



## Legacy Program Update

### The Legacy Program to announce Full Proposal invitations by next week:

The Legacy Program is finalizing the review of 206 pre-proposals and will announce pre-proposal turn-downs and approvals through its website the Legacy Tracker. Invitations to submit full proposals will be announced through the Legacy Tracker at [www.DoDLegacy.org](http://www.DoDLegacy.org) by mid October, 2007. Full proposals are due November 1<sup>st</sup>, 2007.

## Legacy Project Highlight of the Month

### Legacy Project 03-187 Sanctuary effects of enforced protection on near shore marine resources: a case study in PR

The impact of military exercises at insular bombing ranges on adjacent coral reefs has not been convincingly established. Some investigators imply widespread and catastrophic damage to reef organisms from errant ordnance, while others suggest that military zones create a de facto sanctuary from deleterious human activities such as coastal development, deforestation, and overfishing.

This study documents the condition of fringing coral reefs in military and non-military areas, using the Puerto Rican islands of Culebra and Vieques as models. Historical records of military training and civilian use were reviewed in order to designate study sites as one of three types: civilian, military target, and military non-target. A total of 18 study sites were evaluated for biotic and environmental parameters. Proxy indicators of reef condition included percent coral cover, coral species richness, juvenile coral abundance, topographic complexity, fish species richness, fish abundance, herbivorous fish abundance, echinoid abundance, macroalgae cover, turf algae cover, incidence of coral diseases, and incidence of coral bleaching. To examine the relative condition of fringing reefs at Culebra and Vieques, Bray-Curtis distance measurements were combined with an Unweighted Pair Group Method with  
*See Legacy, page 4*



## In The News

### Navy Testing Waters with 6 New Sites

After fiasco, military officials trying not to ruffle feathers

By [Gareth McGrath](#)  
Staff Writer, Star News Online

Maple Hill, NC | Woodrow Wilson Morgan rubbed his grizzled chin as he pondered the question. "Jets," he said slowly. "They wouldn't like that."

For 37 years, Morgan has run a produce stand at the corner of N.C. 50 and N.C. 53 in this predominantly black community nestled in the northeast corner of Pender County.

Admittedly, there isn't a lot happening here.

But Morgan, 79, said that's the way residents like it - quiet and slow, where forests and farmers' fields provide most of the scenery.

Thousands of fly-overs a year by Navy and Marine F/A-18 Super Hornet jet fighters practicing touch-and-go landings at a nearby landing field, though, could certainly change things.

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# Training

**FEATURED! Applied Plant Conservation Workshop:** March 2-8 2008, at the Bishop Museum, Honolulu, Hawai'i. The Center for Plant Conservation, with botanists nationwide, has created a curriculum covering key conservation topics. The workshop sponsored by the DoD Legacy Program is open to DoD personnel only. Participants will receive pragmatic tips, information resources, contact lists of experts and an opportunity to get your questions answered by experts in the field. There will be over 17 topics taught throughout the week, including academic and practical components such as population evaluation-demography, population viability analysis, plant conservation genetics, restoration and management (ex-situ and in-situ), tools and Partnerships, and many more! [Register](#) for this unique workshop by visiting their website at <http://www.centerforplantconservation.org/2008dodpcworkshop.html>

**Riparian Zone Ecology Restoration/Management:** June 23-27, 2008, in Phoenix, AZ. This course addresses planning and management issues that pertain to riparian (streamside) ecosystems in a variety of ecological and geographical settings. Emphasis is placed on the ecology, restoration and stewardship of riparian habitats associated with Civil Works projects and activities. Students will receive instruction on the functions and ecological importance of riparian zones, conservation needs, and potential impacts resulting from various land use practices, restoration and management techniques that can be applied to maintain or improve riparian systems. For more details visit <http://pdsc.usace.army.mil/CourseListDetail.aspx?CtrlNbr=281>.

**Health & Environmental Risk Communication Workshop:** January 22-24, 2008 in Barstow, CA & April 1-3 in MCB Quantico, VA. This 3-day ISEERB approved course provides attendees with basic knowledge and tools to effectively communicate risk and risk management issues to stakeholders of diverse interests. This includes developing a proactive program to establish and maintain a sound relationship through dialogue with stakeholders based on mutual trust and credibility. Instruction focuses on how to have open discussions on environmental restoration issues, establish confidence in communicating key messages, develop effective media and public meeting techniques, improve verbal and non-verbal communication skills, and revitalize stakeholder dialogue. Although the course was originally designed to meet the needs of restoration personnel, other environmental personnel can benefit from this training. Eligible personnel include Military and civilian personnel responsible for communicating environmental risk management issues to the public, regulators and/or media stakeholders including remedial project managers, BRAC Environmental Coordinators, Base Closure Team members, installation environmental program managers, experts, engineers, scientists, health and safety personnel, natural resource personnel, and others. For more information visit <https://www.cecos.navy.mil/coursedetail.cfm?courseid=67>.

**Natural Resource Compliance:** January 15-18, 2008 in Corpus Christi, TX. This course offers instruction in specific natural resource laws, regulations, policies, Executive Orders, DoD Instructions, and other guidance, noting Service-specific requirements. Course addresses stewardship, preservation, and process; fish, game, and wildlife management laws; protection of wetlands, waterways, and other protected ecological areas; forest and land use management laws; and interservice cooperation. Practical exercises and guest speakers are included. This course is approved by the Interservice Environmental Education Review Board (ISEERB). For details visit <https://www.cecos.navy.mil/coursedetail.cfm?courseid=42>.

**COMING SOON! 2008 NMFWA Training Workshop:** March 25-28, 2008 in Tucson, Arizona. For details visit the National Military Fish and Wildlife Agencies announcement at [http://www.nmfwa.org/2008\\_Meeting/index.cfm](http://www.nmfwa.org/2008_Meeting/index.cfm).



## Announcements and Events of Interest

**NEW! National Sea Grant Aquatic Invasive Species Research and Outreach RFP for 2008 & 2009.** The National Sea Grant College Program invites research and outreach proposals that address the introduction and spread of aquatic invasive species. The goal of this program is to discover and develop information and tools that can lead to the prevention, monitoring and control of aquatic invasive species threatening United States coastal, oceanic and Great Lakes communities, resources and ecosystems. The National Sea Grant Office anticipates making approximately six awards of between \$30,000 and \$300,000 in 2008 and six additional awards in 2009. They do not anticipate issuing a separate solicitation for the program in FY 2009. Projects can be for a maximum duration of two years, with a proposed start date no earlier than August 1, 2008. Preliminary proposals must be submitted to the California Sea Grant office by 1 p.m. PDT (4 p.m. EDT), October 11, 2007. For more information, please visit [http://www.csgc.ucsd.edu/PROPOSAL/SPEC\\_COMPET/SpecCompetIndx.html](http://www.csgc.ucsd.edu/PROPOSAL/SPEC_COMPET/SpecCompetIndx.html) for the National Sea Grant RFP online announcement. If you have questions, please contact Dorn Carlson, National Sea Grant College Program at [Invasive.Species@noaa.gov](mailto:Invasive.Species@noaa.gov) or our Proposal Coordinator, Debi Jeffery at [proposaladmin@seamail.ucsd.edu](mailto:proposaladmin@seamail.ucsd.edu)

**2007 EPA/State/DoD Region III Environmental Colloquium:** October 30 - November 1, 2007 at the Radisson Plaza Lord Baltimore in Baltimore MD. There is a pre-conference reception on the evening of October 29 at the National Aquarium. The theme for this year's Colloquium is "COMPLIANCE AND BEYOND – Merging Mission and Environment." This is two and half day environmental forum and an excellent partnering and training for environmental professionals at all levels within DOD, state and EPA. Online conference registration visit [http://www.bakerprojects.com/r3\\_envconf/](http://www.bakerprojects.com/r3_envconf/).

**Wildlife Habitat Council 19<sup>th</sup> Annual Symposium “The Value of Green”:** November 12-13, 2007 at the Hyatt Regency Baltimore, MD. Each year, WHC brings together record numbers of corporate, government and conservation leaders from around the globe. Learn how to build an awareness, understanding and commitment to biodiversity. Innovative sessions will explore economic benefits, volunteerism, invasive species, educational resources...plus much more! Participate in hands-on outdoor workshops or attend indoor conservation training. For registration details and general information visit <http://www.wildlifehc.org/events/symposium.cfm>.

**Partners in Environmental Technology Technical Symposium & Workshop:** December 4-6, 2007 at the Marriott Wardman Park Hotel in Washington, D.C. This conference assembles environmental researchers and technology developers with the defense user and regulatory communities to showcase cutting edge environmental technologies and ideas, as well as communicate the most difficult challenges of our defense establishment. The conference has a comprehensive technical program consisting of concurrent sessions highlighting proven environmental technologies, as well as technologies needed to address emerging DoD environmental challenges. Full registration in advance is \$415. For online registration and details visit <http://www.serdp-estcp.org/symposium/>.

**Annual Conference on Ecosystem Restoration and Creation:** The 34th anniversary of The Annual Conference on Ecosystems Restoration and Creation will be held November 1 - 2, 2007 at the Trinkle Building located on the Plant City campus of Hillsborough Community College (Plant City, Florida). The Annual Conference provides a forum for the nationwide exchange of results of the latest scientific research on restoration, creation, and management of not only freshwater and coastal systems but total ecosystems including upland and transitional areas. For more details visit their website at <http://www.hccfl.edu/depts/detp/ecoconf.html>



*Legacy, continued from page 1*

Arithmetic Averages (UPGMA) linkage method to perform a cluster analysis of the proxy indicators and to generate associated dendrograms.

The UPMGA analyses produced clusters deviating from a priori expectations (i.e., that site types would cluster together). Resulting dendrograms showed that sites cluster roughly by island (i.e., Culebra sites are more similar to each other than to Vieques sites) and that the sites with the lowest reef condition score were the Vieques military target sites. Overall, the Culebra sites surveyed appeared to be in better condition than the Vieques fringing reefs when considering the sum of the proxy indicators of reef condition. Yet, the Culebra sites contained more incidences of coral maladies (coral diseases, bleaching, and fish predation) than the Vieques sites. The UPMGA analyses on similarity matrices consisting of proxy indicators of reef condition suggest that the reefs of Culebra and Vieques are different types of reefs or reef environments.

Turbidity was the only environmental parameter that was consistently higher at Vieques during the course of the survey. More turbidity data from Vieques and Culebra would be needed to verify that Vieques fringing reefs are consistently bathed by water that is naturally more turbid than at Culebra. Although reefs can function under turbid conditions, turbidity negatively affects their level of development. Sedimentation rates on Vieques near shore reefs (fringing and crest) are significantly greater than in deeper reefs (18 meters (m) [59 feet (ft)] water depth). Further, sedimentation rates on near shore reefs at Vieques do not differ between the live impact area (LIA) and the Eastern Maneuver Area (EMA), and do not differ between the north and south sides of the island. One possible explanation for the differences in turbidity levels observed between Culebra and Vieques may be due to differences in near shore circulation (tidal currents) as it affects fine sediment resuspension.

This study shows that despite decades of military training exercises on Vieques and Culebra, the condition of fringing reefs around the military portions of these islands appears to be similar to civilian sectors. Negative impacts from military exercises, especially live-fire exercises, have probably been concentrated in areas adjacent to bombing targets of the LIA (e.g., Bahia Salina del Sur, Vieques). Because the areal extent of the former military lands greatly exceeded the area of the LIAs, much more shoreline and adjacent reefs and sea grass meadows were probably spared and protected than were impacted. Although not expressly forbidden in waters adjacent to military lands, deleterious human activities (e.g., fishing, diving, and anchoring) may have been diluted or excluded by the presence of the military and the schedule of military exercises. Also, the existence of the military base necessarily precluded civilian coastal development on military lands. On other islands in the Caribbean (e.g., mainland Puerto Rico), extensive coastal development (e.g., commercial, residential, and recreational) has triggered a cascade of environmental degradation and ecological disasters.



This photo features a military non-target study site at Isla de Vieques, Puerto Rico in June 2003. Despite decades of military training exercises on Vieques and Culebra, the condition of fringing reefs around the military portions of these islands appears to be similar to civilian sectors. (Photo by Geo-Marine, Inc.)



***Navy Testing Waters, continued from page 1***

"I know these people in Maple Hill wouldn't like that," Morgan said.

Last week the Navy, with the blessing of the state, unveiled six new proposed sites for its controversial Outlying Landing Field, a remote training site that would allow pilots to simulate night landings on aircraft carriers.

Virginia, where most of the F/A-18 jets that would use the facility are based, also has proposed a dozen sites.

The move comes after the military's favored site for the facility in northeastern North Carolina ran into stiff opposition from just about everyone - residents and politicians worried about noise and the loss of quality of life, and environmentalists were concerned about the site's proximity to a wildlife refuge frequented by thousands of migratory waterfowl.

Those same concerns seem set to follow the project around the state.

Still, military officials last week said they had learned from the earlier OLF fiasco and were taking a different tack this time around. They promised to work with state and local officials instead of being seen as "imposing" a project on a community.

Also, the Navy said it might not need as much land as originally proposed and would look to other tools such as conservation easements rather than outright purchasing to secure the "buffer" area around the airfield.



Official U.S. Navy file photo of an F/A-18E Super Hornet.

But all of that doesn't mean the project is going to be an easier sell this time around.

**Six N.C. sites**

Of the six proposed North Carolina sites, four are in the northeastern part of the state. Those, however, have already generated opposition from local officials, including powerful state Sen. Marc Basnight, D-Dare. The two other sites are in the Hoffman Forest in Jones County and around the Angola Bay Game Land area near the Pender-Duplin county line. Like the other North Carolina locations, the Pender site is largely undeveloped and has the advantage of having thousands of acres under a single owner - in this case the state of North Carolina.

Along with farming and timbering, the largely rural and undeveloped area is popular with hunters and city slickers looking for a little fun in the country. The area also could certainly do with an economic shot in the arm. But state Sen. Charles Albertson, D-Duplin, said he didn't know if a few dozen well-paying jobs was worth the noise and potentially thousands of acres suddenly off limits for future industrial or residential development. "Wherever this thing is put, I think it's going to affect economic development in a negative way," he said. "Truth is, I'm not excited about it coming here."

F.D. Rivenbark, chairman of the Pender County Commissioners, said the Angola Bay Game Land and surrounding areas were popular with hunters, many of whom use dogs. "I don't think dogs and jet noise would mix very well," he said with a tinge of sarcasm. Repeating a mantra of local officials and residents, Rivenbark said there was a more basic reason for his personal opposition to the project. "If no one wants it north of here, we're going to take it?" he said. "This concerns me a great deal."

**Waiting and seeing**

While almost united in their opposition to the original OLF site in Washington County, environmentalists are taking much more of a wait-and-see attitude this time around.

Rick Studenmund, director of conservation programs for the N.C. chapter of the Nature Conservancy, said he believed the Navy was willing to work with officials and environmentalists to find the best site possible for all involved. "The difference this time versus last time is that they are talking in a much more pro-active and seemingly more harmonious ways in dealing with the communities," he said.

Studenmund added that the Nature Conservancy has had very positive experiences working with the Pentagon on environmental matters, particularly in regard to red-cockaded woodpeckers at Fort Bragg and protecting sensitive ecological areas around Camp Lejeune.

Also reserving judgment was Steve Holland, a former Pender commissioner who operates a popular restaurant and campsite midway between Burgaw and Maple Hill on N.C. 53. He said no one wants extra noise in his or her backyard. "But I like living in America, being free," Holland said. "So it's hard to throw stones and say we don't want it when they're protecting us."

The Navy expects to whittle down the 18 proposed sites to a few favored ones for further study by Thanksgiving.

## Recovery plan touted for plover

North County lagoon could play key role in tiny shorebird's comeback

By Dave Downey  
Staff Writer, North County Times Online

Federal wildlife officials have come up with a road map for boosting populations of the imperiled Western Snowy Plover, a tiny sparrow like bird that builds nests at several North County beaches and lagoons.

The U.S. Fish and Wildlife Service's recovery plan, released earlier this week, sets a goal of doubling the current number of adult bird species living along the Southern California coast -- in San Diego, Orange and Los Angeles counties -- to at least 500. And it aims to rebuild the entire Pacific Coast population in California, Oregon and Washington to 3,000, up from 2,000 today.



Western Snowy Plover guarding its eggs. Photo courtesy of NOAA.

Al Donner, a Fish and Wildlife Service spokesman in Sacramento, said by telephone Tuesday that the new plan relies heavily on the cooperative efforts of federal, state and local agencies, military bases such as Camp Pendleton, and volunteers from a variety of community groups. Donner said the plan is, by definition, a voluntary document and it does not impose new restrictions on coastal recreation and development.

Environmental groups criticized the 292-page blueprint, saying it falls well short of what is needed to help the tiny shorebird make a comeback.

"This is an extinction plan, not a recovery plan," said Kieran Suckling, policy director for the Center for Biological Diversity in Tucson, Ariz.

Suckling said the federal agency set the bar too low. He maintained that reaching a population of 3,000 will not ensure the bird avoids extinction.

Audubon California, a statewide environmental group that has long monitored the plight of the bird, charged that the plan relies too heavily on the efforts of volunteers.

"We are long past the point with this species where cooperation and volunteerism alone can make a difference," said Glenn Olson, executive director of Audubon California.

Federal officials defended the population target and the strategy for hitting it. Donner said it is patterned after a successful one that has helped populations of a cousin, the piping plover, make a comeback along the East Coast.

Donner said that, in the absence of a plan, volunteer efforts already have helped boost the West Coast population from 1,500 -- at the time the Western Snowy Plover was declared threatened in 1993 -- to 2,000. Donner stressed that the bird, unlike many imperiled animals, doesn't live in the backwoods. On the contrary, it lives on the very beaches that millions of Californians flock to for swimming, surfing and sunbathing. "Plovers are in the thick of people, where people want to play and recreate," said Jane Hendron, spokeswoman for the Fish and Wildlife Service in Carlsbad. And Hendron said adult plovers lay their eggs and raise their young just as recreation enthusiasts begin to head for the beach in spring.

Because of the largely unavoidable conflicts with beachgoers, federal officials say they are counting on the volunteer community groups to guide people and their dogs away from nests by posting signs and temporary

fences. Officials say they do not have the luxury of creating large reserves that are closed to the public.

Andy Mauro, conservation chairman for Buena Vista Audubon Society, said that developing plans for the restoration of North County's Buena Vista Lagoon could create a rare such reserve. He said that one of the restoration options being studied would return Buena Vista to its original status as a coastal salt marsh lagoon. That could create islands that provide nesting areas protected from people and dogs. "We see that as sort of a bright light for the Western Snowy Plover in San Diego County," Mauro said, adding that the plan could be finalized by the middle of 2008.

Jim Watkins, plover recovery coordinator for the wildlife service in Northern California, said the agency currently estimates San Diego County's bird population at 191 and Southern California's total at 238. Hendron said plovers build nests at the Tijuana River estuary, Silver Strand, Naval Air Station North Island, South Mission Beach, South Carlsbad State Beach, San Elijo Lagoon and at Camp Pendleton in San Diego County, and at Bolsa Chica State Beach, Salt Creek Beach and Seal Beach Naval Weapons Station in Orange County.

Phil Unitt, curator of birds and mammals at the San Diego Natural History Museum, said the highest concentration of plovers in the region is at Camp Pendleton, with most nests being made at the mouth of the Santa Margarita River.

Eric Kershner, wildlife management branch head for Camp Pendleton, said biologists counted 80 plovers on the base this year, down from about 120 last year and in 2005. The tiny plover grows to 6 inches long. It has a white belly and a pale brown to gray back and head that matches the color of beach sand. And it has a black bill and a few black marks. "They nest on the ground out in the open," Unitt said. "They are masters of camouflage. Their eggs match the sand colors very well, with a few black speckles in them." Consequently, Hendron said, it is easy to step on them by accident.

"When Western Snowy Plovers are born, they are tiny cotton balls with toothpick legs," Hendron said. "They're cute. They're adorable. But they are very vulnerable when they first hatch."

## New York State Conservation Council, Inc. awards West Point Manager

By USAG-West Point Natural Resources Branch

On Friday, 14 Sept, James Beemer, West Point's Natural Resources Manager, was presented with the Professional Conservationist of the Year Award by the New York State Conservation Council, Inc. The NYSCC is the oldest conservation organization in New York State (est. 1933), comprised of volunteers who are concerned with sound management of the state's and the nation's land, water, fish and wildlife. Their volunteers are involved in all aspects that deal with the environment, ranging from educating youth and adults, to legislation, and including hands-on projects, cleaning up waterways and roadsides, and habitat improvement projects. The NYSCC is also the largest not-for-profit conservation organization in New York, comprised of over 350,000 individuals and organizations.

The Professional Conservationist of the Year Award is presented for outstanding conservation achievements by a professional in any field, including but not limited to fish, wildlife, forest, water, and air or soil management. The award is in recognition of Mr. Beemer's achievements at West Point over the past 18 months and its benefits to the sportspeople that enjoy New York's natural resources; especially West Point's hunting and fishing programs. He received many compliments and congratulations from some of the long-time representatives to the Council as well as from leadership representatives of New York's Department of Environmental Conservation that were also present.



James Beemer, US Military Academy at West Point Natural Resources Manager, was named Professional Conservationist of the Year by the New York State Conservation Council, Inc.

The Mission of the NYSCC is to aid in the formulation and establishment of sound policies and practices designated to conserve, protect, restore and perpetuate forests, wildlife and scenic and recreational areas with especial regard to the state of New York, to the general end that the present and succeeding generations may continue to enjoy and to use these great natural resources.

## Recent Natural Resources Documents On [DENIX](#) and Web

**NEW!** [Endangered Species Management Plan for Fort Hood, Texas: FY06-10](#) ERDC/CERL TR-07-11. Army Regulation (AR) 200-3 requires installations to prepare an Endangered Species Management Plan (ESMP) for all listed and proposed T&E species. The installation ESMP should be used as a tool to achieve conservation objectives for populations of listed and proposed T&E species and to minimize impacts on the training mission. AR 200-3 further encourages, but does not require, the development of ESMPs for all candidate species, and recommends that an integrated ESMP covering all T&E species be prepared if more than one such species occurs on an installation. The U.S. Fish and Wildlife Service Biological Opinion for Fort Hood (March 2005) provides requirements and guidance for endangered species management on Fort Hood. This ESMP is written specifically for use by natural resource managers and leaders of training operations on Fort Hood to accomplish military training objectives while meeting conservation objectives for T&E species. The objective of this ESMP is to provide a comprehensive plan for maintaining and enhancing populations and habitats of Federally listed endangered species and species of concern on Fort Hood while maintaining mission readiness in a manner consistent with Army and Federal environmental regulations. See document at <http://libweb.wes.army.mil/uhtbin/hyperion/CERL-TR-07-11.pdf>.

[Burrow Collapse as a Potential Stressor on the Gopher Tortoise \(\*Gopherus polyphemus\*\)](#) ERDC/CERL TR-07-33. The gopher tortoise is a species of concern throughout the Southeast, and is a keystone species throughout its range. It is federally listed as "Threatened" in part of its range and has been proposed for listing elsewhere. During forest thinning and harvesting, and during military training exercises, tortoise burrows are often accidentally run over. No formal studies of the potential for tortoise injury resulting from burrow collapse had been conducted in the natural environment, however. This research was designed to determine the potential for tortoise injury from the direct crushing of the burrows or loss of life through inability to escape from a collapsed burrow. Forty intentional burrow collapses by heavy equipment were studied. Data were acquired on pre- and post-collapse movement patterns and several general health and physiological measures. No tortoises appeared to have any life-threatening injury, and all tortoises self-excavated, with excavation intervals ranging from an hour to 85 days. All tortoises remained within a normal home range of their collapsed burrow, resulting in little change in movement patterns after burrow collapse. Changes in home range, number of burrows used, daily movement patterns, or the mean distance moved by the tortoises does not appear significant. If you wish to access/download the document (64 pages, 2.3 mb) in pdf format, the address is: <http://libweb.wes.army.mil/uhtbin/hyperion/CERL-TR-07-33.pdf>.

### Redesign Notice

**DENIX is currently being redesigned and an intensive analysis, cleansing, and migration of web site content is currently in process. The planned launch of the redesigned web site is scheduled for November 1, 2007. In preparation for the launch, the current DENIX website will be 'frozen' and no new content will be posted effective October 1, 2007.**

## Did You Know?

**What do you call a very funny snake?** – Hiss-terical! The Southern Hognose Snake, *Heterdon simus*, is a fairly small, heavy-bodied snake that reaches about 24 in (61 cm) in length. These snakes are easily distinguished from most snakes in the southeast US by their pointed, upturned snouts. The dorsum is gray-brown to tan with three longitudinal rows of dark brown blotches outlined anteriorly and posteriorly with black. The larger middorsal blotches usually alternate with smaller lateral blotches. There is a dark brown or black stripe on either side of the neck and a short dark stripe may occur from the rear of the eye to the corner of the mouth. A dark transverse bar often occurs on the snout in front of the eyes. The venter is white, cream, or pinkish-brown with faint brownish pigment posteriorly.



The Southern Hognose Snake, (*Heterdon simus*).

Southern hognose snakes also have more sharply-upturned snouts than eastern hognose snakes. Although generally less elaborate than those of the eastern hognose, southern hognose snakes also often put on threat displays (including neck spreading, hissing, and playing dead) when confronted by a predator. Female southern hognose snakes are larger than males and the young resemble miniature adults.

The southern hognose snake occurs in many installations across the Southeast including Eglin Air Force Base (AFB), Avon Park Air Force Range, Fort Stewart, Fort Gordon, Fort Bragg, Fort Jackson, Fort Benning, Marine Corps Base, Camp Lejeune, and it has potential to be also found at Fort McClellan-Pelham Range and Camp Shelby. Southern hognose snakes are found almost exclusively in sandhill, pine flatwood, and coastal dune habitats, and in the sand ridges of central Florida. Because of their fossorial habits, hognose snakes sometimes persist in suburban or agricultural areas with sandy soils. The Savannah River Site is one of the few areas where southern hognose snakes are still relatively common. Habitat loss and fragmentation are the primary threats to the species survival. Southern hognose snakes are active strictly by day and are often seen on warm mornings in the spring and fall. They are highly fossorial (living underground) and are most often encountered crossing roads that pass through sandy habitats. When disturbed, hognose snakes will flatten their neck, spreading an almost cobra like hood, and emit a loud hissing sound. If this display fails to intimidate, the snake will roll over on its back, writhe about with its mouth held open and its tongue hanging out, and finally lie still playing dead. Despite this fairly convincing show, southern hognose snakes virtually never bite. If righted, the snake will immediately roll back over. Hognose snakes feed almost exclusively on toads, although they will occasionally consume other prey. They seem to be immune to poisons produced by toads, and are equipped with enlarged teeth (called rear fangs) in the back of their mouths that are used to puncture inflated toads so that they may be more easily swallowed. Female southern hognose snakes lay 6 - 14 eggs in sandy soil or logs in the early summer. The eggs usually hatch in September - October. To this day, no scientist has reported seeing the hognose smile.

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## Disclaimer

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