

Invasive Fish and Wildlife Update



Staff Report
September 27, 2018



Florida Fish and Wildlife Conservation Commission

Version 1

Divisions: Habitat and Species Conservation, Law Enforcement

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Photos:

Dwarf mongoose (Wikimedia Commons)

Burmese python (FWC)

Argentine black and white tegu (FWC)

Outline

- Overview of Invasive Species in Florida
- Role of Division of Law Enforcement and Regulatory Framework
- Role of Habitat and Species Conservation
- Staff Recommendations



This presentation will cover background information on invasive species in Florida, the role of law enforcement, and current regulation status. Staff will provide information on current and potential future prevention strategies.

Photo: Panther chameleon captured in South Florida. (FWC)

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Photo: Panther chameleon captured in South Florida. (FWC)

Nonnative Fish and Wildlife in Florida



FWC 1924 - Present

- Over 500 nonnative fish and wildlife species have been observed in Florida
- At least 150 species are reproducing
- Nearly 60,000 observations of nonnative wildlife (not lionfish)
- Over 500,000 lionfish removed from around Florida



Lionfish reports in the USGS
Nonindigenous Aquatic Species
Database 1985-Present



Almost 60,000 observations of nonnative wildlife have been recorded in our state. This represents over 500 different nonnative species. Of these we estimate that more than 150 have reproducing populations. Despite it being illegal to release any animal not native to Florida, it is believed that the vast majority of these species entered the wild as a result of either being released or escaped from captivity.

The marine environment also represents its own challenges. Over 500,000 lionfish have been removed from coastal Florida waters, as documented by FWC staff since the beginning of the FWC Lionfish Program in 2014 through 2018.

- Invasive Species: Nonnative plants, animals or diseases occurring outside natural range that cause or are likely to cause economic or environmental harm or harm to human health
- Global movement of people and products has increased the movement of invasive species.

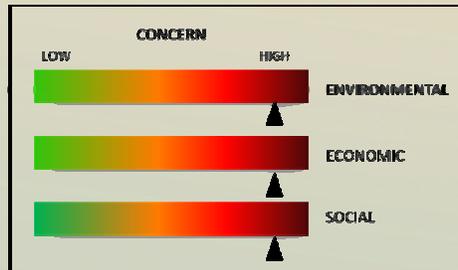


Invasive species are defined as those that are occurring outside of their natural range that cause or are likely to cause economic or environmental harm, or harm to human health.

The global movement of products and people, the increased demand in the global market for exotic animals, the ease by which to acquire them has increased the potential for nonnative fish and wildlife to escape, be released and ultimately cause impacts. Because of this, invasive fish and wildlife are considered to be the second most significant threat to biodiversity, after habitat loss.

Photo: Gathering at a exotic pet show in Florida. (FWC)

Evaluating level of concern



- Not all nonnative species are invasive
- Assessment of risk
- Level of concern may change based on location



Not all observed nonnative species result in established reproducing populations. Of those species that do become established, few of these are considered invasive. Although invasive species are not a problem unique to Florida, Florida's subtropical climate has been conducive to the expansion of many nonnative species including pythons, Argentine black and white tegus, green iguanas, monitor lizards, and many freshwater fish species.

Our challenge is determining what species we need to address. We do this through evaluating the potential impacts that a species may have if or when it is released into the wild.

Impacts of Invasive Fish and Wildlife

- Ecological Impacts
 - Direct predation
 - Competition with native species
 - Habitat alteration
 - Disease
- Human health and safety
- Economic impacts



The level of concern is determined by assessing the potential impacts of invasive fish and wildlife. These impacts can be ecological such as direct predation, human health and safety including injury or disease transmission, or economic impacts that are a result of the introduction.

Photos:

Top left: Black and white tegu raiding an alligator nest in Miami-Dade County (University of Florida)

Right: Bird remains found in Burmese python, including piled bill grebe, blue heron and roseate spoonbill., (University of Florida)

Bottom left: Burmese python that had consumed adult white-tail deer (Everglades National Park/National Park Service public domain)

Economics of Invasive Animal Species

- Economic Impacts
- Management Costs
 - Over \$8 million annually in Florida
 - Over \$3 million annually by FWC
 - Over \$500 thousand annually managing tegus by FWC, nearly \$1M annually by all managing partners

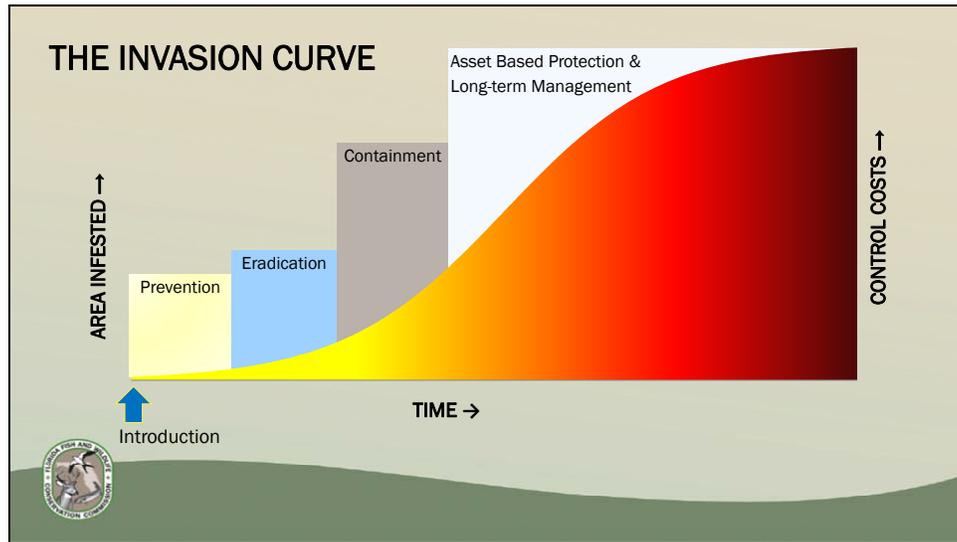


Economic impacts from the presence of invasive species vary. Examples include impacts to water control structures, seawalls and landscaping by iguanas or sailfin catfish, and agriculture impacts by tegus. They may also include impacts that are harder to measure, such as impacts to tourism when reef ecosystems and fisheries are adversely affected by lionfish.

Control costs over the last decade for invasive have also risen. Management cost by FWC and our federal partners are over \$8 million each year, with \$3 million being spent by FWC. One of our primary management priorities for instance over the last few years has become the Argentine Black and white tegu, where nearly \$1 millions is being spent yearly in trying to reduce the population of this species where it is found.

Another component to the economics of invasive species is the benefit to the commercial market in Florida. Although there are pet industry studies indicating a multi-billion dollar industry in Florida, much of this is likely driven by domestic animals (<http://cra.gmu.edu/wp-content/uploads/2017/02/Economic-Impacts-of-the-Pet-Industry-2015-Final.pdf>).

Photo: Iguanas are known to clear vegetation and burrow into the sides of canals and levees causing collapse. (University of Florida)



The slide illustrates what has been referred to as the invasion curve. As more area becomes infested, the less likely the species will be eradicated and costs of management go up. Preventing the release and establishment of nonnative wildlife is clearly the key.

Graphic adapted from Department of Environment and Primary Industries, Victoria, Australia

Invasive Fish and Wildlife Pathways



- Hurricanes and Natural Disasters
- Ballast Water
- Hitchhikers
- **Live Animal Trade**
 - Aquaculture/Aquaria Releases
 - Escaped/released captive wildlife/live animal



While not the only pathway, it is widely accepted that the greatest pathway by which nonnative fish and wildlife find their way into Florida's habitats is through escape or release from the pet trade. due to Florida's prominence in the exotic pet trade, many species of imported pets are released or escape.

Although these actions can lead to major impacts, there is a large number of Florida's residents that want to own exotic species as pets. Reptiles for example are extremely popular, especially in urban areas as they do not require large backyards. Exotic pet shows and expos are popular in Florida with more events than in any other state. Almost 90% of the exotic pets purchased at these events go to private individuals.

Photo: FWC investigator with intercepted shipment of Nile tilapia in Miami. (FWC)

Species Introductions in Florida			
	Number of Introduced Species	Introduced via Live Animal Trade	Established and Reproducing
Mammals	18	9 (50%)	13 (72%)
Reptiles	180	166 (92%)	59 (33%)
Freshwater Fish	130	115 (88%)	29 (22%)
Amphibians	27	16 (59%)	4 (15%)
Marine Fish	40	36 (93%)	4 (10%)
Birds	198	135 (68%)	17 (9%)
Total	593	477 (80%)	126 (21%)



Staff conducted a literature and database review to better understand the number of species introductions and where those species originated. Over 80% of the species introduced into Florida have originated from the live animal trade. Not included here are invertebrates as a full literature review has not been completed for those taxa.

Live Animal Business



- Over 224 million live animals imported annually
- Volume of wildlife shipments has doubled since 2000
- Commercial Use
 - Buy within state as pets
 - Breeding
 - Exhibition



Many animals are imported into Florida each year, through 15 points of entry. Some of these shipments are then moved immediately to elsewhere in the county, others remain here as part of Florida's commercial wildlife trade.

Over 224 million individual animals and are imported into the United States each year, primarily through three major ports – New York City, Los Angeles, and Miami (Smith et al 2017) . The trade in wild animals has also been increasing. The number of declared animal shipments has doubled since 2000.

Between 1999-2010 over 12 million wild caught reptiles from elsewhere in the world were imported into the U.S. and of these over 9 million reptiles were imported through Florida ports alone (Romagosa 2011).

Commercial use in Florida may include direct sales, exhibition, and breeding houses either for food fish or to get placed within the pet industry pathway.

Photo: Child looking at captive lizards (FWC)

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Photo: Panther chameleon captured in South Florida. (FWC)

Captive Wildlife

- FWC regulates ownership of captive wildlife for:
 - Commercial use
 - Personal pets
- Captive Wildlife Section purpose:
Ensure animals are lawfully possessed, housed, exhibited, and sold/transferred



There are 21 captive wildlife investigators who are responsible for inspecting and monitoring the more than 7,000 captive wildlife licensees. Investigators ensure facilities meet all captive wildlife regulations while proactively combating the illegal trade, possession and commercialization of wildlife. FWC promotes responsible ownership of captive wildlife, and it is the goal of the FWC to develop the best regulations possible that provide for public safety, animal welfare, and the legitimate use of wildlife for educational, exhibition, or personal purposes. Florida's captive wildlife regulations are among the most stringent in the nation. FWC investigators routinely conduct inspections of captive wildlife facilities to ensure humane treatment and sanitary conditions are in place for the animals. FWC investigators also inspect to ensure that cage and security requirements are followed to ensure public safety. Florida Statutes and captive wildlife regulations provide the tools our investigators need to address issues when violations occur. The captive wildlife section continues to systematically review rules and identify needed revisions with the goal of increasing public safety, clarifying regulations and ensuring animal welfare.

Changes in numbers of licenses:

1970- less than 1,000

2014- approximately 5,500

2017- more than 7,000

2018- approximately 4,279

Photos:

Top - Photo from Daytona Reptile Show. Bottom Left – Lorikeets at an exhibition facility.. Bottom Right – A red tailed boa constrictor was found under a vehicle, wrapped around the drive shaft. After he called FWC, an investigator responded. Ultimately the vehicle was put onto a lift at a local car care shop and the snake was removed from the drive shaft by the investigator- Northeast Region (FWC)

Captive Wildlife Regulatory Classes

- Class I – very high risk of human death or injury
- Class II – moderate / high risk of human injury
- Class III – minimal risk of human injury
- Venomous Reptiles- Moderate / high risk of injury
- Conditional Species
- Prohibited Species



Prohibited species are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. They may be imported and possessed for research, following approval of the research plan that must include detailed security measures to prevent escape, and for public exhibition by applicants that meet strict biosecurity measures. They may not be acquired or kept as pets.

Conditional Species (formerly referred to as restricted species) are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. They may be imported and possessed for research purposes, commercial use, or public exhibition. They may not be acquired or kept as personal pets, with the exception of red-eared sliders.

The majority of wildlife that has the potential for the most impact on our environments ecology are class III wildlife.

Photos: left to right: lion (Class I), macaque (Class II) (from Google), capybara (Class III)

Class III Wildlife

- Commercial possession of Class III wildlife requires an exhibition and sale license which costs \$50
- Personal possession of some Class III wildlife requires a no cost permit (ex: marmoset)
- Most exotic pets are exempt from permit requirements
 - Most amphibians and reptiles
 - Fish
 - Many birds (ex: canaries and parrots)
 - Some small mammals (ex: prairie dog and hamsters)



Class III wildlife includes all other wildlife not listed as Class I or II. There is minimal risk of human injury when encountering most of these species, except venomous reptiles. The captive wildlife Class System was developed to address human health and safety concerns. Conditional and Prohibited lists were created to address ecological concerns.

Many of the species that have escaped, a ball python for example, are on the class III exemption list and do not require a permit for personal possession. No sales records are required from a dealer to a private individual strictly for personal possession. This makes identifying owners and responsible parties difficult when recovering animals that have escaped. An example of a reptile not regulated elsewhere by the Commission that has a breeding population established in Florida is the tegu. Additionally many of the species on the Injurious species list, that are not regulated elsewhere, are considered Class III. For example, yellow anacondas are considered Injurious by the USFWS but do not require any permit for possession as a pet in Florida because they are exempted like the ball python.

Commercial use for conditional species is authorized on a Class III Exhibition and Sale license. Currently there are 497 Conditional Species Licenses issued for commercial activity in Florida.

*Photos: Top right – ball python turned in at an Exotic Pet Amnesty Day (FWC)
Bottom right- prairie dog – (Google image)*



Captive wildlife section serves both a proactive and reactive role when it comes to containment of wildlife.

Inspections are a big portion of our program. In Fiscal year 2017/2018 Investigators conducted a total of 6,231 inspections

Inspections at Class I and Class II facilities are the highest priority due to the heightened human safety concern. 1,397 inspections were conducted at Class I and II facilities. 1,362 (approximately 50%) of the licensed Class III commercial facilities were inspected, and 358 (approximately 30%) personal pet licensees were inspected.

Captive wildlife staff responded to 156 calls for service to address nonnative free roaming wildlife, seized 137 animals, 18 of which were conditional species and 16 were prohibited species. There were 35 escapes of Class III wildlife, 1 of which was conditional. From 2010 to date, there were 146 Class III wildlife escapes, 11 of which were conditional. The escape totals only include the escapes that we were made aware of.

Captures were conducted by captive wildlife staff, and are in addition to any wild captures by contractors, nuisance trappers or other FWC staff and do not include any animals surrendered under FWC amnesty program. The captures were 28 class III and 8 conditional species.

Photo: ball python- (Google image)

Captive Wildlife Case Highlights



Tegu case: Investigator Shores responded to a complaint of abandoned tegus at a residence. Investigator Shores found 38 tegus at the location, 4 of which were deceased. The remaining tegus were found to be dehydrated and malnourished. Some of the tegus at the location had escaped their containment. The owner of the tegus was currently unlicensed and was reportedly one of the largest dealers in the southeast. The tegus were turned over to FWC for placement and the owner currently has 2 outstanding felony warrants that resulted from this case.

Burmese Python case: In 2016 Investigator McDaniel responded to a residence at the request of animal control when they discovered a Burmese python in a home while investigating a separate matter. Investigator McDaniel responded and seized the unlicensed 16 foot long python.

Photos:

Tegu – One of 38 caught in Panama City. Investigator Shores (retired) (FWC)

Burmese Python seizure in Lady Lake in 2016 (FWC)

Port Investigations

- Dedicated Port Investigations Unit:
 - 1 Statewide Coordinator
 - 6 Investigators
 - 5 K-9 Officers
- Port Investigations mission:
 - Detect the unlawful commercial trade and trafficking of fish and wildlife species.
 - Enhance FWC's capabilities and effectiveness for preventing the illegal importation, exportation and potential release of invasive species within the State of Florida.



The Port Investigations Unit's primary responsibilities include monitoring and interrupting the illegal import and export of invasive species, marine life, illegal saltwater products and the commercialization of Florida's native fish and wildlife. The unit conducts inspections of imports, exports and domestic shipping at U.S. international airports, seaports as well as international and domestic mail facilities. The Port Investigations Unit also monitors the pet trade for legal, ethical and health standards associated with the shipment of live animals. The Unit assists the US Fish and Wildlife Service inspecting packages for Federal Lacey Act, CITES and Migratory Bird Treaty Act violations. Other federal partners include US Customs and Border Patrol, NOAA Office of Law Enforcement as well as the United States Postal Inspectors

The Port Investigations Unit utilizes specialized equipment to conduct Inspections such as borescopes, Infrared Cameras and a newly acquired Portable X-Ray Unit. The portable X- Ray Unit has proven to be an effective tool when identifying illegal and invasive species being smuggled into Florida.

\$150,000 operating budget

\$730,616.38 In salaries

Total- \$880,616.38 in Law Enforcement Port Budget Yearly

Photos: Top: Port Investigator Stiffler holding a wild caught Green Iguana that was sold without being licensed. Bottom: FWC K-9 team inspecting packages. (FWC)

Port Investigations

Investigators

Hours of Investigations	6,781
Special Details	10
Airport Cargo Inspections	477

K-9

Deployments	212
Parcel Sniffs	259
Reptiles Found	1,689
Tropical Fish Found	346



The hours of investigations includes investigations related to port and domestic shipping facilities.

The special details are focused on the import and export of fish and wildlife and occur statewide.

Port Investigations - Case Highlight



While working with USFWS, Inv. Stiffler was notified of an imported shipment of reptiles, amphibians, and arachnids that had arrived at Miami International Airport. Inv. Stiffler arrived at the British Air Cargo facility and inspected the shipment along with an Inspector with the USFWS.

The shipment contained several species of lizards including (400) Nile Monitors, and (150) centipedes along with frogs, geckos, and snakes. The subject importing the wildlife did not have a valid FWC license or an import permit to bring nonnative wildlife into Florida. The subject was also on probation for previous wildlife violations.

The subject was arrested and booked into jail for the following:

- Unlawful possession/importation of wildlife with intent to sell. 2 counts
- Unlawful importation and possession of Conditional Species without a valid CSP with intent to sell. 408 counts (Nile Monitors)
- Unlawful importation of arachnids without Dept. of Ag permit. 150 counts (150 centipedes)

An inspection of the subjects van revealed in plain view several boxes and pillow cases customarily used to hold wildlife. Inside the boxes and bags were the following; (53) Uromastix lizards (47) Various color forms of Green Iguanas, (33) various chameleons, (1) Tokay Gecko, (8) Nile Monitors, (2) Ball Pythons, (1) wire cage.

Additional charges were added due to discovering 8 more Nile monitors. The subject was provided the option of having the entire shipment seized, or have it re-exported to the county of origin. The subject chose for the re-export. In reference to the reptiles in the van, the subject requested to have the reptiles taken to a properly licensed facility.

Photos of shipping containers and 1 Nile monitor (FWC)

It takes a team

- Division of Law Enforcement
 - Captive Wildlife
 - Statewide Investigations
 - Port Investigations
 - Regional Sworn Personnel
- Habitat and Species Conservation
 - Wildlife Impact Management
 - Nonnative Fish and Wildlife Program

But things still get out



Staff in Law Enforcement and the Division of Habitat and Species Conservation work together when we receive reports of nonnative species.

Photos:

Left: A pet Burmese python that was released and later captured in the Florida panhandle. Subject in picture had to shoot it after it attacked her dog. The snake was approximately 12 feet in length.

Top right: Advertisement for the National Reptile Breeders Expo held annually in Daytona, Florida.

Bottom right: Reward letter for a lost pet yellow anaconda in Leon County in October 2017. Yellow anacondas grow to an average of 10 – 14 feet and require no permit for personal possession.

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Photo: Panther chameleon captured in South Florida. (FWC)

HSC Nonnative Fish and Wildlife Program

Focal Areas:

- Assessment/evaluation
- Early Detection/Rapid Response
- Control
- Prevention



The Nonnative Fish and Wildlife Program multiple focal areas that mirror the invasion curve. We spend much of our time and resources responding to high priority species and removing them from the wild. This presentation focuses on some of the work and opportunities for improvement in Prevention.

Photo: FWC staff member removing a Nile monitor from the wild in Palm Beach County, FL. (FWC)

Prevention Strategies

- Exotic Pet Amnesty
- Awareness Campaigns
- Outreach events/Festivals
- Python Patrol Program
- Regulation



Preventing introduction and establishment of nonnative species is the first line of defense against invasions. This can take the form of education and outreach to encourage members of the public to not release their unwanted pets, providing alternatives to releasing unwanted pets such as our Pet Amnesty Program, or regulating what wildlife is allowed in personal possession.

Regulation is an essential component to prevent access to potentially invasive species.

Photo: A veterinarian inspects a Burmese python surrendered at one of FWC's Exotic Pet Amnesty Events. (FWC)

Stakeholder Engagement

- Informal feedback from stakeholders
- Reptile Industry
- Zoos and other exhibitors
- Florida Department of Agriculture and Consumer Services



Regulation as a preventative tool is a dynamic issue with many viewpoints. At the April Commission meeting staff were directed to continue to work with stakeholders to gather feedback on importation and potential regulation of species that are currently listed by the USFWS as Injurious. Throughout the last few months, staff have met with zoos and aquaria representatives, other exhibitors, members of the reptile industry, and the Florida Department of Agriculture and Consumer Services' Division of Aquaculture to receive informal input on possession of specific species on the Federal Injurious list, importation of these and other nonnative species, and potential rule changes.

Photo: Members of the public at a Python Management Workshop November 2017. (FWC)

Identified Challenges

- Confusing Rule Language
- Rules lack clear definitions
- Importation rule lacks evaluation criteria
- High Risk Injurious Species



During this process, it became apparent that the structure of the Chapter 68-5, F.A.C. was confusing, cumbersome and difficult for the public to understand. Many terms within the nonnative species rule are not well defined and cause confusion when individuals apply for permits and when staff are trying to determine if they qualify for the permit requested. Importation language in rule is also vague in regards to when a species should be allowed to enter the state, and what criteria the commission will use to evaluate those requests. Not all stakeholders agree with regulating some of the Injurious Species or what defines risk.

Photo: Dwarf mongoose (Wikimedia Commons). This species is listed as "Injurious" but not regulated in Florida as prohibited or conditional.

Steps Moving Forward

- Clarify rules
- Improve rule language
 - Provide definitions of key terms in rule
 - Address importation language
- Address high risk injurious species

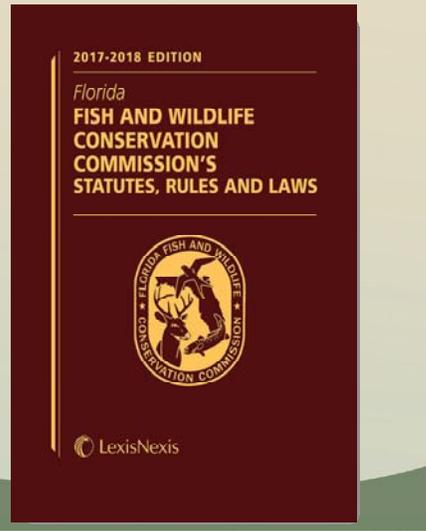


In order to appropriately respond to the challenges presented by invasive species, staff have identified a stepped approach.

Photo: Brown tree snake – pictured here in Guam - are listed as Injurious only (Janelle Lugge).

Clarify Rules

- Proposed Rule Restructure
 - Separate out importation and introduction language, possession requirements, and lists of species
 - Add a section for rule intent
 - Add a section for future definitions



Staff have recommended that Chapter 68-5 F. A.C. be restructured and filed a Notice of Rule Development to accomplish that in July 2018. This step is considered a non-substantive change – it does not change the specifics of the rule, and neither increases or decreases regulatory requirements but simply organizes it to improve clarity and conciseness. This step would help set the stage for future rule development.

Improve Rule Language

- Definitions of Key Terms
 - Commercial Use
 - Public Exhibition
 - Closed Tank System
 - Personal Possession
- Importation Permit Criteria



Staff will draft rule language that would add definitions of key terms, such as commercial use, public exhibition, closed tank system, and personal possession.

Currently there are no criteria in Chapter 68-5 that address how requests for permits to import nonnative species are evaluated. Staff will draft new criteria to be added to the rule for the purpose of providing clarity and predictability for those applying for permits.

Staff will develop definitions and permit criteria through engagement with stakeholders and solicit stakeholder input on proposed draft rule changes.

Photo: Staff providing a presentation on Python Management in South Florida, November 2017. (FWC)

Address High Risk Injurious Species

Explore adding the following to the Prohibited List

- Mammals: meerkats/mongoose, raccoon dog, dhole, brushtail possum, flying foxes
- Birds: red-whiskered bul bul, dioch, Java sparrow, pink starling
- Reptiles: Brown tree snake, yellow anaconda, Beni anaconda, Deschauensee's anaconda



These species are listed by the USFWS as Injurious meaning they can not be imported into the U.S. They are not on the State of Florida Prohibited List and therefore can be imported into Florida from other states. Staff utilized recent risk assessments or conducted new risk screenings determined these species present a high level of risk to the state.

Long-term approach

- Continue to conduct risk screenings and assessments
- Propose additions to Conditional or Prohibited Lists
- Continue management of nonnative species that are being encountered in the wild in Florida



Focusing on prevention staff will continue to conduct additional risk screenings and assessments. Additional species may be considered for regulation in the future, as staff continue to assess the potential risk of nonnative fish and wildlife that enter the state and the wild in Florida. Management and control of existing established nonnative species will continue and expand as resources allow.

Photos: Nile perch have a wide gape and large appetite, and are listed as both Conditional and Injurious (CatFeet/Flickr).

Argentine black and white tegus are spreading in south and central Florida and are documented as having an impact on native fish and wildlife (FWC).

Staff Recommendations

Address Rule structure to aid in future rule making

- *Approve Chapter 68-5, F.A.C., rule restructure without further hearing unless requested*

Approve staff moving forward to work with stakeholders, draft definitions and importation criteria, and add some species to the Prohibited Species list

- *Staff would seek approval of draft language in December commission meeting*



Staff have recommended that the chapter be restructured and filed a Notice of Rule Development to accomplish that in July 2018. This step is considered a non-substantive change – it does not change the specifics of the rule, and neither increases or decreases regulatory requirements but simply organizes it to improve clarity and conciseness.

Further, staff request to move forward to workshop rule concepts. The workshops would focus on adding species to the Prohibited list, developing definitions for the rule, and clarifying permitting issuance requirements for importation of nonnative species. Draft rules will be brought to the December Commission meeting for consideration. Staff would seek final consideration of proposed rule changes at a subsequent Commission meeting.