Pest Plant Council 16th Annual Symposium began in St. Augustine, with the theme: "Weeds in La Florida, 2001" – Marking 500 years of North America's first contacts with alien plants. Sarah Reichard set the stage with her insightful keynote address, "Nipping new invasives in the bud: evaluating plants for invasive potential," Kathy Burks' slate of speakers was informative and involving. Lots of folks worked hard to keep things moving on many fronts serving as moderators, audiovisual geeks, field trip leaders and registrars. Continuing Education Units (CEUs) for Certified Pesticide Applicators were provided for the first time at a FLEPPC Symposium.

Outstanding Achievement Awards went to Hugh Gramling of the Tampa Bay Wholesale Grower's Association and FLEPPC's Doria Gordon for their efforts and accomplishments with the FLEPPC/FNGA nursery industry dialogue. This committee has established trust and communication between the groups while addressing the problem of nursery trade plants that are invasive in natural areas. Hugh and Doria's tenacious efforts have been reported in *Wildland Weeds*.

Local arrangements were headed by DEP's JB Miller. Highlights included Thursday night's banquet and social, which definitely helped everyone relax for a little while. The band kept everyone dancing. All of the Casa Monica staff was accommodating and friendly, and I would recommend St. Augustine and the Casa Monica to anyone for a meeting.

Friday morning brought torrential rains, tornado warnings, and a tropical depression bearing down on Florida. But, we barrelled ahead, holding our Annual Business Meeting and final Symposium session. Elections chose Mike Bodle as Vice Chair and JB Miller, Tom Fucigna, Kathy Burks, and Jim Burney as board members. Thanks were expressed to outgoing Directors, Mike Bodle, Hillary Cherry, Francois Laroche, and Brian Nelson, and a special plaque was presented to Dan Thayer in appreciation for his many years of dedication to FLEPPC including the past three years as Treasurer.

Brian Nelson is already hard at work for local arrangements next year in the Tampa area and we look forward to seeing everyone there next September - without any outside distractions. - *Ken Langeland, FL-EPPC Chair.*

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Invasive Species, Coming to America.

Figure 1. Kudzu (*Pueraria montana*) was imported from Japan in 1876 as an ornamental porch vine, and used later for erosion control throughout the South. Kudzu now infests over 7 million acres and causes over $500 million in control costs and timber losses per year. Photo by R. Westbrooks, U.S. Geological Survey.

New Strategies for Biological Protection through Prescreening, Early Warning, and Rapid Response.

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Introduction. Over the past several thousand years, humans have intentionally and accidentally moved many organisms far beyond their historical native range around the world. The majority of these species are either beneficial to human civilization or at most benign in free living populations. However, a small percentage of introduced species pose a threat to the biodiversity of natural areas and/or diminish the production capacity of managed or agricultural ecosystems. Unlike chemical pollutants that degrade in the environment over time, invasive species, now termed biological pollutants, have the ability to reproduce and spread. By moving plants and animals far beyond their native ranges, the major biogeographical realms are being blurred, and a biological Pangaea is being recreated that will have negative impacts on biodiversity.

Currently, about 3,800 species of known introduced plants (compared to a native flora of 18,000 species) have established free-living populations in North America (J. Kartesz, Biota of North America Program, UNC-Chapel Hill). These represent established exotics that have become invasive (1,450 species are recognized as agricultural weeds) or could become invasive in the future. Researchers at Cornell University have calculated the total cost of invasive species to the American economy to be in excess of $138 billion per year. Preventing the spread and establishment of invasive species throughout the world is thus a critical strategy in protecting the sustainability of agriculture and biodiversity.

Invasive Species, Coming to America. Since the breakup of the supercontinent Pangaea about 180 million years ago, North America has been geographically isolated from the rest of the world, and thus largely protected from biological invasions. However, that changed in a short time with the beginning of modern European colonization about 500 years ago, and became a serious problem with the onset of modern transportation and travel in the 20th century.

During colonial days, when global trade and travel were minimal, foreign pests, which threatened crop and livestock production, were the primary concern. Invasive species of natural areas had few pathways and opportunities to spread beyond their native ranges in other regions of the world. In those days, before natural areas were invaded by alien invasive species, there was little concern or even notice of the thousands of plant and animals that were being imported for utilitarian purposes such as game fishing (carp), soil erosion [kudzu (*Pueraria montana*)] (Figure 1), windbreaks [Russian olive (*Eleagnus angustifolia*)], medicinal herbs (purple loosestrife (*Lythrum salicaria*)], and for ornamental use [salt cedar (*Tamarix chinensis*)]. In fact, such introductions were widely encouraged. While many of these introductions remain beneficial today, some of them have become invasive and pose a threat to many of our remaining natural and conservation areas….. Areas that have been reduced to 'islands' in a sea of disturbance.

Development of New National Strategies for Addressing Invasive Species. In 1997, the national Office of Science and Technology Policy, in response to a petition from over 500 scientists in the United States and abroad, directed the departments of Interior, Agriculture, and Commerce to establish a working group to make recommendations for improving the federal government's ability to address the invasive species issue. As a result of these ongoing deliberations, a national campaign against invasive species was initiated. Eight major goals of the campaign include:

1) development of an executive order to update the government's position on invasive species (signed by President Clinton, February 3, 1999);
2) establishment of a National Invasive Alien Species Council to provide direction and oversight to federal agencies in fulfilling their roles and responsibilities for invasive species (established in June, 2000);
3) increased interagency cooperation at the local, state, and regional levels;
4) increased federal funding to address emerging invasive species problems;
5) evaluation of present federal laws and regulations on invasive species;
6) development of a national management plan for invasive species (adopted by the National Council in January, 2001);
7) increased efforts to raise public awareness and understanding of the invasive species problem; and,
8) increased international cooperation on invasive species issues. Interagency initiatives that are recommended by the National, Regional, and State Councils will be coordinated by interagency task forces such as the Aquatic Nuisance Species Task Force and the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW).

Prohibited Lists – The Heart of the Current U.S. Crop Protection System. The current U.S. federal/state agricultural protection system was developed in the late 1800s and early 1900s in response to outbreaks of plants and animal pests such as foot and mouth disease, Mediterranean fruitfly (*Ceratitis capitata*), and gypsy moth (*Lymantria dispar*). The current system includes programs that form two lines of defense against invasion through:

1. **Exclusion of Foreign Agricultural Pests**
   A. Production of pest free commodities in exporting countries (e.g., disease free beef)
   B. Pre-clearance at ports of export
   C. Inspection and clearance at ports of entry
2. **Early Warning and Rapid Response to Domestic Outbreaks.**
   A. Early Detection
   B. Rapid Assessment
   C. Rapid Response

On the surface, it would seem that this system could provide protection against invasion by all types of invasive species. However, in reality, the system was set up to facilitate trade by protecting American agriculture from invasion by high profile, devastating plant and animals pests and diseases. For decades, alien pests of concern have been assessed for invasiveness and prohibited introduction into the U.S. under a menagerie of federal laws. In 2000, most of these laws were superseded by the omnibus Federal Plant Protection Act. While the new Plant Protection Act provides equal authority for regulation of all types of invasive species, including invasive plants, the decision to assess a candidate species to determine whether it should be regulated is still optional in most cases. As a result, most species that are imported into the United States are still not being assessed for invasiveness – in general, the system does not require it. (The exception to this is new fruits and vegetables, which must be assessed under Quarantine 56 for invasiveness prior to importation).

The current system generally works fine to protect monocultural agricultural production systems from *known* foreign pests. However, in order for the nation to effectively meet the challenge it faces with invasive species in all types of environments, scientific evidence is persuasive that new approaches for preventing introduction, establishment, and spread of invasive species are needed.

Prescreening – A Regulatory Yield Sign Needed to Slow the Global Movement and Spread of Invasive Species. Based on past experience in Hawaii and New Zealand, it is has been concluded that a very low percentage of all introduced plants will become invasive in a new area over time. Since intentionally introduced species represent a very high percentage of all species that become invasive, mandatory prescreening of all proposed plants and animals is the only sure way to potential invaders before they are imported into the United States.

In theory and practice, there is nothing inherently wrong with the assessment tools being used in the current federal prohibited list system. However, in order to identify all potential new invaders that are being imported, <u>all</u> proposed species should be assessed for invasiveness and to determine whether they should be regulated. The very successful Australian Weed Risk Assessment System has demonstrated the viability of this approach, and could serve as a model in developing a similar system in the United States.

For continuity with the current U.S. plant regulatory system, the proposed prescreening system could continue to focus on 'prohibited' species. However, unlike the present federal system, which only assesses a small percentage of proposed species for invasiveness, the new system would assess all proposed species to determine whether they should be prohibited entry[1], regulated entry[2], permitted entry[3], or placed on a National Invasive Plant Watch List[4].

Under this proposed system, as in the past, species found to be invasive that are absent from, or occur in a limited percentage of, their potential ecological range within the U.S., would be formally listed under the Plant Protection Act of 2000 and prohibited entry except under permit from USDA APHIS. Following current international rules under the International Plant Protection Convention, proposed species found to be invasive that

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1 **Prohibited species** would be officially listed, highly destructive species (absent from or occupying a small percentage of their potential ecological range in the U.S.) with no commercial or recreational use that would cause great harm to native ecosystems or agriculture if released into the wild.

2 **Regulated species** would be officially listed species (absent from or occupying a small percentage of their potential ecological range in the U.S.) that have some beneficial commercial or recreational use, but would become invasive unless regulated.

3 **Permitted (approved) species** would be placed on an informal list for future reference.

4 **Species of ecological concern** that are not prohibited or regulated could be placed on a National Invasive Plant Watch List.

SePRO full page

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Prescription

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already occur in a large percentage of their potential ecological range in the U.S. (either in trade or in free living populations) would not be formally listed. However, if appropriate, such species could be placed on a National Invasive Plant Watch List (non-regulatory), to *discourage* further artificial spread (see Diagram 1). Kudzu, which is obviously a serious invader in the southern U.S., would not be officially prohibited entry under this approach because it does not meet the traditional definition of a 'quarantine significant pest' – it is simply too widespread to regulate. However, it could definitely be placed on a National Watch List to discourage further importations. New introductions of kudzu from different parts of its native range could hybridize with populations here and create more invasive biotypes, such as cold tolerant biotypes in the Northeast. Development of a new land conservation ethic that is based on the need to conserve and preserve biodiversity would be a philosophical cornerstone of this regulatory/non-regulatory based biological protection System.

At the state level, where enforcement is typically conducted at the point of sale, it makes sense to combine the traditional prohibited listing system with a formal permitted listing approach. Under this approach, all species proposed for importation into a state would fall into one of the following regulatory categories:

1) *Prohibited non-native species* (highly destructive species which may not be possessed, imported, purchased, sold, propagated, transported, or introduced except under permit issued by an appropriate agency);
2) *Regulated non-native species* (species that have some beneficial commercial or recreational use, and would become invasive unless regulated);
3) *Unregulated (permitted) non-native species* (species which have been reviewed by an appropriate agency and have been determined to present a low risk of becoming invasive, or is an invasive species that is currently present and beyond control).
4) *Unlisted non-native species* (species that have not been reviewed and classified by and appropriate agency and thus may not be possessed, imported, purchases, sold, propagated, transported or introduced into the state).

New Approaches for Early Warning and Rapid Response to New Invasive Plants.

Under the current crop protection system, federal and state plant regulatory agencies work to protect the nation from economically important plant and animal pests and diseases. However, due to a lack of resources and organized constituencies, new invasive plants (both agricultural weeds and invasive plants of natural areas) are seldom addressed on public or private land until populations become widespread and prevention/eradication becomes impractical. The recent appearance of the Brazilian floating fern giant salvinia (*Salvinia molesta*) in 30+ water bodies in nine states, is a notable example of the problem, and has highlighted the serious need for a new and systematic approach for addressing new invasive species, and, in particular, invasive

plants (Figure 2). With this in mind, the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) hosted a workshop in Ft. Collins, Colorado, in June, 2000, on creating a National Early Warning and Rapid Response System for Invasive Plants. Subsequently, the proceedings of the workshop were posted on the FICMNEW Home Page. During 2001, an Early Warning/Rapid Response Action Plan was developed that closely follows major recommendations that were developed at the workshop, as well as relevant recommendations under the National Invasive Species Management Plan, which was approved by the National Invasive Species Council in January 2001. Refer to **Diagram 1, Diagram 2A, Diagram 2B, and Diagram 2C,** for an outline of system elements and how information is expected to flow in the system.

The overall purpose of the National Early Warning and Rapid Response System will be to provide a coordinated framework of public and private partners at the local, state, regional, and national levels to more effectively address new invasive plants through:

- Early detection and reporting of suspected new plants to appropriate officials
- Identification and vouchering of submitted specimens by designated botanists
- Verification of suspected new state, regional, and national plant records
- Archival of new records in designated regional and plant databases
- Rapid assessment of confirmed new records
- Rapid response to new records that are determined to be invasive.

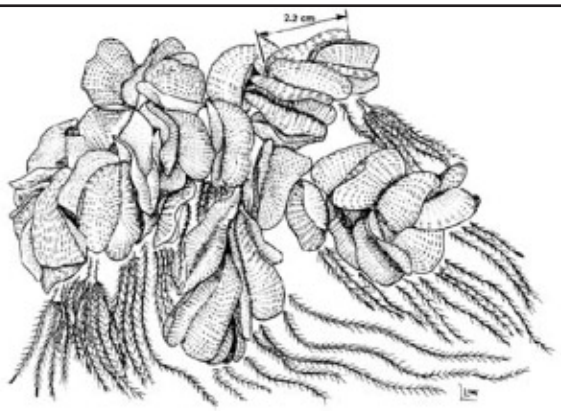


Figure 2. Giant Salvinia (*Salvinia molesta*), a floating fern from Brazil that is widely regarded as one of the worst aquatic weeds in the world, now occurs in at least 30 water bodies in nine states in the U.S.A. (Illustration courtesy of the Center for Aquatic and Invasive Plants, University of Florida).

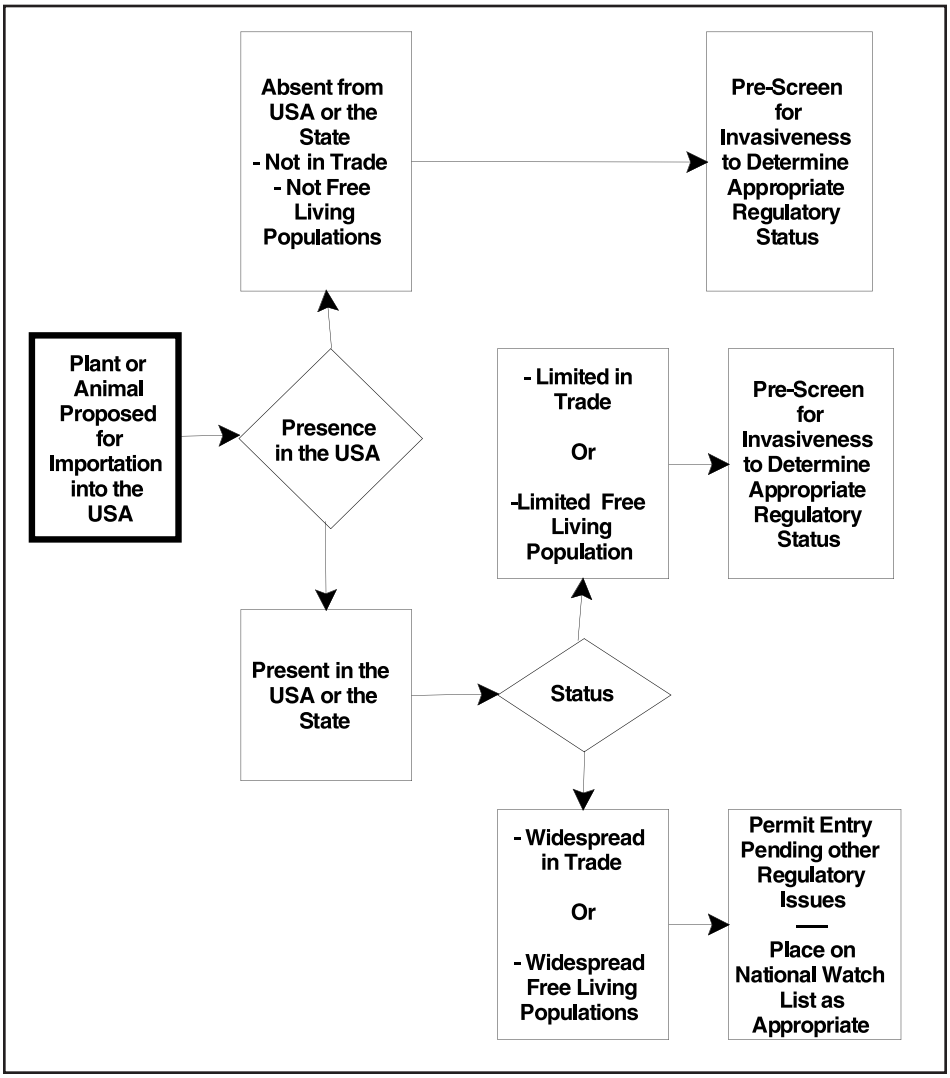


Diagram 1. Proposed system for prescreening of imported plants and animals.

Once fully implemented across the United States, the proposed early warning and rapid response system would provide an important second line of defense against invasive plants, that would work in concert with federal efforts to prevent unwanted introductions at the ports of entry (the first line of defense). With both systems in place, the nation would be better able to defend against future economic and environmental losses due to "plants out of place."

Conclusions. Based on existing scientific knowledge, we should have serious concerns about allowing importation of certain species that are well established and invasive in one part of the U.S. for which assessments show that they could become established in other regions of the country. The notion that once a species becomes a problem in a particular part of the country, it may be freely imported and used ANYWHERE in the U.S. because it is too widespread to regulate makes no sense ecologically. Also, importation of a species from throughout its native

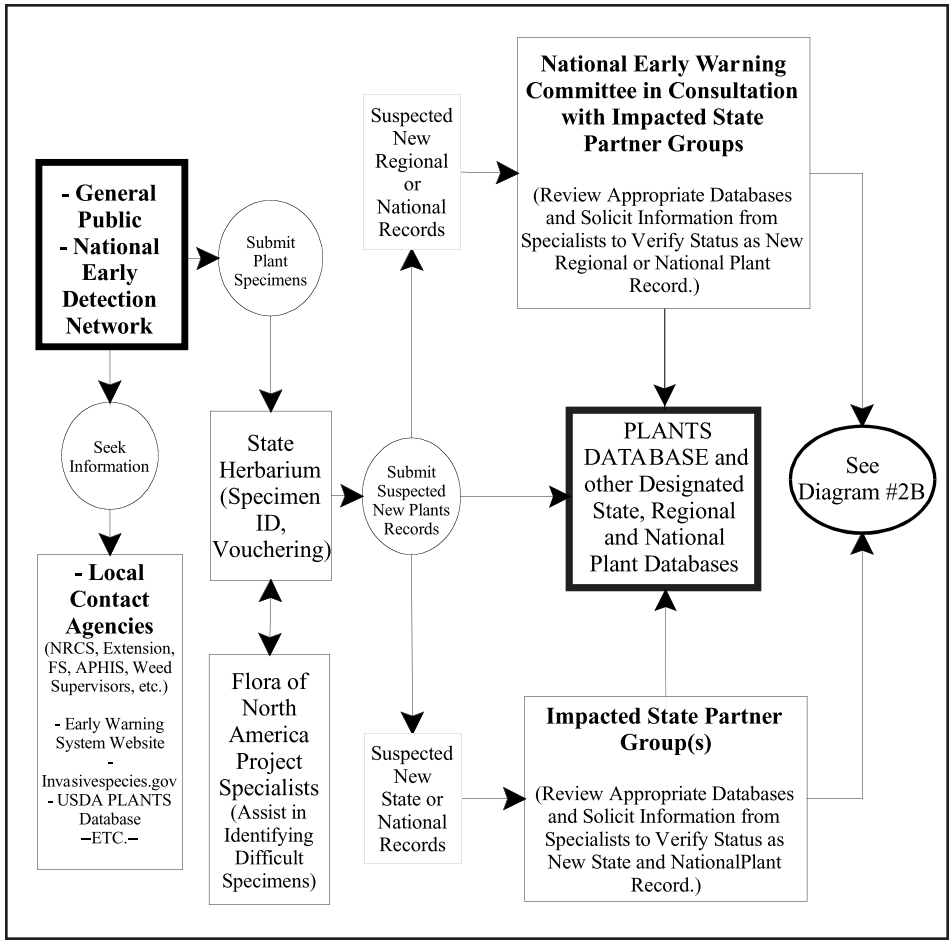
Diagram 2A. National Early Warning and Rapid Response System for Invasive Plants. Early Detection, Reporting, Identification, Vouchering, and Verification.

range (as well as other areas where it has become invasive) risks genetic "enrichment" of the species in the U.S., thus increasing the risk to native biota. While many exotic invasive species in the U.S. are widespread and technically beyond the scope of our current federal/state plant regulatory system, *their use should be strongly and officially discouraged* (based on scientific criteria).

In order to effectively address new environmental invaders that have no obvious political constituency, we need to develop a science based Biological Protection System for more effectively preventing the introduction, establishment and spread of invasive species in natural and managed areas of the United States. To accomplish this, we need to:

A. Prescreen all new plants and animals proposed for importation into the United States, to determine if they should be prohibited, regulated, or permitted entry at the federal and/or state level, or placed on a National Watch List.
B. Develop a National Early Warning and Rapid Response System for Invasive Species.
C. Create new local, state, and regional interagency partnerships to rapidly assess and respond to new invaders.

Randy Westbrooks began his federal career as a Plant Quarantine Officer with the USDA Animal and Plant Health Inspection Service (APHIS) in Charleston, South Carolina, in 1979. From 1986-1996, he served as a Federal Regulatory Weed Specialist with APHIS in Whiteville, North Carolina. From 1996-1999, he served as the APHIS National Weed Coordinator. Currently, he is the USGS Invasive Plant Coordinator, and is still stationed in Whiteville, NC.



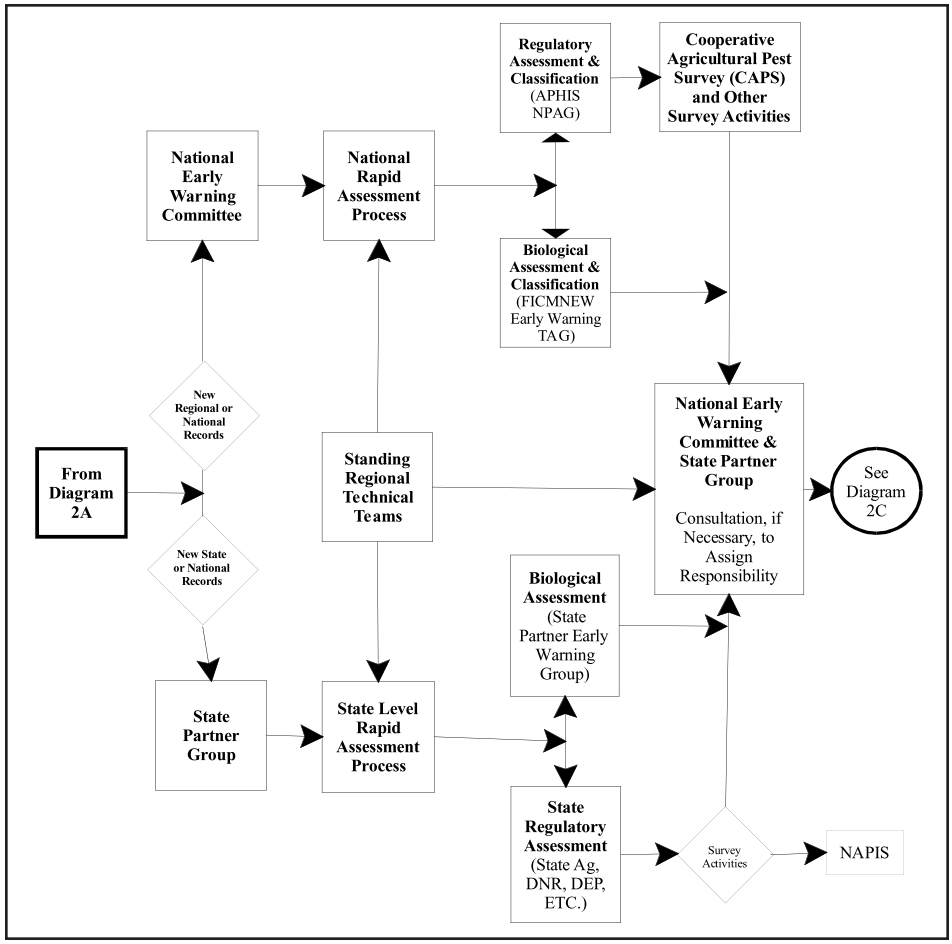
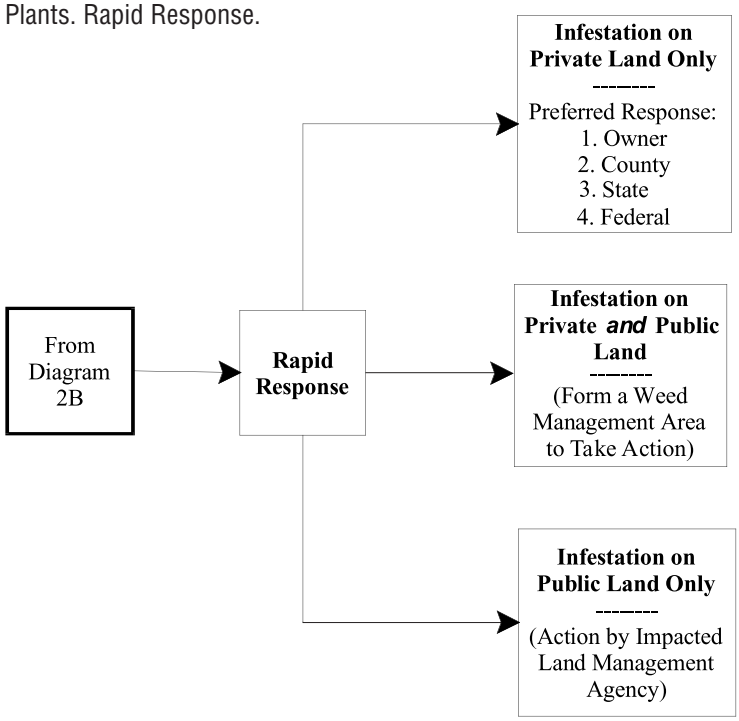


Diagram 2B. National Early Warning and Rapid Response System for Invasive Plants. Rapid Assessment.

Diagram 2C. National Early Warning and Rapid Response System for Invasive Plants. Rapid Response.



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Call for Papers and Participation

Southeast Exotic Pest Plant Council Symposium

Rescuing Our Natural Heritage

Wednesday, April 3 – Friday, April 5, 2002

Bell South Auditorium

Nashville, Tennessee

Conference Objectives

The objectives of this interdisciplinary conference include: 1) exchange information and technology leading to cost-efficient management of invasive exotic species in natural areas; 2) provide a forum for participants to develop networks of mutual assistance; and 3) facilitate interdisciplinary dialog between policy makers, land managers and researchers.

Call for Papers and Posters

Participants are invited to submit proposals for oral presentations or posters at the Conference. Accepted abstracts will be published in Conference program and should be written in English. Specific topics to be covered will include, but are not limited to, the areas below:

- *Applied and basic ecological research*
- *Control and management - herbicide technology/Integrated Pest Management*
- *International initiatives · Outreach and extension · Public policy · Regional and federal action plans*
- *Screening and assessment techniques*

Instructions for Authors

The abstract should be a maximum of 400 words and provide sufficient information for readers to fully analyze the objectives, methods, results and implications of the work in question. Each submission must be original work that has not been previously published. Each abstract will be reviewed by the conference committee and recommended for either acceptance or rejection. E-mail abstracts of papers and posters (MS Word, WordPerfect, or Plain Text) to Richard Clements**, clements@cstcc.cc.tn.us**.

General Instructions

Headings. The title, names(s) of the author(s), their affiliation(s), city and country should be included. Please do not include university degrees, titles, street address, and zip code. *References*. Please try to minimize the amount of references.

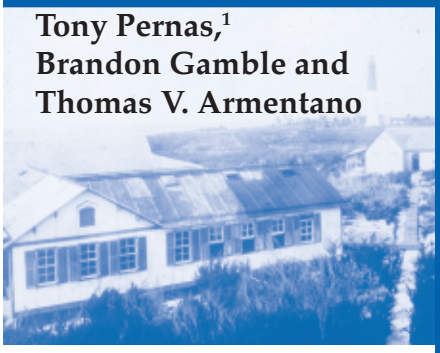
January 4, 2002: Abstract submission deadline
January 15, 2002: Notification of acceptance
March 13, 2002: Early registration due.

Conference fee will be $80 before March 13 $100 thereafter. A special room rate of $82 (plus tax) for single or double occupancy is available at the downtown Nashville Courtyard by Marriott. For this rate, reservations must be made before March 13. **Updates on the symposium, a registration form, and an agenda will be posted at the SE-EPPC web site, www.se-eppc.org.**

Dry Tortugas National Park-

Loggerhead Key Exotic Plant Management & Island Restoration Project

Tony Pernas,[1] Brandon Gamble and Thomas V. Armentano



Carnegie Laboratory, c. 1917

Figure 1. Dry Tortugas area map

Figure 2. Fort Jefferson, Garden Key

INTRODUCTION

History

The Dry Tortugas, discovered in 1513 by Ponce de Leon are located 70 miles west of Key West, Florida. Named for the lack of freshwater and abundance of sea turtles they comprise the western terminus of an ancient coral reef tract that extends 220 miles from Miami (see Fig. 3).

The biologically rich waters pro

Department of Interior, South Florida Natural Resources Center, [1] Florida Exotic Plant Management Team, Atlanta, GA

vided food, and the islands safe harborage, to countless mariners who traversed this popular trading route. Consequently, the U.S. Military deemed this area an ideal place for protecting and controlling Atlantic-bound Mississippi River trade via the Gulf of Mexico.

Military occupancy of the Dry Tortugas during the 1800s paved the way for numerous construction projects that lasted throughout the century. The largest of which was never completed and is the Dry Tortugas's most famous structure, Fort Jefferson.

As the practical use of Fort Jefferson waned, protection of the cultural and historical resources of the area became the priority. In 1934, the Dry Tortugas area was designated Fort Jefferson National Monument. To assure that the natural resources of the area were also protected, in 1992 the Dry Tortugas was re-designated as a National Park. Dry Tortugas National Park at 100 sq. miles is now the second largest marine-based park in the National Park Service, harboring a unique assemblage of resources unparalleled within the National Park Service system.

Of the total area, only 85 acres is terrestrial habitat capable of supporting plant and animal communities. The native flora on these islands mainly consists of plant species typical of Caribbean islands including grasses, sedges, herbaceous flora, shrubs and trees. Of the 125 plant species reported 81 species (65% of total) are of exotic origin; the result of accidental and deliberate introduction by man during the past century. The smaller islands (East, Bush, Long, Sand) consist mainly of native species, while the larger islands (Garden and Loggerhead), with their long history of human habitation and disturbance, have a significantly larger abundance of exotic taxa.

The islands of the Dry Tortugas have been the subject of many studies since the 1800s, including detailed vegetation maps and floristic inventories giving the NPS valuable baseline information on historical flora.

Loggerhead Key

In the 1840s Loggerhead Key was covered with "a large stand of old white buttonwood trees" that was cut or burned by the island residents (Stoddart and Fosberg 1981) resulting in the first documented impacts to the island community.

The presence of two structures on Loggerhead Key, the U.S. Coast Guard Lighthouse of 1856 and the Carnegie Research Laboratory of 1910 functioned to draw people to the island, increasing the likelihood of plant introductions and habitat modifications.

Literature dating back to the early 20th century depicts this area as remarkably free from common exotic weeds, with the dominant community principally composed of bay cedar, *Suriana maritima* (Bowman 1918). By 1918, introduced plants were possibly influencing the natural ecology of the island by producing shade and conserving water. These introductions include coconut palms (*Cocos nucifera*), Australian pine (*Casuarina equisetifolia)*, fig (*Ficus elastica*), *Hymenocalis,* oleander (*Nerium oleander*), sea hibiscus (*Hibiscus tiliaceus)*, mahoe (*Thespesia populnea)* and century plant (*Agave* spp.*)*. By 1942, the once dominant *Surinana* began to be replaced by prickly pear cactus (*Opuntia stricta)*, Coastal beach sandmat (*Chamascyce mesembrianthemifolia*), century plant, as well as others (Davis 1942). At this time, the most prolific exotic was Australian pine

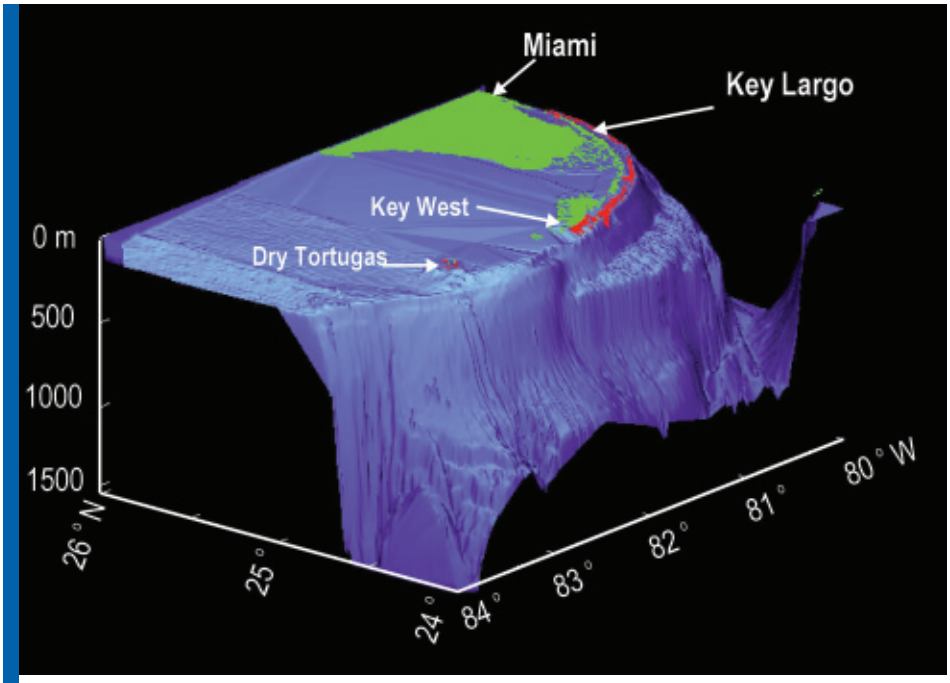


Figure 3. Bathymetric map of Florida keys region

(introduced by the director of the Carnegie Laboratory ca. 1910 (Stoddart and Fosberg, 1981)) had spread from its original plantings with seedlings noted to be growing over many parts of the island. Davis states, "It is entirely possible that these trees will continue to grow and eventually replace the existing vegetation." By 1980, the words of Davis came to fruition, as nearly all of the native communities were displaced and out competed by two species, Australian pine and century plant.

Helena Ad 2/c
P/U

North end of Loggerhead Key, circa 1916. Note the Australian pine planted around the Carnegie Laboratory.
<

North end of Loggerhead Key, circa 1942. Note the expansion of Australian pine.
<

North end of Loggerhead Key, 1995. Dense Australian pine covers the island.
>

North end of Loggerhead Key, 2000. Restoration efforts aim to return the island to pre-Australian pine conditions.
>

Management Activities

In 1992, upon the establishment of the Dry Tortugas National Park, resource managers began to assess the alterations to the communities of Loggerhead Key with the intent of restoring the island back to pre-settlement conditions.

In 1995, an exotic plant management plan was developed and implemented for Dry Tortugas National Park. The plan called for eradicating Australian pine and century plant from Loggerhead Key. Both genera have altered native plant communities and reduced the native habitats for island wildlife. Where Australian pine occurs on sandy beaches, the trees and their root systems have hindered the movements and nesting activities of federally listed threatened and endangered sea turtles. In many places, changes in beach morphology, from gentle slopes to steep embankments, have accompanied the invasion, further exasperating the problem of sea turtle habitat disruption. In addition, these invasive species have altered the composition and structure of the island's terrestrial plant communities by outcompeting native plants thus, reducing species diversity in areas where the exotics were dominant. The natural habitats and food sources of native animals that use these communities have similarly diminished.

The management of exotic pest plants on these islands is essential for maintaining the integrity of the natural and physical environments found at the Dry Tortugas. The establishment and spread of exotic plants can have severe consequences for any environment but, due to the effects of geographic isolation, islands are especially vulnerable. With its long history of human habitation, Loggerhead Key has been subjected to substantial human-influenced impacts, second only to Garden Key in this respect. The control of the ubiquitous Australian pine and century plant on Loggerhead Key is the focal point of the

Treatment of Agave sisalana, Loggerhead Key, Bill Snyder (left) and Biddy Simet (right).

Prescribed fire treatment and beach debris removal, 1995

vegetation management action within the Dry Tortugas.

Treatment of Australian pine involved the basal-bark application of Garlon 4 herbicide (20% solution diluted in JLB oil). Century plants not killed by fire were treated with a crown applications of Garlon 4 at 20%, diluted in JLB oil.

Treated Australian pine trees were left standing; however, trees adjacent to beaches were cut down and treated with herbicide to prevent their falling and impacting sea turtle nesting habitat. In early 1998, the remaining 13.5 acres of Australian pine growing on the island's northern half were cut down (no herbicides were used). The felled wood was burned in late 1998, eliminating not only the Australian pine slash on the ground but also killing a large number of century plants. Vegetative sprouts and seedlings of Australian pine and century plants in the treatment areas continue to be controlled by hand-pulling and application of herbicides. Other invasive exotic species on Loggerhead Key (*Colubrina asiatica, Scaevola taccada, Panicum maximum, Thespesia populnea, Terminalia catappa*) occur only sporadically and are treated as they appear.

The National Park Service has carried out treatment and monitoring work. From 1994-2001 the U.S. Forest Service and the U.S. Fish and Wildlife Service provided assistance with tree cutting and prescribed burning. In addition, the NPS Southeast Archeological Center conducted an archeological survey of Loggerhead Key in early 1998 to determine the effects vegetation management actions may have, if any, on the island's cultural resources.

Natural areas along the eastern beach strand were protected from management activities. These areas were monitored and used as a tool to determine if restoration objectives were being met.

Monitoring

Monitoring the restoration effort was accomplished through a series of 10 permanent transects. Transect were established perpendicular to the axis of the island. Vegetation along these transects were measured utilizing the line intercept technique. This technique involved extending a line between two fixed points and measuring the length of occupancy of a species along that line, thus depicting the spatial patterns in vegetation cover.

Transect 1-5, with the exception to the native community along the eastern beach strand, are in an area which was heavily dominated by exotics. This area was used to monitor the response to the management activities, namely chemical and mechanical treatment. Transects 6-10 represent the native communities and were used as the target for defining restoration success.

Vegetation Response

During the sampling period 1994-2001, a total of 48 species were identified on Loggerhead Key. Of the 48, 17 are considered exotic in origin, and 31 are native.

Within treatment area we have seen reductions in the numbers of exotics, with a concomitant increase in the numbers of native species (Fig. x). Essentially all of the exotic species present in the managed areas in 1994 have been removed as of 2001.

Sea Turtle Nesting

One of the primary environmental threats to nesting sea turtles in Dry Tortugas National Park is the presence of Australian pine on Log-

gerhead Key. The trees have reduced suitable turtle nesting habitat and impeded efforts of nesting females and emerging hatchlings. (Reardon 2000). Ocean waves have undercut the sand adjacent to the roots of the trees creating steeper beach embankments; these embankments make the beaches difficult to surmount by nesting sea turtles. In addition, the network of roots themselves can interfere with the excavation of nesting holes by these turtles. Successful nest excavation by sea turtles is dependent upon soft, debris-free sand, a condition not found in or around the root systems of Australian pine. Fallen Australian pine trees have also physically hindered the movements of nesting turtles on the beaches and reduced the amount of nesting beach available to them. The consequences of these conditions include trapped turtles, hatchlings encountering roots, altered nesting routes, nesting in fallen branches, and turtles abandoning pits due to obstructions. "The trees have reduced suitable turtle nesting habitat and impeded efforts of nesting females and emerging hatchlings." (Reardon 2000).

Visual observations of the beaches over the past two years indicate that the removal of Australian pine has caused marked improvements in beach morphology at some locations: beaches, gradually sloping and without embankments, are largely free of surficial and buried debris. The program can expect to see further enhancement of sea turtle nesting habitats on the island as the physical barriers created by Australian pine are eliminated.

The transformation of Loggerhead Key has been nothing less than remarkable. The vegetation structure of the island now visually approximates the pre-Australian pine condition. Monitoring of native species succession will continue to shed light on the dynamics of the sand island plant community's response to restoration.

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Nesting turtle impacted by Australian pine roots.

Russell Reardon conducting the annual nesting turtle survey, Loggerhead Key.

Natural Areas Weed Management Certification Testing Available

The Florida Pesticide Law administered by the Florida Department of Agriculture and Consumer Services (FDACS) requires all persons who apply or supervise the application of pesticides classified as restricted use to be certified as restricted-use to be certified and licensed by the Department. FDACS has established a certification and licensing category for persons who apply herbicides for the management of weeds in natural areas (also referred to as invasive plants) of the state. According to the rule, the category called Natural Area Weeds Management "is applicable to individuals who use or supervise the use of restricted-use herbicides to control unwanted vegetation to protect natural communities of conservation and recreation lands and natural areas" (5E-9.021(1)(r) FAC).

Although no herbicides used in Florida's natural areas are classified as restricted-use, it is recommended that anyone who uses herbicides in natural communities be certified. Agencies or individual who contract with applicators for the control of invasive plants on their properties may require this certification. Employers may require applicators to use herbicides in natural areas to be certified/licensed. A license can be obtained by an individual who has met the certification requirements of FDACS. The certification requirements are met by successfully completing testing to assure that the individual is knowledgeable and competent in the use and supervision of restricted-use pesticide application.

License classification

Certified natural area herbicide applicators may be licensed as either **public applicators** or **commercial applicators**. A **public applicator** is a licensed applicator employed by a public or governmental agency and the public applicator license is only valid when performing work for the public or governmental agency. The **public applicator** license fee for a four-year license is $35. A **commercial applicator** is a licensed applicator who is licensed to apply restricted-use pesticides on any property provided they are certified in the category for which the applications are made. A **commercial applicator** is usually a contract applicator. The **commercial applicator** fee for a four-year license is $90.

Certification Requirements

Although the fees are different for public licensing and commercial licensing, certification requirements are the same for both. Two examinations must be passed, a general standards (core) examination, which tests general knowledge of proper pesticide use and safety; and the Natural Area Weeds Management category examination, which tests specific knowledge of applying herbicides in natural areas. A passing score on both examinations is required before the license can be issued.

Examination Locations

Examinations are administered at most University of Florida, Institute of Food and Agricultural Sciences (IFAS), County Cooperative Extension Offices. If the Extension office in your county does not administer the exam, call the IFAS Pesticide Information Office (352/392-4721) to find out where to take the examination.

The FDACS Certification and Licensing Office (850/488-3314) will notify you of your exam results. If you passed, you will receive a license application. If you failed, you will need to retake the examination to obtain a passing grade.

Preparing for the Examination

All questions in the on the General Standards (Core) Exam are based on information contained in "Applying Pesticides Correctly – A Guide for Pesticide Applicators", IFAS Publication SP1. All questions on the Natural Area Weeds Management Category Exam are based on information contained in "Natural Area Weed Management, a Training Manual for Restricted Use Pesticide Applicators", IFAS Publication SP295 and "Identification and Biology of Non-Native Plants Found in Florida's Natural Areas", IFAS Publication SP257. These publications can be purchased from: IFAS Publications, University of Florida, IFAS Building 440, Gainesville, FL 32611 (352/392-1764) or the IFAS Publications Web site, http://edis.ifas. ufl.edu.

MARK YOUR CALENDAR

55th Annual Southern Weed Science Conference, **January 28-30, 2002**. Hyatt Regency, Atlanta, GA. Contact: www.weedscience.msstate.edu/swss.

Weed Science Society of America Annual Meeting, **February 10-13, 2002**. Reno Hilton, Reno, NV. Contact: www.wssa. net/

Florida Weed Science Society Annual Meeting, **February 26-27, 2002**. Mid Florida Research and Education Center in Apopka, FL. Contact: Anne Gideon, Program Chair (561)562-6549, anne.gideon.b@bayer.com

Southeast Exotic Pest Plant Council Symposium, **April 3-5, 2002**. Bell South Auditorium, Nashville, TN. Contact: www.se-eppc.org.

First Latin-American Short-Course on Biological Control of Weeds, **June 24-28, 2002**. Montelimar, Nicaragua. Contact: Julio Medal medal@gnv.ifas.ufl.edu.

European Weed Research Society's 11th International Meeting on Aquatic Weeds, **September 2-6, 2002**. Moliets, France Contact ewrs.2002@bordeaux. cemagref.fr

A Note from the Library -

From *Some Notes and Reflections Upon a Letter From Benjamin Franklin to Noble Wimberly Jones, October 7, 1772* by Malcolm Bell, III, Ashantilly Press, Darien, Georgia, 1966.

". . . I send also a few seeds of the Chinese Tallow Tree, which will I believe grow and thrive with you. 'Tis a most useful Plant." B. Franklin, London, Oct. 7, 1772 to Dr. N.W. Jones, Savannah, Georgia

The usefulness that Mr. Franklin anticipated was that "the white wax which encloses the seed of the plant would be gleaned and moulded into candles by enterprising Georgians." Both Benjamin Franklin and a Mr. John Ellis were fellows of the Royal Society of London. They were avid enthusiasts of importing plants from Asia, studying methods for preserving their viability over long voyages, and dispatching them to America. Another exotic gardener in Georgia received tallow seeds from Mr. Ellis. He later reported that

"the Ou Cow or Tallow-tree will certainly succeed well here; it has stood the winter in the open gardens, and the plants that were out all the winter have thriven, and now look better than those that were housed."

According to the author, an American botanical reference from 1803 (Andre Michaux, *Flora Boreali Americana*...II, p. 213) stated that the tallow tree was spreading "spontaneously" into the coastal forests. Descendant trees of the original seeds were reported growing at Wormsloe State Historic Site in Savannah, Georgia (formerly Wormsloe Plantation) at the time *Some Notes and Reflections* was published in 1966. In his writing, Mr. Bell waxes poetic about the Chinese tallow:

"Attaining a height of fifty to sixty feet, the tallow trees bend to the wind with a stiff grace like that of Chinese maidens, and the small leaves quiver and dance with the slightest motion of the air. The tree is perhaps most noted for its brilliant, almost garish fall colors, and its otherwise forgotten fruits can often be found decorating coastal houses. . . . The candles envisioned in London illuminated no Georgia houses. Only the burning colors of the tallow trees, offending the gloom of the swamps, testify to the common hopes of Ellis and Franklin."

Karen Brown
University of Florida
Center for Aquatic and Invasive Plants

Notes From The Disturbed Edge

Chapter 3

Last night he'd dreamed that he was falling, tumbling headlong through layer after layer of clawing vegetation, crashing downward but never hitting bottom, grasping at crumbling branches and crackling leaves as he hurtled down and down.... memories of the invasive exotic vegetation he'd laid waste to, never ending, haunting his sleep.

Every morning he drove out of town, down a two lane road lined like some obscene botanical Champs d'Elysees of Australian pine, crossed ditches with banks infested with Brazilian pepper, past cypress heads draped thick with Old World climbing fern from floor to canopy, through neighborhoods landscaped with carrotwood trees and *Bischofia*, past abandoned ag lands that had become earleaf acacia and melaleuca tree farms. They loomed over and around him like silent specters, waved in the breeze like rank upon rank of the unstoppable barbarian hordes. Everywhere he looked they flaunted their superiority and dared him to take a swing.

He'd spend all day in the heat or the cold, the dust or the damp, or some other intriguing combination of the elements, and then climb back into his truck and make the drive home. What he saw along the way had hit him hard tonight. It was like he had enhanced perception, true-view, a special filter in his brain that distinguished good from evil, in a color-coded spectrum. Natives glimmered across the rainbow's spectrum, but the aliens stood flat black, moving like a storm cloud, consuming the horizon. Was he insane? He'd never be able to overtake this monster. How could he ever think he was going to even make a dent, let alone instigate some drastic reversal? He was outnumbered, outgunned, powerless, useless. Who'd have thought a simple rural road could stir such passion? But it did. He could barely breathe.

Amidst the depths of his despair he heard her voice crackle across the radio. "Hey- I got done down there – I'm headin' home. You?"

He swallowed hard "Yeah, I'm headin'- somewhere..."

Uh-oh. She recognized that tone. "You OK?"

"I don't know..." he slowly answered "...Am I insane?"

"Hell yeah!" she shot back.

" No. I'm serious. How am I ever gonna do this, you know, really accomplish anything?"

There was a long silence. He felt embarrassed, whining over the radio. He never should have said anything. Should have just not answered her, just quietly quit and gone to look for a job where he could measure success in dollars and cents. But then her voice came across the radio again.

"I'll help you ..." He smiled as she continued speaking. "See you tomorrow? Same bat channel?"

"Yeah" he answered through a spreading grin, shaking his head, "see you tomorrow".

He ran a finger along the corner of his eye, adjusted his sunglasses and hat, and grinned at his reflection in the rearview. Disgusting. He stared out the window at the silent alien onlookers, took a deep breath, and raised a finger to salute them: "Manana, we dance". As for tonight, he decided, he would dream about fishing.

- J.A.

An excerpt from "The Adventures of Hack Garlon and his buxom sidekick Squirt."

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