Invasive Exotic Species Strategic Action Framework

Carrie Beeler
U.S. DOI Office of Everglades Restoration Initiatives
South Florida Ecosystem Restoration Task Force

July 24, 2014

The South Florida Ecosystem Restoration Task Force

- Established by the Water Resources Development Act of 1996 and includes 14 top level policy makers from four sovereign entities:
  - 7 federal, 2 tribal, 5 state and local government representatives
- Duties:
  - **Coordinates** the development of **consistent** policies, **strategies**, plans, programs, projects, activities, and priorities addressing the restoration, preservation, and protection of the South Florida ecosystem.
- South Florida Ecosystem =
  - Natural and Built environments within SFWMD boundary +
  - Coastal/Marine systems that are ecologically connected to the mainland
- Florida-based Working Group and Science Coordination Group
- Office of Everglades Restoration Initiatives

Brief History of Task Force/ Working Group Invasive Efforts

- 1997: NEWTT
- 2000: Weeds Won't Wait
- 2004: FIATT
- 2008: FIATT Draft
- 2010: Information Brief
- 2012: TF Direction:
  - Review current efforts and provide updated recommendations

Working Group and
Science Coordination Group of the
South Florida Ecosystem Restoration Task Force

Information Brief Series

Invasive Exotic Animals: Managing a Threat to Everglades Restoration

Non-native plant and animal species are defined as those species living in an area outside their native range. If a non-native species causes or is likely to cause economic or environmental damage or pose a threat to human health and safety, it is considered an invasive species. Invasive species have infested millions of acres of natural areas in the United States with the associated loss of native species, including rare and endangered species. Particularly pervasive in Florida, invasive species have been documented to alter the ecological structure and function of entire ecosystems, sometimes leading to irreversible changes in ecosystem processes and food webs.

Invasive exotic species cause serious environmental and economic losses and the management and control of these species costs billions of dollars each year in the United States. Research in the United States, United Kingdom, Australia, South Africa, India, and Brazil indicates that over 120,000 non-native species of plants, animals, and microbes have invaded these countries. Many have caused major economic losses in agriculture and forestry, as well as negative impacts to ecological integrity (Pimentel et al. 2001). Feral cats and pigs, for example, are responsible for the extinction of various native animal species and habitat damage around the world. Though precise economic costs associated with some of the most damaging exotic species are not available, it is estimated that non-native species invasions in the above six nations are causing more than $314 billion per year in damages (Pimentel et al. 2001).

Ongoing scientific research provides insight into the habits and impacts of Burmese pythons in the Everglades ecosystem. Photo courtesy Everglades National Park.

Invasive animal species are a rapidly increasing environmental and economic problem in south Florida. Florida is second only to Hawaii in the severity of the threat posed by invasive species and is particularly vulnerable to the introduction and spread of invasives because of its subtropical climate, major ports of entry, and the pet, aquarium, and ornamental plant industries. Of the known and thriving animal species introduced into south Florida, four are amphibians, 32 are fish, 12 are birds, 46 are reptiles, 17 are mammals, and approximately 79 are invertebrates (SFWMD 2003). One high-profile example in the Everglades is the Burmese python (see photo at left). According to Fish and Wildlife Service records, legal wildlife shipments into the United States between 2000 and 2004 comprised over one billion individual exotic animals, representing 2,241 different species from 190 countries (Aldhouse 2007; Smith et al. 2009). This number does not include any parasites or diseases these individuals might have harbored. Only a small percentage has been subjected to risk analysis, a critical need to prevent and manage unwanted introductions.

Whereas invasive exotic plants have been the focus of various planning, prevention, and management activities for the past 35 years, the focus on invasive animals essentially began within the past decade. In addition, invasive animals are much more difficult to manage and eradicate. Experts in every taxonomic group (mammals, reptiles, amphibians, fish, invertebrates, etc.) are needed to work collaboratively on invasive animals. The lag in time and the expansive scope of the invasive animal issue present an immense challenge in the Everglades. However, the management of invasive animal species can draw from the many lessons learned regarding invasive plants. The exact methodologies may differ, but the same primary strategies apply.

What we Learned

- That we know what it takes to solve this problem
- Effective invasive exotic species management requires an integrated approach with sustained resources
- July 9, 2013 Task Force direction
  - Develop a comprehensive Invasive Exotic Species (IES) **Strategic Action Framework** that includes a cross cut budget tool

Why a Strategic Action Framework?

- Help decision-makers understand the connections between goals, strategies, and tactics;
- Maximize the extent to which the current capacity for partnership is leveraged to meet common goals;
- Help decision-makers make wise and timely investment decisions in the battle against invasive exotics; and
- Define success and provide for accountability.

Current Status

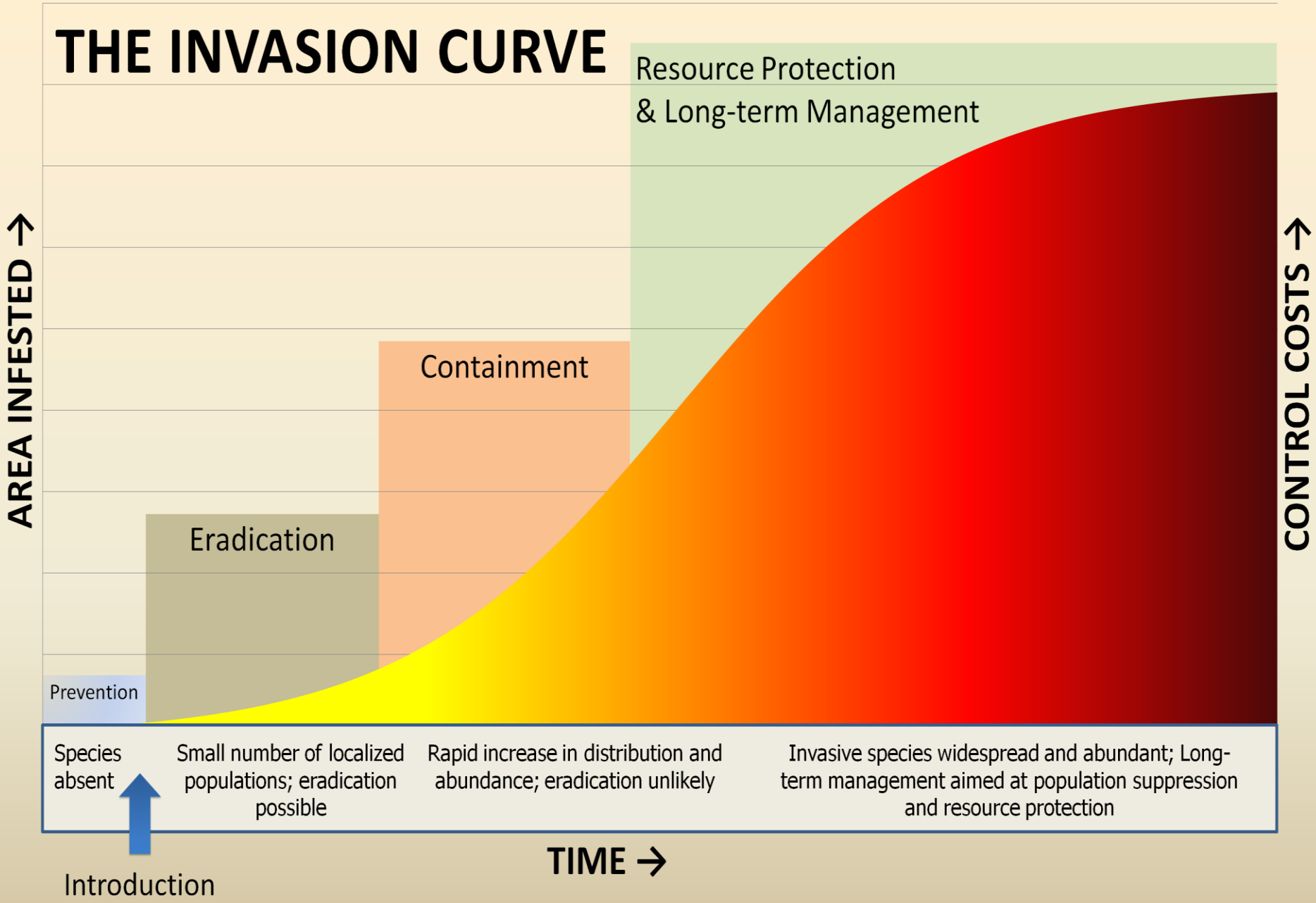
- More than 25 agencies, tribal governments, academic institutions, and NGOs are simultaneously developing under the coordination of OERI:
  - Printable Framework document
  - Web-based Framework
  - Suite of case studies
  - Cross-cut budget tool
  - Consistent IES goals included in reporting requirements to Congress, Task Force members, and the public (Strategy and Biennial Report 2014)

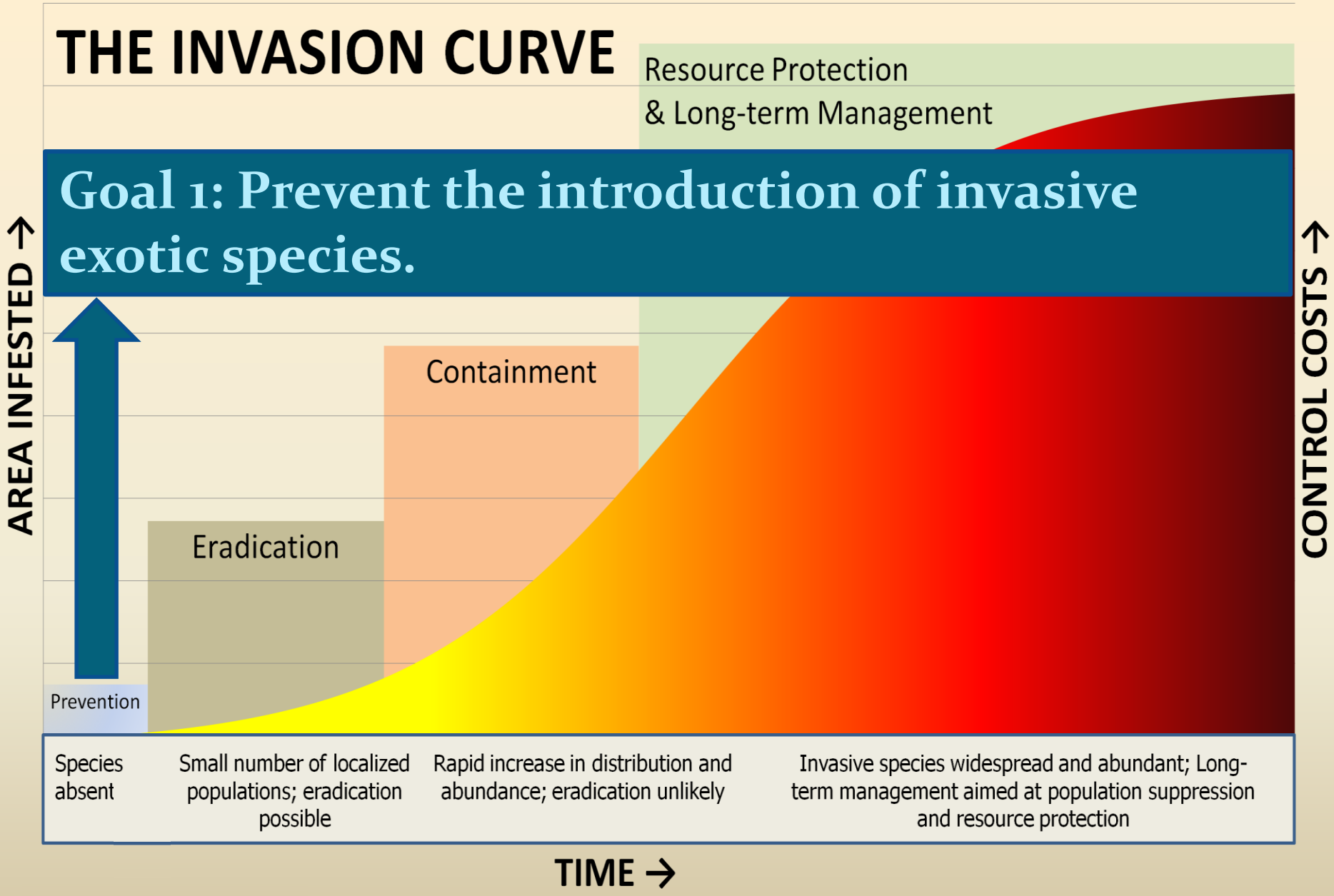
Science, Coordination, Outreach, and Funding are Vital

- Science forms the foundation for the strategies within every goal area.
- Success will require interagency cooperation, innovative partnerships, and an informed, involved public.
- A successful invasive exotic species program requires long-term commitment of resources.

The Invasion Curve

How we assess the challenges, establish our goals, and formulate our strategies


THE INVASION CURVE
Resource Protection
& Long-term Management
Containment
Eradication
Prevention
AREA INFESTED →
CONTROL COSTS →
Species absent
Small number of localized populations; eradication possible
Rapid increase in distribution and abundance; eradication unlikely
Invasive species widespread and abundant; Long-term management aimed at population suppression and resource protection
Introduction
TIME →


THE INVASION CURVE
Resource Protection
& Long-term Management
Goal 1: Prevent the introduction of invasive exotic species.
AREA INFESTED →
CONTROL COSTS →
Containment
Eradication
Prevention
Species absent
Small number of localized populations; eradication possible
Rapid increase in distribution and abundance; eradication unlikely
Invasive species widespread and abundant; Long-term management aimed at population suppression and resource protection
TIME →

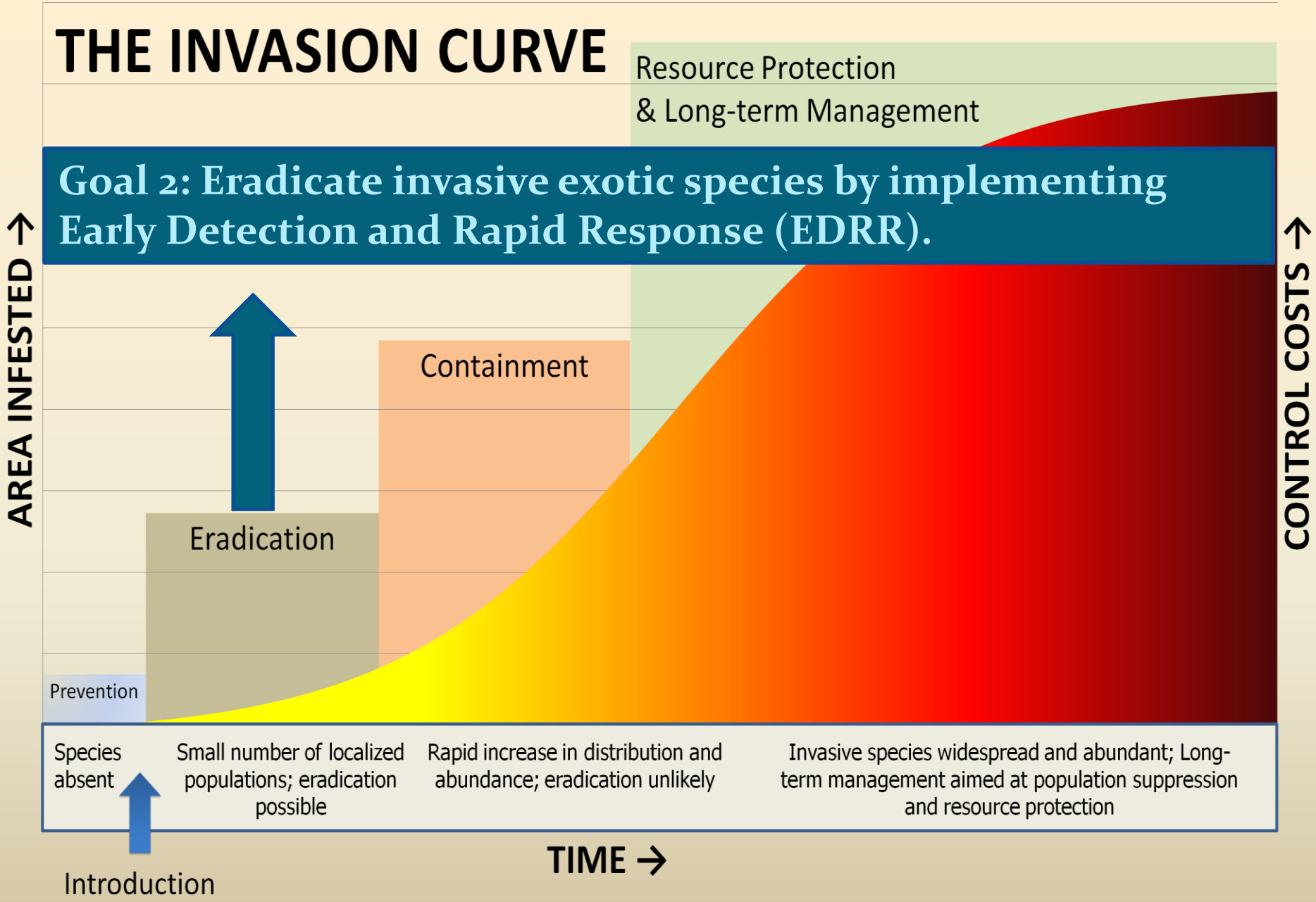
Goal 1: Prevent introduction of invasive exotic species

Preventing introductions of new invasive exotic species is the most cost effective strategy and can yield benefits provided funding and current barriers are addressed up front.

- Objectives:
  - **Prepare & Prioritize:** Prepare for and prioritize prevention efforts.
  - **Prevent:** Prevent entry of invasive exotic species.
- Examples:
  - Lacey Act Authority
  - Don't Pack a Pest
- Case Studies:
  - Heartwater Diseases

Tropical Bont Tick

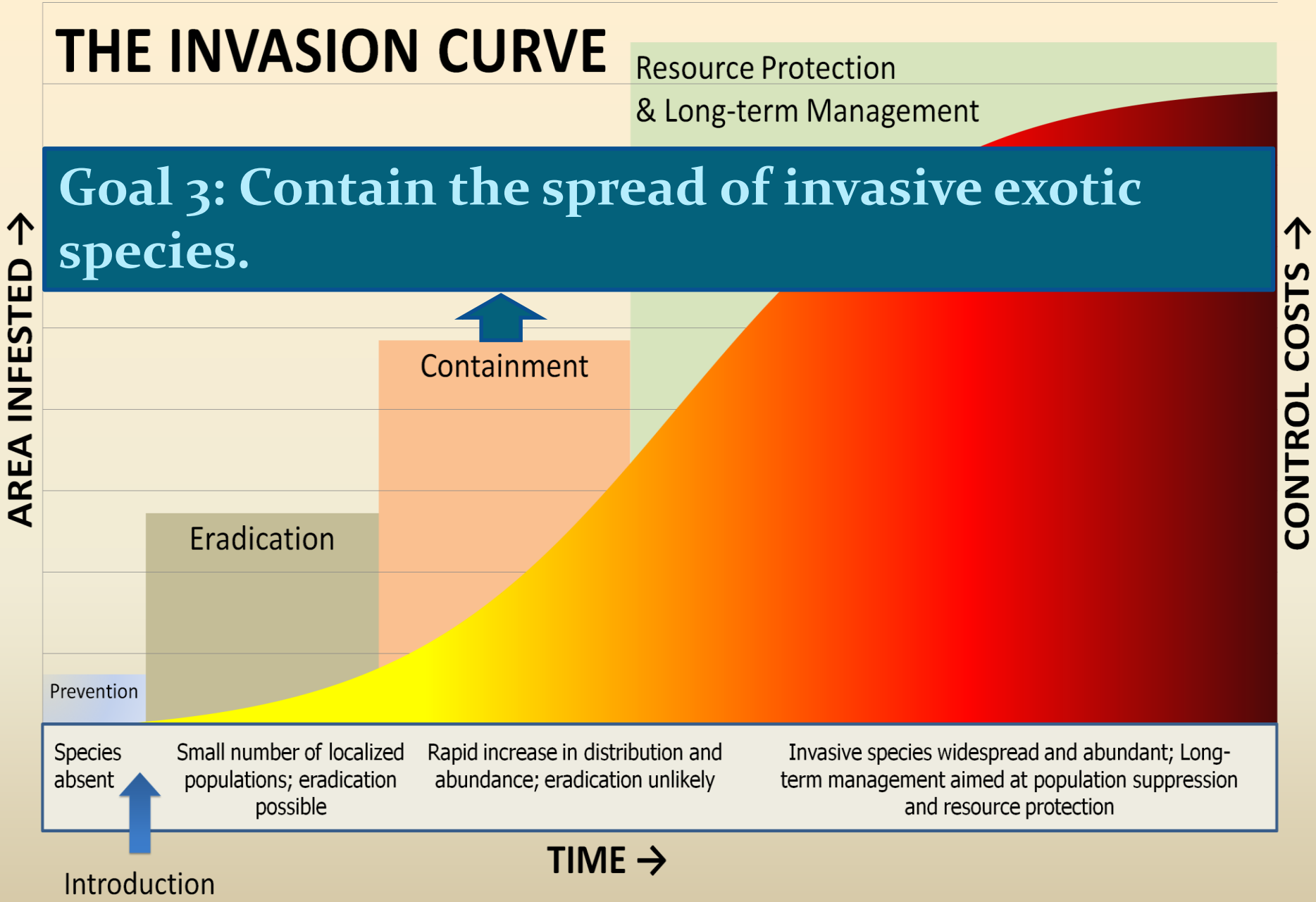
Photo: USFWS Law Enforcement


THE INVASION CURVE
Resource Protection
& Long-term Management
Goal 2: Eradicate invasive exotic species by implementing Early Detection and Rapid Response (EDRR).
AREA INFESTED →
CONTROL COSTS →
Containment
Eradication
Prevention
Species absent
Small number of localized populations; eradication possible
Rapid increase in distribution and abundance; eradication unlikely
Invasive species widespread and abundant; Long-term management aimed at population suppression and resource protection
Introduction
TIME →

Goal 2: Eradicate invasive exotic species by implementing EDRR

Successful eradication of newly established invaders through EDRR requires formal collaboration and dedicated staff and funding.

- Objectives:
  - **Prepare & Monitor:** Prepare and monitor to enhance early detection.
  - **Assess:** Ensure rapid assessment of newly detected species.
  - **Respond:** Rapidly respond to identified threats.
- Case Studies:
  - Gambian Pouched Rats
  - Sacred Ibis
  - Tephritid fruit flies


THE INVASION CURVE
Resource Protection
& Long-term Management
Goal 3: Contain the spread of invasive exotic species.
AREA INFESTED →
CONTROL COSTS →
Containment
Eradication
Prevention
Species absent
Small number of localized populations; eradication possible
Rapid increase in distribution and abundance; eradication unlikely
Invasive species widespread and abundant; Long-term management aimed at population suppression and resource protection
Introduction
TIME →

Goal 3: Contain the spread of invasive exotic species

Consistent resources to address containment, resource protection, and long-term management are needed.

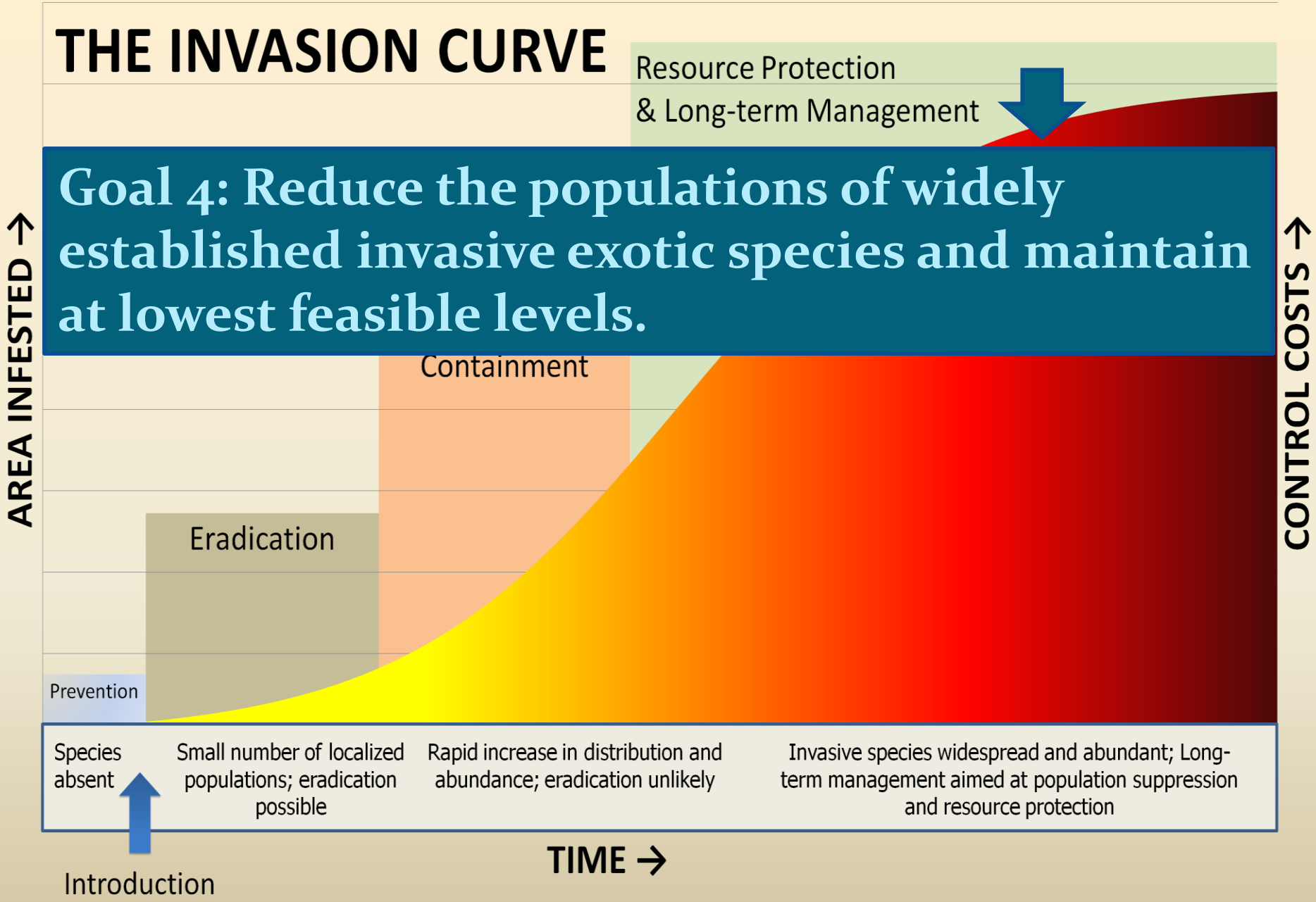
- Objectives:
  - **Contain:** Utilize existing control tools to contain invasive exotic species.
  - **Improve:** Improve effectiveness of containment efforts on invasive exotic species populations.

Goal 3: Contain the spread of invasive exotic species

Argentine Black and White Tegu

Photo: Dennis Giardina, FWC

- Case Studies:
  - Argentine black and white tegu
- Examples:
  - Lacey Act Authorities


THE INVASION CURVE
Resource Protection
& Long-term Management
Goal 4: Reduce the populations of widely established invasive exotic species and maintain at lowest feasible levels.
AREA INFESTED →
CONTROL COSTS →
Containment
Eradication
Prevention
Species absent
Small number of localized populations; eradication possible
Rapid increase in distribution and abundance; eradication unlikely
Invasive species widespread and abundant; Long-term management aimed at population suppression and resource protection
Introduction
TIME →

Goal 4: Reduce the populations of widely established invasive exotic species and maintain at lowest feasible levels.

Consistent resources to address population reduction, resource protection, and long-term management are needed.

- Objectives:
  - **Combat:** Reduce population and extent of established invasive exotic species through Integrated Pest Management approaches.
  - **Restore & Recover:** Reduce impacts of invasive exotic species through restoration of native habitats and species.
  - **Improve:** Improve effectiveness of long-term management efforts on invasive exotic species populations.

Goal 4: Reduce the populations of widely established invasive exotic species and maintain at lowest feasible levels.

- Case Studies:
  - Shoebutton Ardisia
  - Ambrosia beetle/laurel wilt disease
  - Lionfish
  - Burmese python
  - Melaleuca

Invasive Exotic Species Strategic Action Framework

Next Steps

Schedule

- August 27: IES Working Meeting (@MODS)
- September 16: Draft IES Strategic Action Framework presented to Working Group/Science Coordination Group (@SFWMD)
- October 2: IES Working Meeting
- October 23: Final IES Strategic Action Framework presented to Working Group/Science Coordination Group (@SFWMD)
- November 18: Final IES Strategic Action Framework presented to Task Force (@SFWMD)

Schedule – DUE July 25th ☺

Goal 1: Prevention		
Objectives and Strategies	**Action Steps – Current Projects/Resources**	**Action Steps – Needed Projects/Resources**
Objective 1A: Prepare for and prioritize prevention efforts.		
Strategy 1A1: Identify pathways and prioritize potential threats and invasive exotic species.	• High Risk Areas-target domestic inspection activities at vulnerable points in the safeguarding continuum. • Interdiction Sites and Marinas and Canals	• Assemble a multi-agency/multi-disciplinary work group to conduct the following prevention efforts: ○ Catalog high pressure exotic species. ○ Prioritize species by assessment of ecological, economic, and human health risk. ○ Determine invasion pathways.
Strategy 1A2: Engage stakeholders and the public to support prevention efforts.	• Create public awareness about the threat of invasive through continued implementation of Habitattitude. (NPS, FWS, NOAA, PIJAC)	• Design and implement outreach.
Objective 1B: Prevent entry of invasive exotic species.		
Strategy 1B1: Enhance and improve the pathway inspection/screening process.	• Increase the ability to properly identify exotic fruit fly species in the genus Anastrepha by implementing the Enhancement of Fruit Fly Immature Stage Identification and Taxonomy project (USDA-APHIS and USDA-ARS) • Increase knowledge and awareness of exotic species of first detectors by implementing First Detector Training (Southern Plant Diagnostic Network and University of Florida extension)Enhanced pest detection at high-risk domestic interdiction sites and marinas/canals systems • Brown Marmorated Stink Bug (interception and research for potential biocontrol) • Enhancement of Fruit Fly Immature Stage ID and Taxonomy • Exotic Psyllids and Liberibacter species	• Increase first detector training. • Increase capacity for regulatory inspections. • Increase success of public declarations.
Strategy 1B2: Develop new/utilize existing voluntary	•	• Seek new regulatory tools. • Encourage the use of prevention practices in partner agency contracts and by entities working on or on the