

TESTIMONY OF MARCY HEACKER, SMITHSONIAN INSTITUTION, NATIONAL MUSEUM OF NATURAL HISTORY, FEATHER IDENTIFICATION LAB BEFORE THE HOUSE SUBCOMMITTEE ON NATIONAL PARKS, FORESTS AND PUBLIC LANDS AND THE SUBCOMMITTEE ON INSULAR AFFAIRS, OCEANS AND WILDLIFE OF THE HOUSE NATURAL RESOURCES COMMITTEE FOR THE JOINT OVERSIGHT HEARING ON “HOW TO MANAGE LARGE SNAKES AND OTHER INVASIVE SPECIES”

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Introduction

Members of the Subcommittees, I am Marcy Heacker, Research Assistant with the Smithsonian Institution (SI), Feather Identification Lab (FIL) which is housed in the Division of Birds at the National Museum of Natural History (NMNH) in Washington, D.C. I greatly appreciate the opportunity to address the Subcommittees on such an important wildlife subject. Today, I will be presenting the findings from a feather identification project done by Dr. Carla Dove, Program Director of the Smithsonian FIL in conjunction with Ray “Skip” Snow of the South Florida Natural Resources Center, Everglades National Park (ENP), Homestead, Florida. The purpose of this project was to analyze and document bird species eaten by Burmese Pythons in the ENP from 2003 through 2007. The information presented here is based on the article “Birds Consumed by the Invasive Burmese Python (*Python molurus bivittatus*) in Everglades National Park, Florida” by Carla J. Dove, Ray W. Snow and Michael R. Rochford. This article is currently pending publication; Dr. Dove has given permission for the summary and use of this information and that I present it in her stead.

The Burmese python is well established in the Everglades National Park (ENP), Florida. Burmese pythons are considered the largest subspecies of the Indian python (*Python molurus*). Adults can grow to more than 12 feet long and can weigh over 150 lbs. They were first recorded in ENP in 1979 and have since been observed or taken from canals, along main park roads, and mangrove backcountry areas and have also been documented as actively breeding in the wild. The introduction of this snake to the ENP is almost exclusively from released or escaped snakes originating from the pet trade. Over the past two decades, the Burmese python has spread throughout ENP and can now be found in the Florida Keys and elsewhere in Florida.

Pythons and other constrictor snakes are predators with a widely varied diet that is a testament to the opportunistic nature of these organisms. Typical python food items include mammals, amphibians, lizards, snakes, birds, and fish; essentially, anything they can catch. Identifying and understanding the specific dietary habits and prey species of the Burmese python in ENP is essential to interpret the impact of this invasive species on the native Florida fauna.

Study Methods

The Smithsonian Feather Identification Lab specializes in identifying bird species from degraded and fragmented feather remains from bird strikes (bird/aircraft collisions). This identification service is primarily for military and civil aviation personnel in an effort to understand the dynamics of bird strikes, reduce the damage costs due to bird strikes, and ultimately increase the

overall safety of flying. This expertise in feather identification has led to the Smithsonian FIL frequently being called upon to identify bird species from other sources of avian material such as anthropological artifacts, law enforcement cases, food contaminants, and prey remains studies (as in this case for Burmese pythons).

Standard identification methods for all cases examined at the Smithsonian FIL consist of three different ways to identify bird/feather material. First, intact carcass parts and whole feathers are directly compared to museum study specimens housed in the extensive collections of the Smithsonian NMNH Bird Division. Second, microscopic examination of the downy (plumulaceous) portion of feathers can indicate general bird groups; and lastly molecular analysis of blood/tissue in the sample. Molecular analysis is routinely applied to bird strike cases. However, many times the material from prey remains is too degraded to extract viable DNA using the standard lab molecular protocols established for bird strike cases. Molecular analysis of the prey remains material was not applied in this project.

For this study, sixty-five Burmese pythons were collected during all months of the year from various locations in the Everglades National Park (2003-2007). In most cases, standard body measurements and sexing of the pythons were done at the ENP. Intestinal tracts or gut contents of each individual Burmese python was sent to the Feather Identification Lab for possible species identification. After initial sample sorting and cleaning, identification methods were applied depending on the type, quality and quantity of material, and on the degree of digestion of each sample. The prey remains material from the pythons were varied and included: whole/partial bird carcasses, whole feathers, feather fragments, and partial bones.

Final identifications were based wholly, or in combination, on whole feather/partial carcass comparison with museum specimens, comparison of bone fragments with museum skeletal references, and microscopic examination of feather fragments. Geographical location and time of year of the sample was also considered to narrow down possible bird species. When possible, the minimum number of individuals of the same bird species were documented for each sample.

Results

The sex of sixty-four of the pythons was determined and showed an almost equal ratio of males (n=34) to females (n=30). Body measurements for sixty-two of the pythons indicate that approximately 70% of the snakes in this study were adults. No bird eggs or chicks were found in any of the samples in this study.

Attachment 1 details the bird species identified from the Burmese pythons sampled for this study. Twenty-three (23) species of birds representing 9 taxonomic orders were identified from the 65 Burmese python samples. A total of 68 individual birds were recorded including 42 samples that were identified to the species level; 14 samples that were identified to the taxonomic family level, and 12 samples that were identified only as “Aves” due to lack of diagnostic feather material.

Of the 9 taxonomic orders of birds documented in this study, rails and rail allies (order Gruiformes) were the most numerous prey items of the ENP Burmese pythons - represented by 8

different species and 29 individual birds. One of these rail “allies”, the Limpkin (*Aramus guarauna*), was found in 7 different samples making it the most numerous species identified in this study. The Florida Fish and Wildlife Conservation Commission consider the Limpkin a species of special concern (<http://myfwc.com/imperiledspecies/species.htm>).

Hérons and bitterns (order Ciconiiformes) were also heavily preyed upon and the species identified in this study include 6 of the 13 species that occur in Florida. Three of the species identified in this group - Little Blue Heron (*Egretta caerulea*), Snowy Egret (*Egretta thula*), and White Ibis (*Eudocimus albus*) are also listed as species of special concern by the Florida Fish and Wildlife Conservation Commission. The remains of a Wood Stork (*Mycteria americana*) was found in one of the samples in this study – this species is currently on the federal endangered species list (<http://www.fws.gov/endangered/wildlife.html>).

A wide variety of other types of birds were found in the Burmese python prey remains of this study. They include: Magnificent Frigatebird (*Fregata magnificens*), Anhinga (*Anhinga anhinga*), Pied-billed Grebe (*Podilymbus podiceps*), Blue-winged Teal (*Anas discors*), Domestic Chicken (*Gallus gallus*), Whimbrel (*Numenius phaeopus*) – a type of shorebird, pigeons/doves, and various songbirds/passerines. The average size of these prey species is also broad with average weights ranging from 0.4 ounce for the House Wren to over 5 pounds for the Wood Stork and Great Blue Heron; the latter two species can have body lengths over 3 feet long and wingspans over 5 feet (Sibley Guide to Birds of Eastern North America, Alfred A. Knopf, Inc., 2003).

Conclusion

In summary, the bird species identified from this study sample of Burmese pythons from the Everglades National Park:

- 1) Are very broad in species diversity
- 2) Are significant in body size including birds over 3 feet in length and over 5 pounds
- 3) Include one livestock species, the chicken
- 4) Include the Limpkin, the most common species found in this sample of prey and a species of concern for the state of Florida
- 5) Include one federally endangered species – the Wood Stork

It should also be considered that state of Florida is an important region for the Atlantic flyway migratory bird route – making the area crucial for not just native species but for migrating birds that overwinter or pass through the state. Also, it is well known that pythons and other constrictor snakes do not only prey on birds – mammals are just as vulnerable to these efficient predators. Additionally, the rapid spread in numbers and distribution, plus the efficient and opportunistic predatory nature of these non-native snakes challenges the development of avoidance and survival strategies of prey species – the prey are simply up against a highly successful predator that they have not naturally evolved with.

Given the information provided in this testimony, we conclude that the Burmese python, and other invasive, non-native constrictor snake species, are a considerable threat to the natural fauna of the state of Florida, endangered and threatened wildlife, livestock, domestic pets and potentially to humans. We support the concept of continued study, education, and assessment of

this problem; regulated hunting of designated snake species in areas like the Everglades; and support federal regulation banning the importation and distribution of potentially injurious, invasive snake species.

This concludes my testimony. Again, I would like to sincerely thank the Subcommittees for the opportunity to present this information on such an important subject. I would be happy to answer any questions you may have.

Attachment 1: List of bird species and number of individuals found in the Burmese python samples from the Everglades National Park with total number of individuals of each taxon. Average species weights from Sibley Guide to Birds of Eastern North America, Alfred A. Knopf, Inc., 2003.

Bird Identification	# of Individuals	Ave. Bird Weight
PELECANIFORMES (Pelicans and Pelican Allies)		
Anhinga (<i>Anhinga anhinga</i>)	1	2.7 lb
Magnificent Frigatebird (<i>Fregata magnificens</i>)	1	3.3 lb
PODICIPEDIFORMES (Grebes)		
Pied-billed Grebe (<i>Podilymbus podiceps</i>)	5	1.0 lb
undetermined grebe species (family Podicipedidae)	1	
CICONIIFORMES (Hérons, Egrets, Bitterns)		
Great Blue Heron (<i>Ardea herodias</i>)	1	5.3 lb
Great Egret (<i>Ardea alba</i>)	1	1.9 lb
Little Blue Heron (<i>Egretta caerulea</i>)	1	12 oz
Snowy Egret (<i>Egretta thula</i>)	1	13 oz
White Ibis (<i>Eudocimus albus</i>)	4	2.0 lb
Wood Stork (<i>Mycteria americana</i>)	1	5.3 lb
undetermined heron/egret species (family Ardeidae)	1	
ANSERIFORMES (Waterfowl)		
Blue-winged Teal (<i>Anas discors</i>)	1	13 oz
undetermined waterfowl species (family Anatidae)	2	
GALLIFORMES (Chickens, Turkeys, Gamebirds)		
Domestic Chicken (<i>Gallus gallus</i>)	1	~ 1-3 lb (variable)
GRUIFORMES (Rails and Rail Allies)		
American Coot (<i>Fulica americana</i>)	3	1.4 lb
Clapper Rail (<i>Rallus longirostris</i>)	2	10 oz
Common Moorhen (<i>Gallinula chloropus</i>)	1	11 oz
King Rail (<i>Rallus elegans</i>)	4	13 oz
Limpkin (<i>Aramus guarauna</i>)	7	2.4 lb
Purple Gallinule (<i>Porphyrio martinica</i>)	1	8 oz
Sora (<i>Porzana carolina</i>)	1	2.6 oz
Virginia Rail (<i>Rallus limicola</i>)	1	3 oz
undetermined rail (family Rallidae)	9	
CHARADRIIFORMES (Shorebirds, Gulls)		
Whimbrel (<i>Numenius phaeopus</i>)	1	14 oz

Bird Identification	# of Individuals	Ave. Bird Weight
COLUMBIFORMES (Pigeons, Doves)		
undetermined pigeon/dove (family Columbidae)	1	
PASSERIFORMES (Perching/Songbirds)		
Eastern Meadowlark (<i>Sturnella magna</i>)	1	3.2 oz
House Wren (<i>Troglodytes aedon</i>)	1	0.4 oz
Red-winged Blackbird (<i>Agelaius phoeniceus</i>)	1	1.8 oz
undetermined bird species (Aves)	12	