

1997 Annual Report

Bowdoin Scientific Station

Since the Last Annual Report

Two more Kent Islanders were selected in 1997 for National Science Foundation Graduate Fellowships in the field of ecology. With their awards, Justin Schuetz ('94) and Andy Zink ('94) bring to six the number of recent Kent Island alumni who have received the highly competitive fellowships. Beth Archie ('96) and Marney Pratt ('96) received Honorable Mentions. All four are presently pursuing their PhDs, Justin and Andy at Cornell University, Beth and Marney at Duke University.

Kent Island is currently being considered for designation as an "Important Bird Area in Canada" in a program administered by BirdLife International, Bird Studies Canada, and the Canadian Nature Federation. The program is part of a continent-wide effort to identify sites of unusual avian conservation concern or value. Kent, Hay, and Sheep Islands are a major staging area for or hundreds of thousands of migratory shorebirds, and the field station's long-term studies of Leach's Storm-Petrels, Savannah Sparrows, Tree Swallows, and meteorology make it particularly critical for conservation.

Various articles were written about the Bowdoin Scientific Station in 1997. Science News reviewed work on the reproductive ecology of Savannah Sparrows (Vol. 151, "Nesting with the Enemy"), and the Portland Press Herald reported on the behavioral context of song in Savannah Sparrows (May 12, "Birdsong: Spring's musicale boils down to chemistry"). In its series on island ecosystems in the Northeast, the Island Journal included a piece entitled "Kent Island: Sixty years of field studies" (14:42-43). The Grand Manan Historical Gazette (June 1997) published a brief biography of Ernest Joy and a description of his role as Kent Island's Caretaker during the field station's early years, based on a series of poignant letters Ernest wrote to Bob Cunningham between 1937 and 1949. In August, 1945, Ernest wrote, "The fog is molding my eyebrows," and, after the long winter of 1947, when the gulls finally began to nest again, "Black back eggs taste some good."

Bob recently recalled another Ernest Joy story, this one about crows: "During hunting, lobster, and egg seasons, Ernest and Carrie Chase [Ernest's 'housekeeper'] had lots of visitors, but for the rest of the year they would be isolated for months at a time with no visitors, no mail, and no supplies. Ernest would run out of things, particularly tobacco and matches. Now, for a few years, Ernest raised a sequence of pet crows, which, as I remember, were a damn nuisance, stealing everything in sight. He would try again each summer as the previous one would disappear each fall—he said the young birds would wander off to White Head, where people were not so friendly to crows, particularly the kind that landed on your head. Ernest was cured of his pet project when one day 'Croki' snatched the last package of loose tobacco from his shirt pocket and flew off to a tree limb. When the crow saw Ernest standing below, he started to pick out the tobacco a bill-full at a time and drop it. It must have been quite a sight as Ernest told it. He danced below with his large brimmed hat, cursing loudly and trying to catch

each flake of tobacco as it fell, while Croki laughed away.”

The Summer of 1997

Russell Ingalls, Caretaker of the Bowdoin Scientific Station, opened the station in early May, in time for my spring Ornithology/Conservation Biology class field trip. Once again I earned a reputation as a “weather breeder”; the previous fall we’d had to postpone the Ecology field trip a week because of a hurricane. This time I brought snow, sharp winds, and extreme tides, so we couldn’t make it to Kent Island the first night. Russell’s brother Joseph put us all up at his camp at Miller Pond. The next day, when Junior Ingalls (Russell’s father) brought us down in the Bonus, White Head fisherman Barry Russell was waiting for us in Three Islands harbor with a gift of fresh salmon. In late May I returned again, arriving a day before the students and Chuck so that I could prepare the lab and have a hot dinner

Qwaiting for them. As I walked alone up the path to the dorm, I flushed a young Bald Eagle from the widow’s watch.

The major work project on Kent Island during the summer of 1997 was reshingling the south-facing roof of the Warden’s house. Since 1987, we have gradually been repairing each of the island’s 12 buildings. Nobody could remember when the Warden’s house’s cedar shingles had last been replaced, but, judging from the nails holding them on, rusted needle-thin, it probably had been 50 years at least. Russell painted the floors of the dorm and new lab, remodeled the old double outhouse for use as a storage shed, and, with help from Ryan Woods (‘99), created a new home in the outhouse eaves for nesting Barn Swallows. He also added windows to the cow barn. We affixed a small aviary to the side of the cow barn, which we can now use as a room for observing the behavior of captive birds through one-way glass. The solar water pump works like a charm, silently pushing a steady trickle of water from the well several hundred meters up to the 500-gallon cedar storage tank by the dorm. Peter Ingram (‘99) and Ryan shared the job of adjunct assistant caretakers. Wielding our new brush-cutter and driving the Gravely tractor, they opened the trails to the north and south ends of the island. This fall Russell returned with a mason to rebuild the stone foundation of the Warden’s house. It will be a relief no longer to have to remove Snowshoe Hare carcasses from the basement each spring.

In a matter of just two days last winter, Beaver Mullen trapped 78 Snowshoe Hares on Kent Island. Frazer Shepherd, stranded several days in Three Islands Harbor by a severe April storm and record high tides—the floor boards of the Captain Gillett were lifted off the joists—, used his time well, snaring and skinning 150 Muskrats. From what I could tell, their efforts hardly put a dent in the population of either species. Unfortunately, a big dent has been taken out of local fisheries as a result of relentless harvesting pressure, particularly from vessels from Nova Scotia and abroad. Grand Mananers complain that regulations now require them to phone authorities as they leave the wharf and to report their catch by cell phone on their way back in. Permit fees can amount to as much as \$7000 per year, which can threaten the livelihood of small fishermen such as Russell. As each trophic level is exhausted, the fisheries seem to drop a level down the marine food chain. In the last decade, I have been impressed with a shift in the local fisheries from ground-fish to salmon aquaculture to sea urchins to, most

recently, marine algae. The latter is a particularly controversial and ominous development.

Then there was the mystery of the Frank. Discovered by her namesake Frank Pierson in 1993, washed ashore on the southern tip of Kent Island, the dinghy vanished from its mooring off Plank Beach one day this summer. “Easy come, easy go,” we thought. Five days later, as Russell eased the Misty Maid through a cotton-candy fog outside of Sheep Island, he slowed down to avoid hitting an exposed ledge that he’d never noticed before. Sure enough, it was the Frank, bobbing back into service once more.

Research in 1997

- Leach’s Storm-Petrels

Chuck Huntington completed his 44th field season investigating the life history of Leach’s Storm-Petrel. With Ryan Woods as his assistant, Chuck was inspired to reactivate his Hodgson House study site. Of note was the late breeding season: by the end of July, there were few storm-petrel nestlings large enough to band. The record for the oldest known Leach’s Storm-Petrel has been tied by Ahab, a 36-year old bird found again this year nesting at Crockett’s Point. Jim Mountjoy (formerly University of Nebraska, now a visiting assistant professor at Bowdoin) initiated a pilot project on storm-petrel vocalizations with the aim of understanding the functional significance of the birds’ “purr” call.

- Savannah Sparrows

Since 1987 we have banded more than 3000 individual Savannah Sparrows, measured 6000 birds (counting multiple handlings of the same individuals), and located more than 1000 nests. By now you’d think that we’d have figured everything out about their biology, but it seems that interesting questions keep emerging. Normally about one-third of all adults breeding within the study site turn out to have been raised in the same site, and a minimum of 70% were raised on Kent Island. In 1997, however, an unusually high percentage of the population was made up of yearlings that recruited into the population from outside the study area.

We established this spring that yearlings already sing well-formed songs by the time they return from migration in early May. Meredith Swett (‘99), Patrick Kane (‘96), and I, in collaboration with Don Kroodsmma (University of Massachusetts-Amherst), are working to understand where, when, and from whom males learn their individually distinctive songs, and whether females take advantage of differences in songs to select mates. A small percentage of Savannah Sparrows breeding on Kent Island have what we call the “stutter” dialect. Interestingly, none of them turns out to have been born on the island, as far as we know. Since the dialect is relatively common on White Head Island, it is possible that our stutterers represent immigrants from that population. I am spending part of this sabbatical year quantifying the inheritance of behavioral and morphological traits and analyzing a rich genealogical data set. We were able to trace the lineage of one bird we captured this summer back five generations.

Janet Beagley ('99), my field assistant, proved to be a superb nest-finder, which laid the foundation for her independent research on Savannah Sparrows. Using a Hobo™ datalogger smaller than a pack of cigarettes to record nest temperatures, she compared the incubation patterns of yearlings with more experienced females. Female sparrows tended to retire to their nests for the evening at about 2000 hr, whereas males continued to sing for another hour and a half. At about 0445 hr, males began singing again, but females didn't leave their nests until around 0630 hr. Females stayed up later and left the nest earlier during their second clutches, in July when days were shorter, possibly because of more moderate temperatures, reduced food availability, or the increased foraging demands of molt or caring for fledglings from their first broods. Next year for her honors thesis Janet plans to analyze her extensive results and test the hypotheses that, compared to young birds, older females are able to invest in longer incubation bouts, show less variance in the length of incubation bouts, spend a greater proportion of the day incubating their eggs, and as a consequence have shorter incubation periods.

Jennifer Templeton (formerly University of Nebraska, now a visiting assistant professor at Bowdoin) teamed up with us on a study of learning in Savannah Sparrows. We captured fledglings whose ages were known to the day, placed them in the cow barn aviary, and challenged them to solve several foraging tasks (e.g., find the mealworm under the goldenrod leaf). A time-budget program that Bob Mauck wrote for the Newton (Macintosh's hand-held computer) allowed us to record the birds' behaviors continuously. Intriguingly, fledglings are quite inept at finding food until they are about 25-days-old—just about the same age that Corey Freeman-Gallant ('91) and I determined that their parents stop caring for them in the field.

Last summer on Machias Seal Island, Tony Diamond (University of New Brunswick) and his students mist-netted a breeding Savannah Sparrow that we had banded as a nestling on Kent Island.

- Tree Swallows

Taryn Kruger ('98) took charge of the Tree Swallow colony. It was a spectacular year in terms of reproductive success, with 133 fledglings, the most since 1993, when there were 142. (There were 432 fledglings in 1987, however, which illustrates the region-wide decline of the species over the last decade) Thanks to the mild weather, the proportion of nests that fledged at least one offspring (93%) was a record high, as was the average number of fledglings per successful nest (5.1). Taryn marked offspring from 21 nests so that she could determine post-fledging parental care, which she discovered extended a minimum of 4.3 days after the last young leaves the nest, considerably longer than expected. Her ambitious experiment on feather choice yielded equivocal results. Once the birds had lined their nests with feathers, they showed no interest in collecting feathers from Taryn's display, regardless of feather size or whether feathers had been removed from their nests; in fact, control nests actually accumulated more feathers than nests where feathers had been removed. With help from her father, Rick, Taryn mapped and measured the nest boxes and entered the information into our database. Her analysis of nesting success as a function of nest characteristics will be the basis of her honors thesis.

Taryn and Ryan had plans to study social foraging in Bank Swallows, but for the

first time in a decade, no Bank Swallows nested on Kent Island (although a few birds were present). Instead, Ryan monitored the 5-6 Barn Swallow and 3 Cliff Swallow nests. Some Cliff Swallows, it turns out, visit more than one nest. Whether these represent intraspecific brood parasites, polygamous males, or simply individuals on a social call remains to be determined. On July 6, when the other two pairs of Cliff Swallows were feeding nestlings, a third pair laid the first egg of their late clutch; it hatched July 24.

- American Redstarts, Yellow Warblers

Sarah Bartos (Bates College, '98) investigated age-specific reproduction in American Redstarts. The Kent Island redstart population is unusual because it is so dense (15-18 pairs nest on the island, with perhaps 3-5 "floating" males) and because birds' territories are located in thick coniferous woods rather than the deciduous forests that they favor on the mainland. Territories ranged in size from 0.2 to 1.6 ha; territories in coniferous forest were larger than those in Mountain Ash-Heart-leaved Birch forest. At least one color-banded male defended two territories separated by 500 m. Even though males sing throughout the day, nests were difficult to find because mate-guarding is infrequent and inconspicuous. Moreover, females remain tightly on the nest even while observed from 1 m away. Older males appear to have a richer song repertoire than second-year males. Males generally sing a single, diagnostic, repetitive song near their nest or mate; while defending their territory or advertising for females, they sing a more diverse set of different songs.

Peter Ingram initiated what is likely to become a long-term study of Yellow Warblers. Unlike redstarts, Yellow Warblers are obvious during all phases of nesting, position their nests in predictable sites, and perch in the open where they are readily observed. Among other things, Peter found that Yellow Warblers are interspecifically territorial against redstarts and that incubating females are fed on the nest every 3-5 min by their mates. The incubation period, nestling period, and duration of post-fledging parental care average 14, 9, and 9 days, respectively. Part of Peter's project was a collaboration with Steve Rothstein (University of California-Santa Barbara), who had spent a summer himself on Kent Island during the 1960s and who is now the authority on the ecology of Brown-headed Cowbirds. Because there are no more than a handful of records over the last 30 years of cowbirds parasitizing songbird nests on Kent Island, one hypothesis is that the island's birds have lost, or never evolved, anti-brood parasite adaptations. As an extreme test of the evolutionary lag model, Steve provided brilliant blue and scarlet artificial eggs, which we used to "parasitize" nests experimentally. The model eggs were accepted and incubated in all nine Yellow Warbler nests and both Savannah Sparrow nests in which they were placed.

- Herring Gulls

Two research teams from the Canadian Wildlife Service continued long-term studies of Herring Gulls on Kent Island. The Kent Island population serves as a relatively clean control for comparison with Great Lakes populations, which are exposed to high levels of environmental contaminants. Angela Lorenzo and Len Bastien, working with Laird Shutt of the National Research Centre in Ottawa, collected 100 Herring Gulls eggs

in order to determine the sensitivity of the embryos' hepatocytes (liver cells) to halogenated aromatic hydrocarbons. According to their protocol, stress is reflected in porphyrin accumulation and the induction of a particular protein (cytochrome P4501A); high levels of the protein are found in birds chronically exposed to polychlorinated biphenols. Another consequence of chronic exposure to pollutants can be defective immune responses. To test for signs of pollution stress, Glen Fox, Debbie Jeffrey, and Suzanne Trudeau injected 40 gull chicks in the web of the foot with lectin and sheep blood cells. The procedure called for recapturing the birds six days later for histopathological studies. Analyses of their results are currently underway. Glen is considering expanding his pollution-monitoring efforts to Tree Swallows on Kent Island.

- Bird Populations

During a field trip in early May, we stumbled upon 10 Harlequin Ducks (five males and five females) at the southern tip of the island. An Orchard Oriole was netted on 29 May and a European Whooper Swan was seen on Sheep Island in July (the latter, presumably an escapee from captivity, subsequently moved to White Head Island, where it has remained at least through December). A male Bay-breasted Warbler maintained a territory all summer and may have bred on the island. Similarly, one or more Black-billed Cuckoos were seen throughout the summer. Neither species has nested on Kent Island in recent years. A pair of Bald Eagles nested on Hay Island (the pair that nested the previous year on Kent Island?). A Carolina Wren spent at least eight days on the island in late July.

Black-capped Chickadees, which were absent from Kent Island for at least a decade, seem firmly reestablished, with 3-6 pairs breeding on the island. A pair of Boreal Chickadees that nested in a Tree Swallow box in the North field laid 13 eggs. The fact that the clutch was so huge and that all of the eggs were sterile raises the possibility of female-female pairing. Alternatively, their infertility could be due to high levels of inbreeding in this isolated population.

All summer, Atlantic Puffins, Common Murres, and Razorbills were seen off the southern end of the island. However, by early August the shorebird migration had still failed to materialize. Perhaps the late spring or the mild summer weather resulted in a delay in the birds' southbound flight.

- Insect ecology

After returning from a semester in Australia, where he worked on insect ecology, Kyle Apigian ('98) decided to study ground beetles, which are black, nocturnal, flightless, predatory insects in the family Carabidae. Earlier we had noticed that the beetles abounded even in the deep barren shade of White Spruces. By monitoring grids of pitfall traps, Kyle determined that population densities were as high as 6000-20,000 ground beetles per 100 m². Each of the seven species that he studied appeared to have slightly different habitat preferences (e.g., Mountain Ash vs. mixed deciduous woods vs. Balsam Fir). The number of species and individuals captured in his traps declined over the course of the season. After marking them with "white-out," Kyle discovered that individuals wandered as far as 100 m, although, if relocated, they showed little tendency

to return to where they had originally been captured. The beetles avoided crossing open areas, a finding that affirms the importance of habitat “corridors” for animal dispersal. To evaluate the effect of the beetles on their invertebrate prey (mainly other insects, isopods, and spiders), Kyle removed all trapped individuals (50-100 per day) from several habitat patches. Prey densities appeared to rise in plots where beetles had been removed, whereas they remained relatively constant in control plots. Ground beetles are eaten in bulk by Herring Gulls; however, in feeding trials with captive Savannah Sparrows, even young fledglings avoided them, presumably because of the noxious sprays the beetles eject.

Although we have not yet quantified butterfly population cycles, it is apparent that their numbers vary from year to year. Last summer, Monarchs were common, especially early in season, even though their host plant, Milkweed, does not occur on Kent Island. Red Admirals were abundant. As usual, mosquitoes and black flies were hardly seen (or felt), but in early August deer flies and some species of biting muscid fly appeared.

- Plant ecology

Following up on Cara Greenlaw’s 1996 pilot study, Peter Ingram also investigated the reproductive ecology and foraging behavior of Round-leaved Sundew (*Drosera rotundifolia*), a small predatory plant growing at densities of up to 300 plants/m² in wet habitats. In each of three major study sites (the West Beach, the stream near the well, and the north end of the island where Petrel Path emerges), he selected a random subset of plants. Half of the plants served as controls; each of the other plants had their normal diet supplemented by one fly per week. In the lower lab, Peter set up a planter with 72 plants treated similarly. By the end of July, there was no difference between control and experimental plants in average leaf size, leaf number, or number of flowers, but plants that were fed extra grew taller flower stalks. Flowers began to open in mid-July, about a week earlier than in 1996, presumably because of the sunny weather. The longevity of individual flowers was only a few hours. The single pollinator observed, a syrphid fly, *Toxomerus marginatus*, appeared to trap-line the few available flowers. Small flies were digested by the plants within two days; large flies took up to six days. Ants, centipedes, and ground beetles acted as “kleptoparasites,” stealing insects from the sticky sundew leaves. Nocturnal and diurnal prey removal rates were similar. In the field, nocturnal removal rates varied from 5% of the insect prey in the exposed north site to 55% of the prey near the stream. In captivity, ground beetles showed a clear preference for freshly captured flies versus flies that had already been subdued by the sundews.

We continue to monitor reproduction in a marked population One-leaf Rein-Orchis (*Habenaria obtusata*). One of these days I plan to analyze our data on tradeoffs between growth and reproduction in the perennial orchid.

- Meteorology

! Bob Cunningham (MIT, retired) set up the weather station in May with Russell and Howard Ingalls’ help. A major improvement was installing the anemometer and recording wind vane on a new mast on the Wardens house, connected to “Fog Heaven”

(the weather station) by an underground cable. The wind vane replaces one used on the Warden's house since the 1940s. The Campbell datalogger recorded wind speed and direction, air and ground temperatures, solar radiation, and fog pH and water flow continuously during most of the summer.

From a weatherman's point of view—i.e., Bob's—last summer's weather “was rather dull. There were few rain storms, no hurricanes, and little fog. Some records were broken, however.... Last July, for instance, had the third highest average maximum temperature and the lowest total precipitation in 47 years. Temperatures, precipitation and fog frequency have been particularly variable during the 1990s.” Since the 1930s, average summer maximum temperatures at Kent Island have fluctuated around 16.6oC (62oF) with a slight upward trend in the last eight years. During the same period, average minimum temperatures have risen relatively steadily from 8.9 to 10.6oC (from 48 to 51oF).

We placed one Hobo temperature recorder in the Petrel Path weather shelter to record winter temperatures at 4-hr intervals. Another was placed at a depth of 2 m in Three Islands Harbour to give ocean temperatures in place of the Gannet Rock temperature-recording buoy that sunk last winter.

The dry summer had several consequences. Mushrooms in general were very scarce; *Boletus edulis*, which we had feasted on in 1996, never fruited. We didn't even play the “hidey game,” which normally provides an indoor diversion during the typical summer's foggy spells. The pond on Hay Island shrank to less than half its size. On the other hand, our well continued to supply the best-tasting water in the archipelago, and the weather was perfect for our solar shower. On a sunny July day when the ambient temperature reached only 65o F (18.3o C), the shower water measured 106o F (41.1o C).

The Fall 1997 issue of *Windswept*, the newsletter of the Mt. Washington Observatory, featured an article entitled “Kent Island and the Observatory.” The article describes the establishment of Kent Island's weather station in 1936, when Charles Brooks, Professor of Meteorology at Harvard, sent two students to set up equipment obtained by Harvard for the study of the 1932 solar eclipse. For several years, Kent Island regularly communicated by radio with the summit of Mt. Washington to compare weather conditions.

- Marine Ecology

With funds from a National Science Foundation grant to the Bowdoin Scientific Station, Heather Lee ('99) upgraded the lower lab into a functional marine biology laboratory. At high tide, when the Basin fills, a small pump powered by photovoltaics refreshes the seawater in five aquaria. Heather investigated the distribution and functional morphology of the smooth periwinkle, *Littorina obtusata*. Smooth periwinkles around Kent Island are significantly darker, larger, and higher-spined than their counterparts along the coast of Maine. There was no difference in the size of the snails as a function of height in their favorite substrate, knotted wrack (*Ascophyllum nodosum*). Using “snail polish” to flag individuals in a series of mark-recapture experiments, Heather found higher return rates along the protected northern shore than along the exposed southern shore. Snails of the southern end of the island tended to be smaller. Unexpectedly, densities were greater on the exposed eastern shore than on the protected western shore.

Artist-in-Residence

Kristen Hand ('97) was chosen as Kent Island's first "artist-in-residence." Summarizing her experience, she wrote, "Kent Island is a magically simple and beautiful place—not only a special nesting place, but a haven for any artist doing creative work.... From a panoramic West Beach seascape, ink and charcoal studies of gull chicks, and watercolor studies of irises, Monarch butterflies, and the Mountain Ash tunnel, I tried to present the diverse natural experience of Kent Island." Particularly impressive were her "Rock Studies," a series of three 8"x8" oil paintings of cobbles found along the eastern shore of the island, which Kristen hopes to have made into prints. Kristen transformed the southern corner of the Shop into a studio and her room in the Dorm into a gallery space, where she hosted a final show of her works. All of us appreciated her art classes, where we learned techniques in the use of artists' crayons and watercolors.

Ryan Woods brought a different artistry to Kent Island. Advised from afar by John McKee, Bowdoin's photography professor, Ryan used his spare time to take black-and-white images using a large-format camera. A collection of Andy Goldsworthy photographs inspired several island art projects made of arrangements of natural objects.

Kent Island Life

In 1934 Bill Gross posed with three other Bowdoin students in what has become known as the "Kent Island Pioneers" photograph. Peter Cannell ('75) and Jan Pierson ('74) inspired an annual tradition of reenacting the photo with current Kent Islanders. Last summer, Bill returned for a visit with his wife Abby and daughters Baba and Cynthia, and we took advantage of the opportunity to pose Bill in his customary position, along with Bob, Chuck, and I (the ages of this latest group of "pioneers" added up to 284 years...). Tidying the Radio Shack in anticipation of the Grosses' visit, we came upon Tom Gross's ('36) old radio receiver and the Victrola that Don Griffin used to disorient Leach's Storm-Petrels in his classic homing experiments.

Other summer visitors included Alan Pooley, who sailed his small boat, the Kingfisher, from Nova Scotia to Maine; Wendy Datham from the Grand Manan Museum, who identified 54 plant species during her short stay; a Victor Emanuel Nature Tour; Ruth Fogler ('77), Darragh Brady ('77), and their families; Ryan's mother and friend; and Don Dorsey (University of Southern Maine). When I had to leave the island for several days in early June, Ralph Rynning ('94) and Marney Pratt served ably as adjunct acting directors.

Heather and Kristen teamed up as masterful cooks for the summer. Their culinary wizardry has been preserved in a booklet they put together entitled Kent Island Creations, which presents recipes of the summer's best dressings, breads, entrees, and desserts. For the cover, Kristen painted each student's study subject. The Thanksgiving dinner they prepared instigated a call for a Christmas dinner, which led to stockings, secret Santas, and even caroling at the Warden's house. Maybe that was the inspiration for transforming the Club Dingleberry into a disco one evening, complete with strobe flashlights, a reflecting ball, platform shoes, and aluminum foil outfits.

The Fourth of July was one of the few rainy days we had all summer, but the inclement weather didn't stop our annual beach cleanup. Boaters must be dumping less garbage these days—for the first time, we were able to transfer the collected trash in the Ernest Joy, rather than Russell's much larger boat. That evening we performed a unique arrangement of the "Star-Spangled Banner," accompanied by Kyle's didgeridoo and Ryan's mandolin. None of us attended Canada Day on Grand Manan. Since the administrative amalgamation of Grand Manan's villages, Canada Day festivities have been moved to Grand Harbour, and the old favorite water sports such as the greasy pole, distance swing, and looney dive have been discontinued, hopefully only temporarily.

Taryn's green thumb, plus the cold frame that we kept in place through July, yielded a vegetable garden overflowing with lettuce, spinach, broccoli, basil, zucchinis, and radishes. Just about everybody on the island learned to knit and produced beautiful mittens, socks, vests or hats (I'm still working on my bookmark). Russell delivered another hilarious seminar on knot-tying. Swimming was a big activity, with Janet sometimes taking several dips a day in the frigid Bay. The end of summer song was "Blowin' in the Breeze."

Russell took us on several boating adventures, including an outing to Machias Seal Island, site of the region's largest Atlantic Puffin, Razorbill, Common Tern, and Arctic Tern colonies. We had a magical afternoon chumming for seabirds south of White Head Island. It was so calm that we cut the engine and drifted. Three finback whales lazily fished around us while we netted and banded Greater Shearwaters and Wilson's Storm-Petrels. I led a trip to White Head Island, where I discovered the hard way the location of the redredged harbor channel. Myhron Morse guided us on a wonderful tour of the island where he has lived for more than six decades.

The last Kent Island visit for the season was an ecology field trip lead by Jennifer and Jim in mid-September. After dark, one of the students received an emergency radio transmission: a local pilot, Claus Sonnenberg, disappeared in the dense fog somewhere west of White Head Island. A search party fanned out over the north end of the island. As it turned out, Claus crash-landed near Miller Pond on Grand Manan, suffering only a few broken bones. During this sabbatical, I plan to visit the island in January and February to assess the possibility of winter research.

Kent Island T-Shirt

Last year, under the misguided impression that nobody wore anything but oversized shirts these days, I failed to order enough medium-sized Bowdoin Scientific Station T-shirts. Now we've reordered plenty of the 100% cotton shirts with a white storm-petrel flying across an outline of Kent Island. If you would like to purchase one or more, please send a check for \$11 per shirt. Available colors are: navy and stone-wash light blue (medium only); red, plum and slate (any size except medium).

Addenda to the List of Publications from the Bowdoin Scientific Station

More than 135 articles have been published in peer-reviewed journals based on research on Kent Island. Papers with an author who was an undergraduate at the Bowdoin Scientific Station are indicated by asterisks. Numbers in parentheses represent

Contribution Numbers from the Bowdoin Scientific Station. The complete list of publications can be found linked to the Kent Island web page (www.bowdoin.edu/dept/bio/kent/kent.html).

Yauk, C., and J.S. Quinn. 1996. Multilocus DNA fingerprinting reveals high rate of heritable genetic mutation in herring gulls nesting in an industrialized urban site. *Proceedings of the National Academy of Sciences* 93: 12137-12141. (136)

** Wheelwright, N.T., J. Lawler, and J. Weinstein. 1997. Nest-site selection in Savannah sparrows: using gulls as scarecrows? *Animal Behaviour* 53: 197-208. (122)

** Zink, R.A., and N.T. Wheelwright. 1997. Facultative self-pollination in island irises. *American Midland Naturalist* 137: 72-78. (119)

Mauck, R.A., and T.C. Grubb, Jr. 1997. Monogamy in Leach's Storm-Petrels: DNA fingerprinting evidence. *Auk*. In press. (118)

** Freeman-Gallant, C.R. 1997. Extra-pair paternity in monogamous and polygynous Savannah sparrows, *Passerculus sandwichensis*. *Animal Behaviour* 53: 397-404. (124)

** Freeman-Gallant, C.R. 1997. Parentage and paternal care: consequences of intersexual selection in Savannah sparrows? *Behavioral Ecology and Sociobiology* 40: 395-400. (126)

Wheelwright, N.T., and R.A. Mauck. 1998. Philopatry, natal dispersal and inbreeding avoidance in an island bird population. *Ecology*. In press. (121)

Wheelwright, N.T. 1998. Savannah Sparrow banding returns. In A.W. Diamond, A.D. Brewer, and E.J. Woodsworth (eds.). *Atlas of Canadian Bird Banding Recoveries: 1921-95*. In press.

** Wheelwright, N.T., T.M. Smith, and R.A. Zink. Self-pollination in an island plant community. *Canadian Journal of Botany*. In review.

** Freeman-Gallant, C.R., and N.T. Wheelwright. Offspring condition and survivorship in Savannah Sparrows: implications for the measurement of adult fecundity. *Proceedings of the National Academy of Sciences*. In review. (128)

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