

BHI CONSERVANCY'S CONSERVATOR

Notes from the Field

by Maureen Dewire

It was a busy 2008, wildlife-wise, and 2009 is shaping up to be just as fantastic! First off, a couple of updates on previously mentioned matters. The baby green sea turtle that was cold stunned and floating in the marina back in December is reported to be doing very well up at the Topsail Turtle Hospital. State officials are working on a plan to take many of the cold-stunned turtles out to the warm waters of the Gulf Stream for release later this month. The 3-legged alligator that was first reported in November has since been seen back in the lagoon near Hole 8 and the missing limb appears to be healing nicely.

One of the most frequent questions I have gotten this winter is “what is that spiral-sand thing washed up on the beach?” (see photo). Amazingly enough, it is the egg mass from an animal called a Moon Snail and is commonly referred to as a sand collar. A moon snail lays her eggs at



Moon Snail Egg Mass
Photo by Paul Hearty

night, combining these with mucus and sand in a gelatinous sheet which hardens. She lies at the center of the collar as she creates it, so the hole in center of the collar gives an indication of the size of the mother snail. When the eggs are still viable, the collar will feel hard and a bit like plastic and each collar contains thousands of living eggs. When the eggs hatch or if it washes up too high on the beach, the collar will dry out and crumble into fine sand once again. Moon snails, commonly referred to as “sharks eyes” are quite common in the waters surrounding BHI, both in the marsh and the ocean and you can often find their shells washed up along the wrack line. They are a cannibalistic snail, feasting on other mollusks. If you’ve ever found a shell with what appears to be a perfectly round hole near the top, there’s a

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BHI Underbelly Exposed!

Dr. Paul J. Hearty
Director of Conservation

The subsurface geology, geometry of the aquifers, and nature of the groundwater resources of Bald Head Island are barely known. Yet these rocks and sediments may provide a long-term supply of fresh water. By learning about and monitoring the aquifer we can better use and conserve our freshwater resources. This study puts the BHI community on the cutting edge of water conservation in North Carolina and nationwide.

The sustainability of the groundwater resources on Bald

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very good chance it was made by a moon snail! They secrete an acidic substance to soften the shell of its next meal, and then use its radula (a tongue-like device with teeth on it) to scrape out the unsuspecting mollusk.



Moon Snail
Photograph by Paul Hearty

Birding on the island has been outstanding this winter as well, although it always seems to be outstanding! However, we have been fortunate to witness some wonderful birds these past couple of months. In mid-January, the Monday morning birders were treated to three Bald Eagles sitting in the trees off

the end of Middle Island. The temperature was low, the wind was howling, but the eagles (and the birders!) didn't seem to mind one bit. One of the three was an adult – complete with white head and white tail while the other 2 birds appeared to still have juvenile plumage. BHIC staff have seen an increase in the number of eagles around BHI and we are hopeful they will start nesting in the extensive marsh/hammock habitat. In addition to the eagles, the birders also found a young red-headed woodpecker excavating a hole in a dead tree. This species also appears to be making an island comeback, as multiple birds have been reported across different parts of the island. They historically nested on BHI but in recent years their preferred nesting trees were knocked down in storms. This was the first red-headed woodpecker I have seen on BHI in 2 ½ years and I am hopeful they will successfully nest this spring. I can't stress enough the importance of dead trees to the wildlife of the island – insects, birds, mammals, reptiles and amphibians all rely on dead trees for a variety of purposes – food, shelter, nesting – and it is important to leave dead trees standing whenever possible. The loggerhead shrike, a winter-only visitor, has taken up his annual perching spot on top of the gazebo near Beach Access 1. At first glance they can be easily mistaken for a mockingbird, but the Zorro-like mask across their eyes, thick bill and gray body with a white belly quickly sets them apart. Their hunting method is quite unique and a bit ghastly, actually! After catching prey such as dragonflies, grasshoppers and even small rodents, shrikes will impale their meal on a branch or wire so that they can tear them into bite-sized pieces. This behavior has earned them the nickname of “butcher birds”. In addition to these great birds, it also appears that we have at least a few pairs of great horned owls on Bald Head and Middle Island. BHIC staff and island residents have reported hearing several birds in different locations, often in pairs hooting back and forth. Great horned owls nest very early in the season, typically in January or February. They do not build their own nest, but rather “borrow” the nest of other species such as red-tailed hawks or ospreys since they finish up their nesting season before these birds return in the spring for their own breeding season. A very clever way to get out of building your own nest!

Grab a pair of binoculars, throw on some walking shoes and enjoy this wonderful season on the island!

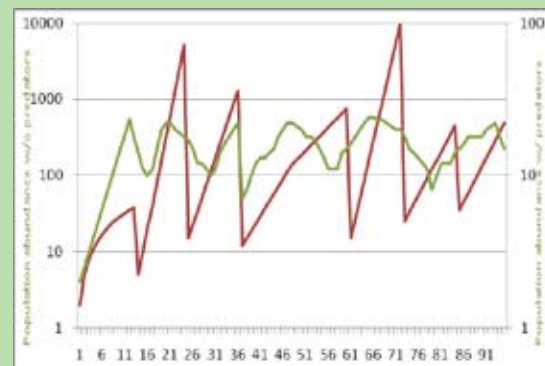
The Paradox of the Predator

By Suzanne E. Dorsey, Ph.D.

Bald Head Island has experienced a rabies epidemic primarily in her fox and raccoon populations this winter. The result is that both populations are crashing and this summer you won't likely see very many foxes on the road or scampering around turtle nests. We are seeing a recurring pattern on BHI. First, Raccoons and foxes become overpopulated and wipe out our mice and reptile populations. Then a disease, rabies this time but distemper last time, takes the mammal populations down to a very low level. The first population to recover will be our rodents (start mouse proofing your home now). Hopefully by the end of the summer we'll see more of our snakes return and begin to control the mice. After a couple of years we will once again see foxes and raccoons taking advantage of abundant snake and rodent prey.

This cycle perfectly illustrates a new ecological theory put forth by Duke researcher, John Terborgh; first outlined in his 2001 Science paper¹. He challenged the accepted theory called “island biogeography”, which explains species abundance based on the size and quality of habitat (bigger places - more animals). Conservationists therefore, use preservation of habitat as a primary tool to protect populations. Dr. Terborgh looked at even big landscapes and saw distortion. He didn't only blame a lack of habitat he blamed a lack of predators.

Terborgh claimed that nature is out of wack in most parts of the world because we no longer have top predators. In a summary of his paper Dr. Terborgh² implores, “look at the overgrazed grasslands of the American Southwest, giving way to prickly scrub and thorn; or to the forests of the eastern U.S. being swallowed by white-tailed deer. Look at the nationwide plague of opossums and raccoons and foxes and feral housecats—those mid-sized predators that used to be prey—now consuming birds and small mammals by the billions.” With no top predators we are altering nature and transforming ecosystems. Terborgh further states that for conservationists preserving land is no longer the only tool that must be applied. “If you know there is a biological mechanism operating, and you know who the



This fictional graph contrasts a population without predators (red line), which grows rapidly and crashes catastrophically with a predator controlled population that has lower amplitude cycles. The bottom axis is time, whereas the left axis displays the population abundance without predators (red), and the left axis shows predator abundance with predators (green). High population levels often result in disease and steep population declines. The presence of predators keeps populations lower and epidemics less frequent.

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Rabies: FAQ's

What is rabies?

Rabies is a virus, typically transmitted to one animal from the bite (saliva) of a rabid animal. Most rabies cases reported to the CDC each year are from wild animals including raccoons, bats, skunks and foxes. Domestic animals are also susceptible, but these cases account for fewer than 10% of reported cases in the United States. Rabies affects the central nervous system, eventually leading to death.



Juvenile Raccoon
Photograph by Donna Finley

How is rabies transmitted?

1. Raccoon is bitten by a rabid animal.
2. Rabies virus enters the raccoon through infected saliva.
3. Rabies virus spreads through the nerves to the spinal cord and brain.
4. The virus incubates in the raccoon's body for approximately 3-12 weeks. The raccoon has no signs of illness during this time.
5. When it reaches the brain, the virus multiplies rapidly, passes to the salivary glands, and the raccoon begins to show signs of the disease.
6. 6. The infected animal usually dies within 7 days of becoming sick.

Transmittal information courtesy of the CDC.

What are the signs and symptoms of rabies and who are carriers?

Rabies is transmitted by mammals, so on Bald Head Island the most common carriers of rabies would be raccoons, red foxes, gray foxes and bats. Although

deer and rodents could carry rabies, they are much less likely to be carriers of the virus. It can often take weeks or even months for the first symptoms of rabies to appear in wild animals after they have been bitten by a rabid animal. A wide variety of symptoms can occur, including a loss of fear of humans, difficulty walking, erratic behavior, aggressive behavior, biting of inanimate objects or the appearance of choking or trouble with its mouth, paralysis and foaming of the mouth.

What can you do?

First and foremost, keep your distance from any wild animal – you can never be sure how they will react to your presence. Second, if you see island mammals, especially raccoons and foxes, displaying any of the typical symptoms of rabies please call the Village Police Department (911) and the BHI Conservancy (910.457.0089) to report the location, kind of animal and behavior. Third, keep your pets on a leash and be sure they are up to date with their rabies vaccinations. It is important to remember that it is not uncommon to see red foxes and raccoons during the day on BHI. They have become accustomed to humans, especially those that have been fed, and simply seeing them during the day does not mean they are rabid.



Red Fox
Photograph by Donna Finley

DRILLERS *continued from page 1*

Head Island will be assured by a comprehensive subsurface hydrogeological project (HGP). The project will drill an array of new shallow and deep wells across the island. The Conservancy-led HGP groundwater-aquifer initiative, in concert with the BHI Village and Club, was approved by the Village Mayor and Council on 22 February 2009. The drilling, well-construction, and evaluation of the BHI upper unconfined and lower semi-confined aquifers will be a team effort by the BHI Conservancy (led by Dr. Paul Hearty) and Applied Resource Management, P.C.(led by Mr. Jim Cornette, P.G.), of Hampstead, NC.



Figure 1. Expect to see the “big rig” on the Island in late March and Early April.

The HGP will explore the sediment and rock layers beneath BHI with an array of both deep and shallow drill holes at ten localities around BHI and Middle Island. At each site, the deep boring will penetrate approximately 100 feet. Each well will yield sediment samples taken at 5-foot intervals. From 10 of these wells “stratigraphic sections”, or rock layers will be used to construct a three dimensional image of the various rocks and sediments that define water resources on BHI. Adjacent shallow wells will penetrate 25 to 35 feet, accessing the upper unconfined aquifer. Samples collected from these cores will be analyzed for a variety of characteristics including grain size (gravel, sand, silt, clay or mixtures thereof), composition (mineral grains, organics fossils, etc), water yielding and conductive capability, and geologic age. These characteristics along with water quality will help us understand how freshwater is stored and impacted by our many activities on BHI. By monitoring the aquifer seasonally over several years we will be able to make decisions about how best to protect and maintain our freshwater resources.

Although much of the fresh water on BHI has traditionally arrived via pipeline from Brunswick County, the future

PREDATOR PARADOX *continued from page 2*

actors of that mechanism are then management interventions become possible.”

I share this point of view because I believe the BHI is at yet another environmental crossroads. Our raccoon and fox populations will continue to cycle in this “altered state” unless the community imposes a management regime on them. The Conservancy has already started discussions about fox management and the first order of business was to obtain population estimates. Now that the populations are being decimated by rabies we will need to start fresh in considering a management plan. It is an opportunity to step back, look at the broader issue of our populations and ask ourselves how to best take care of our altered landscape.

Please share your concerns about BHI’s midsize predator populations and your ideas about how we should be involved in managing them. The Conservancy will once again convene Public Forums to discuss these issues but for those of you who are not able to attend please email your ideas to email@bhic.org. We also have a Facebook group page: Bald Head Island Conservancy. Additionally, we started a dialogue on Twitter: <http://twitter.com/BHIC>. We’ll continue to share ideas on our web page and in the Conservator as we develop consensus around a plan.

¹Terborgh, J. et al. 2001. Ecological meltdown in predator-free forest fragments. *Science* 294(5548) 1923-1926.

²Stolzenburg, W. 2008. Ecosystems Unraveling, Pull predators out of the mix and a once lush green world turns into an ecological shop of horrors. *Conservation Magazine*. Vol. 9 No. 1. Jan-March.

strategy for the island is to become more self-sufficient by producing and recycling most of the fresh water on the island within our own hydrologic cycle...in a sense becoming more environmentally sound, and drought, storm, and supply-pipeline-loss “resistant”. In the coming months, three reverse osmosis plants will come on line, greatly increasing the fresh water yield from on the island. The vast majority of waste water will be treated, purified, and sterilized and returned to the unconfined aquifer via infiltration ponds for natural filtration and irrigation use. This constant aquifer recharge will further defend the fresh water resource from saltwater intrusion. Only the reject water from the RO system will be lost from the island. Through the ingenuity of design and detailed understanding of the extent and yield of the water resource, it is expected that BHI will set a precedent and become of model of sustainability of freshwater resources for barrier and other oceanic islands.

Turtle Patrol 1982: Lessons From the First Night

Historic Perspective of Challenges Facing the BHIC

by Cindy Meekins Amos, the Turtle Lady

Left alone after one week of training by Joe Morgan, the wildlife officer in Brunswick County, I was energetic and ready to begin the nocturnal existence of sea turtle conservation. Arriving by the last departing ferry from the mainland, I walked the distance to the maintenance area where the three-wheeler was stored, fully confident of my ability to carry out the first of many missions to survey the beach for incoming loggerheads. Gear loaded, I made access to the beach via the riverfront through an old parking area for large equipment, a relic of the road paving job which had just preceded my initial voyage. Having made prior note of the high tide arrival later that evening I thought the river already looked a bit swollen, but with such a small frame of reference (four rides with Joe), I didn't know enough to be cautious. Lesson #1: *Trust your instincts for reading the natural settings around you.*

Completing the patrol along a quiet South Beach, I turned across the upper portion of cape point and headed north up East Beach. Above Bluff Island, the sea gulls roosted out on the beachfront in substantial numbers, having had centuries of uninterrupted sleep along this desolate stretch. Though riding as low as the tide would allow, I still managed to disrupt the collective harmony of the colony, for which I was duly dive-bombed. Making note to wear a pith helmet on future runs (which I did for several weeks), I continued my slow patrol up to the Fort Fisher Inlet. Lesson #2: *Protect yourself from the lesser evil to achieve the greater good, adding comfort only if the option avails itself.*

Leaving a shimmer of stars at the inlet, I returned to the linear world of East Beach and trained myself to focus on only what appeared in the conical light projected by the red lens of my headlight. Gulls buffeted my knees on the landward flank, but the tide was so insistently reclaiming the beachfront, I had little choice than to ride the dry, upper sands. Lesson #3: *Accept the little piece of the world given you and make every attempt to live harmoniously therein.*

see *TURTLE PATROL* on page 6

Bhic's Newest Member: Katie Craig, Operations Assistant

Born and raised in Western Pennsylvania, Katie joined the Conservancy in February 2009. She earned her BA in anthropology from Indiana University of Pennsylvania and moved to Washington, DC after graduation. When she grew tired of traffic on I-495, she moved to Wilmington to try her hand at beach life. Her hours spent away from the Conservancy often consist of hiking, enjoying the beach, watching Penguin's hockey, or cooking dinner for her friends.





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Just short of the cape, I had my first track of the evening – a false crawl. The track coiled senselessly on the open sands of the upper spit, but in my inexperience, I failed to decode the turtle's apprehension. She was seeing water on both sides, not the dunes she was seeking. Lesson #4: *Feel the weight of mounting evidence and stop to assess its gravity on your given situation.*

I began the return trip across South Beach though the waves lapping both accreted edges of the cape incessantly attempted to dissuade me otherwise. Just short of the easternmost of the Captain Charlie trio, my press with conditions came to an ultimatum – the invisible shipwreck that Joe had warned me about was now stripped bare of its sand blanket and baring rusted teeth of opposition. I had a mere split second to react and protect my balloon tire, leading a spike to lodge in the left shock of the front fork. As I sailed off the vehicle, I had a moment of clarity with nature and full understanding of what the +6 feet meant in the tidal chart. South Beach had barely withstood the first cyclic peak of tidal bore of the diurnal sequence – hence the uncovering of the shipwreck – and

I was about to questionably withstand the second. Lesson #5: *Cataclysm is an impatient translator of nature; default to survival mode.*

Before I could stand up and limp to the vehicle, the first wave washed beneath us. My adrenalin rush pushed it back out to sea and I lifted the fork off the spike to find the front tire flatly uncooperative. At quick glance, the adjacent sand dune was a fine educational tool, shown fully in cross-section with a four foot depth of tangled roots being exposed to the salt spray. Between two crests must come a trough, and before the next wave could repeat the cycle, I pushed the stalled bike onward to find the closest low point in the dune line. As I heaved the machine, gear and all, up a waist-high wall of sand, a wave washed up the back of my legs, scarping the dune face to boot. Lesson #6: *Recovery is a hasty step toward higher ground that rarely feels good when you're doing it. Carry on nonetheless.*

Next came the two-mile run back to the precariously-placed pods of the inn, which were also taking the brunt of the tide, though anchored a bit more securely than the sands of South Beach. Finding Spunky Burton there, I breathlessly relayed my predicament.

The rescue ensued with a pick-up truck, a dry dock for the bike at the maintenance shop, and a salty mix of safety lecture and sleep for the driver on the brown sofa at Island Base (the trailer version). Within hours, the tire would be patched, the turtle would successfully nest just after nightfall and I would go on to ride the beaches with greater wisdom for five more years. Lesson #7: *Smooth sailing is overrated; a shipwreck on the beach speaks volumes with regard to overcoming adversity, despite being a continuance of archeological proof that those who do not learn from history are destined to repeat it.*



Loggerhead Hatchling
Photo by Devon Lang