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Northern Harrier Nesting: An Update from Block Island

BY MICHAEL E. BYRNE

One of the most easily recognized and charismatic of our local raptors, the Northern Harrier (*Circus cyaneus*), is no doubt familiar to even the most casual of Ocean State birders (see the photo on page 17).

While many may consider the bird

to be a relatively common sight in our area during the winter months, crisscrossing coastal marshlands in search of prey, the Harrier is actually listed as endangered in Rhode Island (RIDEM 2001). This status is because the nesting population is quite small; in fact, Block Island is the only location in the state where Harriers are now known to nest (Enser 1992). Unfortunately the situation is not unique to Rhode Island. The Harrier has been declining as a breeder in New England since the early 1900s (Christiansen and Reinert 1990), and is listed as endangered in Connecticut (CDEP 2004) and threatened in Massachusetts (MDFW 2004). The bird's decline may be a result of the combined forces of habitat loss and increases in numbers of mammalian predators (DeGraaf and Yamasaki 2001). In southern New England the bird is mainly relegated to nesting on the offshore islands and parts of Cape Cod.

Despite the species' situation in New England, very little direct attention has been paid to the Harriers nesting on Block Island. The only documented attempt to survey the population that I could uncover was an unpublished report to the R.I. Division of Fish and Wildlife nearly two decades ago (Serrentino 1989). There have been no follow-up studies conducted, and currently very little is known about the population size, productivity, nesting phenology, and habitat use of Harriers on Block Island. A major focus of my M.S. thesis research is addressing these questions. What I present here are the results from the 2005 nesting season on Block Island—the first year of a planned two-year study into the nesting ecology of these birds. The end results of my study will serve as a baseline for future monitoring efforts and help guide land-management decisions on the island.

Methods

I began the search for nests during the second week of April. Territories were found by observing one or more key behaviors: mutual soaring over a given habitat patch by two birds of the opposite sex, "sky-dancing" displays, copulation, nest building, prey deliveries from male to female, and aggressive behavior towards same-sex conspecifics. The exact location of each nest could be determined by watching the female return to the nest following a prey delivery from the male.

Once a nest was found, I visited it every 1–5 days for the course of the season, until it was clear that either the young had fledged and left the nest area, or the nest had failed and/or been abandoned. Although rare, it has been reported that directly approaching a nest may cause the parents to abandon it (MacWhirter and Bildstein 1996). As I did not want to risk the possibility of researcher-induced nest failure, no nest was directly approached until the nest had fledged or failed. Observations were carried out from a location that allowed a clear view of the nest site but did not cause disturbance to the birds. Dates of important nesting events—first egg, hatching, and fledging—were estimated for each nest by a combination of behavior observation and back-dating from dates of known events using values published in MacWhirter and Bildstein (1996). A successful nest is defined as fledging at least one young. Harriers use a highly visible method of transferring prey in mid-air to nest mates and fledglings, often allowing for identification of the prey item. For each prey delivery observed, the prey item was recorded as a small mammal, bird, snake, or unidentifiable.

Following fledging or failure, the location of each nest was determined using a handheld GPS. Each nest was clas-



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sified as being in either upland or wetland habitat. Microhabitat characteristics were recorded in a 3-m radius around each nest using a classification method modified from Simmons and Smith (1985). Site wetness was recorded as dry, wet (ground wet or saturated), or very wet (standing water within 3 m of nest). Vegetation height, vertical density, and horizontal density were measured along four lines radiating out from the nest center at 90° angles. Vegetation height was measured along each line every meter (3 measures per line), and the values averaged. Vertical density was measured along each line every meter by counting the number of leaves, stems, and branches touching a wooden dowel plunged vertically through the vegetation. All values were averaged. To measure horizontal density, a 3-m wooden dowel was held horizontally 50 cm off the ground and all leaves, stems, and branches touching the dowel were recorded. The totals for each line were averaged. At each site the dominant vegetation was recorded. Nesting patch size was obtained by digitizing each patch from 1:5,000 true color orthophotos (available online from the RIGIS, www.edc.uri.edu/rigis) using GIS software. A nesting patch was defined as the discrete plot of habitat in which a nest was located; the borders of each patch were defined as obvious changes in vegetation and/or major walking paths/roads.

Results and Discussion

Six pairs of Northern Harriers nested on Block Island in 2005; one additional pair began courtship and defended a territory but never initiated a nest. That pair had disbanded by the last week in May. Harriers are unique among raptors in that they are prone to polygamous mating (Simmons 2001), however all nests on Block Island were tended by monogamous pairs. Nests were located in both southern and northern portions of the island (Figure 1).

The Block Island Harriers used both upland and wetland habitats for nesting in 2005, with four and two nests located in each habitat type, respectively (Table 1). The four upland nests were all located in very similar patches of dense thickets dominated by briars (*Smilax* spp.). In some cases the thicket was so dense that the nest itself was actually suspended off the ground by as much as 30 cm, resting on a layer of vines (Figure 2). The wetland nest sites were located in Common Reed (*Phragmites australis*) and Broad-leaved Cattail (*Typha latifolia*), respectively (Table 1). Wetland sites had the tallest vegetation, while the vegetation surrounding

Table 1. Habitat characteristics of Northern Harrier nests on Block Island, 2005. See Figure 1 for nest locations.

	Nest Number					
	1	2	3	4	5	6
Habitat	Wetland	Upland	Upland	Upland	Wetland	Upland
Patch Size (m²)	26,708	11,815	5,645	8,016	37,990	3,397
Vegetation Type	Phragmites marsh	Vine-shrub	Vine-shrub	Vine-shrub	Cattail marsh	Vine-shrub
Dominant Species	<i>Phragmites</i>	<i>Smilax</i> spp.	<i>Smilax</i> spp.	<i>Smilax</i> spp.	<i>Typha</i>	<i>Smilax</i> spp.
Site Wetness*	Wet	Dry	Dry	Dry	Very Wet	Dry
Vegetation*						
Height (m)	2.66	0.85	1.20	1.15	1.48	1.15
Horizontal Density	14.50	41.25	42.25	41.05	20.00	41.00
Vertical Density	12.38	8.24	22.13	22.20	5.25	23.00

*Nest Site characteristics within 3 m of nest

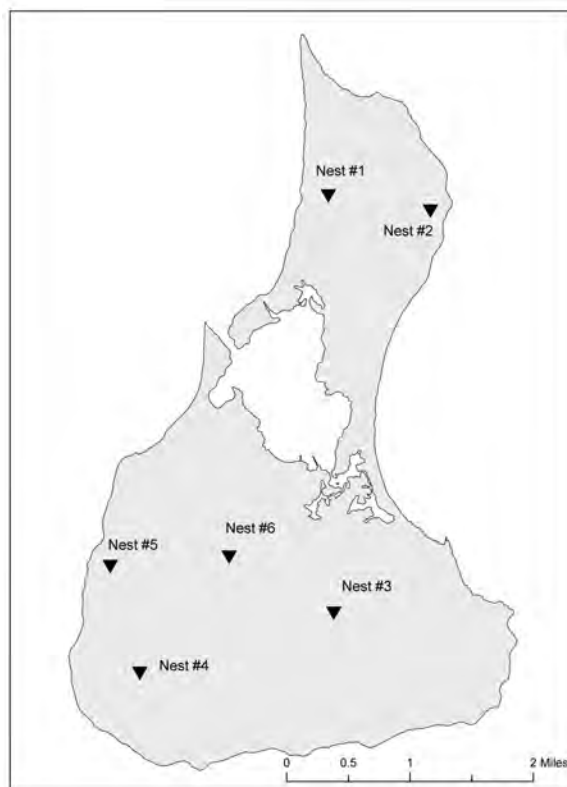


Figure 1. Northern Harrier nest site locations on Block Island in 2005.

upland nests (dominated by *Smilax*) was very dense. Nest #2 bears special mention; the surrounding Black Cherry trees (*Prunus serotina*) growing on the periphery of the nest site formed a sort of canopy over the nest that was too tall for me to measure. Nesting patch size was larger for wetland sites than for upland sites (Table 1). Both wetland sites were located in extensive marsh areas, while the upland sites were generally located in small hollows located within habitats of taller woody vegetation.



Figure 2. Northern Harrier nest suspended in a thick briar thicket, with a work glove for scale. (photo by M. Byrne)

Table 2. Northern Harrier nesting chronology and success, Block Island, 2005

Nest	First Egg	Hatch	Fledge	# Young Fledged
1	May 3	June 6	July 4	4
2	May 1	June 5	July 5	4
3	May 7	June 8	July 10	2
4	May 3	June 4	July 4	4
5	May 2	--	--	0
6	May 2	June 3	July 3	4

Nesting chronology was remarkably synchronous around the island in 2005 (Table 2). The average date of first egg was 3 May (range 1–7 May), average hatching date was 5 June (range 3–8 June), and average fledging date was 5 July (range 3–10 July). Nest #3 lagged behind the rest by about a week.

Five of the six nesting pairs (83.3%) successfully fledged young in 2005 (Table 2). Although only six pairs nested on the island, nest success in 2005 was actually the highest ever reported for this species in North America—and just slightly higher than observed on Nantucket Island, Massachusetts (R. Bowen, personal communication). A total of 18 young were fledged. The average number of young fledged per nest was 3.0; the average number of young fledged per successful nest was 3.6.

Although the nesting population is not very large, evidence from 2005 (as well as ancillary data collected in 2004) indicates that Block Island is a great place for a pair of Northern Harriers to raise a family. The reasons that Harriers have such high nesting success on Block

Island are not 100% clear, but the lack of mammalian predators may be important (DeGraaf and Yamasaki 2001). There was no evidence of predation on Block Island, while on Cape Cod (where I also work) only two out of five nesting pairs were able to fledge any young. The other three nests were lost to predators. The one Block Island nest that failed in 2005 failed not because of predation, but because it was located in a marsh and was flooded during a nor'easter over Memorial Day weekend.

I observed 150 prey passes in 2005, and was able to determine the prey item for 92 of those. Small mammals (voles and mice) made up just over half of the identified prey items (55.4%), followed by birds (35.9%), and finally snakes (5.3%).

Conservation Implications

Raptor breeding densities are often governed by availability of both food and nesting habitat (Newton 1979). Northern Harrier nesting populations in some areas are strongly tied to Meadow Vole (*Microtus pennsylvanicus*) abundance, with fewer birds nesting in years of low vole abundance (Hamerstrom et al. 1985). Harriers on Block Island, however, showed no evidence of food stress, and prey-provisioning rates (not shown here) are equivalent to rates in other areas of North America (MacWhirter and Bildstein 1996). There have been historical accounts of nests in areas where I was not able to detect any nesting activity (C. Littlefield, personal communication; Serrentino 1989), and in at least two of these areas the habitat has been reduced and fragmented due to housing development. Loss of historical nests plus the lack of evidence of food limitation on nesting pairs seem to indicate that the abundance of nesting Harriers on Block Island is limited by the availability of suitable nesting sites. Conservation efforts therefore should be aimed at preserving areas of suitable nesting habitat, in this case marshland and dense briar thickets.

Acknowledgments

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Is *Carex kobomugi* (Asiatic Sand Sedge) in Coastal Rhode Island a Threat to the Maritime/Beach Dune Community?

B Y S U Z A N N E E N S E R

Native to eastern Asia, *Carex kobomugi* Ohwi (Asiatic Sand Sedge or Japanese Sedge) is a perennial sedge that has become naturalized in the maritime beach/dune community along the eastern coast of the United States. First reported in 1929, plants were observed to have good dune stabilization properties and subsequently intentionally introduced into the coastal environment for conservation purposes. Since then, *C. kobomugi* has been reported from Massachusetts to North Carolina, where it has been observed to compete with native dune vegetation.

Life History

C. kobomugi is a robust perennial that grows 10–30 cm in height and may be the only member of the genus *Carex* found in the upper beach habitat along the U.S. Atlantic coast (Lea and McLaughlin 2005). *C. kobomugi* is a coarse and stout sedge that forms extensive colonies through rhizomatous growth. In Japan, Nobuhara (1967) observed *C. kobomugi* rhizomes extending to depths of 0.5–1.2 m. In New Jersey, Wootton et al. (2003) routinely observed *C. kobomugi* roots extending 1.2 m deep.

While *C. kobomugi* can reproduce sexually, seeds have been shown to have a low germination rate (Yamamoto 1964). Thus, *C. kobomugi* spreads vegetatively to maintain and extend its population (Nobohara and Miyazaki 1974, Sasaki 1987) and sexual reproduction is not necessary for a colony to expand locally (Lea and McLaughlin 2005). Additionally, *C. kobomugi* is tolerant of salt spray and high winds associated with the maritime environment, thus allowing it to persist and spread.

The stems form low, dense stands on coastal dunes and have been found in densities up to 200 plants per m², effectively excluding American Beachgrass (*Ammophila breviligulata*) and decreasing native plant diversity (Mehrhoff et al. 2003). These characteristics make *C. kobomugi* a potentially effective dune stabilizer (Wootton et al. 2005). This unique combination of these life history characteristics, however, has ultimately enabled *C. kobomugi* to invade the maritime beach/dune community.

History of Introduction—Pathway to Invasion

C. kobomugi was first discovered from “a sand dune near Seaside Park, near Tom’s River, New Jersey” in 1929, and shortly thereafter it had “spread rapidly over the dune...” (Fernald 1930). The plants may have been accidentally introduced as packing in barrels of Oriental porcelain (Halsey 2002). A second hypothesis suggests that propagules were discarded in ballast water (Small 1954). Belcher (1990) suggested that the original colony was broken up by storms and spread to several locations from New Jersey to Virginia; however, Lea and McLaughlin (2005) contend that the viability of long-distance dispersal by *C. kobomugi* seeds is uncertain.

Apparently *C. kobomugi* was intentionally introduced into coastal sands from New Jersey to Virginia beginning in the 1930s for erosion control and as a sand stabilizer (VDCR 2005). The U.S. Dept. of Agriculture Soil Conservation Service (SCS) promoted the use of *C. kobomugi* in propagation and planting programs from Massachusetts to North Carolina. *C. kobomugi* was also promoted in conservation planting programs because it was resistant to diseases and pests that had impeded the growth of American Beachgrass, and it was found to be more tolerant of trampling (Belcher et al. 1984, USDA 1984). In 1983, SCS and the New Jersey Agricultural Experiment Station released “Sea Isle” Japanese Sedge for the prevention of beach erosion (Belcher et al. 1984). By the 1980s, a combination of accidental and deliberate introductions had resulted in the species’ spread from Falmouth, Massachusetts to Duck, North Carolina (Shisler et al. 1987).

History of *Carex kobomugi* in Rhode Island

C. kobomugi was first reported on the Rhode Island coast in 1981 (Champlin 1994). The exotic sedge was observed and collected among the dunes at East Beach, Charlestown. At that time, the main population occupied an area of about 170 m² in a blow-out in the primary dune, with both male and female plants present (Standley 1983). Scattered plants were also found growing in loose sand inshore from the blow-out, and in a second location nearby. *C. kobomugi* had successfully invaded the disturbed areas of the primary dunes, which Standley (1983) hypothesized to have been coincident with increased disturbance of the coastal dunes from increased anthropogenic activity. Recent observations indicate the *C. kobomugi* population at East Beach has expanded (Enser 2005). There are six large colonies covering about 12,000 m² in total, extending from the beach front, over the entire dune, and across the sandy road into the backdune area.

Research Results

Would *C. kobomugi* have the ability to stabilize disturbed dunes in sites where *Ammophila*, the native beachgrass, was

not able to survive? Would *C. kobomugi* provide more resistance to erosion by wind than does *Ammophila* (Standley 1983)? These questions and, more recently, concerns regarding the invasive nature of *C. kobomugi*, have led a small group of ecologists to conduct inventories and research to better understand this non-native, potentially invasive species.

In New Jersey, where the majority of introductions and research have occurred, the most extensive data come from Small (1954) and Wootton (2005). Small (1954) reported on the migration of *C. kobomugi* and its successful invasion of the established flora at Island Beach in Ocean County from 1939 to 1951. Measurements over 12 years clearly indicated that the patch size had increased, with maximum densities of about 350 shoots per m². Comparative observations indicated that the rhizomes of *C. kobomugi* were placed deeper, had shorter internodes, and rooted more profusely than *A. breviligulata*. Small (1954) suggested that the establishment and continued expansion of this colony demonstrated the ability of *C. kobomugi* to compete successfully with *A. breviligulata*, further noting that *A. breviligulata* was rapidly reduced by *C. kobomugi*. Subsequently, increased awareness of the potential damage caused by non-native plants led to the species being listed as one of the ten most unwanted plant species in New Jersey (Bennet-Chase 2001).

By the early 1990s, planting of *C. kobomugi* in the U.S. ceased and management practices changed from introduction to elimination (McGough et al. 2003). With greater attention directed toward exotic species, the New Jersey stands of *C. kobomugi* faced aggressive eradication efforts (Halsey 2002). However, since the species had initially been planted as a dune stabilizer, its control or removal required special care (Wootton et al. 2005). In response, the New Jersey Sea Grant Extension Program, in cooperation with Georgian Court University, initiated research to assess spread rates and impacts on dune ecology by *C. kobomugi* (Wootton et al. 2003). Results found that, to some extent, *C. kobomugi* colonized back dune areas in which other dune species did not thrive. However, numbers and diversity of other species within *C. kobomugi* beds were generally lower than those in comparable plots just outside those same beds, suggesting that the expansion of this species was significantly impacting the ecology and diversity of coastal dunes (Wootton 2002). Wootton et al. (2005) provide evidence to suggest that the spread of *C. kobomugi* has played a role in the decline of native plant species, species richness, and diversity in invaded areas.

Maritime Beach/Dune Community

The maritime beach community is a sparsely vegetated community that occurs on unstable sand, gravel, or cobble beaches above the mean high-tide mark, where the shore

is modified by storm waves and wind erosion (Enser and Lundgren 2005). The maritime dune community is located inland and adjacent to maritime beaches, and is dominated by grasses and low shrubs. Vegetation occurs in patches resulting from past disturbances such as erosion, sand deposition, and dune migration. *A. breviligulata* grows in the active portion of the primary dunes where sand shifting is greatest (Enser and Lundgren 2005). *C. kobomugi* has been observed to thrive in and among the maritime beach/dune community, in dense patches, effectively excluding *A. breviligulata* (Mehrhoff et al. 2003).

In Rhode Island, the maritime beach/dune community presents a unique and limited resource such that any negative impacts to the physical structure and composition of the community may endanger the viability of associated species. Although as yet there is no direct evidence implicating the spread of *C. kobomugi* in the decline of these species, the potential exists for this exotic sedge to usurp the open habitats required by these species and other members of the maritime beach/dune community.

Invasive Species Policy: *Carex kobomugi*

The Rhode Island Invasive Species Council (RIISC) was formed to address threats to biodiversity from invasive non-native organisms, and a preliminary list of invasive plants was established (Gould 2005). *C. kobomugi* does not appear on the list. Although its occurrence is extremely localized at a single location, recent observations at East Beach indicate the population has increased substantially since discovery in 1981 (Enser 2005). Moreover, as observed elsewhere (i.e., New Jersey), the species appears to exhibit a “lag phase” followed by extremely rapid expansion, a trait common to invasive species. At present, *C. kobomugi* is reported as invasive in Maryland, New Jersey, and Virginia (Swearingen 2005). Interestingly, it has been deemed “invasive” by the Connecticut Invasive Species Council, even though the species has not been reported there. In the meantime, I would encourage that some level of policy be developed to manage the advance of *C. kobomugi* at East Beach.

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Launching a Sea Turtle Disentanglement Program in Rhode Island

BY MALIAL SCHWARTZ

Many Rhode Islanders are not aware that there are sea turtles in New England waters, and even in Block Island Sound and Narragansett Bay. There are five species of sea turtles in the North Atlantic, and four of them occur regularly off southern New England. Leatherbacks (*Dermochelys coriacea*) and Loggerheads (*Caretta caretta*) are the most common, Green Sea Turtles (*Chelonia mydas*) and Kemp's Ridley Sea Turtles (*Lepidochelys kempii*) are relatively rare, and Hawksbills (*Eretmochelys imbricata*) are accidental (Lazell 1980, Shoop 1980, Shoop and Kenney 1992).

All sea turtles occurring in the North Atlantic are listed as endangered or threatened under the U.S. Endangered Species Act (ESA) (NMFS/OPR n.d.). One human impact that

threatens their survival is entanglement in fishing gear (NRC 1990). Turtle bycatch in shrimp trawls and high-seas swordfish long-line gear is most familiar, but turtles can be caught in almost any type of fixed fishing gear, including lobster lines, fish traps, gill nets, and crab pots. Because of its intensity, the lobster fishery is the most significant threat in New England (James et al. 2005). A turtle may be attracted to seaweed and animals growing on or swimming around buoy lines, accidentally get a line wrapped around a flipper, and



Figure 1. A Leatherback Sea Turtle killed by entanglement in a fish trap in Rhode Island Sound in the late 1970s. (CETAP/URI file photo)

then panic, further entangling itself (Schwartz 2001).

Strandings of sea turtles along our coasts are not uncommon. There is a regional Stranding Network in the Northeast that deals with stranded marine turtles. Because they are protected under the ESA, any interaction with a stranded sea turtle, living or dead, requires special federal permits. Mystic Aquarium is the designated stranding responder for Rhode Island and Connecticut. But a clear need for better response to reports of live turtles tangled in gear has existed for quite some time.

From 1987 to 2004, Rhode Island recorded a minimum of 23 entanglements of sea turtles—primarily Leatherbacks (Figure 1). Lack of dedicated and trained responders, response vessels, and funding has limited the number of entanglements that could be responded to in a timely manner. As a result, entangled turtles have been lost (fate unknown) or died from the entanglement.

In the summer of 2005, the National Marine Fisheries Service (NMFS) Northeast Regional Office (NERO) in Gloucester, Massachusetts contracted with Rhode Island Sea Grant (RISG) to establish and operate a new program—the Rhode Island Sea Turtle Disentanglement Network (RISTDN). Coordinated by David Beutel and myself, both from RISG and the URI Department of Fisheries, Animal & Veterinary Science (FAVS), the objectives of the RISTDN were to respond

to reports of entangled marine turtles in Rhode Island and to disseminate knowledge gained from the response effort. This included training a group of experienced people and enlisting a cadre of boats to respond to turtle entanglement calls, fielding calls for all Rhode Island marine turtle entanglements through a dedicated cell-phone hotline, and responding to the entanglement and attempting to release the turtle.

Training Workshop

Working with NERO's Kara Dodge, the Coordinator of the Northeast Sea Turtle Stranding Network, we engaged 14 interested and experienced volunteers to participate in the RISTDN program and hosted a volunteer training workshop at the Bay Campus on 29 June—in anticipation of the 1 July unofficial start of marine turtle season (Fig. 2). Brian Sharp of the Provincetown Center for Coastal Studies assisted us in discussing marine turtle species expected to occur locally, how turtles get entangled, recovery of entangled turtles, legal and regulatory aspects of disentanglement response, reporting and documentation, disentanglement equipment, and the actual process of freeing an entangled turtle.

Since the initial workshop, Dave Beutel has trained additional responders in the East Bay area, which was initially our area of lightest coverage. Dave has also trained all R.I. Department of Environmental Management (RIDEM) Enforcement personnel so that they may respond if closest or on-scene at any hour of the day. We now have a total of 51 trained members of the RISTDN, including people from FAVS, the URI Graduate School of Oceanography, the Apex Predator Group at the NMFS Narragansett Laboratory, the U.S. Coast Guard, RISG, Mystic Aquarium, RIDEM, the Audubon Society of Rhode Island (ASRI), Roger Williams University, and Rhode Island commercial fishermen and lobstermen.

The Network

A cellular telephone Turtle Disentanglement hotline was set up; the hotline number is (401) 633-4116. The hotline tele-



Figure 2. Brian Sharp (left) demonstrating a self-jamming grappling hook from the disentanglement kit to participants at the training workshop.

phone was monitored 24/7 for the rest of the season, usually by Dave or me. On the rare occasion when both of us were unavailable, one of the RISTDN volunteers was enlisted to fill in, thus insuring constant coverage. Volunteer call lists for weekdays and weekends and the boat list were arranged geographically, so when a call came into the hotline, we could mount the fastest response based on the locations of the closest trained disentangleurs and boat.

NERO provided four disentanglement kits. Each kit contains a set of specialized equipment (poles, hooks, clamps, knives, etc.) that can be used to safely remove entangling ropes, nets, and other gear from a turtle without needing to get in the water with the animal. The kits were distributed to maximize coverage and efficiency. They are presently located at URI Fisheries at East Farm, the URI Bay Campus, the NMFS Narragansett Lab, and the ASRI Environmental Education Center in Bristol.

Publicity

A hotline only works when everyone knows the number to call. RISG Communications distributed a news release to Rhode Island media, alerting the boating public that sea turtles were in our waters and to call the hotline if an entangled turtle was spotted. The news release was also sent to police departments, RIDEM Enforcement, the U.S. Fish & Wildlife Service, harbormasters, and other groups that might receive calls reporting a turtle in trouble. In addition, a flyer was developed and distributed to Rhode Island marinas and bait shops.

Responding to Calls

When a call came into the hotline, we asked for the location of the turtle, the species (if known), its condition, and a contact phone number for the caller. We asked that the caller try to remain with the turtle until the response boat arrived. Then, if appropriate, a response team and vessel was identified from our call lists and boat list based on the closest proximity to the entangled turtle. If a caller to the hotline was reporting a dead or stranded turtle, we coordinated with Heather Medic from the stranding program at Mystic Aquarium to determine and arrange the appropriate response.

Once on scene, the RISTDN volunteers assessed the situation, decided on an appropriate response, and disentangled the turtle if necessary. Responders recorded detailed information on all phases of their activities on a Sea Turtle Entanglement Report form for later assessment and analysis. Responders were tasked with documenting the event, with photographs if possible, emphasizing the gear to facilitate identification of the fishery involved and injuries to assess biological impacts of entanglement.

Following a disentanglement event, Dave and I were responsible for communicating directly with the NERO to provide them with details about the event and its outcomes. A final Sea Turtle Entanglement Report was completed for each entanglement response event. Copies of any available representative photographs and videos and any other documentation of the event were included with the file for each report.

Results & Discussion

The RISTDN hotline received six calls during the 2005 season, and responded to three of them. Two of those calls were entanglements of live Leatherbacks, and both resulted in successful disentanglements. On 17 July a Leatherback was reported entangled in the Point Judith Harbor of Refuge. I responded along with Kathleen Castro and Laura Skrobe from FAVS and lobsterman Richard Fuka, aboard Rich's boat, the F/V *Lady Lori*. On scene, a passing lobsterman with a more maneuverable boat was able to successfully remove all of the gear with no visible sign of injury to the turtle. On 29 August another Leatherback was reported entangled in the West Passage of Narragansett Bay. A Coast Guard crew aboard one of their small boats accomplished the disentanglement, again with no sign of injury to the turtle. On 7 August there was a report of a dead, entangled Leatherback near Elisha Ledge in the Sakonnet River. Dave Beutel and Barbara Somers of FAVS responded aboard the F/V *Oceana*. The turtle was never relocated. It was probably the same animal that was later found washed up at the Sachuest Point National Wildlife Refuge in Middletown and reported to the Northeast Stranding Network.

Three calls to the hotline did not result in disentanglement responses. On 9 August the Coast Guard reported a dead Loggerhead washed up at Castle Hill in Newport. We passed the information on to Mystic Aquarium. In September we got a report of a dead turtle, not identified to species, floating about a mile east of Point Judith. The information was passed on to Mystic, but the report was called in too long after the sighting for any response. Finally, on 5 September (Labor Day) we got a report of live-stranded juvenile Loggerhead at McCory's Point Beach in Portsmouth, with obvious boat-strike injuries. I coordinated with Heather Medic at Mystic Aquarium to have the turtle taken to New England Aquarium for treatment and rehabilitation. Unfortunately,

the turtle had sustained massive internal injuries from the propeller wounds and had to be euthanized soon after its arrival.

We found that the training workshop, interaction of RISTDN volunteers, and the Sea Grant news release and flyers were responsible for all calls to the hotline. This resulted in the most efficient/appropriate network action (on-scene response, communication with the Stranding Network, etc.).

It was also highly gratifying to see such positive interest from fishermen. Several commercial fishermen/lobstermen participated in our training workshop and volunteered/used their boats to respond to entanglements. More have expressed interest in working with us in the coming year and in the future. The recreational fishermen have also been supportive and have promoted the hotline in their organizations.

We expect to be continuing our disentanglement efforts again this year. Another volunteer training workshop is currently being planned. If you are interested in volunteering or in making your boat available, please contact me at (401) 874-6936 or malias@gso.uri.edu.

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Dr. Malia Schwartz is the Marine Turtle Extension Specialist and Director of Communications with Rhode Island Sea Grant and an Adjunct Professor in the URI Department of Fisheries, Animal, and Veterinary Sciences. She also serves on the RINHS Board of Directors.

Notes from Field and Study: What's in a Name?

B Y R I C H A R D E N S E R

In my “Notes from Field and Study” column in the Spring 2005 *Rhode Island Naturalist*, I addressed the ever-changing and sometimes controversial nature of taxonomic nomenclature (the naming of species and higher biological categories), focusing on vascular plants. Although advances in DNA mapping have resulted in considerable refinement of what we understand about the relationships among species within all biological groups, it seems that the greatest number of alterations have involved plants. This observation may be biased, but a discussion between more than two botanists always seems to dissolve into a review of the most recent name changes and the challenge of updating local floras and manuals to reflect these advances in taxonomy.

Taxonomy is controversial because names are applied by authorities who follow two very different schools of nomenclatural thought. “Splitters” separate taxa by identifying relatively minor distinctions in morphology, assuming that such variations are evidence of true genetic diversity. Conversely, “lumpers” accept that small variations do occur among individuals of the same species, but believe that many differences are probably due to variable environmental conditions throughout the range of the species.

Dr. M.L. Fernald, compiler of the Eighth Edition of *Gray's Manual of Botany* (1952), is often described as the quintessential splitter. Using his taxonomic distinctions, more than 213 varieties and subspecies are identified in the Rhode Island flora alone. But the authors of the more recent *Manual of Vascular Plants of Northeastern United States and Adjacent Canada* (Gleason and Cronquist 1991) did not accept many of Fernald's distinctions, and using this manual reduces the number of Rhode Island varieties and subspecies to about 93. However, the taxonomy which formed the framework for both of these manuals was based solely on morphology, i.e., the visible differences in structure. Although morphological studies still provide much of the material for separating individual taxa, recent refinements in genetic mapping have greatly improved our understanding of plant phylogeny. A particularly relevant example involves a plant known only from southeastern Massachusetts and Rhode Island, the New England Boneset.



New England Boneset was originally described by Fernald in 1937, giving it the name *Eupatorium leucolepis* var. *novae-angliae*, or a variety of the species *E. leucolepis* (Justice-weed), which occurs locally from Florida and Louisiana north to New Jersey, and rarely to Long Island. Surprisingly for a renowned splitter, he did not identify the New England plants as a full species because he did not detect enough variation in the structure of the flowers and seeds to distinguish it from *E. leucolepis* at the species level. His determination persisted for more than 40 years until Dr. Victoria Sullivan (University of Southwestern Louisiana) conducted a more exhaustive morphological analysis and found that the floral characters of the New England plants actually ruled out *E. leucolepis* as a close relative. Instead, she believed that the New England form was a hybrid between two other species, *Eupatorium resinosum* (Pine Barren Thoroughwort) and *E. album* (White Thoroughwort).

To refine this conclusion, one of Sullivan's students (Dona Weifenbach) examined DNA sequencing data from several species of *Eupatorium*. In 1993, Weifenbach travelled to Rhode Island and Massachusetts to collect living tissue (leaves) of New England Boneset, preserving the bits of material in dry ice until her return to Louisiana. In the lab she isolated a particular gene from the chloroplast of each species of *Eupatorium* and compared the nucleotide sequence of each. The results actually ruled out *E. album* as a likely progenitor, and instead suggested that New England boneset was probably a paleohybrid; i.e., it was derived from hybridization between *E. resinosum* and another species of *Eupatorium* that has since become extinct.

Although not able to conclusively define the parentage of New England boneset, the work conducted by Sullivan and Weifenbach affirmed that the taxon did not arise as a divergent population of *E. leucolepis*, and therefore was deserving of full species status. As proposed by Arthur Haines in 2005, the name is now “*Eupatorium novae-angliae* (Fern.) V. Sullivan ex A. Haines & Sorrie, comb. et stat. nov.” The actual name pales in comparison to what it represents, a taxonomically distinct species which is no longer considered a variant of something more common, but a distinct entity limited to 16 populations, 10 in Massachusetts and 6 in Rhode Island—a southeastern New England endemic worthy of our highest conservation concern.

Richard Enser is Coordinator of the RIDEM Natural Heritage Program and serves on the RINHS Board of Directors.

RINHS Annual Conference Explores Rhode Island's Natural Heritage

B Y T O D D M C L E I S H

The eleventh annual RINHS conference on March 3 examined a wide range of topics on the theme of “Stewarding Rhode Island’s Natural Heritage.” Held at Rhodes-on-the-Pawtuxet in Cranston, the event attracted nearly 200 attendees from around the state and beyond.

The conference began with a heartwarming presentation by Kim Gaffett from the Ocean View Foundation, as she recounted the life and educational and ornithological contributions of Elise Lapham, the Block Island bird bander whose four decades of data are playing an important role in understanding bird migration in the Northeast. The 94-year-old Lapham received a well-deserved standing ovation as she was presented with the 2006 Distinguished Naturalist Award.

The keynote speaker at the conference was Harold Ward, professor emeritus of Environmental Studies at Brown University and one of the founders of the Coalition for Water Security, a newly formed organization of environmental groups working to address urgent water supply issues in Rhode Island. His presentation, “Who cares about Brook Trout? Who will protect the cold water streams they require?” described the formation of the Coalition and provided an overview of annual stream flow issues. He said the health of the aquatic ecosystems in freshwater streams in the state depend on maintaining adequate stream flow profiles, and the increased pumping of groundwater from wells is reducing stream flows to critical levels and increasing stream temperatures.

The keynote address was followed by 13 shorter presentations discussing such subjects as invasive species, grassland habitat restoration, dragonflies in urban wetlands, endangered American Burying Beetles, songbird feeding during migration, and the Rhode Island Environmental Monitoring Collaborative. Of particular interest were Lori Gibson’s presentation on the state’s deer population and its impact on forests, and Numi Mitchell’s discussion of her coyote study on Aquidneck and Conanicut islands, in which she tracked the wide-ranging movements of seven separate coyote packs. Eric Dinerstein of the World Wildlife Fund closed out the program with a presentation that examined natural history questions on a global scale, “From Rhode Island to Christ-

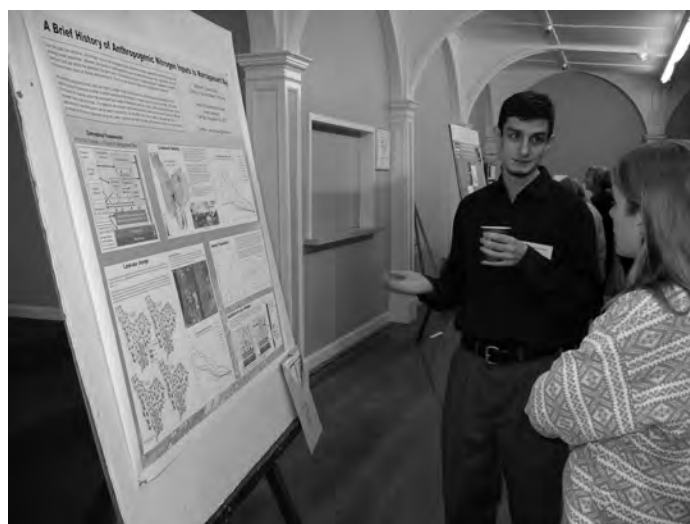
mas Island: Global Patterns of Rarity, Endemism and Intact Assemblages Among Terrestrial Vertebrates.” Signed copies of Dinerstein’s latest book, *Tigerland and Other Unintended Destinations*, were available for sale.

In addition to the oral presentations, 22 posters and 7 organizational displays were exhibited for attendees to view and discuss.

The conference was sponsored in part by generous support from the USDA Natural Resource Conservation Service. Additional thanks are due to the Rhode Island Foundation, Christopher Powell at the RIDEM Division of Fish and Wildlife, the URI Department of Natural Resources Science, and the URI Cooperative Extension Education Center.

For abstracts of the oral and poster presentations, visit the RINHS website at www.rinhs.org.

Todd McLeish is a Public Information Officer with the URI News Bureau and member of the RINHS Board of Directors.



Photos: Todd McLeish

President's Message



Over the past eight years, my students and I have been studying pool-breeding amphibians in southern New England. The situation faced by Wood Frogs in the region this spring is in some respects analogous to the dilemma facing the R.I. Natural History Survey, so let me digress for a second to tell you about Wood Frogs.

In my mind, Wood Frogs (*Rana sylvatica*) are the true harbingers of spring in Rhode Island. They are among the first amphibians to emerge from their upland wintering sites, typically in mid-March. Wood Frogs generally only migrate on rainy nights, thus drought deters them. This March was the third driest March on record, which slowed down the procession of Wood Frogs to breeding ponds. The frogs that did make it to ponds in March were met with water levels that were often much lower than in previous years.

Since Wood Frogs generally deposit their eggs in shallow sections of ponds, as pond levels dropped throughout March, many egg masses were left high and dry with no chance of hatching. Rains in early April gave other Wood Frogs the green light to initiate their annual migration and mating ritual. However, without substantial rainfall to restore pond levels, many tadpoles do not survive to undergo metamorphosis in early July.

Wood Frog populations are adapted to these New England weather cycles. They seem to do best in areas with several breeding ponds that provide a variety of hydroperiods (number of days with surface water inundation). In addition, they need large contiguous forested landscapes that provide plenty of over-wintering sites for adults and permit juvenile migration among ponds. It is this juvenile dispersal among ponds that maintains long-term population stability. Ponds that have low reproductive success are replenished by juveniles from adjacent ponds that fared better. In another year with different conditions, the Wood Frogs in a different set of ponds will have the highest reproductive success. Biologists refer to this phenomenon as metapopulation dynamics.

To some extent, the history of RINHS tends to mirror the metapopulation structure of Wood Frogs. In the landscape of Rhode Island's environmental science and conservation community, the Survey's range of programs and services are like a series of ponds experiencing varying conditions. It is not rainfall that is varying, however—it's finances. Our programs are sustained by multiple pools of funding coming from a variety of sources, including membership, publications, programs, donations, and grants. The Rhode Island Agricultural Experiment Station has been a strong backer of the Survey's programs, particularly supporting Lisa Gould's efforts with invasive plant species. The Rhode Island Foundation and the Champlin Foundations have given support to a variety of our programs and we hope this support will continue in the future. In addition, the Sharpe Family Foundation has been extremely supportive and we owe much to their generosity. The balance among funding sources changes with time, and the Survey has to adapt by balancing our programs so that we can best insure the long-term viability of the overall organization.

Our Ecological Inventory, Monitoring, and Stewardship (EIMS) program is a good case in point. The EIMS program was initiated in 2002 in collaboration with and with substantial funding from The Nature Conservancy (TNC). The program's objectives included stewardship of TNC lands throughout Rhode Island and providing the Survey with an expanded capability to provide scientific data to land managers. Since 2002, the EIMS program has been involved with surveys on state, federal, and private lands. EIMS was a big factor in the increased efforts put into our biodiversity database, including the incorporation and upgrading of the state Natural Heritage Program data. In a relatively short time the Survey grew into a substantially larger organization.

The hope of both the Survey and TNC was that EIMS would grow into a totally self-sustaining program—conducting biota surveys, monitoring protected areas, managing biodiversity data, and providing stewardship advice. It has become clear, however, that we may have been overly optimistic. There is a real need for inventory services, for example,



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by the numerous land trusts around the state. However, the land trusts understandably use their scarce resources for land acquisition and preservation and typically cannot afford to pay the real costs of inventory, monitoring, and stewardship. At times we have grants that allow us to provide discounted services for land trusts, but those are only short-term solutions. One obvious source for long-term financial support is the State of Rhode Island; however, those purse-strings have stayed tightly closed up to now.

Some portions of the EIMS program will have to take a brief hiatus. The database will continue to be actively managed and we'll still be a source for information and advice, but, except for certain cases, we will not be able to send people into the field on a routine basis to conduct new inventories or to do follow-up monitoring. The challenge facing the Board over the next few months will be to re-evaluate the program and determine how to reinvigorate it. The EIMS program is sorely needed; the question is how to fund it so that the program can be sustainable over the long term. The question is what path we will take. Can the Survey adapt—like Wood Frogs—to changes in the financial landscape? Is there a strategy that will balance our multiple programs and multiple funding sources for the long run? If any member has any suggestions on how we should proceed to develop a long-term strategy, I am open to suggestions. Feel free to contact me at ppaton@uri.edu.

Rhode Island Natural History Survey Advisory Board, 2005–2006

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The Invasives Beat: Shutting the Barn Door

B Y L I S A L . G O U L D

One of the frustrating aspects of dealing with invasive species is that they never stop coming. Whether by deliberate introduction (e.g., via agriculture, the pet and aquarium trade, or aquaculture), or by accident as hitchhikers in ballast water, packing materials, birds' feathers, or myriad other routes, species will always be on the move around the globe.

This mobility has led invasive species biologists and managers to look more closely at routes of introduction and at methods to predict which introduced species are most likely to become invasive. Prevention is clearly the most cost-effective method of dealing with invasive species—once an organism has gained a foothold in a new home, it is usually difficult, if not downright impossible, to eradicate, and its invasion may have impacts both damaging (and therefore expensive) to human activities, and devastating to local ecosystem processes.

A goal of coordinated environmental monitoring is to identify small problems in time to keep them from growing. With this in mind, RINHS is developing an Invasive Species Preparedness Strategy for Rhode Island, and is actively seeking support to implement it. The plan includes a central coordination system and data repository, collaboration with existing monitoring programs in the state and region, and creation of a coordinated invasive species response plan with appropriate public authorities.

To create an effective prevention, early detection, and rapid response strategy for invasive species, RINHS has delineated the following essential components:

1. A venue and agreed system (including criteria) for reviewing and prioritizing invasive species threats and reviewing preparedness planning;
2. Assessment of the economic impact of invasive species in Rhode Island on human health, infrastructure (such as water supply systems), agriculture, forestry, fisheries, property values, and recreational activities, and on overall ecosystem health;
3. A workable long-term plan for monitoring the state's terrestrial, freshwater, estuarine, and marine ecosystems;
4. Collaboration and data exchange with existing invasive and nuisance species monitoring efforts (such as the Narragansett Bay Rapid Assessment Surveys of non-indigenous aquatic nuisance species conducted by the RI Department of Environmental Management [RIDEM] and the Coastal Resources Management Council [CRMC], RIDEM Division of Forest Environment's Forest Health Program, the Invasive Plant Atlas of New England [IPANE], and Comprehensive Weed Management Areas) and enhancing other on-going environmental monitoring efforts (such as URI Watershed Watch) to include invasive species monitoring;
5. Information technology resources for acquiring, integrating, and assessing monitoring data and invasives sightings from any source, with a mechanism to ensure access to and timely dissemination of data and assessments to all pertinent parties;
6. A system for "vouchering" (identifying and archiving) specimens: people who can do field visits, identify specimens brought in, and/or get specimens to the appropriate taxonomic experts for verification, and a place to locate, gather, and properly house vouchers and reference materials. This becomes especially important (and time-consuming) when volunteer programs are involved, and when obscure taxa (such as many plant and invertebrate groups and microorganisms) need to be identified. Where introducing a species is a crime, or where this may result in claims for criminal or civil damages, specimens must be identified by recognized experts and samples handled according to the rules of evidence;
7. An in-place, rapid response system (including pre-identified personnel and materiel) with designated lead agencies having enforcement powers;



Grateloupia turuturu, a new algal invader in Narragansett Bay.
Photo: Martine Villalard-Bohnsack

8. An understanding of existing or needed state and local legal and regulatory tools for invasive species prevention, early detection, and rapid response;
9. Collaboration with industry/trade concerns, regulatory agencies, and other decision makers to ensure that policies and regulations do not encourage, and are effective in preventing, new introductions of potentially invasive species;
10. Networking with regional and national invasive species programs. Rhode Island will benefit from this support network in its efforts to protect itself. There exist ideas, data, experience, and protocols that could be adapted for use in Rhode Island, and other jurisdictions have experience with invasions that Rhode Island can learn from.
11. Public education and outreach will be critical to the success of any invasive preparedness plan in Rhode Island. Through media releases, published outreach materials, seminars/workshops, and the internet, public engagement improves prevention, detection, and response.

A healthy environment contributes directly to the strength of the region's economy: Rhode Island's biggest industries, including tourism, boating, and fishing, rely on a healthy environment, and an attractive environment is a major consideration for companies thinking about locating in Rhode Island. Surprisingly, however, Rhode Island has dedicated far fewer resources to invasive species issues than any other New England state, and it has put in place much less regulatory structure than other states in the region (for example, see New Hampshire's Division of Fish & Game's Prohibited Species list at <http://gencourt.state.nh.us/rules/agr3800.html>, or Massachusetts's newly implemented Prohibited Plant List at www.mass.gov/agr/farmproducts/proposed_prohibited_plant_list_v12-12-05.htm). Yet given its ties to shipping, aquaculture, the nursery and pet and aquarium trades, and other major invasion routes, it is probably the most vulnerable to invasion of any of the states in the region. The RINHS/RI Invasive Species Council, the RI Agricultural Experiment Station, URI outreach programs, CRMC, RIDEM, and others are doing what they can to keep the barn door shut, but a concerted, well-funded coordinated effort is badly needed. Implementation of an Invasive Species Preparedness Strategy will save the state much headache and many dollars in the long run.

Lisa Gould is a senior scientist at the Rhode Island Natural History Survey, a Research Associate in URI's Department of Natural Resources Science, and an IPANE volunteer.

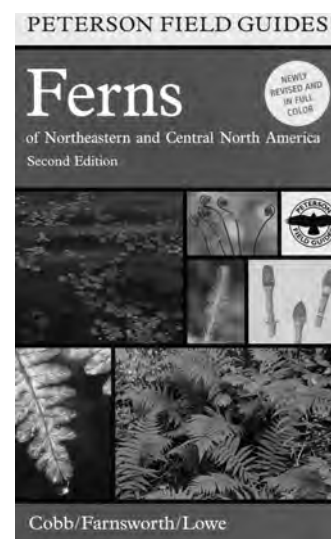
Book Review: *Peterson Field Guide to Ferns of Northeastern and Central North America, Second Edition*

B Y G A R R Y P L U N K E T T

Peterson Field Guide to Ferns of Northeastern and Central North America, Second Edition

by Boughton Cobb, Elizabeth Farnsworth, and Cheryl Lowe
Houghton Mifflin, New York, NY; 2005. 304 pp. \$20.00
ISBN: 0618394060

There was some concern on my part over the news that a revision of Boughton Cobb's classic fern book was in the works—updated through the efforts of Elizabeth Farnsworth and Cheryl Lowe of the New England Wild Flower Society. I had come of age, fern-wise, with this field guide and those intricately detailed fern drawings by Laura Louise Foster. Like a favorite pair of old blue jeans, I wasn't sure I wanted to give up something that had been my hip pocket companion on so many tramps through woodland fern glades.



Not to worry. I was immediately comfortable with the “feel” of the new book since Farnsworth and Lowe retained Cobb's basic format, much of the original text, and the lovely Foster drawings. One senses that changes were made reluctantly and only when there was real benefit to be gained. Updating taxonomy and scientific terminology was one welcome change, happily with “synonyms” for those who have learned earlier terms. The clubmosses were especially due for updating since the old, single *Lycopodium* genus is now split into seven genera. The revised clubmoss section, in fact, illustrates the high quality of the entire book. It is readable, succinctly descriptive, and has its own list of terms unique to clubmosses. The identification keys tailored for each genus and complete with precise drawings will be especially helpful in the field. I dare say that even week-enders can now master those Ground Pines and Creeping Jennies.

Beyond clubmosses, the coverage of all the fern “relatives” (their suggested term to replace fern “allies”) is superb. There is new material on reproductive cycles, evolution, taxonomy, and individualized identification keys for each plant group. All of this is written on a level that is just technical enough to communicate the subject well. As if to prove that point the new glossary is barely seven pages long. Another nice addition is a discussion of fern habitats and conservation that describes fern-friendly natural conditions and the ferns typically found in each.

Perhaps the most valuable new feature is the photography that now supplements Foster’s sketches. This will be particularly appreciated by readers who are new to ferns, and to whom many fern species usually look like so many other fern species. They now have the best of two illustrative worlds: the minute detail of idealized line drawings for learning plant identification, and excellent color photography for a realistic overall impression of each fern in its natural setting—ideal for recognition.

Elizabeth Farnsworth and Cheryl Lowe have done a masterful job with this new and truly improved version of an old standard. This is a sequel that does not disappoint. Perhaps one could quibble with the “pocket-size” descriptive held over from the old book, since this second edition is almost twice as thick as Cobb’s original book. So, one only needs to find some jeans with extra-large hip pockets.

Garry Plunkett experiments with natural habitat landscaping on his property in Tiverton, and teaches native plant programs with the Rhode Island Wild Plant Society and New England Wild Flower Society. This review originally appeared in WildFloraRI, the RIWPS newsletter, and is reprinted here by their permission.

Scientists Decry Attempts to Weaken Endangered Species Act

B Y T O D D M C L E I S H

Nearly 6,000 leading biologists from around the country, including 106 from Rhode Island and several affiliated with the Rhode Island Natural History Survey, signed a letter released in March that urges the U.S. Senate to stand by scientific principles that are crucial to species conservation in the Endangered Species Act. The letter asks Congress to stop efforts to weaken the Act.

The letter reads in part: “One of the great strengths of the Endangered Species Act is its foundation in sound scientific principles and its reliance on the best available science. Unfortunately, recent legislative proposals would critically weaken this foundation. For species conservation to continue, it is imperative both that the scientific principles embodied in the Act are maintained, and that the Act is strengthened, fully implemented, and adequately funded.”

RINHS board member Jennifer Hughes Martiny, assistant professor in the Department of Ecology and Evolutionary Biology at Brown University, was among a small number of scientists who personally delivered the letter to Congress on March 8. “The Endangered Species Act has protected many species over the last 30 years. The Bald Eagle, for instance, was on the brink of extinction in the 1970s and is now found in all the lower 48 states,” she said.

The scientists credit the success of the Endangered Species Act to its reliance on the best available science, and caution that recent congressional proposals—particularly those that seek to narrowly define or limit the science used to enforce the ESA—will result in extinctions. The letter emphasizes that “the current Endangered Species Act standard of ‘best available science’ has worked well and has been flexible enough over time to accommodate evolving scientific information and practices.” The scientists recommend the Senate can best protect and strengthen the ESA by ensuring sound scientific practices in five areas: species listings, habitat, scientific tools, recovery plans, and scientific advances.

Robert Kenney is another RINHS board member who signed the letter; his own research is on the North Atlantic Right Whale—a critically endangered species that has yet to show any signs of real recovery. He said, “The Endangered Species Act exists to protect our biological diversity, which is the real foundation of the nation’s economic prosperity. There are already more than adequate provisions for considering economic and political issues in decision-making; the proposed changes are clearly designed to condemn the Act to a slow death.”

The complete list of signers includes 12 MacArthur “genius award” recipients, six National Medal of Science recipients, 39 National Academy of Science members, and 20 Pew Marine Science Fellows.

For further information, visit the website of the Union of Concerned Scientists at http://www.ucsusa.org/scientific_integrity/restoring/science-in-the-endangered.html.



Photo: Wade Thompson

Elise Lapham RINHS Distinguished Naturalist, 2006

B Y K I M G A F F E T T

A true citizen scientist, a subtle educator, a committed conservationist, a generous benefactor with a legacy that generations to come (both avian and human) will treasure.

Elise Lapham is among the elite of Rhode Island's naturalists. She is a top-notch scientist, an educator who has enlightened the lives of countless people over the years, and a conservationist who has dedicated her life to the preservation of wildlife habitat on Block Island. In fact, Block Island would be a completely different place without the foresight of Elise Lapham and her family.

In 1967, at the age of 55 and with the assistance of her daughter Helen, Elise started to band birds during fall migration on Block Island. With this, the Block Island Banding Station was born (see the Spring 2004 *Rhode Island Naturalist*). It has since become one of the longest running banding operations in North America. The station is located on the Bluestone property, on Clay Head, and has been in operation continuously during spring and fall migration for 39 years. Amazingly, over 100,000 birds have been banded at the station, with over 162 species documented. At the age of 94, Elise's insights into avian migration ecology continue. She has become one of the top ornithologists in the region, building a considerable body of knowledge about avian migratory ecology and documenting the importance of Block Island as a stopover site for neotropical migratory birds.

Elise Lapham is a true citizen scientist. Not only has she supported the work of many of the nation's top ornithologists, but students and scientists from Brown University, the University of Rhode Island, the University of Southern Mississippi, and Cornell University have used her property as a base for their own studies or utilized the station's computerized database for comparative research. She co-authored one of the definitive articles on avian migration in the region, "Landbird Migration on Block Island: Community Composition and Conservation Implications for an Island Stopover Habitat," published in the Rhode Island Natural History Survey's (2000) book, *The Ecology of Block Island*.

Elise is a subtle educator who is always available to discuss her avian research because she feels it is critical to educating children and adults about avian ecology and their habitat requirements. She has opened the doors of the banding station to hundreds over the years because she knows that once people have seen or held a bird in their hand and watched it flit away on its journey, they inevitably become strong advocates for avian conservation. School groups, birders, researchers, and eco-tour groups have visited the station. For over 30 years, the annual Audubon Society of Rhode Island's birding weekend has included a stop at Elise's home, where birders have been enthralled by the magic of birds in the hand.

Elise's dedication and commitment to conservation set her apart from many other naturalists. Elise and David Lapham, her husband, who passed away in 1991, first ventured out to Block Island in 1951 for a vacation from their home in New Canaan, Connecticut. They enjoyed the island so much that after 10 years of renting vacation homes, they bought 140 acres near the northeast end of the island and built a home there. In the early 1980s, they took the bold step of working with The Nature Conservancy to protect their land from development by placing it into a permanent conservation easement, thus saving one of the jewels of Block Island from future development. The Laphams were stewards of their land, planting thousands of trees and flowers in the area and taking the selfless step of opening the Clay Head Trail to the public, offering impressive views of the Atlantic Ocean. They leveraged their own gifts of land to protect habitat across Block Island. We all owe a debt of gratitude to Elise, as well as to David and Helen, for their efforts to protect critical wildlife habitat on Block Island: it is a legacy that generations to come (both avian and human) will treasure.

Kim Gaffett is the director of the Ocean View Foundation, a non-profit organization, based on Block Island, that is dedicated to year-round environmental education for both the Island community and its visitors.

RINHS News

In June, Lisa Gould left her job as the Rhode Island Natural History Survey's senior scientist and moved to Winston-Salem, North Carolina. Gould had been senior scientist since 2004 when she gave over the position of executive director to David Gregg. She had served as executive director since helping to found the Survey in 1994.

As RINHS's first executive director, Lisa Gould helped create RINHS's most successful public programs, including the annual "Ecology of Rhode Island" conference, one of the most important regular ecological science conferences in the region, and "BioBlitz," an annual science and outreach activity in which biologists and naturalists volunteer their expertise to document and publicize biodiversity in Rhode Island. Gould also created and edited RINHS's publication series, including such important works as the *Illustrated Key to the Seaweeds of New England* and *Vascular Flora of Rhode Island*. In addition to her work on RINHS publications, Gould has a long catalogue of her own publications, being author, co-author, or editor of more than two dozen books and articles, including *Coastal Plants from Cape Cod to Cape Canaveral* (University of North Carolina Press, 2000) with Irene H. Stuckey.

As RINHS senior scientist, Lisa Gould has been primarily involved with advocating better research, education, coordination, and planning in Rhode Island and southern New England on the problem of invasive species. She also worked extensively to build and quality-control RINHS's state-wide database of animals and plants, called the "Biota of Rhode Island."

With a BA in Biology from the University of North Carolina at Greensboro, Lisa Gould came to Rhode Island in 1969 to study for her MS in zoology at URI, which she received in 1972. For some time after that, she did biological inventory projects for the National Oceanic and Atmospheric Administration, URI, and other parties as a private environmental consultant, and was an Instructor at URI's College of Continuing Education.

Gould gradually developed an expertise in Rhode Island plants as well as an interest in environmental education, and she became one of Rhode Island's most widely sought speakers on native plants. She led programs or taught classes for URI (including the Master Gardener Program and Watershed Watch), the RI Wild Plant Society, New England Wild Flower Society, The Nature Conservancy, The Audubon Society of Rhode Island, and others. She served on the steering committee of the New England Invasive Plant Group (NIPGRO) and as a field volunteer for the Invasive Plant Atlas of New England (IPANE) and the New England Plant Conservation Program (NEPCoP).

Gould created and then served as the Coordinator of the RI Invasive Species Council (RIISC), a joint project of RINHS and the Rhode Island Agricultural Experiment Station.

In 1987, Lisa Gould participated in the founding of the Rhode Island Wild Plant Society and she served as its president from 1987 to 1989. She also was a founder and trustee of the Meadowbrook Waldorf School, now located in West Greenwich. She was an active member of the Westerly

Friends Meeting and involved in activities of the Society of Friends at the regional and national level.

When Gould's many friends across the region heard of her imminent departure, they formed a committee to send her off in style and a grand party was held June 15th at the Environmental Education Center at URI's Alton Jones Campus in West Greenwich. One hundred thirty people came and partook in a memorable program. Special thanks for planning go to Joan Pilson, Karen Asher, Marion Gold, Garry Plunkett, Betty Merner, Hope Leeson, Linda Fraunfelter, Edward Baker, Marnie Lacouture, and Sue Cerullo, as well as RINHS board members Alex Frost, Dave Clayton, and Todd McLeish.

As a going-away gift, the committee also organized the creation of a permanent fund in Lisa's name—the Lisa Lofland Gould Native Plant Program Fund—the income from which will support regular public events on native plants of Rhode Island to be organized cooperatively by RINHS, the Rhode Island Wild Plant Society, and the URI College of Environmental and Life Sciences. The Gould Fund has raised nearly \$11,000 in cash and pledges to date, and additional contributions are gratefully accepted: the higher the total, the more money will be available every year for the Gould event. Contributions may be made by contacting the Survey office in person or through the website, www.rinhs.org.



Photo: Dave Clayton

Of course, Lisa Gould's departure for North Carolina to be closer to her family will be a huge loss to Rhode Island, but she has shown us by her example how to do what needs to be done and has helped provide us with several strong institutions through which to carry on her work. We can look forward to the first Lisa Lofland Gould Native Plant Program in the spring.

Rhode Island Collections: URI Marine Animal Sounds in the Macaulay Library's Marine Collection

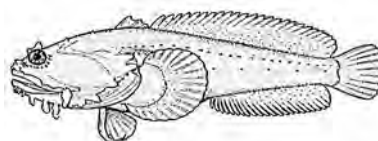
BY ROBERT D. KENNEY

When I arrived as a new graduate student at the University of Rhode Island's Graduate School of Oceanography (GSO) in September 1978, I expected to start on a thesis research project on marine mammal vocalizations. My thesis advisor, Howard E. Winn (1926–1995), was a world authority on marine animal sounds (e.g., Winn 1964) and had published some of the early work on Humpback Whale songs (Winn and Winn 1978). I came to URI with some experience in marine acoustics, having spent four years in the Navy during an extended break in my undergraduate education—listening to Soviet submarines, and the occasional whale, while flying patrols high above the North Atlantic. But research funding in Howard's lab took a sharp turn in another direction, and I ended up studying whale ecology instead of whale acoustics.

When Dr. Winn joined the GSO faculty in 1966 from the University of Maryland, there was already a vigorous acoustic research program underway here. GSO's predecessor institution, the Narragansett Marine Lab, had been founded in the 1930s by Charles J. Fish (1899–1978) and his wife Marie Poland Fish (1902–1989). Marie Fish was an expert on fish sounds, a topic that was of great interest to the Navy with the advancing development of sonar. After World War II, she and electronics engineer William H. Mowbray had been funded by the Office of Naval Research to record and catalog fish sounds. After 20 years of recording, they published the classic compilation of descriptions and sonograms of sounds from 153 species of North Atlantic fishes (Fish and Mowbray 1970). Another collaborator in that lab was Paul J. Perkins, who retired from the Navy as a chief sonarman in 1962 and came to work as a technician for Marie Fish. The group eventually expanded their research from

fish sounds to marine mammal sounds (e.g., Perkins et al. 1967). Marie Fish retired and Howard Winn continued the acoustic research program, with Paul Perkins remaining on as his technician into the early 1980s. You might still come across Paul dropping a hydrophone into Narragansett Bay or the Narrow River (Perkins 2001), or recording bird songs almost anywhere in South County.

The stars and planets all aligned in 2001. The Library of Natural Sounds at the Cornell Laboratory of Ornithology (now called the Macaulay Library) had received some sizeable grants to locate, conserve, digitize, and archive existing collections of acoustic recordings of fishes and marine mammals. Rodney Rountree from the University of Massachusetts was developing his own research program on sound-producing fishes, and was inquiring about the Fish & Mowbray and Winn collections. I was being forced to deal with several thousand tape recordings as Howard Winn's former office, lab, and storage spaces were being re-assigned. Although many of Marie Fish's original recordings had been lost in a fire at the Bay Campus in 1959, some remained with Howard's extensive collection. There were boxes and loose tapes stacked in my lab, in the campus storage barn, and in a trailer that was neither heated in winter nor air-conditioned in summer, so the surviving recordings were in danger of serious degradation. Then GSO assistant dean Ken Hinga bumped into Paul Perkins in town, and Paul told him that the original reel-to-reel tapes of all the sounds included in Fish & Mowbray had been stored in a vault on the Bay Campus. Ken checked into it—30 years later, the tapes were still there. Finally, the Pell Library staff came upon an unopened case of Fish & Mowbray books that they were going to throw away.



Oyster toadfish (*Opsanus tau*) are extremely vocal and were studied extensively by Howard Winn and several of his graduate students. (drawing by Louella E. Cable from Bigelow & Schroeder 1953)

Ken Hinga funded a student to copy all of the Fish & Mowbray tapes (just try finding a good reel-to-reel tape deck these days) into computerized sound files and then onto CD's. The 2-CD sets were put up for sale to recover the costs, along with that last remaining case of books. The CD's can still be purchased (<http://www.gso.uri.edu/fishsounds>), although the books are long gone. Rod Rountree convinced Rhode Island Sea Grant to fund a small project to “rescue” the GSO sound collection (Rountree et al. 2002). We brought Paul

Latest News

Perkins out of retirement (his third one, because he'd gone back to work at the Naval Undersea Warfare Center after leaving GSO) to catalog all of the recordings that we could find. When he finished, all of the tapes, including the Fish & Mowbray originals, were packed up and shipped to Ithaca. Macaulay Library staff then set to work conserving the sometimes-fragile recordings and making permanent digital copies for archival.

Macaulay Library, with the world's largest collection of animal sound recordings, is in the process of expanding their coverage of fishes, amphibians, and mammals. All of the surviving fish and marine mammal sounds that were recorded over more than 50 years by Marie Fish, Bill Mowbray, Paul Perkins, Howard Winn, and all their students and collaborators are now permanently archived as a significant component of Macaulay's Marine Collection. Assistant Curator Shelagh Smith and two other full-time staff members are responsible for the Marine Collection. According to the first issue of their "Marine Collection Newsletter," as of last spring it included 4,131 specimens and 667 hours of recordings from 57 marine mammal species and 202 fish species. The beta version of the Marine Collection website can be accessed at <http://www.animalbehaviorarchive.org>. In addition to searching the archive and playing the sounds, you can access on-line spectrogram and waveform visualization tools. Their long-term plan is to provide unlimited free access to the collection for registered research users.

The "Marine Collection Newsletter" is distributed via email; at present only the first issue (of three to date) is on-line (<http://mlsource.ornith.cornell.edu/marine/newsletters/MCNIssue1.pdf>). Email Shelagh Smith (sas223@cornell.edu) to be added to the mailing list. Anyone who would like to contribute collections of animal sounds should contact Shelagh by email or by telephone (607-254-2492). The Library will lend a 160-gigabyte external hard drive to facilitate transfer of large digital collections. (See "Weaving the Web" on page 20 for more about on-line sound resources from the Macaulay Library and other sources.)

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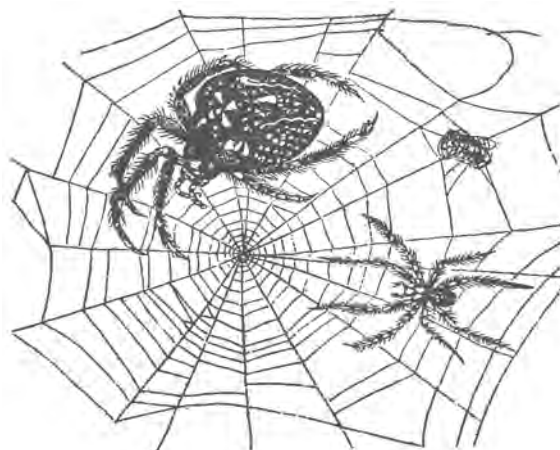
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Dr. Bob Kenney is an Associate Marine Research Scientist and Adjunct Professor at the URI Graduate School of Oceanography, specializing in marine mammal and sea turtle research. He also serves on the RINHS Board of Directors and as the editor of Rhode Island Naturalist.

Weaving the Web: Electronic Resources



Animal Sounds: The Macaulay Library at the Cornell Laboratory of Ornithology houses the world's largest collection of animal sound recordings, with more than 160,000 individual recordings, plus a growing collection of videos. The collection has historically focused on birds, and now includes about two-thirds of the world's bird species and an increasing number of fish, amphibian, and mammal species (see the "Rhode Island Collections" article on page 19 for more about their Marine Collection). The entire collection is available for use for educational, research, or commercial purposes; users are charged a nominal fee that offsets some of the costs of curation. On the website you can search the collection, play sample recordings and videos, download sounds of some common birds, and shop for audio field guides. <http://www.birds.cornell.edu/macaulaylibrary/>

- Dr. Rodney Rowntree from the University of Massachusetts has an extensive research program on fish ecology, with one focus on their sounds. His personal web page includes extensive samples of sounds from fishes and marine mammals, including seventeen fish species from the classic Fish & Mowbray (1970) collection. <http://www.fishecology.org/soniferous/justsounds.htm>
- Samples of six species from Fish & Mowbray can be downloaded from the URI Graduate School of Oceanography, along with information on ordering the 2-CD set and a complete index of the CD's. <http://www.gso.uri.edu/fishsounds/CDindex.html>
- At an associated page, you can download copies of eight short articles on sounds of marine species published between 1960 and 1976 in *Maritimes*. <http://www.gso.uri.edu/fishsounds/Readings.list.html>
- Like the Macaulay Library, the British Library houses a large collection of sounds from all different types of animals, with over 150,000 samples in the collection. At their "Listen to Nature" page you can search the on-line catalog and order sounds, and also listen to 400 different samples of sounds from birds, mammals, reptiles, insects, and "soundscapes" such as the dawn chorus in an Australian rainforest. "The Language of Birds" is a review article on bird communication and behavior, with numerous sound clips scattered throughout. <http://www.bl.uk/listentonature/>
- Finally, the "Bad Vibes" web page from the Acoustic Research Center at the University of Salford in Manchester, England is actually part of a research project. The goal of the research is to find out what sounds people find the most awful, and why. Visitors can listen to about 30 different choices, including crying babies, microphone feedback, scraping Styrofoam, howling Tasmanian devils (making it acceptable for inclusion in this "Animal Sounds" collection), and retching (the "winner" so far). <http://www.sound101.org>

Global Vertebrate Diversity: Eric Dinerstein's closing presentation at the RINHS Annual Conference this year addressed the problem of identifying regions where conservation efforts would produce exceptionally valuable results by protecting areas with high vertebrate species diversity. The "Wildfinder" web page from the World Wildlife Fund includes databases that allow users to map the distributions of 30,000 species of terrestrial vertebrates—amphibians, reptiles, birds, and mammals. Selecting any species will generate a map showing which of the 867 ecoregions of the world are occupied by that species. You can also select a locality—one of the ecoregions, country, state, or city (or even ZIP code in the

U.S.)—and get a list of all of the vertebrates living there. Detailed global maps of species richness, endemism, and threatened species occurrence for all terrestrial vertebrates or only amphibians, reptiles, birds, or mammals are also available. <http://www.worldwildlife.org/wildfinder>

- The 867 ecoregions of the globe can be explored further at the "Wild World" web page, a joint effort by the World Wildlife Fund and the National Geographic Society. Beginning from a world map, you can zoom in, select a single ecoregion, and get back a summary description of its habitats, species, special features, and conservation issues. There is also a link to detailed information in a WWF scientific report. Rhode Island is within the "Northeastern Coastal Forests" ecoregion (number NA0411) in the "Temperate Broadleaf and Mixed Forests" biome. The other major part of the website is the "Global 200"—more than 200 terrestrial, marine, and freshwater regions that have been selected as the top priorities for conservation. <http://www.worldwildlife.org/wildworld>

Natural History Literature: The American Museum of Natural History (AMNH) recently announced that complete series of all four of their scientific publications were available on-line as full-text PDF files. The journals being made available include *Bulletin of the AMNH* (beginning in 1881), *Memoirs of the AMNH* (1893), *Anthropological Papers of the AMNH* (1907), and *American Museum Novitates* (1921). Users can browse any of the journals by author, title, or year (starting either with the oldest or most recent issue), or search any or all of the journals by keywords, author, title, or volume number. <http://digitallibrary.amnh.org/dspace>

eBird: Version 2 of "eBird" has been launched by the National Audubon Society and the Cornell Laboratory of Ornithology. Birders can submit their sighting lists for specific locations, with over 22,000 submitted in January alone. The resulting database can then be searched by researchers interested in particular species, areas, or trends. Especially valuable are links to other resources, most notably *Birds of North America On-line*, usually accessible only by subscribers. BNA is a collection of detailed life histories of all 716 species of birds known to nest in North America. The print version, completed in 2002, comprises separate folios for each species totaling 18 volumes and over 18,000 pages. The online version includes the species accounts, sound and video clips, and image libraries, and has the capability to be continuously updated with the latest information. <http://www.ebird.org>

Call for SEANET Volunteers!

The Audubon Society of Rhode Island, U.S. Fish and Wildlife Service, and Wildlife Rehabilitators of Rhode Island are teaming up with SEANET (Seabird Ecological Assessment Network, <http://www.tufts.edu/vet/seanet>), a citizen-science monitoring project coordinated by the Cummings School of Veterinary Medicine at Tufts University. Hundreds of volunteers are performing important research via beached-bird surveys throughout the northeastern U.S. and Atlantic Canada. SEANET, which began in 2002, monitors patterns in bird mortality to provide baseline information as well as help detect mass mortality events. Seabirds are especially sensitive to petroleum and other pollution. Numerous other threats such as contaminants, diseases, and offshore development threaten coastal and marine birds, which can serve as indicators of ecosystem and human health.

Volunteers walk a designated stretch of beach, generally a mile or two, once or twice per month. Each volunteer is provided with a kit that includes datasheets, a ruler, calipers, and gloves. They record location information, date, and conditions, as well as details on any bird carcasses encountered, including basic measurements, condition, and photographs if possible. It is NOT necessary to handle carcasses to collect useful data! If there are large mortality events, Tufts will send staff to pick up fresh carcasses for necropsy. Volunteers with bird ID skills are also encouraged to keep track of live birds seen while doing the surveys.

Volunteers are needed for monitoring beaches in Rhode Island. A volunteer training session has been scheduled for Saturday, August 26th, 1:00–3:00 PM, at the ASRI Environmental Education Center, 1401 Hope Street, Bristol. Training will include seabird identification, measurement techniques, and general monitoring protocol. This project has been integrated into school science classes and is a good way to get students involved in field research. Anyone interested in volunteering should contact Becky Harris by email (becky.harris@tufts.edu, preferred) or telephone (508-887-4933) to sign up for the training session or for more information. Please indicate your location and the beach(es) that would be convenient for you. You will be contacted to confirm.



Writers Wanted

We are always looking for your contributions to future issues of *Rhode Island Naturalist*. Our new format is designed for increased visibility and enhanced focus on scientific

research. We now lead off with Scientific Reports, and are especially interested in your contributions there. This is the perfect time to dust off that half-finished note in the back of your desk drawer. Contributions from amateur naturalists are particularly welcome. We are also looking for your contributions in these other areas:

- Reviews of recent books related to natural history (plants, animals, habitats, geology, hydrology, soils, etc.);
- Articles on Rhode Island natural history collections;
- “Focus On” pieces featuring one of the RINHS member organizations;
- Upcoming conferences, seminars, lectures, workshops, field trips, etc. that have natural history themes or components. Be sure to include: title of event, date, time, location, and contact information (phone, email, and/or web).

- Interesting web sites related to any aspect of natural history. Please include a brief summary and the complete URL.
- Opportunities for volunteers and students. Do you need volunteers for special projects? Offer internships? Have other natural history opportunities you’d like people to know about?
- Any other information you think would be pertinent to the Rhode Island ecological/natural history community.

We publish two issues per year, in spring and fall. The Fall 2006 issue is planned for distribution in November, and our working deadline for submissions is September 1st. Copies of recent issues can be viewed or downloaded at our web page — <http://www.rinhs.org> (go to “Web Publications,” then “RI Naturalist”). For a copy of our author’s guidelines, contact me at rkenney@gso.uri.edu or the RINHS office at info@rinhs.org. Or feel free to contact me if you have any other questions about submitting an article.

Robert D. Kenney, editor

Events Calendar

April 30th–October 6th. *Advanced and specialty natural history seminars:* Humboldt Field Research Institute, Steuben, Maine: Each summer, national and regional authorities in the field of natural history come to the Humboldt Institute, at Eagle Hill on the coast of Maine, to lead intensive field seminars and workshops in their specialties. The seminars are offered for an advanced and professional audience, well-qualified graduate and undergraduate students, naturalists, and scientific illustrators. Seminar participants include professional field biologists and consultants, independent scholars, university professors, foresters, and teachers, as well as personnel from museums, botanical gardens, federal and state agencies, and numerous environmental organizations. Most programs meet all day from Monday through Friday and generally combine intensive field studies and follow-up work in the lab with lectures, discussions, and a review of the current literature. Meals are relaxed settings for informal discussions. Evenings are free for independent studies and/or slide presentations and follow-up discussions by the fireplace in the dining hall's comfortable lounge. Eagle Hill overlooks one of the most beautiful areas on the eastern seaboard, the rocky evergreen coast of Maine from Acadia National Park to Petit Manan National Wildlife Refuge and beyond. For the study of natural history, the unusual variety of essentially pristine habitats in the immediate area offers many outstanding opportunities. A complete list of this year's seminars is at <http://www.eaglehill.us/mscalend.html>. For more information, please contact: Humboldt Institute, P.O. Box 9, Steuben, ME 04680-0009; (207) 546-2821; (207) 546-3042 (fax); office@eaglehill.us, or <http://www.eaglehill.us> (also for on-line registration).

September 15 – 17. RINHS is pleased to sponsor the 31st Andrew's Foray, a relaxed, weekend long gathering of professional and amateur bryologists and lichenologists. Lodging, meals, and the "laboratory" will be housed at the University of Rhode Island - W. Alton Jones Campus, Environmental Education Center in West Greenwich, RI. More information, registration forms & fees, photos, and detailed descriptions of some field trip sites can be found at <http://www.cs.rpi.edu/~ingallsr/andrews-foray.html>.

September 21. RINHS Annual Meeting, lecture, and natural history book sale [see also p. 24]. Donate books to the sale and come replenish your bookshelves with our first annual USED NATURAL HISTORY BOOK SALE. Treasures will abound! Contact Kira Stillwell at kstillwell@rinhs.org for more information or visit the RINHS website at www.rinhs.org.

On-going. The Rhode Island Wild Plant Society provides opportunities through field trips, walks, workshops, courses, and lectures to learn about native plants and their habitats while enjoying the outdoors. The full calendar with all the details can be found at http://www.riwps.org/programs/programCalendar_main.htm. Pre-registration is necessary for most RIWPS events. For information, or to register, please contact the RIWPS office at (401) 453-3777 or office@riwps.org.

On-going. The Rhode Island chapter of The Nature Conservancy (TNC) offers several hiking trails at its 841-acre Francis C. Carter Memorial Preserve in Charlestown, Rhode Island. Habitats on the Carter Preserve include oak forest, pine barrens, wetlands, and grassland. TNC encourages passive recreation such as hiking, bird watching, nature study, and photography on the Preserve, and also offers walks with a TNC naturalist. Programs are free and open to the public. Registration is required so that participants can be contacted in the event of cancellation or changes. Call (401) 331-7110 to register. For the most up-to-date calendar of programs, visit <http://nature.org/wherewework/northamerica/states/rhodeisland/events/>.

On-going. The Audubon Society of Rhode Island offers a wide variety of programs year-round at 15 refuges around the state. There are educational and fun programs for birders, beginners, families, children, and anyone who wants to learn more about the natural world. The Education Department runs many after-school, school break, and summer camp programs as well, and also offers a number of teacher workshops. For the full calendar of programs, workshops, and other offerings, pick up a copy of their quarterly "Nature Tours and Programs" booklet, available at many locations statewide, or visit <http://www.asri.org>.

Benefits of membership in the Rhode Island Natural History Survey

For Individual, Family, and Student Members

Rhode Island Naturalist, the newsletter
Participation in the RINHS List-Serve
10% discount on all publications
Discount on annual conference fee
20% discount on subscription to the journal *Northeastern Naturalist*

For Organizational Members

Rhode Island Naturalist, the newsletter
Participation in the RINHS List-Serve
Listing in Annual Conference Program
10% discount on all publications
1 free registration at annual conference
20% discount on subscription to the journal *Northeastern Naturalist*

Our Mission

- * To facilitate and coordinate the gathering and dissemination of information on RI's biota, ecological communities, and geological systems;
- * To enhance communication among RI's natural scientists, educators, and decision makers;
- * To provide sound scientific data that can be used to help make informed management decisions;
- * To foster the preservation of RI's natural history collections; and
- * To provide educational outreach.

To Contact Us...

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Mark your calendars & join us!

RINHS 2006 Annual Meeting, Thursday, September 21, 2006, beginning at 5:30 p.m. in Weaver Auditorium, Coastal Institute – URI Kingston Campus. New this year, the Annual Meeting will include a used book sale. Interested in donating books of a natural historical character? Contact Kira in the Survey office (401) 874-5800 or kstillwell@rinhs.org

Following the Annual Meeting, at 7:30 p.m., **Dr. James T. Carlton**, Professor of Marine Sciences, Williams College, and Director, Williams-Mystic, The Maritime Studies Program of Williams College and Mystic Seaport, will present: *Biological Invasions in the Sea: History, Science, and Policy*.

Line-up for the 2006–2007 Mark D. Gould Memorial Lecture Series on Rhode Island's Fauna, Flora, Geology, and Ecosystems:

Thursday, September 21, 2006 at 7:30 p.m.
Dr. James T. Carlton (see above)

Thursday, November 30, 2006 at 7:30 p.m.
Dr. David K. Skelly, Professor of Ecology, School of Forestry & Environmental Studies, Yale University.
Emerging Disease in Amphibians.
Weaver Auditorium, Coastal Institute – URI Kingston Campus

February, 8, 2007 at 7:30 p.m.
Dr. Laura A. Meyerson, Assistant Professor of Habitat Restoration Ecology, Department of Natural Resources Science, URI.
Phragmites australis: The Good, The Bad, The Ugly.
Weaver Auditorium, Coastal Institute – URI Kingston Campus

Thursday, April 19, 2007 at 7:30 p.m.
Dr. Elizabeth Farnsworth, Stewardship Ecologist at the Mount Grace Land-Conservation Trust.
Symptom or Cause? A Critical Look at the Threats Invasive Species Pose to Rare Species.
Kettle Pond Visitors Center, USFWS, Charlestown, RI

R H O D E I S L A N D



NATURAL HISTORY SURVEY

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