



Year of the Snake News

No. 5

May 2013

www.yearofthesnake.org



by Jen Williams, Ph.D.

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Commission

The 2013 Python Challenge™ —what was this event all about anyway?

Before that question is answered, the Burmese Python (*Python bivittatus*) first needs to be introduced. Burmese Pythons have been reported in Florida since 1979. Its native homeland includes India, lower China, the Malay Peninsula and some islands of the East Indies. While it's not entirely certain how this species became established into the wilds of Florida, prevailing theories are that it escaped from breeding facilities that were destroyed in Hurricane Andrew or that enough unwanted python pets have been released to create a breeding population.

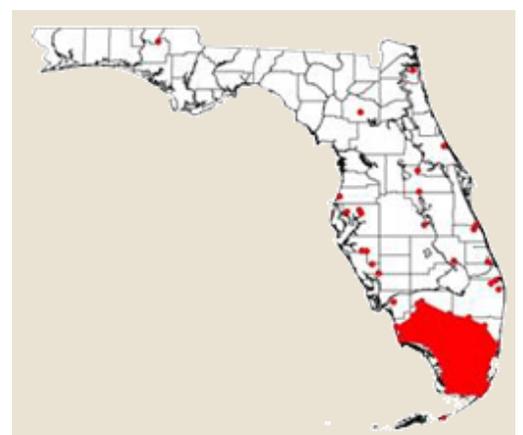
What makes the Burmese python so successful in south Florida?

- The climate in south Florida is very similar to that in its native range: tropical to subtropical.
- There are very few predators of adult pythons in Florida.
- It has a generalist diet: a wide variety of bird and mammal species (both native and nonnative to south Florida) have been found inside Burmese Pythons, as well as a small number of American Alligators (*Alligator mississippiensis*).
- Burmese Pythons can lay large clutches of eggs—up to 107, although the average clutch size in south Florida ranges from 30 to 40.
- They can live for over 20 years.
- They are able to survive long periods without eating.

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Get Your May Photo Contest Calendar



Green as the grass and just as harmless! May Photo Contest winner **Jonathan D. Mays** found this **Smooth Greensnake** (*Opheodrys vernalis*) on the perfect background. The runner-up photo is another great example of cryptic coloring in snakes, in a much different environment. Download your free May calendar to see at <http://parcplace.org/images/stories/YOS/YearoftheSnakeCalendarMay.pdf>.

Call for Photos for the 2013 Year of the Snake Calendar Photo Contest

We are seeking close-up, digital photos of snakes, preferably in their natural habitats or within an educational or conservation context. One winner will be selected each month to be the featured photo as part of the Year of the Snake online calendar. Runner-up photos will also be included in the calendar. Additionally, all submitted images will be considered for use in the Year of the Snake monthly newsletter and website as well as other Year of the Snake-related conservation, outreach, and educational efforts. Give us your best shot! For more information and for entry details, please visit http://parcplace.org/images/stories/YOS/YOS_Photo_Contest.pdf.

The annual **Snake Count, May 18 - 27**, would be a great time to get out and take some photos of seldom-seen snakes! See [page 14](#) for details of how you can participate.

2013 YEAR of the Snake

Visit www.yearofthesnake.org

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AMPHIBIAN AND REPTILE CONSERVATION

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A Year to Highlight

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Monthly Newsletter

Monthly Photo Contest & Calendar

Year of the Snake outreach posters:
Available at www.yearofthesnake.org!

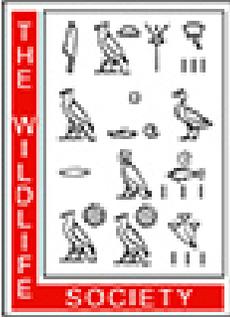
More Year of the Snake Stamps



It's not at all surprising that Taiwan is celebrating the Year of the Snake with stamps (right). It's a bit more surprising that Estonia issued a stamp, as well (left).



Year of the Snake Collaborating Partners



The Wildlife Society

www.wildlife.org

The Wildlife Society was founded in 1937 and is a non-profit scientific and educational association of nearly 11,000 professional wildlife biologists and managers, dedicated to excellence in wildlife stewardship through science and education. Our mission is to represent and serve the professional community of scientists, managers, educators, technicians, planners, and others who work actively to study, manage, and conserve wildlife and its habitats worldwide.

The Virginia Herpetological Society (VHS)

www.virginiaherpetologicalsociety.com

Virginia Herpetological Society is a nonprofit 501(c)(3) charitable organization that supports scientific research and conservation of our native reptiles, amphibians and their associated habitat. Public education is included as one of our primary goals. Much of our public educational material regarding snakes can be found on our website.



Research for Reptiles

www.research4reptiles.biz

Research 4 Reptiles' mission is to provide challenging, hands-on, field-based programs for participants ages 12 years to adult to inspire enthusiasm for and understanding of native Illinois reptile and amphibian species. Our educational programs are unique in that they allow participants to assist in ongoing herpetological research studies in a small group setting and to learn using critical inquiry methods. All programs emphasize the importance of herpetological species' conservation and environmental protection.

Life Is Short But Snakes Are Long

<http://snakesarelong.blogspot.com>

Andrew Durso is a PhD student at Utah State University, where he studies the behavior, physiology, and ecology of toxin-resistant snakes. The many fascinating aspects of snake natural history have led Andrew to research this topic, which is quite narrow compared to his interest in snake ecology as a whole.



Life is Short, but Snakes are Long

Additionally, his work brings him into frequent contact with the serious need for snake conservation, which really requires holistic conservation of ecosystem structure and function, on which human society depends. Andrew believes that we can only accomplish this goal through education, and that is partly why he decided to publish this blog. The title is a quote by David Quammen, one of the best science writers around.

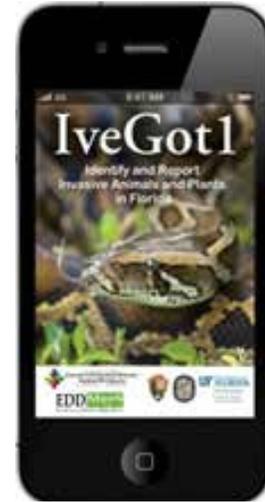
Our growing list of Collaborating Partners will be featured in future newsletter issues.

If you are interested in contributing to the Year of the Snake efforts, please send an email to parcyearofthesnake@gmail.com with a brief description of your organization and its efforts. Our full list of partners can be found at: <http://www.parcplace.org/news-a-events/2013-year-of-the-snake/271.html>.

Are You an Educator or Interpretive Naturalist?

We are working to create resources for teachers and naturalists! If you are willing to share, please send your unit materials, educational program information, or PowerPoint presentations to parcyearofthesnake@gmail.com. Please include your name, the name of your school/nature center or organization, and location. If you did not create the materials, please be sure to tell us where you found the materials.

Python Challenge 2013, continued from p. 1



Haven't natural resource professionals been doing anything to remove Burmese Pythons from the wild or to limit their spread?

Yes, multiple management strategies have been taken, including (but not limited to):

2006: The Florida Fish and Wildlife Conservation Commission (FWC) established the Exotic Pet Amnesty Program, for which the FWC hosts events where the public can surrender their exotic pets and FWC makes every effort to place healthy pets with qualified adopters. The purpose of this program is to discourage pet owners from releasing their unwanted pets into the wild and to promote responsible pet ownership. Some aspects of this program are funded by the Everglades National Park (ENP).

2008: The FWC listed Burmese Pythons as reptiles of concern. This classification mandated an annual license, permanent marking, and increased security requirements for ownership.

The Nature Conservancy (TNC) began the Python Patrol Program in the Keys; the program spread to the mainland in 2010 and is currently funded by ENP. For this program, the TNC trained employees with state and federal agencies, utility companies, and other professionals who work in natural areas that are likely to encounter pythons in their work how to identify and capture Burmese Pythons. The public can call 1-888-Ivegot1 when they see a Burmese Python. This number (which is now also a phone app) was developed for use in the Keys as well, but started being used in the rest of south Florida in 2011. It is currently answered by FWC who contacts one of 200 trained responders to find and remove the animal(s). This phone number can be used by the public to report any exotic species and is also the means through which the public can reach Pet

Amnesty Program staff.

2009: The FWC enacted an executive order allowing pet owners to surrender their reptiles of concern 24 hours a day, 7 days a week, even if the owners were not licensed to have the reptiles of concern. No longer did pet owners have to wait for a planned Pet Amnesty Day event. A rule was established in 2010 to make this 24/7 liberty permanent.

The FWC established the Python Removal Program, which allows the public to get permits from FWC to remove pythons from three public hunting areas during any time of the year (i.e., not just during an established hunting season). The FWC partners with another state agency, the South Florida Water Management District (SFWMD), in this program. The SFWMD has many public lands on which the python permit holders are authorized to remove pythons. No pythons can be kept; they must be killed on site or deposited with scientists at the University of Florida (UF) for research.

2010: The Florida Legislature wrote into law a prohibition on personal possession of the Burmese Python and other conditional species; however, persons owning these animals prior to enactment of this law were allowed to keep the reptiles they already owned, provided they had permits to do so.

The FWC reclassified the Burmese Python from reptile of concern to conditional species in the Florida Administrative Code. Conditional species classification prohibits a Burmese Python from being possessed for personal use in the state of Florida. The penalty is a first-degree misdemeanor with up to a year in prison and a \$1,000 fine.

During the 2010-2011 hunting season, the FWC made all conditional reptiles legal to take on four public hunting areas in south Florida during all established area

hunting seasons (e.g., during archery season).

2011: During the 2011-2012 hunting season, the FWC added a Conditional Species Season on three public hunting areas. During this season, which runs from early March to mid April, only Burmese Pythons and other reptiles that are classified as conditional species can be hunted.

2012: The United States Fish and Wildlife Service placed the Burmese Python on the injurious species list. This classification prohibits importation into the United States and interstate transfer without a federal permit.

In addition to the aforementioned effort, FWC also has a staff member who coordinates FWC's management activities and objectives with other field offices and agencies, tribes, universities, other researchers, and non-governmental organizations to ensure that efforts are not duplicated and that projects are working together in a complimentary way when possible. This individual also tracks new Burmese Python sightings and directs efforts

for further investigation or control of new populations.

The Everglades Invasive Reptile and Amphibian Monitoring Program (conducted by UF and funded by SFWMD and FWC) surveys for exotic amphibians and reptiles throughout the Greater Everglades to determine their status and spread. When possible, they remove exotics and gather data on diet, condition, gender and reproductive status.

The United States Geological Survey is contracted by ENP to conduct python surveys along Main Park Road in ENP and to track pythons with implanted radio transmitters. Tracking pythons helps to determine movement throughout the landscape and is useful during the breeding season as "Judas snakes" (named for Judas Iscariot, the disciple who betrayed Jesus), termed such because they lead researchers to other pythons.

The ENP has a program similar to FWC's Python Removal Program. The Park authorizes volunteers to remove pythons from ENP and drop them off in a locked box.



Back to the original question—what was the purpose of the 2013 Python Challenge™?

There were multiple goals of the Challenge:

1. To raise awareness about the Burmese Python and other exotic species.
2. To remove pythons from the wild.
3. To try an incentive-based program as a management tool and evaluate its effectiveness.
4. To gather other data about Burmese Pythons, such as whether their geographic range had spread, the habitat in which they were found, and their level of contaminants, all of which can be used to understand how this species should be managed.

How was the Challenge designed? The fee for entry was \$25 and registration was online at www.pythonchallenge.org. Registrants were required to take snake identification training so that they would be aware of other snake species with which the Burmese Python could be confused. (Taking native snake species on public hunting areas is illegal in Florida.)

Two categories of competition were established—general public and python permit holders. Only Burmese Pythons could be harvested and only those from the wild. The pythons had to be killed on site. Contestants had 24 hours to get their pythons to a drop off location and were also required to fill out and turn in data sheets (containing information such as GPS location and habitat) with their snakes. Python permit holders were required to turn in GPS track logs so that person-hours of effort could be determined. →

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The contest began on January 12, 2013 and ended February 10, 2013. Those months are typically the coldest in south Florida, granting the public the greatest opportunity to see pythons during the day, as they tend to sun themselves on levees more often during this timeframe. The 2013 Python Challenge™ Kickoff Event marked the start date, which was held at the UF Fort Lauderdale Research and Education Center. Three classes were held throughout the day—Data Collection and GPS Use, Rules and Regulations Overview, and

Snake Identification. The big attraction, however, was a live Burmese Python brought to show participants how to capture and handle the snake in the field.

February 16, 2013 marked the Awareness and Awards Event, which was held at Zoo Miami. Numerous conservation groups and local, state, and federal government agencies set up booths at the event to help spread awareness about the Burmese Python and other invasive, exotic species.

Close to 1,600 individuals registered for the competition—24 in the python permit holder category and 1,558 in the general public category. Contestants came from 38 states and one Canadian province. Python permit holders succeeded in removing 42 pythons, while the general public scored 26 pythons, for a total of 68 snakes.

A grand prize of \$1,500 was issued to the contestant bringing in the most pythons in each category. The grand prize winner in the python permit holder category harvested 18 pythons, while the grand prize winner in the general public category harvested 6 pythons.

A first place prize of \$1,000 was given to the contestants who got the longest python. In the python permit holder category, the winner had an 11'1"-long

python (3.38 m). The winner in the general public category had a 14'3"-python (4.34 m).

Was the mission of the 2013 Python Challenge accomplished?

Yes! The education and awareness goals were far exceeded. By the close of the event, more than 80 million television viewers from across the nation had seen a report about the Challenge.

The FWC was hoping to get at least 50 registrants for the competition. They got over 31 times that number.

Pythons were removed from the wild and the number harvested was greater



than expected. The number of man hours that goes into harvesting a single python is significant. In 2011, python permit holders spent close to 20 hours per python in effort. Burmese Pythons are also very cryptic and the habitat of the Everglades makes pythons difficult to find and capture. If a contestant was successful in seeing a python, the snake could still easily slip away into vegetation that is not easily traversed. Due to these reasons and others, organizers did not expect a higher number of snakes to be harvested.

The Burmese Python is one of many exotic species that need attention and management. It is a good poster child for this issue because it is a flashy species that garners a lot of attention. Because of the Challenge, the nation and the world are now aware of this and other exotic species and the problems they are causing in the Everglades ecosystem. Hopefully more time, money and effort will be made available to meet the challenges these species present.



Despite their size, pythons can be difficult to spot.

Partners in the event included: UF, TNC, Zoo Miami, Wildlife Foundation of Florida, ENP, SFWMD and The Future of Hunting in Florida.

Submit Your Citizen Science Projects

A compilation of snake citizen science (volunteer) inventory and monitoring projects has begun. These will be featured in our monthly newsletters. Send any information on these types of projects to parcyearofthesnake@gmail.com.

Submit Your Snake Art, Stories, and Poetry

Submit photos of your snake art (jpg, tiff, or pdf files) and copies of your stories and poems via email to parcyearofthesnake@gmail.com. Please include your name, location, and any comments about the submission in your email message. We will select submissions to include in upcoming newsletters.

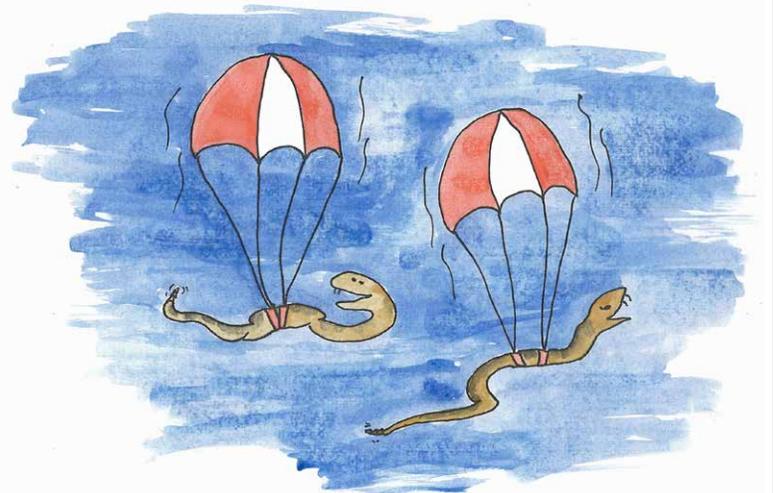
Snake Myths

by *Carrie Elvey*,
The Wilderness Center

Because of their unique lifestyle, snakes are prone to being the subject of myth and legend. Some of these myths have a kernel of truth, others have no discernible origin. Read on to learn the truth about these myths.

Myth: The Division of Wildlife drops rattlesnakes from planes to control the turkey populations

Facts: While this particular rumor seems to circulate mainly in the Ohio, Kentucky and Virginia area, rumors about the secretive re-establishment of venomous snakes are pervasive. Wildlife agencies are not using rattlesnakes to control turkey populations, and they are certainly not dropping them from airplanes—even low-flying ones. However, some state wildlife agencies used to stock fish in mountain lakes using airplanes and helicopters.



Artwork courtesy of *The Wilderness Center*

Snakes can be the invaders, as with *Burmese Pythons* in Florida (see p. 1) or *Brown Tree Snakes* in Guam. But native snakes can also be affected by other invasive species.

Invasive Grass and Great Basin Rattlesnakes in the Vanishing Sagebrush Sea

by Christopher L. Jenkins, PhD., CEO, The Oriante Society



Sagebrush shrub steppe, formerly one of the dominant vegetation types of the western United States. It is now gravely threatened by the expansion of invasive Cheatgrass. Photo by Christopher Jenkins.

When you are standing in the middle of a sagebrush steppe desert it seems to go on forever, reaching towards every horizon with no sign of human development. This is often the case when you visit the deserts of the Great Basin and Interior Columbia Basin of the Northwest United States. The region has had relatively little disturbance in the form of roads and development, but rather has long been used to graze livestock. These deserts are characterized by the sagebrush shrubs they are named after. Most are no taller than a few feet but they can be deceptively old, sometimes many hundreds of years old. Thus, standing in the middle of a sagebrush steppe desert can be thought of like standing in an old-growth forest. Beneath the sagebrush is a complex community of grasses, forbs, lichens, and mosses that form a biological crust on the soil surface. There are many great wildlife icons of these deserts, including Sage Grouse, Pronghorn, and Great Basin Rattlesnakes (*Crotalus oreganus lutosus*).

The entire sagebrush steppe ecosystem is threatened by a small, exotic, invasive annual grass from Europe and Asia called Cheatgrass (*Bromus tectorum*). Cheatgrass

made its way to North America as seed in imported livestock feed and has since begun the process of completely converting the sagebrush steppe ecosystem into a grassland. The conversion process is driven by fire: sagebrush and native grasses and forbs are adapted to infrequent fires while Cheatgrass is adapted to frequent fires (as frequent as every 3-5 years in some cases). Soil disturbance from livestock grazing, roads, or other activities allows cheatgrass to take hold. It produces seed early and then dies, providing abundant fuel in the heart of fire season. Lightning strikes, discarded cigarettes, or vehicle exhaust systems can then ignite fires. Once the sagebrush in an area has burned, it can take 50-100 years for it to reestablish, but the Cheatgrass has such a large seed bank that it can come back quickly and will burn again long before sagebrush has the chance to recover. This process is rapidly changing the entire ecosystem into an annual grassland.

What are all these changes to the landscape doing to wildlife species such as the Great Basin Rattlesnake? To understand how these changes affect rattlesnakes, it is important to understand the life history of rattlesnakes.



A Great Basin Rattlesnake among native wildflowers and the roots of the Sagebrush (*Artemisia* sp.) that forms the backbone of its ecosystem. Photo by Christopher Jenkins.

Rattlesnakes have evolved a life history that allows them to weather variation in resources. The best way to think of this is to compare a female mouse and rattlesnake. If food was not available, the mouse would quickly perish, while rattlesnakes are known to be able to go long periods without food. It is also important to understand that this ability to weather variation in resources, like food availability, is achieved because rattlesnakes store energy over long periods of time, use energy at a lower rate, and use energy more efficiently than mammals. For example, it takes many rattlesnakes years of acquiring and storing energy to reach maturity at a late age (4-5 years old in Great Basin Rattlesnakes) and takes multiple years of storing energy between pregnancies (3-5 years in Great Basin Rattlesnakes). Understanding their life history and how dependent their reproductive schedules are on food, I conducted my dissertation work examining how these landscape changes influence prey availability, in turn rattlesnake reproduction, and ultimately rattlesnake population biology.

The conversion of sagebrush steppe to invasive grasslands is drastically changing prey availability for rattlesnakes. Specifically, the small mammal communities in converted areas have fewer small mammal species, the average size of prey is smaller, and there is a lower overall abundance of prey. Basically, the prey community is going from one with many individuals of a wide range of species from mice, squirrels, and chipmunks, to a community dominated by mice. As you might predict, snake reproduction is much 'slower' in converted sites. Snakes in disturbed sites have lower body condition (i.e., they are skinnier), grow at a slower rate, reach sexual maturity later, and give birth to fewer offspring. Finally, Great Basin Rattlesnake populations in areas dominated by invasive grasses have lower population growth rates.

While rattlesnakes are adapted to weather out these variations, much of the decline in prey communities will likely not bounce back until the system is restored, leaving rattlesnakes, as well as other predators, to face adapting to a future with less prey. There are many groups working on solutions to this problem, but often invasive species spread like a disease or an epidemic, at scales that are difficult to fix. Today if you visit many places in Nevada, Utah, or Idaho, you can stand in a wild place and look in every direction for 25-50 miles and not see a road, building, or what would have historically dominated the landscape, sagebrush. Instead you see the 'soft-fluffy' look of Cheatgrass as far as the eye can see.

There are still many great stands of sagebrush steppe, and I encourage you to enjoy them while it is still possible. Get out into the desert; see a Great Basin Rattlesnake in its native habitat. Finally, learn more about this issue and do everything you can do to support groups trying to deal with it as they work to prevent the vanishing of our great sagebrush sea.

Upcoming Meetings & Events

Indigo Snake Release, May 9, Auburn University and The Orianne Society, Alabama.

Sabino Canyon Lizard Walk, May 11, Sabino Canyon Rec. Area, Tucson, AZ. Meet at 8 am at the visitors' center.

Graduate and Professional Course - Species Monitoring and Conservation: Reptiles, May 13-24, Smithsonian Conservation Biology Institute, Front Royal, VA

Coastal Herpetology Course, May 13-24, University of Southern Mississippi, Gulf Coast Research Laboratory, Ocean Springs, MS

2013 Spring Snake Count, May 18-27, Center for Snake Conservation. For more information please visit www.snakecount.org.

Sabino Canyon Lizard Walk, June 8, Sabino Canyon Rec. Area, Tucson, AZ. Meet at 8 am at the visitors' center.

Venomous Animal Safety & Husbandry Training Seminar, June 13-16, Catocin Wildlife Preserve & Zoo, Thurmont, MD, and Frederick Community College, Frederick, MD. <http://cwpzoo.com/2nd-venomous-animal-safety-and-husbandry-training-seminar/>

Goby Gorgin'

By Sam McCoy and Kristin Stanford, OSU Stone Laboratory, Put-in-Bay, OH

What comes to mind when you think of invasive species? Is it the Asian Carp, Emerald Ash Borer, Zebra Mussel, or any of the other examples of harmful invasives to grace headlines recently? Maybe you think of the habitat destruction invasives wreak and the harm they typically cause native flora and fauna. While invasive species have myriad negative impacts on the environment, sometimes they have positive effects too. One of the best-documented examples in snakes is highlighted by the complex relationship between the Lake Erie Watersnake (*Nerodia sipedon insularum*) and the invasive Round Goby (*Neogobius melanostomus*).



Close-up of Lake Erie Watersnake.

The Lake Erie Watersnake, often referred to as LEWS, is a formerly state endangered, federally threatened subspecies of the Northern Watersnake (*Nerodia sipedon sipedon*) that is restricted to the island region in the western basin of Lake Erie. Its limited geographic range and sustained human persecution initially fueled population declines through the 1990s. However, in 2011 the snake became the 23rd species to be removed from the federal list of threatened and endangered wildlife. Its population recovery was largely facilitated by the Round Goby, a small invasive benthic fish that is now prevalent among all the Great Lakes. The Round Goby was introduced to the Great Lakes from the Black and Caspian seas in the early 1990s via ballast water discharge. Since then, goby populations have exploded, displacing many native benthic species the LEWS fed on such as Mottled Sculpin (*Cottus bairdi*) and Logperch (*Percina caprodes*). Today there are an estimated 9.9 billion round gobies in the western basin of Lake Erie alone!

The initial line of research regarding Round Gobies and the LEWS began during the first few years of an intensive mark-recapture sampling effort, now known as “The Nerodio”. Led by Dr. Richard King of Northern Illinois University and Dr. Kristin Stanford of The Ohio State University’s Stone Laboratory, 14 study sites on 5 islands are annually censused for LEWS over a two-week period. It was during these surveys that King and Stanford directly observed a large number of LEWS consuming and regurgitating Round Gobies, and began gathering stomach contents. In 2003-2004, a diet analysis was conducted by former King graduate student Dr. Julie Ray, which demonstrated that Round Gobies constituted more than 92% of the LEWS diet. Furthermore, this diet change was one of the most rapid on record, occurring in less than two snake generations, and likely due to the superabundance of gobies as a food source for the LEWS.

It was this initial study that spurred its own rapid shift within the LEWS research program: What effects were these Round Gobies having on the Lake Erie Watersnake population? The first beneficial effects that were demonstrated concerned maximum body size and relative growth. Since the snakes have been “gorging on gobies”, they are now 6-9% larger and their growth rates are 0.15 mm/day higher. Additional research demonstrated that other important demographic parameters of the LEWS population had also increased as a result of this all-you-can-eat goby buffet. Survival is now higher (17% higher for males and 4% higher for females) and females produce both more and larger offspring, equating to approximately a 25% increase in fecundity.



LEWS regurgitating a goby.



Despite these beneficial life history impacts, the LEWS research team investigated potential negative effects the diet shift may be having on the snakes, especially regarding the bioaccumulation of contaminants such as PCBs. Studies showed that several contaminant concentrations in blood plasma samples had indeed increased following the diet shift. However, none of the identified compounds have since produced any observable effects on reproductive or physiological parameters in LEWS so far. Nonetheless, the study demonstrated that the insertion of invasive species (Dreissenid mussels and Round Gobies) into the Lake Erie food web could indeed act as a vector for harmful substances, and still remains an open topic of investigation.

It was apparent to the researchers that there were complex interactions now occurring between watersnakes and Round Gobies, most of which favored the watersnake. But what effects were watersnakes having on the gobies? In 2005, the LEWS research team received funding to quantify the potential impacts watersnake predation may be having on Round Goby population dynamics. The results of a feeding frequency study on wild-caught watersnakes were

coupled with maximum prey consumption and digestive rate experiments in the lab conducted by another former King lab graduate student, Dr. Peter Jones. His study demonstrated that snakes are able to digest fish rapidly (90% complete digestion after 16 hr at 30°C), are able to consume a large proportion of prey compared to their own body mass (117% of body mass in neonates over 5 days), and are likely feeding frequently. The study also concluded that despite the high consumption and digestion rate of the LEWS (LEWS may eat about 1 million Round Gobies annually), unfortunately there would be no observable effects on the robust Round Goby population in the Western Basin. However, localized effects in near-shore foraging areas are possible and are still being investigated.

In the years following, the team has continued to amass one of the largest mark-recapture data sets for any snake in the world, with the total number of adult captures now exceeding 14,500. Most importantly, they were able to demonstrate that population sizes of adult Lake Erie Watersnakes had met and exceeded the Population Persistence criterion of the USFWS recovery plan (largely facilitated by the Round Goby) which ultimately led to their delisting. There is no doubt that the Lake Erie watersnake also benefitted from the other criteria required for their full recovery, including an extensive public education and outreach campaign, and collaborative habitat protection and management strategies. However, the positive influence the Round Goby has made on their populations is undeniable.

For more information on the recent research mentioned regarding Lake Erie Watersnakes and Round Gobies:

1. King RB, Ray JM, Stanford KM. 2006. Gorging on gobies: beneficial effects of alien prey on a threatened vertebrate. *Canadian Journal of Zoology* 84:108-115.
2. Jones PC, King RB, Stanford KM, Lawson TD, Thomas M. 2009. Frequent consumption and rapid digestion and prey by the Lake Erie watersnake with implications for an invasive prey species. *Copeia* 2009: 437-445.
3. King RB, Stanford KM, Ray JM. 2008. Reproductive consequences of a changing prey base in island watersnakes (reptilia: colubridae). *South American Journal of Herpetology* 3:155-161.
4. Fernie KJ, King RB, Drouillard KG, Stanford KM. 2008. Temporal and spatial patterns of contaminants in Lake Erie watersnakes (*Nerodia sipedon insularum*) before and after the round goby (*Apollonia melanostoma*) invasion. *Science of the Total Environment* 406: 344-351.
5. Stanford KM. 2012. Spatial and temporal variation of demographic parameters of the Lake Erie Watersnake (*Nerodia sipedon insularum*). PhD Dissertation. Department of Biological Sciences, Northern Illinois University, DeKalb, IL.
6. Respect the Snake website, www.respectthesnake.com



LEWS eat a LOT of gobies. In this case, an invasive fish, although detrimental to other native fishes, has proven to be a benefit to an endangered snake species.

An Interview with Bob Reed

By Cameron Young,
Center for Snake Conservation



Bob with an invasive Boa Constrictor (*Boa constrictor*) in Puerto Rico.

1. How did you become interested in snakes, at what age, and how long have you been working with snakes?

Starting at a very young age in Illinois, I was always the weird kid down the street who tried to pick up every critter he saw. I planned to be a vet, but as an undergrad in Berkeley I took a vertebrate natural history course with Harry Greene and immediately veered into herpetology. I started my graduate career radio-tracking rattlesnakes at the bottom of the Grand Canyon in 1992 and never looked back. It's surprising to realize I've been a snake ecologist for over 20 years!

2. What is your current role in snake research and conservation?

I'm a Principal Investigator for research on invasive reptiles, working for the U.S. Geological Survey. We have a great group of scientists working to develop and test control tools for invasive reptiles and understand their impacts on ecosystems. My job allows me to

use my knowledge of snake ecology to try to reduce their impacts on native species. I also serve as Federal Liaison for the Center for Snake Conservation, and I participate in education and outreach activities to help people, especially kids, understand and appreciate the positive role of native snakes in the environment.

3. Tell us a little about the Brown Treesnakes in Guam.

In the 1940s, Brown Treesnakes (*Boiga irregularis*) were accidentally introduced to Guam, a U.S. territory without native snakes. Within only a few decades, the snakes had wiped out almost all of the forest birds and some of the lizards on the island, and this invasion first alerted scientists to the fact that introduced snakes can have devastating impacts on biodiversity.

A lot of the current Brown Treesnake research and control efforts are focused on preventing the snakes from being accidentally transported to Hawaii or other snake-free Pacific islands by trapping snakes and inspecting cargo around ports and airports. You may have also seen recent media coverage of upcoming efforts to see whether poisoned mice air-dropped by helicopters can control Brown Treesnakes at larger scales. If it's successful, we might be able to reduce snake populations to a point that would allow the restoration of Guam's ecosystems. It would be wonderful to see birds on Guam again!

4. Tell us a little about the Burmese Pythons in the Everglades.

Unless you live under a rock, you've probably seen TV shows and

news stories about invasive pythons in Florida. A good deal of this coverage is sensationalized and full of incorrect or biased information. However, the truth is almost as scary—Burmese Pythons (*Python bivittatus*) are now established and breeding across thousands of square kilometers of southern Florida and are already well outside the boundaries of Everglades National Park. Over 40 species of native birds and mammals have been found in the digestive tracts of these pythons, including endangered species. The depressing truth is that we currently have no control tools that would allow us to completely eradicate the snakes from Florida, so our research efforts focus on developing better tools for detection, understanding their ecological impacts, and testing control tools that might allow local control or prevent their spread to areas with high conservation value such as the Florida Keys.



Bob with an invasive Burmese Python (*Python bivittatus*) in the Florida Everglades. Pythons consume many native species of Florida wildlife, including endangered species.



Bob with a Prairie Rattlesnake (*Crotalus viridis*).

5. Where else is a hotspot for invasive snakes?

Unfortunately, the number of invasive snake populations has been increasing worldwide. As examples, there are multiple populations and species of Eastern Watersnakes (genus *Nerodia*) now established in California, there are several invasive populations of Boa Constrictors in the Caribbean, including the U.S. territory of Puerto Rico, and California Kingsnakes (*Lampropeltis getula californiae*) are spreading through Grand Canary Island off the coast of Africa. Most of these populations appear to be established due to the pet trade.

6. What do you believe is the biggest threat facing snakes in the 21st century?

In the case of snakes, I really think that ignorance and fear are the biggest obstacles. It's easy to get someone to care about panda bears or other cute fuzzy critters based only on a picture or video, but many people have an ingrained and illogical fear of snakes that's hard to overcome simply by looking at pictures. As long as snakes are feared, people won't consider them worthy of conservation and so won't care so much about the effect of habitat loss and other stressors on snake populations. I think we need to take snakes to the people and let them experience the wonder of snakes in person—there are very few folks who don't respond positively to a fascinating animal like a Hognose Snake (*Heterodon* sp.) when they're allowed to see it and touch it in person. A subset of adults may never be able to overcome their fear of snakes. However, kids are a different story, and I believe that a single positive experience can influence kids' attitudes towards snakes for a lifetime. Talking to a group of people about snakes is the most enjoyable and rewarding part of my association with the Center

for Snake Conservation, and it's wildly successful in changing peoples' attitudes.

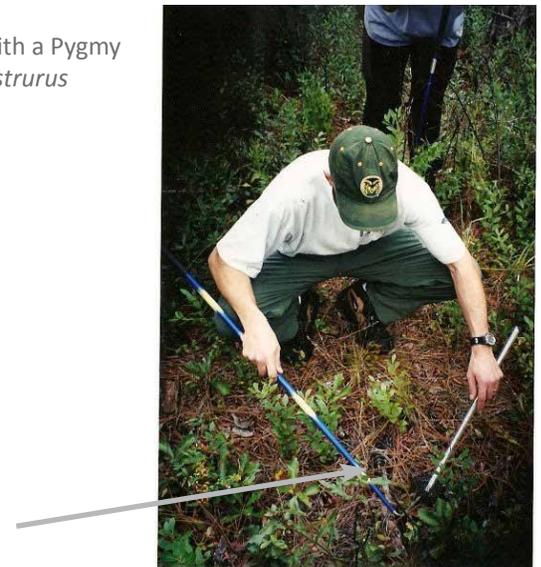
7. How can the public help in the conservation of snakes?

Most of the people reading the Year of the Snake newsletters probably already appreciate snakes, and the next step is to get involved. At a general level, we can all try to educate our friends about the ecological importance of snakes and dispel the worst of the many misunderstandings about snakes. More specifically, there are great organizations like PARC, Center for Snake Conservation, Oriante Society, International Reptile Conservation Foundation, etc. that are involved in hands-on, on-the-ground conservation and research efforts nationwide. Supporting them with dollars and time will allow them to more quickly achieve their goals, and will provide you with really rewarding interactions with like-minded people.

8. What advice would you give to young people or adults who love snakes and want to work with them?

Jobs that involve working with snakes usually revolve around education and outreach, research, habitat conservation, and/or captive husbandry in private (e.g., herpetoculture) or public (e.g., zoos) settings. For a researcher like me, it was obviously important to learn as much as possible about snakes, especially from scientific articles and high-quality field guides. Paying attention in math class and taking statistical classes in college also helped prepare me for some of the complex analyses that are required to be a researcher in herpetology. However, I'd say that the most often overlooked requirement for being a researcher these days is the ability to communicate your ideas. Elected

Bob working with a Pygmy Rattlesnake (*Sistrurus miliarius*).



officials won't listen to someone who talks about snake conservation in a disjointed or purely emotional way. Science nowadays revolves around expressing ideas clearly in written proposals, reports, and journal articles, and the only way to become a better writer is to start writing and regularly seek feedback. A side benefit is that as you become a better writer, clear expression of ideas transfers over to your speaking abilities, allowing you to become a stronger advocate for snakes in classrooms and other settings.

9. *Is there anything else you would like to add?*

I spend a lot of time outdoors, and I enjoy bird-watching and seeing mammals in the field. However, most warm-blooded critters are basically exhibitionists. You can go in your backyard and have a pretty good chance of seeing the same squirrel several times a week,

or seeing all the robins within 50 yards. Snakes are different, and that's one of the things that makes them so fascinating. The concept of detection probability, the odds that you'll see a snake if it's nearby, is probably the most important concept in snake ecology. In many habitats there are more individual snakes in an area than the total of all birds and mammals in that area combined, and yet you might see few to no snakes during a walk through the habitat while seeing lots of birds and mammals. Because snakes are so good at being secretive, most folks have no idea of how many snakes there are or what an important role they play in the environment. It's also why so many of us love snakes, since it's like Christmas morning every time we're privileged enough to find a snake in the wild and get a tiny peek into a life that's hidden from us.

Have a Question? Ask the Experts!

Submit your snake questions via email (parcyearofthesnake@gmail.com) to our panel of snake experts, and we will select questions to answer in upcoming newsletters. Please include your name and location in your email message.

Center for Snake Conservation Snake Count

May 18-27, 2013

By Cameron Young, Center for Snake Conservation



Counting Prairie Rattlesnakes (*Crotalus viridis*) in a Prairie Dog town. Photo by Bob Reed.

The Snake Count is the Center for Snake Conservation's flagship Citizen Science Program to map and track snake distributions across North America. It is a chance for everyday "citizens" to be directly involved in snake conservation. You will learn how to find and identify snakes to help scientists identify conservation concerns for snakes across North America. Everyone who participates in the Snake Count does it for the joy of being outdoors and helping promote the conservation

of our most unique predators—snakes!

Snakes play vital roles as mid- to top-level predators in our natural ecosystems but they are often very misunderstood and feared by humans. This makes conservation efforts for snakes very difficult. In addition, we lack good geographic distribution records for many species of snakes, which limits our ability to adequately measure their conservation needs. The CSC is working hard to increase our knowledge about snakes and their conservation needs, and to educate people about the important roles snakes play in our world.

Taking part in the CSC 2013 Snake Count is a great way to get outside with family and friends, find snakes, record data, help the CSC promote its mission, and support snake conservation. The goal during the Snake Count is to document every species of snake that occurs in the United States in a single time period. This way we can say whether a species still exists and where it occurs in 2013. The data collected during the Snake Count will be used by the CSC to map the current distribution of snakes. In particular, the data collected will confirm the existence of some rare species and provide baseline data to help monitor selected populations of more common species in the future.

It would take scientists a lifetime to collect the same data that Citizen Scientists can collect in one week during the Snake Count. Anyone who can identify a snake or even take a picture to submit can provide important information that enables researchers to learn which species or areas may need additional conservation focus and effort. We need everyone's help to raise the awareness for snake conservation to ensure that they will continue to persist in our developing world. So, tell your family and friends about the Snake Count. Better yet, encourage them to sign up and participate. Citizen Science projects like the Snake Count can be extremely powerful tools for conservation efforts and I think we all can agree that snakes have been ignored in past conservation efforts. With your help, we can make a difference for snakes

Below are some frequently asked questions that we hope will help get you started for an amazing Snake Count!

Where do I sign up to count snakes?

Simply go to www.snakecount.org/register to stay current with all the Snake Count activities.

Where should I count snakes? Do we select our own site?

You can count snakes anywhere: in your backyard, at a local park or nature center, or wherever think you can find a snake. Be sure to know the federal, state, and local laws that may protect some snakes in your area before you catch any snakes. You can also join another group on a Snake Count by checking out the public events on the Snake Count website.

Is it okay for kids to participate in the Snake Count? If so, do you have any recommendations for children's participation?

Absolutely, kids are encouraged to participate in the Snake Count. The Snake Count is a great way to get kids outdoors and excited about nature. Looking for snakes can be very challenging, so it is important to make it fun for kids. Here are some suggestions to ensure that everyone has a great time on the Snake Count:

- Stay close to home to avoid long drives. Snakes can be everywhere, including local parks.
- Use the Snake Count Scavenger Hunt to keep kids engaged and actively participating (link will be available May 2013).
- Keep a checklist of all the wildlife observed (not just snakes).



Counting watersnakes (*Nerodia* spp.) at the spillway. Photo by Shelly Cox.

- Take photographs of flowers, people, and habitats in addition to the snakes you see to view later at home to remember the fun had on the Snake Count
- Make a collage with all the pictures you took on the Snake Count and submit it to the CSC for inclusion on the Snake Count website

Does the CSC prefer that Snake Count participants observe and photograph snakes as opposed to catching them?

Yes. The CSC recommends that Snake Count participants observe snakes as opposed to catching them. We prefer this for your safety as well as the snakes'. That said, we do understand and enjoy that snakes provide unique opportunities for us to interact with wildlife on a personal level. Please remember that all snakes (even the non-venomous snakes) have the potential to bite, and if handled, should be treated with care and respect. Also, please know your local, state, and federal laws regarding the handling of snakes in the area you are conducting a Snake Count prior to catching any snakes.



Kids counting snakes. Photo by Kevin Urbanek.

How do you find snakes?

Finding snakes can be difficult at times. Getting outside and spending time in their habitats is the best way to find them. Check out the CSC's flyer "**How to Find Snakes**" for help. Good luck!

What do I do if I find a venomous snake?

Venomous snakes occur in most places that are covered by the Snake Count, so encounters are inevitable. If you find a venomous snake, give it plenty of room and respect. Remember that they do not want to bite you and typically only bite when threatened or handled. **Do not attempt to catch any venomous snakes.** Instead, take a photograph of the snake—not only will the photograph confirm the identification of the snake you saw, it will serve as a keepsake of your encounter with one of North America's most fascinating creatures.



Pair of Copperheads (*Agkistrodon contortrix*). Photo by Ashley Tubbs.

What if I can't identify some of the snakes I see?

Do your best to figure it out, but we understand that there are some snakes that may be very difficult to identify correctly. Take a look at your state or province checklist on the Snake Count web site to help narrow down the possibilities. Use a field guide to see if you can find the snake you saw. Email a picture to the Snake Count to confirm your identification. If you are still unable to identify a species, no problem. You do not have to report every species you see. Please mark on your datasheet or Project Noah entry that you were unable to identify all the snakes you saw and how many snakes were left unidentified.

What happens to the data collected during the Snake Count?

The data collected during the Snake Count will be used to update our knowledge about the current snake distributions in North America. As our world becomes more and more developed, snake distributions are



The Snake Count helps collect more information on the distributions of rare species like the Florida Pinesnake (*Pituophis melanoleucus mugitus*). Photo by J.D. Willson.

changing in ways that are very difficult for scientists to measure without the aid of programs like the Snake Count. Have new species moved into an area (think pythons), or has a species completely disappeared in an urban setting? These are the questions that we can attempt to answer as the Snake Count grows and more and more people participate each year. The Snake Count data will be made available to scientists with credible needs for snake distribution data, state natural heritage programs, and any other "herp atlas" project where mapping distributions of snakes is important.

For more Frequently Asked Questions, please visit the Snake Count website: www.snakecount.org/faq---frequently-asked-questions.

Happy Snake Counting!—we hope you count hundreds!

Submit your Articles for Consideration in The Year of the Snake News

We would like to hear about your research projects (local, national, and abroad), citizen science efforts, school projects, folklore, natural area conservation proposals, snake luminaries (people or animals that have been shining stars in your life), or other topics related to snakes.

Please include these components:

- 1) Title;
- 2) Author name, affiliation, location;
- 3) Text: ~400 words will fill one page, a nice size to consider. Shorter and longer articles are fine. It is an electronic newsletter, after all! ;
- 4) 1-2 photographs or graphics (with captions and photographer recognition; sometimes we can use more than 2) per page: 300+ dpi resolution, jpg or tiff.

Themes of the upcoming monthly newsletters include: snakes of narrow habitats; snake diseases; aquatic snakes; conservation efforts; international snake conservation; captive breeding & reintroduction; and regulation, trade & commerce. Any snake-related topic is welcome.

Submit your potential articles or any questions pertaining to contributing via email to parcyearofthesnake@gmail.com.