

# South Florida Ecosystem Restoration Task Force

## Invasive Exotic Species

### Preliminary Action Assessment

#### **Priority Strategies**

The Invasive Exotic Species Strategic Action Framework (Framework) identifies 31 strategies to meet four overarching goals. Each of these strategies is considered an important part of a successful invasive exotic species program. However, the Framework development team (team) recognized that some strategies are more urgent or potentially more effective than others. In addition, some strategies can be more directly influenced by the Task Force and its member entities than others. Finally, some strategies in the framework are already the focus of significant effort while others, as effective or even more effective, have not been the focus of adequate effort. Therefore, the team conducted a prioritization process that yielded 11 priority strategies that the team felt warrant additional effort. The team then evaluated existing projects, programs and activities to determine the current level of effort under each priority strategy. Finally, the team identified gaps that should be filled to appropriately implement each priority strategy. In some cases a project supported multiple strategies. The identification of priority strategies does not imply that the other strategies listed in the Framework are not important to the success of invasive exotic species management or ecosystem restoration. Instead, the priority strategies represent action areas where additional effort is needed.

Although all four of the Framework goals were represented by the 11 priority strategies, the majority of highly ranked strategies were focused on achieving Goal 2: “Eradication by implementing EDRR.” Common themes across priority strategies include tool development, monitoring enhancement and monitoring improvement. This action assessment is color coded to correspond with the colors of the invasion curve.

## Priority Strategies for Task Force Action

### Goal 1: Prevent the Introduction of Invasive Exotic Species

#### PRIORITY STRATEGIES

#### Strategy 1A1: Identify pathways and prioritize potential threats and invasive exotic species.

##### Current Activities:

- High Risk Areas-Target domestic inspection activities at vulnerable points in the safeguarding continuum (FDACS)
- BTAG – An interagency group that coordinates on issues related to inspection activities

##### Gaps:

- Prioritize species by assessment (horizon scanning) of potential ecological, economic, and human health risk.
  - Assemble a multi-agency/multi-disciplinary (technical/advisory) work group to conduct the following prevention efforts:
    - Define needed research on nonnative species and their impacts to adequately inform prioritization efforts.
    - Determine invasion pathways and risks.
    - Review and evaluate predictive screening/risk assessment methods for the prevention of new species introductions.
    - The Work Group would inform and share information with the BTAG-type group, agencies, etc.

#### Strategy 1B1: Enhance and improve the pathway inspection/screening process.

##### Current Activities:

- Increase predictive screening/risk assessment on importation of non-native plants (USDA through Q37 NAPPPRA authority)
- Continue to implement the Project-Interdiction Marinas and Canals Survey in order to detect presence of exotic arthropods and plant pathogens at Florida's interdiction stations and marinas and canals in the South Florida Ecosystem (FDACS)
- Increase knowledge and awareness of exotic species of first detectors by implementing First Detector Training (Southern Plant Diagnostic Network and UF extension)
- Enhance pest detection at high-risk domestic interdiction sites and marinas/canals systems (FDACS)
- Enhancement of Fruit Fly Immature Stage ID and Taxonomy (FDACS)
- FDACS Detector Dog Teams (FDACS)
- Detector Dog Pilot Program (FWS Law Enforcement)

##### Gaps:

- Implement predictive screening/risk assessment methods for assessing potential harm of introduction of exotic species
  - Assemble Biological Threat Advisory Group (BTAG)-type group based on USDA/CBP/FDACS port risk model on recognized threats/known commodities to relay recommendations from work group
- Increase first detector training
- Increase capacity for regulatory inspections
- Increase detector dog program at ports
- Implement better state-to-state and international screening for USPS and other mailing and delivery providers
- Develop a process/mechanism to capture importation information by species entering state of Florida

**Goal 2: Eradication Invasive Exotic Species By Implementing EDRR****PRIORITY STRATEGIES****Strategy 2A1: Implement a systematic, prioritized, multi-species monitoring and inventory plan.****Current Activities:**

Assess and leverage the current suite of monitoring activities:

- Continue to implement the Corridors of Invasiveness Vital Sign project for Plants (SFCN NPS)
- Continue to implement the Everglades Invasive Reptile and Amphibian Monitoring Program (FWC/UF)
- Continue to implement the early detection of new exotic fish species in adjacent canals vital sign project (NPS)
- Continue trapping program to detect new exotic forest pests (FDACS-DPI)
- Continue monitoring program to detect presence of any exotic psyllids and Liberibacter species that might prove harmful to Florida agriculture (FDACS-DPI)
- Continue to conduct Northern African python surveys (FWC/ USGS)
- Continue to monitor for the Mexican Red Bellied Squirrel (NPS/BNP)
- Continue digital area sketch mapping for Laurel Wilt within the ECISMA boundary (NPS)
- Continue NPS/USGS efforts to develop reporting and response network for DOI lands in the South Florida Ecosystem (USGS/NPS)
- Fruit Fly Survey and Detection (FDACS)
- Cooperative Agricultural Pest Survey (FDACS)
- Nile Monitor Eradication Project (FWC)
- Development of comprehensive fish monitoring programs in Everglades National Park (NPS)
- Metagenomic survey in south Florida waters (USDA)
- Exotic Species Reporting Hotline and Database Maintenance (I've Got 1) (FWCC)

**Gaps:**

- Develop a system wide SFER regional monitoring network, by synthesizing ongoing IES monitoring networks by:
  - 1a) Leveraging existing monitoring activities (current)
  - 1b) Assessing gaps (needed projects)
- Evaluate existing surveillance protocols or programs and develop or augment programs, for example:
  - Apply existing Burmese python eDNA method in systematic surveys of south Florida waterways to monitor possible range expansions
  - Expand comprehensive aquatic species monitoring programs to the entire South Florida Ecosystem
  - Expand the Corridors of Invasiveness Vital Sign project for Plants to the entire South Florida Ecosystem
- Develop improved methods for monitoring through research and statistical designs
- Increase capacity/coordination for conducting systematic reconnaissance for invasive species and responding to reports of potential new species from I've Got1 network and others

**Strategy 2A3: Employ science and technology for development of early detection tools, e.g., surveys, traps, inspections.**

**Current Activities:**

- Continue to develop and validate eDNA methods for detection of invasive reptiles (USGS)
- Development of eDNA for Nile Monitor detection and removal (USDA)
- Fruit Fly Eradication Methods Development (FDACS)
- Metagenomic survey in south Florida waters (USDA)
- Continue to improve the probability of detection of invasive reptiles (UF)
- Burmese python eDNA development and application (USDA-APHIS)
- Tegu trap evaluation/design (USGS)
- Psyllid traps (FDACS)

**Gaps:**

- Conduct mesocosm trials to detect eDNA levels in flowing water, soils, and other varying environmental conditions to inform eDNA sampling
- Conduct eDNA sampling
  - To detect expansion of pythons into Loxahatchee NWR
  - In area occupied by Northern African Python to assess success of eradication effort
  - Aquatic species DNA (bring from Prevention)
- Investigate/Develop pheromone attractants for use in detecting/trapping incipient populations
- Metagenomic survey in south Florida waters, part 2
- Detector dog program expansion to other species
- Build capacity to conduct surveys

**Strategy 2A5: Establish rapid assessment and response programs/processes/cooperatives/tools that allow for nimble attempts at eradication.**

**Current Activities:**

- Utilize existing FWC on-call expert and responder lists (FWC)
- Continue to implement the Corridors of Invasiveness Vital Sign project for Plants (SFCN NPS)
- Continue to implement the early detection of new exotic fish species in adjacent canals vital sign project (NPS)
- Strike Teams such as, ECISMA EDRR and FISST (FWS, FDACS/USDA, and NPS)
- Everglades Invasive Reptile and Amphibian Monitoring Program (FWC/UF)
- Continue to assess the effects of exotic fish on Everglades structure and function: risk assessment (ENP/USGS)

**Gaps:**

- Formalize cooperative EDRR activities including emergency response
- Develop on-call expert and responder lists.
- Assemble technical expert work groups for specific species of concern.
- Develop Response Action Plan (RAP) for each taxa, utilizing the ECISMA EDRR response protocol.
- Expand and enhance training programs for rapid responders.
- Reduce barriers to interagency EDRR efforts such as permitting issues for responders.
- Establish dedicated resources (funding and staff) for an EDRR Team to conduct rapid assessment and initiate rapid response.
- Update and provide access to EDRR guidelines, model response plans, and other resources.

**Strategy 2B1: Rapidly assess the status and potential threat of newly detected invasive exotic species populations and develop a response/no response plan.**

**Current Activities:**

- ECISMA EDRR Plan (ECISMA)
- Strike Teams (FWS, FWC and FDACS)

**Gaps:**

- Cooperatively implement rapid assessment process that is accepted by participating entities

**Strategy 2C1: Initiate rapid response based upon the plan of action developed during the assessment phase.**

**Current Activities:**

- Chameleon efforts (FWC)
- Eradicate the Gambian Pouch Rat (FDACS/FWC)
- Develop and implement a FWS Florida Invasive Species Strike Team (USFWS)
- ECISMA EDRR: Continue to eradicate *Chrysopogon aciculatus* from Air Force base property in Homestead (FDACS-DPI/ECISMA)
- Giant African Land Snail Eradication Program (FDACS)
- Continue developing response network including Authorized Agents for rapid response to new invasive reptile observation on NPS lands (USGS/NPS)
- ECISMA EDRR: Sacred ibis retrieval (ECISMA)
- MDRR Rapid Response and Invasive Species Removal (Miami-Dade County)
- Fruit Fly (FDACS)
- Exotic mangroves (NPS)
- Bay snook (FWC)
- Caiman and spectacled caiman (EIRAMP)(FWC/UF)
- FWC Exotic Species Rapid Response (FWC)

**Gaps:**

- The EDRR team will establish strike teams to implement the action plan, such as:
  - Enhance the existing FWS Florida Invasive Species Strike Team
  - Enhance NPS Strike Team for animals
- Develop Incident Command Structure and training courses for rapid response activities, modeled on successful programs elsewhere
- Continue/expand support and funding for a formal interagency invasive species strike team

### Goal 3: Contain the Spread of Invasive Exotic Species

#### PRIORITY STRATEGIES

##### Strategy 3A2: Implement control efforts at containment boundaries and known pathways.

###### Current Activities:

- Continue tegu interdiction to prevent expansion into ENP and natural areas (FWC/UF/USGS/ENP)
- Contain known populations of *M. micrantha* as well as survey other areas to allow for early detection and rapid response (FDACS-DPI/UF/ECISMA)
- Multiple forest pests (FDACS-DPI-CAPS)
- Temporal and Spatial Habitat Use, Genetics, Diet and Disease Survey of the Boa Constrictor (*Boa constrictor* spp.) at the Charles Deering Estate at Cutler (Miami-Dade County Zoo Miami)
- Big Cypress National Preserve Exotic Reptile Control response network (BICY)
- Loxahatchee Decision making Workshop on Pythons (Loxahatchee National Wildlife Refuge)
- Chameleon efforts (NPS, FWC)

###### Gaps:

- Formalize cooperative containment activities including emergency response
- Evaluate 2011-2014 tegu capture records to assess efficacy of control efforts and identify dispersal corridors.
- Increase Tegu containment efforts including population reduction through intense trapping in the interior and full containment lines to the north and east of known populations.
- Develop detector dog program to aid in containment and control efforts.
- Implement asset-based exclusion methods for incipient taxa from areas not currently infested

##### Strategy 3B1: Invest in science-based containment methods.

###### Current Activities:

- Conduct tegu brumation study. Thermal biology and behavioral ecology of Argentine tegus in southern Florida. (USGS/ENP)
- Continue radiotelemetric monitoring of Burmese pythons in Collier County to understand opportunities for control in upland habitats (USGS/Conservancy of SW Florida)
- Initiate radiotelemetric monitoring of Burmese pythons on Miccosukee tribe lands (USGS)
- Continue to improve the probability of detection of invasive reptiles (UF)
- Feral Swine Impacts and Control (USDA-APHIS)
- Loxahatchee Decision making Workshop on Pythons (LNWR)
- Continue to develop and validate eDNA methods for detection of invasive reptiles (USGS)
- Continue to improve the probability of detection of invasive reptiles (UF)
- Development of eDNA for Nile Monitor detection and removal (USDA)
- Metagenomic survey in south Florida waters (USDA)
- Burmese python eDNA development and application (USDA)
- Development of biocontrols for Lygodium, Brazilian pepper, Melaleuca (USDA)

###### Gaps:

- Conduct research and develop new control tools to assist in the containment of invasive exotic species.
- Apply information from system-wide monitoring to identify containment boundaries and pathways.
- Build capacity for public participation to apply science-based containment efforts

## Goal 4: Reduce the Populations of Widely Established Invasive Exotic Species and Maintain at Lowest Feasible Levels.

### PRIORITY STRATEGIES

#### Strategy 4C3: Develop and improve tools to assist in the long-term control of invasive exotic species.

##### Current Activities:

- Continue to implement Invasive Species Research and Information Exchange 2007 (SFWMD )
- Continue to develop methods to produce and refine species-specific large constrictor control tools. (ENP/USGS)
- Continue to conduct Lionfish assessment and control in NPS units. (NPS)
- Development and Evaluation of Biological Control Agents for Invasive Species Threatening the Everglades and other Natural and Managed Systems (USDA)
- Biological Control of Imported Fire Ant (FDACS)
- Enhanced Mitigation Techniques for the Control of Several Whitefly Species (FDACS)
- Interception and research for potential biocontrols of the Brown Marmorated Stink Bug (FDACS)
- Expansion of Asian Citrus Psyllid Biocontrol (FDACS)
- Tegu trap and lure evaluation (USDA)
- Continue to improve the probability of detection of invasive reptiles (UF)
- Everglades Complex of Wildlife Management Areas' Exotic Plant Control (Everglades & Francis S. Taylor, Holey Land, and Rotenberger) (FWC)
- Laurel wilt tool development (SFWMD/ USACE)
- Continue radiotelemetric monitoring of Burmese pythons in Collier County to understand opportunities for control in upland habitats (USGS/ Conservancy of SW FL)
- Burmese python eDNA development and application (USDA-APHIS)
- Python removal authorized agent program for South Florida National Parks (NPS)
- Python Responder/Patrol Training (FWC)
- Thermal infra-red detection of Burmese pythons (USDA/UF)
- Python Chemical Communication/Pheromone Development (USDA)
- Trap and lure evaluation with Burmese pythons (USDA)

##### Gaps:

- Develop tools for the long-term control of Laurel wilt
- Develop methods to bring IES fish populations into maintenance control
- Biocontrol development for IES
- Detection dogs

#### Strategy 4C4: Integrate federal, state, and local agency invasive exotic species control programs.

##### Current Activities:

- ECISMA MOU
- Southwest Florida CISMA Partnership (SWFCISMA)

##### Gaps:

- Evaluate barriers to cooperative IES control programs
- Develop comprehensive IES governance structure
- Interagency python management plan

To see a complete list of strategies, please refer to the Invasive Exotic Species Strategic Action Framework at [www.EvergladesRestoration.gov](http://www.EvergladesRestoration.gov)