

Written Testimony on oversight hearing “How to Constrict Snakes and Other Invasive Species”

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As matter of great importance to the South Florida Water Management District (District), we thank you for the opportunity to submit this testimony to the House Subcommittee on National Parks, Forests and Public Lands and the Subcommittee on Insular Affairs, Oceans and Wildlife of the House Committee on Natural Resources. While our regional agency maintains more than 4,500 miles of flood protection and water management canals/levees in 16 Florida counties, the South Florida Water Management District is also charged with protecting and restoring the greater South Florida ecosystem, including Lake Okeechobee, the largest natural lake in the southeastern United States, and America’s uniquely diverse Everglades *River of Grass*. Additionally, the South Florida Water Management District is the largest single landowner in the region with more than one million acres of public land within our boundaries. Our continued ability to successfully restore and manage these important natural resources is hampered by the growing presence of non-native, free-ranging giant constrictor snakes and other invasive animals.

Our written testimony today focuses on the difficult task land managers in South Florida face in managing invasive, giant constrictors and more importantly, the need for comprehensive preventative measures to limit new introductions of non-native animal species. We have a long history of successful invasive plant management experience, but only recently have we had to commit more and more resources to the emerging populations of invasive animals appearing across our landscape. If effective preventative programs were in place nationally to limit introductions of non-native animals, these critical taxpayer-funded resources – and the investments being made in their environmental restoration – could be redirected to other important resource management efforts. Today, however, the negative impacts from the unrestricted importation of new pest animals require active responses on our part. Effective prevention of additional introductions of potentially invasive animals, as previously proposed in H.R. 6699, is the only path to prevent these costs from continually increasing over time.

While Florida, California and Hawaii are the states most impacted by introduced invasive species, every state is affected. Globally, exotic invasive species, including pest animals, weeds and pathogenic diseases are a major cause of global biodiversity decline. In particular, non-native animals compete for food and habitat, upset existing predator/prey relationships, degrade environmental quality, spread diseases and, in our case, may threaten the integrity of flood protection levees and canal banks, and electrical power delivery. Nationally, more than 50,000 species of introduced plants, animals and microbes cause more than \$120 billion in damages and control costs each

year (Pimentel 2005). Already, 192 non-native animal species are established in Florida, and discoveries of newly established species are an annual occurrence in our State. Yet, no formally organized networks of surveyors are looking for new species. We urgently need to develop methods and programs to forecast and respond to the potential economic loss, environmental damage and social stress caused by both newly arrived non-native animals along with long-established invasive species.

Collaborative management, education, training and broadening public awareness – combined with thorough population analyses – may provide a foundation for building effective control strategies and tools. Several states, including California, Hawaii and Idaho, are devising non-native animal invasion prevention programs and/or lists. Federal initiatives should include a framework to unify and standardize these efforts and provide a critical framework to evaluate current and potential problems.

Current measures to monitor and control giant constrictors

Dedicated funding is limited. Yet, governmental agencies, public universities and the private sector are currently engaged in giant constrictor management on several fronts – control, monitoring, regulatory, research and outreach. Ongoing research to understand the natural history of the Burmese python (*Python molurus bivattus*) in Florida and to develop control tools remain a high priority as we have few tools for free-ranging giant constrictors. Available tools for removing reptiles generally include trapping, toxicants, barriers, dogs, and introduced predators. Visual searching and pheromone attractants are also potential control tools. However, many existing methods are often inappropriate in sensitive environments where impacts to non-target species are unacceptable. Currently, inter-agency python control efforts in and around the Everglades region are limited to visual searches, hunting, radio-telemetry and trapping. Since 2005, District personnel have worked closely with other agencies to survey for and remove pythons, fund research and development, and promote prevention of new introductions. We are currently developing an agreement with the U.S. Department of Agriculture's Wildlife Services branch to test control strategies in the eastern Everglades.

Systematic tracking of invasive animals in South Florida remains a significant challenge. There are no established monitoring programs for the majority of invasive animals in the region. When monitoring is conducted, data is often collected using a wide range of methods and spatial scales across jurisdictional boundaries. The resulting patchwork of data for invasive animal populations are not readily comparable, making it difficult to establish reliable baseline information on the status of most invasive animals. Agencies should work toward uniform and consistent reporting methods to build regional monitoring frameworks. Such interagency coordination could lead to much-needed baseline population and long-term data to gauge the success of management strategies.

In a small step toward that goal, the District, the National Park Service (NPS), the Florida Fish and Wildlife Conservation Commission (FWC) and The Nature

Conservancy have developed a protocol for systematic visual searches of large constrictor snakes and other invasive reptiles. Borrowing from the experiences of agencies engaged in brown tree snake (*Boiga irregularis*) management in Guam (Campbell et al., 1999), this collaborative effort has produced a common monitoring and database protocol that can be adopted by agencies and parties interested in assisting with monitoring efforts. In July 2009, the District formed its own invasive animal search team to assist with regional monitoring of Burmese pythons and other priority invasive animals. Comprised of District staff who regularly traverse the Everglades landscape during their normal job duties, the team conducts systematic searches along levees, canals and roadways, and report findings to District and FWC responders. This effort is intended to complement similar efforts in Everglades National Park (ENP), the Florida Keys and the FWC python bounty program.

Current measures to prevent new introductions to Florida's Everglades

Clearly, the most effective and financially efficient approach to prevent biological invasions is to prevent entry. As regional land managers without regulatory authority, the District looks to state and federal wildlife regulators to limit the number of potentially invasive animals entering Florida. Without comprehensive, proactive screening and predictive risk assessment for potential invaders, land managers are forced to respond to the inevitable establishment of non-native species. In the majority of cases, eradication efforts are unsuccessful, and long-term management efforts must be mounted at great cost. To increase the likelihood of eradication success, land managers and scientists in the Everglades region are "working across fence lines" to develop an Early Detection/Rapid Response (EDRR) network aimed at removing newly discovered populations before they become permanently established. These efforts are coordinated through interagency groups, such as the Everglades Cooperative Invasive Species Management Area, but lack dedicated funding and sufficient staffing resources. Given the long-term cost of managing established invasive species, cost-efficient EDRR programs and risk-reducing importation regulations should be adopted at the state and federal level.

In 2005, the Florida Fish and Wildlife Conservation Commission created an invasive animals management section. One of its key recommendations led to a new Florida rule limiting commerce in "reptiles of concern," including the world's five largest non-venomous snakes and the carnivorous Nile monitor. These animals were selected as most threatening because of their large size and extremely predatory natures. Now in force in Florida Administrative Code, the rule requires \$100 annual possession permits, and the animals must be identified via implanted microchip.

Adopting a preventative approach to biological invasions at the national level

Introduction pathways – Florida's pets on the loose

In Florida, the introduction of invasive pest animals has primarily been through the pet trade and live animal importation. Other pathways of introduction include overseas transport of ballast water, which has introduced zebra and quagga mussels (*Dreissena*

polymorpha and *D. bugensis*) to North America. These Asian mussels imperil our aquatic ecosystems and clog commercial and public utility intakes and processes. Accidentally imported within cargo pallet wood, the redbay ambrosia beetle, (*Xyleborus glabratus*) now threatens several laurel tree species in the southeastern U.S. But, to date, Florida's most threatening vertebrate pests have come to us via the pet trade.

When a species successfully establishes a new population in South Florida, whether accidentally or intentionally released, the impacts may be broad and devastating – or they may barely be detected. Better predictive methods could gauge the risk posed by specific animals before they are regularly imported and bred as pets. Screening and risk assessment methods are imperfect, but they must be developed. Several nations, including Australia and New Zealand, already screen for importation risks and proscribe importation of potentially harmful animals. Further, new economic research indicates that proactive screening measures economically benefit nations that use them. These programs may provide valuable guidelines and lessons-learned in the control of exotic animals.

The United States should build upon the successes of other nations' risk analysis programs to better regulate non-native animal imports and determine the appropriate levels of limitations. Practices can be developed that do not impose tremendously adverse impact on the pet industry, yield taxpayer savings and decrease threats to the environment.

Benefits of Public education

Public education programs can be creative, such as the nationally branded Habitattitude™ effort led by the U.S. Fish and Wildlife Service Aquatic Nuisance Species Task Force. This program advises the public at pet shops never to release exotic aquatic fish and plants into any U.S. waters. Yet, regular releases continue – as evidenced by frequent appearances of new species in U.S. waters.

For example, sailfin and suckermouth catfish (*Pteryglichthys disjunctivus* and *Hypostmus plecostomus*) from South America appeared only within the past decade in Lake Okeechobee. Commonly sold as fish tank “vacuum cleaners,” these fish dig deep burrows in sediments and potentially threaten the integrity of canal banks and flood protection levees. They are also overtaking areas of rocky lake bottom, depriving native fish of their preferred spawning sites. The ultimate impacts of the establishment of these species in South Florida are still unknown, but many thousands of the fish already inhabit our lakes and canals, disrupting commercial fishing and displacing natives.

Innovations are needed

Creative solutions may enable ongoing trade in some otherwise invasive species. For instance, Asian grass carp are legal for use as aquatic weed control agents in Florida only when the fish are certified as triply-chromosomed, sterile varieties created by treatments of the eggs. Research is needed to identify how other species could be rendered sterile or unable to establish wild populations. Tropical species could be legal for sale only outside their climate tolerance range, only males of a species may be legal

for sale, or sterile hybrids may be developed. It is simply too irresponsible and too dangerous to keep trading in pest organisms capable of unlimited spread when, with appropriate research, credible ways may be found to allow trade in some of these species.

Select invasive species in South Florida

Burmese python

The non-native Burmese python is an apex predator that is known to prey upon more than 20 native Florida species. Notable among these are the federally listed Key Largo wood rat, white-tailed deer, American alligator, bobcat and numerous wading birds common to the Everglades. The South Florida Water Management District is deeply committed to preserving and restoring South Florida's environmental health and, unfortunately, the Everglades ecosystem is now home to these exotic snakes. A habitat generalist, the Burmese python is now found in all habitat types within the Greater Everglades region. Attempts to manage Burmese pythons divert taxpayers' funds away from urgent primary restoration and protection tasks. Yet, failure to seek controls will leave this aggressive animal as a serious impediment to our Everglades restoration progress. The Burmese python also threatens agricultural interests, as likely prey also includes small livestock.

The significant value of current sales of the Burmese python would be affected if commerce in the species is regulated. Such economic loss could have been avoided if the Burmese python had earlier been identified as a serious potential pest, and trade had focused on smaller, less-threatening snakes.

Since 2000, the South Florida Water Management District, Everglades National Park and other involved agencies have removed more than 1,300 Burmese pythons from the Everglades. As an apex predator and prolific breeder, Burmese pythons threaten ecosystem restoration efforts and natural wildlife, including species already threatened or endangered. In a recent, disturbing development, regional biologists have confirmed an established population of northern African pythons (*Python sebae*) on SFWMD and Miccosukee Indian lands less than 5 miles from the Florida Everglades. The northern African python, identified as a high risk in the 2009 USGS Risk Assessment for Giant Constrictors, presents a similar, if not potentially greater, environmental threat as the Burmese python.

South American apple snails

Several species of South American apple snail are established in South Florida waters. The largest of these is the island apple snail (*Pomacea insularum*) reaching tennis ball size and producing many times more eggs than the smaller, native Florida apple snail. In Asia, these voracious mollusks are known to strip rice fields and wetlands of vegetation. They are displacing our native Florida apple snail with sheer overwhelming numbers and reportedly feed upon the native snail. Apple snails are the sole food of the federally endangered Everglades snail kite and are also an important food for many other animals. Lake Tohopekaliga, an 18,000-acre water body near Orlando, Florida,

now harbors exceptionally large numbers of island apple snails. During recent years of drought, this lake has been a critical refuge for snail kites. Because the exotic snails are larger, heavier and stronger than the native snails, young snail kites have difficulty lifting and opening them to extract their meat. As a result, many young kites are not surviving to maturity there. Also, Lake Munson in the Florida panhandle was historically heavily vegetated, yet today has no vegetation due to the South American apple snail's arrival and proliferation. Rice crops in South Florida and the vast wetlands of the Everglades may become fodder for this rapidly spreading, readily reproducing pest snail. These snails are still available through the pet trade.

Monk parakeets

The South American monk parakeet (*Myiopsitta monachus*) is firmly established in South Florida, perhaps numbering as many as 150,000. To date, their numbers have doubled roughly every five years. Stable North American populations of the bird may also be found from Connecticut to Colorado. They breed rapidly and extensively damage grain, fruit and citrus crops in their native Argentina. As escaped pets in South Florida, they readily establish breeding colonies and build large colonial nests, often choosing power poles and niches in power substations and transformers. The accumulated nest materials damage power transmission hardware with accumulated humidity and serve as sources of ignition. Significant crop damages seem inevitable, but have not yet been documented in Florida. They are outlawed in many states, yet thousands are still sold annually in others. Enacting federal risk assessment legislation will provide a standardized, nationwide mechanism for limiting further incursions of this species.

Green iguana

Central American green iguanas (*Iguana iguana*) already number in the hundreds of thousands in South Florida. They are herbivores and prefer riparian sites where they dig extensive burrows on slopes such as highway embankments, canal banks and flood protection levees. The resulting erosion threatens canals and levees critical for flood control and water management. Their appetite for ornamental plants and large size make them an unwanted pest to homeowners. Their burgeoning numbers in South Florida spurred Palm Beach County commissioners to petition the Florida Fish and Wildlife Conservation Commission to add them to the state list of regulated "Reptiles of Concern." They are sold for as little as \$5 in area pet stores.

Spiny-tailed iguana

South American spiny-tailed iguanas (*Ctenosaur similis*) are also established in Florida and are known to occupy the burrows of the federally threatened gopher tortoise. Further, the USDA Wildlife Services has confirmed that this lizard preys on juvenile gopher tortoises. This is another aggressive predator threatening South Florida's environmental preservation and restoration goals.

Nile monitor

The African Nile monitor (*Varanus niloticus*) is now established in a 20-square-mile area around Cape Coral, Florida and the Homestead area in southeastern Florida. This

carnivorous lizard grows to seven feet and is highly aquatic, climbs well and runs very quickly. It consumes a large variety of prey including the state-protected burrowing owl. Stomach content analyses also indicate that the Nile monitor is a voracious egg eater, raising serious alarm for many of Florida's threatened native animals that are egg-bearing and/or occupy burrows. Wildlife biologists consider the Nile monitor to be a serious threat to gopher tortoises, burrowing owls, Florida gopher frogs and other ground nesting species. According to the U.S. Fish and Wildlife Service Law Enforcement Management Information System (LEMIS), there were more than 60,000 Nile monitors imported through Florida's ports between 2000 and 2004.

Conclusion

While the South Florida Water Management District and other agencies try to contain the documented damage and growing threat of existing invasive animals in Florida, the flow of potentially harmful exotic animals into the state continues. For example, nearly 1,000 venomous puff adders were imported through Florida's ports between 2000 and 2005 (LEMIS data). This African viper is common in its native range and is considered to be one of Africa's most dangerous snakes. The Oriental water dragon is another popular imported species with a potential for establishment in South Florida. Between 2000 and 2005, more than 210,000 Oriental water dragons were imported through Florida ports (LEMIS data). More effective tools are needed to accurately predict if either of these reptile species will become established in Florida and elsewhere in the United States. Rather than wait for the next imported Burmese python or other pet to become established in the United States, the nation should take a risk-averse approach to regulating animal importation and interstate commerce. Such action is urgently needed to protect our environment, economy and quality of life – not just in Florida but throughout the nation.

Citations

Pimentel, D., L. Lach, R. Zuniga, and D. Morrison. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. *Ecological Economics* 52:273-288.

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