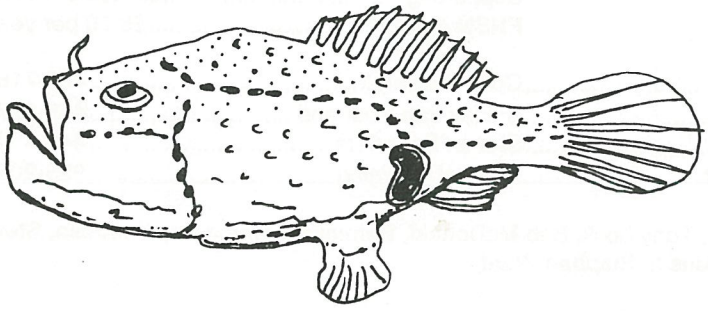
HALIFAX FIELD NATURALISTS' NEWSLETTER

March to May 1993 **No. 70**



Redeye Gaper, *Chaunax stigmaeus*
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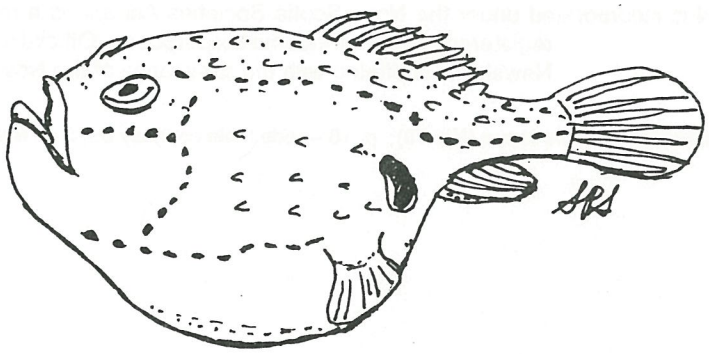

Redeye Gaper, *Chaunax stigmaeus*
Inflated and swollen with tight skin.

Return address:
Halifax Field Naturalists
c/o Nova Scotia Museum
1747 Summer Street
Halifax, NS B3H 3A6

HALIFAX • FIELD • NATURALISTS

Objectives To encourage a greater appreciation and understanding of Nova Scotia's natural history, both within the membership of HFN and in the public at large. To represent the interests of naturalists by encouraging the conservation of Nova Scotia's natural resources.

Meetings On the first Thursday of every month at 8:00 pm in the auditorium of the Nova Scotia Museum, 1747 Summer Street, Halifax.

Field Trips Are held at least once a month, **and it is appreciated if those travelling in someone else's car share the cost of the gas.**

Membership Is open to anyone interested in the natural history of Nova Scotia. Memberships are available at any meeting of the society, or by writing to: Membership Chairman, Halifax Field Naturalists, c/o NS Museum. New memberships starting from September 1 will be valid until the end of the following membership year. The regular membership year is from January 1 to December 31. Members receive the HFN Newsletter and notices of all meetings, field trips, and special programmes. The fees are as follows:

Individual	$10.00 per year
Family	$15.00 per year
Supporting	$20.00 per year
FNSN (opt.)	$5.00 per year

Executive 1992

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HFN is incorporated under the Nova Scotia Societies Act and is a member organization of the Canadian Nature Federation. It is registered for federal income tax purposes. Official receipts will be issued for individual and corporate gifts. The HFN Newsletter is printed with the assistance of the Nova Scotia Museum.

Illustrations **This Issue (No. 70):** p. 15 — tide table courtesy Dept. of Transport;; all other illustrations from copyright-free sources.

HFN NEWS AND ANNOUNCEMENTS

EDITORIAL

After this cold and snowy winter, everyone is yearning to get outside again, but it looks as if the number of threats to our health there has increased. There are reports that the pathogen of Lyme disease and the tick that carries it have been found in the Maritimes, so we should take tick bites seriously. Lyme disease is not easy to diagnose, and is dangerous if not treated quickly.

Predators, the ultimate consumers in the food chain and usually pretty obvious to observers, are often the first to show us the effects of environmental damage, so reports that shrikes are becoming scarce are bad news (page 4). Earlier this month however, the continued presence of the Eastern Cougar in the Maritimes was confirmed. "We know there is ONE!" said the wildlife scientist austerely, having tracked it through fresh snow in New Brunswick, and collected scat from which the identification was confirmed. This makes recent claims of cougar sightings in Nova Scotia much more credible. Their numbers are thought to be increasinng because of the large population of introduced White-tailed Deer.

Paul Keddy, one of HFN's founding members, has a poor opinion of Whitetailed Deer introductions and protection, and tells us why in an article (page 5).

The Board of Directors recently agreed to the Newsletter taking a few paid advertisements, provided that they are congenial. The very first advertisement to appear is for Mary Primrose's photographs (page 14).

A lot of people helped with this newsletter; thanks especially to Doris Butters, Pat Chalmers, Paul Keddy, Regina Maass, Bernice Moores, Stephanie Robertson, Jim Ross, Steve Saunders, and Catherine Strugnell, for providing such interesting material.

There is one more field trip report to come - Susan Hawkins has written about theKejimkujik National Park trip, of 8 November 1992, this will appear in the next issue.

Ursula Grigg

ANNOUNCEMENTS

The Nova Scotia Museum is looking for input iinto its revision of The Natural History of Nova Scotia; if you'd like to help,by contributing information, reviewiing or commenting on the material, please get in touch at once with Sue Browne , Nova Scotia Museum, 1747 Summer St., Halifax, NS, B3H 1A6. Phone, 424-7370; FAX, 424-0560. Comments especially needed on the terrestrial unforested habitats and Theme Regions.

This year's Annual General Meeting of the Federation of Nova Scotia Naturalistswill be hosted by Les Amis du Plein Air in Cheticamp, Cape Breton. The dates are June 18 - 20, and the varied program is directed to families. For more information, contact Daniel Aucoin, Executive Assistant, Les Amis du Plein Air, PO Box 472, Cheticamp, Inverness County, N.S, B0E 1H0.

!HAVE YOU RENEWED!?

HFN memberships expired at the end of the year (except for new memberships dating from September 1st 1992) Please send renewals to the Treasurer, Shirley van Nostrand, at the Museum, or hand them to her at a meeting.

NEW AND RETURNING MEMBERS

Richard Chow
Madeline Comeau
Stuart Dockerty
Susan Lowery
Connie Mack
Anita McKarney
Vilis and Marjorie Nams
John Newbery
Reuben Ware

CONTENTS

SPECIAL REPORTS

HALIFAX HARBOUR CLEANUP

By the time this newsletter appears, the public hearings on Halifax Harbour Cleanup Inc's proposals to deal with harbour pollution will be under way.

The Metro Coalition for Harbour Cleanup, representing several bodies including HFN, is making a counter-proposal; briefly, that Metro would be better served by several smaller treatment plants than by one large one situated in Ives Cove on McNabs Island. This proposal eliminates the need for costly tunnelling under the Harbour and the continuous expense of pumping sewage a long distance. It's also proposed that storm water should be separated from other effluent, which might then be treated to remove or bind toxins. (Under HHCI's proposal only solids would be removed.) The treatment plants would be located in industrial areas on shore and the Province could go ahead with plans to make historic McNabs Island into a provincial park, leaving its northern end as one of the few forest-scapes still existing around Metro. The Coalition is supporting its position with a large body of professional opinion, and believes that its counter-proposal would not only be cheaper, but could be built in stages if necessary.

Maritimers know all about septic fields, honey wagons and natural waterways fouled by domestic or farm outflows, so it is not surprising that they don't want sewage treatment plants "in their back yards." Yet many inland towns and cities put them there, and no-one even notices. Small treatment plants can be seen as one's plane descends over urban areas towards many United States and European airports; these plants put out water clean enough for the nearest swimming hole. In some places there are odourless settling basins treasured by birders; I learned my shorebirds, and many of my migrant song-birds, around the sewage farm outside my University town.

For those of us who cannot attend the meetings in person, the issues will no doubt be well reported by the media. We can still take part in the discussion by calling or writing our Provincial and Federal representatives, the environment ministers at both levels, and our municipal politicians, to give our opinions. For more specific information, call Colin Stewart at 466-7168.

Ursula Grigg

A SHORTAGE OF SHRIKES

It's been nearly three years since scientists sounded an alarm over the worldwide decline of amphibians - a notable example being the disappearing Golden Toads of Costa Rica. Not only are scientists still mystified about the cause of the mass amphibian exit, now they have a new concern: the vanishing shrike.

Of about 30 species of this predatory bird, most are said to be on the decline. Which is why the Archbold Biological Station in Lake Placid, Florida, invited about 100 scientists, from 26 countries, to the first International Shrike Symposium, held on 11-15 January. At this point , no single phenomenon, such as habitat loss, has been identified as the problem, says Archbold ornithologist John Fitzpatrick. Archbold postdoc Reuven Yosef, one of the symposium arrangers, notes that shrikes are an excellent indicator species because they're "top predators" of the grasslands food chain, devouring small mammals, birds, reptiles and large insects. Now, despite their varied and resourceful dietary habits - shrikes impale their prey on sharp things and come back later to dine - reports of dwindling shrike populations have come in from the Russian steppes, African savannahs, Swedish tundra, Canadian grasslands, U.S. prairies, the Israeli desert and the English heaths.

Yosef says the problem in some cases is linked to changing use of agricultural land. In England, for example, monocultures and mechanised farming are limiting insect diversity, destroying habitats of shrikes' prey, and wiping out nesting sites. In Poland, Sweden, and Israel, wetter springs have translated into a cooler environment that is less conducive to reptile and insect activity, and that reduces food for nestlings or discourages female shrikes from breeding altogether.

Much research remains to be done to put together the puzzle of the disappearing shrike. But the evidence, says Fitzpatrick, "makes you wonder if there's something going on globally that we should know about."

Constance Holden, (Ed.), Science. Vol.259, 22 January 1993

DEER TICKS AND LYME DISEASE IN THE MARITIMES

Lyme Alert, the Newsletter of the Lyme - Borrelliosis Support Group of Ontario, is concerned with the spread of deer ticks, *Ixodes dammini*, which carry *Borrelia burgdorfi* (Bb for short), the cause of Lyme disease. The Newsletter comments on the difficulties of getting diagnoses, and the consequent human and financial costs of delayed treatment.

The January - March 1993 issue contains records of deer ticks in the Maritimes. "25 deer ticks have been reported from July, 1984, to the summer of 1991. Even though none of these ticks had evidence of the pathogen of Lyme disease, some interesting aspects of the stages of development were observed.

The recovery of a nymph from a road-killed Common Yellowthroat *(Geothlypis trichas)* in late May, 1990, supports the theory that migrating birds are bringing deer ticks into the province in the spring.

In 1991 five adult deer ticks were found in early spring before bird migration, suggesting that the ticks had over-wintered. In the summer, one gravid female was found on a cat on Cape Breton Island; it produced eggs which hatched into larvae under laboratory conditions. This occurrence also suggests over-wintering, and copulation with a male locally.

REFERENCE:

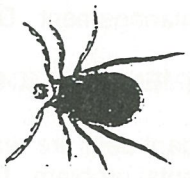
C.B.Bell & others. The Search For *Ixodes dammini* and *Borrelia burgdorfi* in Nova Scotia. Can J Infect Dis 1992."

"More deer ticks are being discovered on P.E.I. A year ago, this newsletter reported an adult female deer tick infected with Bb. It was removed from a Charlottetown cat which had not been off the Island. Now it is reported in the medical literature. The tick was sent to Dr. Harvey Artsob, at the National Laboratory for special pathogens in Ottawa. Bb was isolated and cultured - the first time from a deer tick from Atlantic Canada.

In the same scientific journal, 20 deer ticks are recorded from P.E.I. between 1988 and 1991.

In a random survey of 61 dogs, 4 which had not left the island were found to be seropositive to an IFA test for Bb. A white-tailed deer in a provincial park in eastern P.E.I. was also seropositive.

Paul Keddy provided the information



SPECIAL ARTICLES

DEER ME, HAVE WE CREATED A MONSTER?

Some environmental problems cost money to solve. But many others can be solved by not spending money stupidly in the first place.

Consider, for example, the huge subsidies (roughly a million dollars per irrigated farm) that produced the Rafferty-Alameda dams, or the construction of the Darlington nuclear power plant when a fraction of its inflated costs invested in conservation would have obviated the need for the reactors in the first place, or government subsidies which maintain huge deer populations in our landscape.

Wait - can we commit the blasphemy of speaking of deer, Rafferty-Alameda and Darlington in the same breath? Is the waste of public funds and damage really of a similar magnitude?

First consider the money spent on deer by provincial natural resources departments. Winter deer yards are mapped and protected from logging; deer jaws are collected and aged, poachers are pursued, forests are logged to create deer habitat, areas are burned to improve spring grazing, animals are radio collared and followed, predators are (or were) trapped, shot and poisoned, winter feeding programs are set up, wild apple trees are planted.

Because cultivation of white-tailed deer is so pervasive in provincial ministries across Canada, it is difficult to know the total cost.

Whatever the total, it is much more than the amounts spent on threatened species. Scientists like myself who study endangered species and devise plans to prevent their extinction find that one of our greatest problems is the lack of money. In fact the endangered species list for Canada is incomplete partly because there has never been enough money to study all candidate plant or insect species.

My annual budget for a project studying roughly a group of a dozen rare and endangered plant species in wetlands comes to $20,000 - not enough to hire a single full-time biologist to work on them.

The frustrating fact is, this works out to about $2,000 per species per year. We are having some success, but in a race against time, $2,000 per species is not a race but a crawl.

What is maddening is that at the very time such species are declining, money is poured into deer management. Deer are not rare.

ENVIRONMENTAL PROBLEM

Abundant deer are really a symptom of an environmental problem. Deer do not live in mature forests, and were probably uncommon when mature forests covered eastern Canada. Deer thrive in logged areas and abandoned farmland.

Seeing a deer is not something to celebrate - it is more like seeing an acidified lake or a clear cut.

Large deer populations cause other environmental problems. They spread brain worms which kill moose. The fact moose can again be seen commonly in Algonquin Park is likely the result of deer having finally died back to more natural levels. Large populations of deer damage our forests by interfering with regeneration of commercially valuable tree species (such as yellow birch). In some important parks which protect remnant Carolinian forests, deer populations are so high they are eliminating rare and threatenEd plant species.

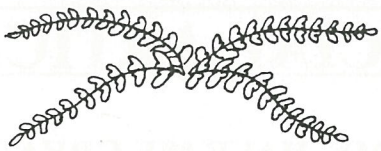
Deer are now also known to be responsible for carrying a dangerous illness - Lyme disease - which is spread to humans by blood-sucking ticks. This disease can destroy a person's health by attacking the central nervous system, brain, heart and joints. It is rapidly spreading in North America - in the United States, more than 5,000 cases were reported to Centres for Disease Control from 1983 to 1986.

Lyme disease has spread into southern Canada. In Ontario there are documented cases from as far north as Algonquin Park and Kenora. Those most at risk are outdoors people such as biologists, hunters, hikers and forestry workers.

Most Canadian doctors have little experience with Lyme disease and diagnostic tests are unreliable. So, we do not know just how common it is - conservative estimates put the figure at more than 100 confirmed cases in Ontario from 1984 to 1991. The actual number is probably much higher. If deer did not have pretty brown eyes and a strong hunting lobby, we would probably be treating them like rats.

Since we know that government does not have enough money to solve all environmental problems, we could ask for two simple acts. Stop subsidising destructive megaprojects. Spend money where it is really needed.

Paul Keddy; published in The Ottawa Citizen, 15 December 1992, and the Kitchener-Waterloo Record, 29 December 1992.



RARE FISH FIND FOR NOVA SCOTIA

Rare fish turn up more frequently in fishermen's catches than they do in scientific exploration. Perhaps the most sensational rare fish in history was the Coelacanth, occasionally caught by fishermen in the South Indian Ocean. The Coelacanth is a 'living fossil', thought to be closely related to the line of fish that evolved into amphibians and eventually into man.

The same sort of thing can happen in Nova Scotia. With the upcoming 1992 Fisheries Exhibition

in Bridgewater, National Sea Products' trawlermen were asked to keep an eye open for unusual fish in their nets to bring ashore for display at the exhibition.. One day a trawlerman brought in an unusual fish caught off the Scotia Shelf. It was a strange looking creature, unlike anything we usually see, so Quality Control called me on Friday, July 17, to see if I could help them identify it.

Strange it was. It was about 15 inches long and had deep orange flabby skin, that felt like sandpaper. It was vertically flattened with a huge head that seemed to make up almost a third of its body. It looked much like an Anglerfish or Monkfish and even had a little protuberance on its forehead, like a lure on an Anglerfish's head. Its paired fins were fleshy at the base, and its gill openings, set way back near its tail, were surrounded by lip-like flesh. The gill openings made me think of the exhaust vents on a twin engine jet aircraft.

After much looking and comparison with pictures and photographs, I came to the conclusion that the fish was *Chaunax stigmaeus* Fowler 1946, also known by a common name as the Red-eyed Gaper. This fish is apparently rare in waters this far north; only two specimens have been caught in Nova Scotia before (Scott & Scott 1988).

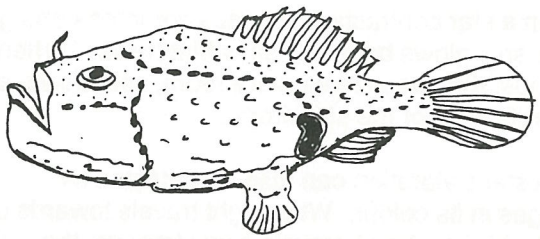
Chaunax species are deep water fish that apparently sit on the bottom and use a modified dorsal fin ray on the snout as a worm-like lure to attract fish close enough to them to swallow. This species in particular can inflate its flat loose skin, making its body look bigger when it feels threatened. In fact Scott and Scott's photograph shows an inflated Red Eyed Gaper, so as the specimen that I examined was deflated, it wasn't until I found the fish in the Peterson Field Guide (Robins, Ray, Douglas and Freund, 1986) that I could identify it. It's always good to check more than one field guide.

REFERENCES:

Scott, W.B. and M.G. Scott. 1988. Atlantic Fishes of Canada. Can. Bull. Fish. Aquat. Sci. 219: 731 p.

Robins C.R., G.C. Ray, J. Douglas and R. Freud. 1986. A field Guide to Atlantic Coast Fishes of North America. (Peterson Field Guide Series), 32 p 324.

Steve Saunders



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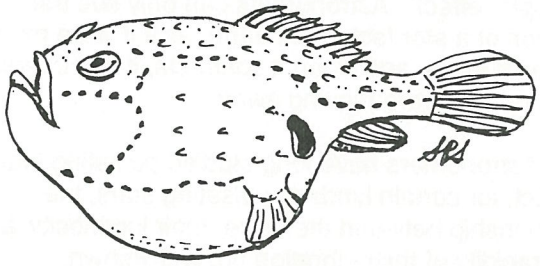


Redeye Gaper, *Chaunax stigmaeus*
Inflated and swollen with tight skin.

DO THE MORNING STARS SING TOGETHER?

Some stars do more than shine; they also 'ring' - or rather, they would if we could hear their vibrations. The discovery that certain stars vibrate much faster than astronomers expected provides us with clues about what stars are made of and how far away they are.

Jaymie Matthews, a Fellow in the Geophysics and Astronomy Department of the University of British Columbia in Vancouver, explains that when you hit a bell it vibrates, and the sound it makes is caused by those vibrations travelling through the air. The size and shape of the bell determine the pitch of its vibration.

In the case of vibrating stars the principles are the same, but stars are so big that even if we could hear through the vacuum of space, their pitch would be too low for the human ear to pick up.

"When a bell rings, the surface of the bell is moving in and out very quickly," says Matthews. "As it moves in and out, it forces the air around it to move in and out also. This sets up waves of pressure that move away from the bell, through the air, and eventually hit our eardrums. The brain translates that physical vibration in the inner eardrum into what we interpret as sound."

Astronomers can identify stars that are vibrating by changes in their colour and brightness. Stars are made up of very hot gases held together by gravity and when they vibrate, they expand and contract.

"When a star contracts, the gases compress and get hotter so it glows brighter," says Matthews. "When it expands, the gases have more room, cool down, and the brightness of the star drops."

A star's vibration can also be detected by changes in its colour. When light travels towards us, it looks bluer, when it travels away from us, the wave lengths are shifted towards the red end of the spectrum. This phenomenon is called 'red shift' or 'Doppler effect'. Astronomers can only see the portion of a star facing the earth, as if it were moving towards earth, and when it contracts, it looks redder as though it were moving away.

Astronomers have long studied pulsating stars. In fact, for certain kinds of pulsating stars, the relationship between their size, their luminosity, and the rapidity of their vibration are well known. Astronomers can use these data in a mathematical formula that tells them the distance to a particular star.

Researchers had always concentrated on star changes occurring over many hours or days and were surprised to discover that some stars vibrate more quickly - over a few minutes or hours. Recent research has focussed on these.

"No one expected to see stars as big as the sun, or even larger, vibrate so quickly." says Matthews. "Seeing these big stars vibrating in the period of a few minutes is a bit like watching a tuba player and hearing the sound of a piccolo coming out. We were surprised to see very high-pitched vibrating in the stars."

Matthews says that astronomers have a good idea of the general structure of stars, but their models are still very simple, and many details are not understood - details of magnetic fields, surface turbulence or rotation time, for example. "All we have are these little pin-points of light. And so, we collect that light and do everything we can with it." Astronomers hope the rapid vibrations will give them more clues to what's going on inside, to the internal structure and composition of stars, and perhaps to what is making them vibrate.

Paige Debergo; from Canadian Science News. Vol.9, No. 9, 1 November 1990

FIELD TRIPS

CLAM HARBOUR HIKE AND CRANBERRY PICK

Date: 25 October 1992
Weather: A fine sunny fall day, 17 degrees Celsius
Coordinator: Bernice Moores
Participants: 23

This outing was held in conjunction with the Parks are for People programme. It was advertised on TV.

We met with members of the Blomidon Naturalists, the Halifax Wild Flora Society, and a Truro group at Clam Harbour.

We enjoyed the walk along the wide long beach. Soon we reached our favoured spot for picking cranberries. There were lots of berries, the picking was easy and our fingers appreciated the warm weather. I picked six quarts and others picked at least as many and there were still many berries left.

We went for a walk later, and spotted some Eider Ducks, and as we drove home, saw several Great Blue Herons, an American Robin and a Common Raven.

It was a great and successful day. Thank you, Bernice!

Regina Maass

HALIFAX FIELD NATURALISTS ANNUAL "SEWER STROLL"

Date: 17 January 1993
Place: Around Halifax Inlet
Weather: Overcast in the morning, flurries and snow in the afternoon. -5 degrees Celsius
Interpreter: Clarence Stevens II
Participants: 10

An 8.15 a.m. departure from the Museum parking lot marked the start of the 1993 HFN annual "Sewer Stroll."

Our first stop was at the 24 hour Sobey's Store parking lot and the Bedford Waterfront Park on the Bedford Basin. Here we saw Common and Barrow's Goldeneye, Great Black-backed, Common and Iceland Gulls, numerous Black Duck, Mallard, some American Crows and Rock Doves. Out over the Basin, a lone Bald Eagle occupied itself by terrifying gulls; Clarence told us it had a mate earlier in the fall, but the mate turned up shot on the Hammonds Plains Road.

Stop two was on the small bridge crossing the Sackville River on Shore Drive, by Fish Hatchery Park in Bedford. Here there were Mallard, Black Duck, Goldeneye, a white domestic duck, an escaped Mute Swan, and Herring and Ringbilled Gulls. Blue Jays and four American Robins were sighted in trees adjacent to the cove.

The Sewer Strollers next proceeded to the Dartmouth side of the harbour, where the third stop of the day was at Tufts Cove, at the end of Nootka Drive near The Narrows. Common Goldeneye, a Barrow's Goldeneye, Great Cormorants, Common Mergansers, Green-winged Teal and American Widgeon were the interesting birds in this area of the harbour.

Sullivan's Pond off Ochterloney Street in Dartmouth provided the fourth stop. In addition to the more usual fare, we saw three Wood Ducks, wild and domestic Mallard, and Song Sparrows, as well as numerous domestic ducks and a flock of about 15 Robins. There was also a single Canada Goose, which Clarence said had arrived in obvious poor condition a few weeks earlier; it was now in much improved health.

On to the foot of Maitland Street for the fifth stop. Of interest here were Common Black-headed and Bonaparte's Gulls. Clarence knew of a Mockingbird frequenting this area, and found it in a Multiflora Rose bush. We followed it down the street and across a parking lot, where we left it feeding on an apple still hanging in a tree. Another point of interest here is a recently painted mural on the side of a very long shed adjacent to the railroad tracks.

At the foot of Cuisack Street there is a sitting-park with an interesting view of the harbour. This was stop six on the stroll and provided us with the first Common Loon of the day.

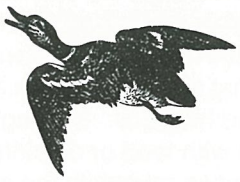
Lunch was at "Tim's" in Woodside. Clarence had received several accounts of a large green parrot in this area. We did not see the poor parrot, but added a solitary Common Raven to our list.

The seventh and final stop of the day was in the Eastern Passage/Hartlen Point area. An Eider Duck, a Red-necked Grebe, White-winged Scoters, and a Glaucous Gull were observed. There were several Song Sparrows in the brush along the shore. By this time (1.30 p.m.), visibility was rapidly deteriorating because of the snow, making it very difficult to see some Great Cormorants near Devil's Island.

A number of species of birds were heard but not seen throughout the day and are not noted here. By my count we saw 30 species this year. Last year we only saw 16 species, in approximately the same areas. All participants agreed that this year's Sewer Stroll was a rewarding outing and thanks go to Clarence Stevens for organising and leading it.

A few participants decided to continue birding after the outing concluded and reported seeing a Pine Warbler for their efforts.

Jim Ross



WINTER EAGLES AT SHEFFIELD MILLS

Date: Saturday 23 January 1993
Place: Sheffield Mills (& vicinity), King's County
Weather: 36° F, occasional heavy rain, low clouds, fog
Leader: Colin Stewart, with Jim Wolford
Attendance: 10 adults, 5 children, and 2 dogs

After slogging through the cold driving rain and the sea of thick mud in the parking lot, the warmth and friendliness inside the Sheffield Mills Community

Hall seemed especially inviting. While waiting for our group to gather, we examined the displays on Bald Eagles and other raptors, which had been organized by the Blomidon Field Naturalists. A large map on one wall showed the major feeding and perching sites for eagles in the neighbourhood, and a sign on another wall announced how many eagles Merritt Gibson had seen that morning at their breakfasts, and dared us to match his total.

A Department of Natural Resources video, documenting the life of Bald Eagles in Nova Scotia, explained how so many had come to winter in the Annapolis Valley in recent years. Beginning with Cyril Caldwell's experimental feeding programme, eagles became attracted to the regular supply of agricultural carrion put out by poultry farmers in the area. The eagles have become such a predictable sight in the winter that the community of Sheffield Mills now plans a yearly festival around them.

A number of specimens from the Biology Lab at Acadia University were on display for us to examine, so that we could become familiar with the field marks and colour phases of the birds. There were seven Bald Eagles, in the first year (light and dark phase), second year (light and dark phase), third and fourth years, and finally the familiar full adult plumage, which is attained in the fifth year. There were also specimens of Barred, Horned, and Snowy Owls, whose soft downy breasts were so tempting to stroke. The display was completed by a selection of Red-tailed Hawks (including a semi-albino), and Rough-legged Hawks.

We took off, armed with copies of the map, about 10:30. At the first three sites we saw 11 immature and five mature eagles, as well as ravens, crows and gulls. At one roadside spot, Jim Wolford had set up a scope, to look at what is locally known as "the eagle tree", a favourite perching site. Six eagles rested, looking either sated with food or dispirited by the drenching rain. The two ravens in the same tree were dwarfed by their neighbours. A seventh, mature eagle glided in to roost, with a harsh, creaky shrieking. The view through the scope showed three eagles so well we could see their talons.

At the Fuller Poultry Farm near Pereaux, we walked 1/2 mile down a dirt road between brush and fields, to a place where dead poultry is dumped for the birds. Chicken feathers strewed the road, and mingled with the wild cucumbers and red nightshade berries in the undergrowth. We saw seven mature and 2 immature eagles, finished their feed, in distant trees. Rose hips, Canada Holly, bracket fungus and bright green lichen were occasions of interest in the bleak and sodden landscape. There were thirty-two eagles, but disappointingly, no other raptors.

We returned to the Hall for the Women's Institute community dinner (which was so successful that they ran out of food within the first half hour); we arrived in good time to enjoy the replenished stock. The Blomidon Field Naturalists were selling their new publication, A Natural History of King's County. Merritt Gibson, who came in from a second round of the sites, was induced to autograph some copies for their eager buyers.

After lunch the clouds lifted, and we parted and went separate ways, occasionally tagging along with one of the other groups which were touring about. Ursula Grigg and I, while driving through Port Williams, saw a Rough-legged Hawk on a telephone wire over the salt marsh. We drove on to Grand Pré, where a faint drizzle resumed, and we saw three more eagles sitting in the plowed fields, looking like brown tussocks; three Mourning Doves cooed in a garden nearby.

We eventually joined a group from the Nova Scotia Museum, led by Peter MacLeod and Fulton Lavendar. At North Grand Pré a Red-tailed Hawk sat in a tree overhanging the road, and then we walked down a dirt lane near a tidal creek, full of muddy ice-floes, to see a light-phase Rough-legged Hawk in a tree further off. We got a good look at it through Peter's scope.

Finally, as Peter said, "We go for the owls". We went past Marshcrest Farms, down another long narrow ice-rutted dirt road, this time in cars, single file, all wondering if we'd we able to turn around at the end. At 3:30 we reached a dyke where we got out and huddled in the thickening mist for Peter and Fulton's instructions. It was important that we "go over the top" together, if we were all to get a good look. As we crested the hill, five big tawny Short-eared Owls flushed from the marsh grass and flew past us, with their typical flopping wingbeats, to Boot Island. These owls now live in the area year round, and breed there in summer.

On our way back to Wolfville, Ursula and I stopped to look at a Red-tailed Hawk. A passerby, seeing our field-glasses, asked us if we were looking for eagles. He pointed out one directly across the road from us, which we had missed! A great many birds in one day, and indeed it was a great day. Thanks Colin, Jim, Peter and Fulton.

Patricia L. Chalmers

NATURAL HISTORY

LIVING WITH BATS

One of my most memorable field experiences occurred in a swamp just after dusk. The night was hot and humid, without even a whisper of wind. I remember wishing for a breeze to scatter the mosquitoes that swarmed around me. The only protection was to tie my hood tightly round my face. My research on bats had brought me here, and as I tuned in my bat-detecting equipment - capable of picking up the ultrasonic cries of bats - the speaker came alive with feeding calls. Against the fading light I watched as a lone bat hovered around me - feeding on the insects that tormented me.

Bats make many people uncomfortable. In fact the inquisitive nature of bats is often misinterpreted as aggression. Although bats appear to fly recklessly, their unpredictable turns and kamikaze dives are essential for catching flying insects. So, even though it may seem as if bats are swooping at you, they're only trying to out-manoeuver their prey. Bats also investigate many sounds. They can be attracted by fluttering your fingers together or by scraping your fingernails on a nylon jacket. Soon their curiosity wears off and they resume hunting.

To see bats in action, stand under a street-light and watch them feed on insects that swarm around the light. Or, visit a pond on a moonlit night and watch for fleeting silhouettes of bats near the water. These glimpses may satisfy the casual observer, but others may find themselves living under the same roofs with bats.

Our most common species, the Little Brown Bat, is also the most readily adapted to living with people. In some cases , one or two bats may roost under shingles or clapboard siding. These stragglers - usually males or young bats - often choose a new roost site each day. But some buildings may house hundreds of bats during summer. These colonies usually consist of pregnant females that need a warm place to raise their young. Attics and unoccupied buildings are chosen because the warm temperature and crowded conditions allow baby bats to grow quickly. Rapid development is critical to ensure that the young bats have sufficient time to gain weight before winter and to learn how to feed.

A few bats in your home may go undetected; a colony can be difficult to overlook. Young bats are noisy - calling for their mothers to nurse them - and as bat droppings accumulate, the colony can become smelly. Despite these inconveniences, bats do not chew insulation, wood or wiring. Having the bats can also be helpful. Consider the insect control that they provide. Bats are the most important predators of night-flying insects; each bat eats up to half of its weight in insects every night - the equivalent of 1,000 to 3,000 mosquitoes. No man-made insect deterrent can compare.

If bats have chosen to live in your house in the past, they will probably return each year. A number of different methods have been used to discourage this.but are usually ineffective. The bats will roost in shadows cast by lights, or will return if the lights go out. Noxious fumes can be annoying to people and pets - and the bats will be back as soon as the fumes dissipate. Rodent repellers that emit ultrasonic sounds may actually attract bats. Sticky traps may catch a few bats, but most will learn to avoid them.

Poisons often they cause more problems than they solve. Dazed and weakened bats can be picked up by children or pets; dead bats may rot in corners and add to the existing odour. The only sure way to keep bats out of your house is to bat-proof it.

In old houses bat-proofing may be difficult because Little Brown Bats can crawl through a hole the size of a quarter. All entrances and exits that bats use should be blocked. One can locate these openings by watching for places where they emerge at dusk, or by looking for droppings on the sides of the house. Bat droppings look like mouse droppings, but can be found stuck to walls where mice cannot reach.

Because bats do not leave their roost every night, place a chute - such as a plastic bread bag with the bottom removed - over the exit for several nights. The device allows bats to leave but prevents re-entry. Once all of the bats are gone, the entrances can be permanently sealed with foam rubber plugs or caulking.

Expect the bats to persist in their attempts to re-enter the house. They will look for an alternative entrance. If they succeed, the eviction process may have to be repeated.

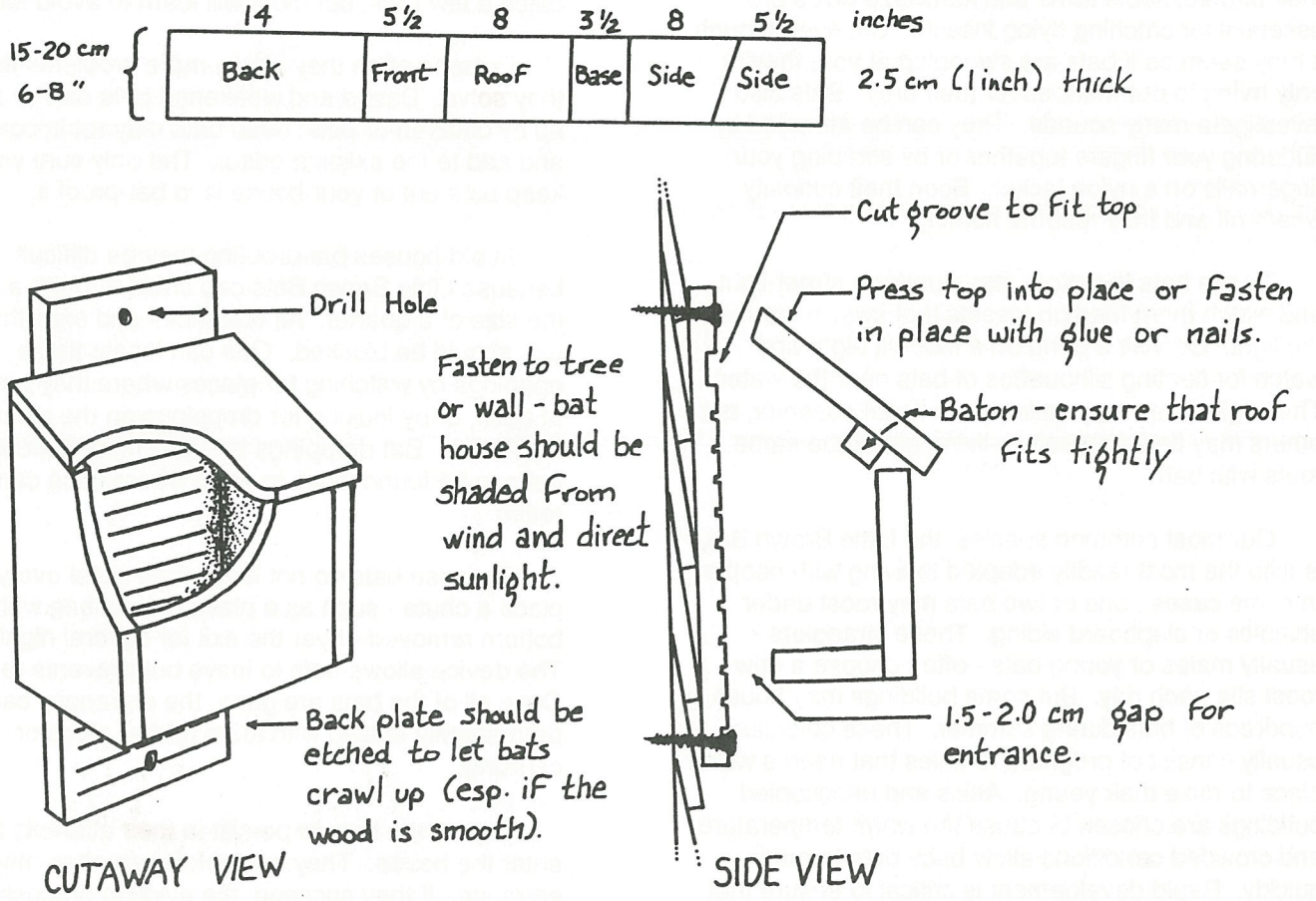
Timing of roost-sealing is critical: the work should be completed before the end of June when the young are born, or after the end of July when the young can fly. If roost entrances are sealed in July, young bats

will be locked inside and will die from starvation. Before blocking any entrances, check the attic to see whether any young bats are present. Newborn bats are furless and are smaller than adults. Furred juveniles look like adults but will not fly when disturbed.

Relocating bats will search for new roosts, often staying nearby and taking up residence in a nearby building. Your neighbours may not welcome this, so appease them *and* the bats by placing a bat house near where the animals once entered your house. Bat houses are simple to construct (see diagram); you can also purchase them through bat conservation organisations. Place the bat house high above the ground on a wall or tree that is protected from wind and direct sunlight. To give the bats a strong grip, construct the house from rough wood or etch the wood with a saw. Paint, stain or wood preservative will deter the bats, so select wood that weathers well.

The importance of providing an alternative roosting site is obvious when you consider that Nova Scotia's bats have only four or five months to feed, raise young and prepare for winter. Disturbances that disrupt their cycle mean that valuable time is wasted searching for new roosts - time that would normally be spent foraging or nourishing young. Careful placement of a bat house can keep you out of trouble with your neighbours, afford an unusual conversation piece and give you the insect control that you need. More importantly, it will help the bats.

Matt Saunders, adapted from an article in N.S. Conservation, Vol.14, No. 1, Spring 1990.



This small bat house may house up to 30 at a time. It can be modified to hold more bats by increasing the width of the board and using the same dimensions for the other parts. Other designs can be used, but the best designs have an entrance no more than 2.0 cm wide and no longer than about 15 cm from side to side. If the distance between the back and front of the house is increased, include a dividing wall in the centre. Bats prefer relatively cramped space and the divider will increase the capacity.

THE BATS OF CHEDWORTH, ENGLAND

(Chedworth is a National Trust property in the west of England)

There is more at Chedworth than dead Roman walls..... We now realise that the property is an important refuge for bats. As we explained when the local bat group held a meeting here, the property is fortunate to have three species for study: Whiskered, Long-eared and Lesser Horseshoe Bats. The Long-eared Bats are resident in the Administrator's house, where they live quietly in the attic. They, in many ways, are the most attractive, like little winged kittens. They are so quiet in their ways that we are still not wholly sure what ways in and out they use, though we find them hanging in friendly clusters inside the roof.

The Whiskered Bats arrive each summer, and have a nursery roost in the Reception Building... fortunately none of our bats uses the Roman buildings (as a nursery). During May the mother bats, who will generally have one baby each, gather on the site, eventually collecting under the north west gable slates. During the day, if you have an ultra-sonic detector, you can hear them talking, a sound as if numbers of them were munching dry corn flakes, just above human hearing range. At dusk, as the temperature falls, you can hear them beginning to probe with pulses of higher pitched sound before they sweep out from gaps in the boarding with a continuous patter of echo-locating pulses. In the autumn they disperse again.

Our most recently recognised resident is a Lesser Horseshoe Bat, probably a solitary male, since the nursery roosts for the females are elsewhere. We have known for some time that there were visits from Lesser Horseshoe Bats, as well as from other species, but have only recently watched for them.

Echo-location by Horseshoe Bats is not a patter of pulses like those of the Whiskered Bats, but a train of high whistles, more or less at radio frequency. We found that a Lesser Horseshoe Bat arrives on the site after dark, and flies into the open roof of one of the Roman baths. There it hangs, twisting its head and probing with sounds in every direction to locate moths and crane-flies; it hunts and eats them under the roof and we have seen it flitting in and out, between the roof pillars. research continues... which means sitting for hours with an ultrasonic detector in the Roman cold plunge as it becomes dark.

There is still life among the Roman stones!

Nigel Wilson, Administrator at Chedworth

HERBAL MEDICINE

Since the first men and women learned to be gatherers, mankind has depended upon plants - for food, shelter, clothing and medicines. Through the ages, people have gathered or cultivated herbs, for flavourings and also for medicinal uses. The old monasteries always had large herb gardens and monks were known far and wide as healers. Every village had a "wise woman" who knew plants and how to use them. Folks flocked to these people for cures of all sorts.

With the trend toward re-greening Earth, I find that many people are turning back to Nature for the basics

Herbal medicine is one basic that is, again, collecting many followers. As a student of herbal medicine, I have been experimenting with several different plants, some common, others harder to come by. All of the remedies I have tried have been successful.

Coltsfoot *(Tussilago farfara)*, for example, has been used over the centuries to calm a cough and ease the symptoms of the common cold. Indeed, I have used it and 'cured' myself in one day!

Many varieties of mint are useful: Peppermint *(Mentha piperita)* is effective for calming heartburn, nausea and headaches, and will reduce a fever. In large quantities, Peppermint is said to be an aphrodisiac. Spearmint *(M. spicata)*, in addition to having the qualities of peppermint, is used for women's complaints such as cramping.

Catmint, or Catnip *(Nepeta cataria)*, has a great aroma and a cup of catnip tea will settle a nervous system (and you won't begin to meow!).

Lemon Balm *(Melissa officinalis)*, another mint, with the characteristic scent of lemons, is superb for easing a bad, irritable mood. Too, lemon balm can be used with coltsfoot for a cold.

Comfrey *(Symphytum officinale)* used to be used for some intestinal problems, and excessive menstrual flow. Recent research has shown that one of its active principles may be carcinogenic, so it is no longer taken internally. It's still used as a poultice or compress over wounds and broken bones.

A familiar bad-tasting diarrhea remedy can be replaced at home with pleasant Wild Strawberry *(Fragaria vesca,* or locally, *F. virginiana)* or Blackberry *(Rubus villosus*, or the local *R. allegheniensis)* leaves. Raspberry *(Rubus idaeus* or

R. strigosus) leaves are good for constipation, as are the flowers of feverfew *(Chrysanthemum parthenium)*. Feverfew leaves are helpful for a hangover, and are used by many migraine sufferers. Feverfew is an ancient herb known to medieval healers and still available through specialised growers.

Brew your own Earl Grey tea by adding Bergamot *(Monarda fistulosa)* to your regular teabags. But go gently, the flavour is very potent.

The most common method of utilising herbs is to make a tea with the leaves and/or flowers. Many plants can also be used as compresses or poultices. Remember Granny's mustard plaster? Very effective, but the cure was worse than the curse, being very irritating to skin and nose. Broad-leaved Plantain *(Plantago major)* is useful as a coagulant and will induce the healing of a cut or abrasion . Daisy leaves *(Bellis perennis)* contain an anodyne similar to aspirin, and will reduce pain when used as a compress.

Several of the kitchen herbs, including Garlic *(Allium sativum)*, Rosemary *(Rosemarinus officinalis)*, Basil *(Ocimum basilicum)*, Sage *(Salvia officinalis)*, Parsley *(Petroselinum sativum)*, Thyme *(Thymus vulgaris)* and tarragon *(Artemesia dracunculus)* are not only flavourful, but are valuable in aiding digestion and appetite, and have other uses as well.

The juice of cranberries and blueberries *(Vaccinium* species*)* contain an enzyme that combats urinary tract infections.

Popular garden flowers are often also medicinal. Violets *(Viola odorata* and *Viola tricolor)*, Nasturtium *(Tropaeolum majus)*, Marigolds *(Calendula officinalis)* and rosehips from all species of Rosa are all medicinally important. Common wildflowers, weeds, ferns and grasses cannot be overlooked either.

We must remember that most of our chemical medicines originated in plants - digitalis, penicillin, mentholyptus and beech nut cough remedies, cancer drugs and so many more. So why not go directly to the source? I have only touched upon a few, the possibilities are endless!

There are several very good guides to herbs and their uses. My favourite is The Herb Book by John Lust, a paperback published by Bantam. It contains several guides, indexes, and line drawings to help with identification.

So experiment and have fun. Who knows? You may become the next village healer.

Catherine Strugnell

USING HERBS SAFELY

People who use herbs, like those who eat mushrooms, had better be sure of their identifications! One way to be safe is to buy seeds or plants from a herb nursery, and there are several which sell plants and leaves in the local Farmers' Markets, or dried herbs from organic food stores. Then there is Richters, established in Ontario in 1969 and quickly acknowledged internationally.

Richters issues a fascinating catalogue, offering all sorts of botanical material, including some medieval rose plants and fixatives for pot-pourri. Herbs are listed in alphabetical order, which makes them a bit difficult to find if one knows the plants by different names (and annoys taxonomists immensely). It is not really a problem, since it's such a pleasant book for browsing. Herb entries note common uses for the plants, and which are poisonous or should be used cautiously. There is also a page-full of books. The catalogue costs $2, from Richters, Canada's Herb Specialists, Goodwood, Ontario, L0C 1A0.

Ursula Grigg

TABLE DES MARÉES

HALIFAX HNA Z+4

1993

APRIL–AVRIL

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0150	5.1	1.6	16	0350	4.7	1.4
	0910	1.3	.4		1025	1.5	.5
TH	1500	4.9	1.5	FR	1635	5.1	1.6
JE	2140	2.0	.6	VE	2305	1.8	.5
2	0310	5.2	1.6	17	0455	4.9	1.5
	1010	1.0	.3		1115	1.6	.5
FR	1620	5.3	1.6	SA	1720	5.3	1.6
VE	2245	1.7	.5	SA	2350	1.6	.5
3	0430	5.4	1.6	18	0545	5.1	1.6
	1110	.8	.2		1200	1.6	.5
SA	1720	5.8	1.8	SU	1800	5.5	1.7
SA	2345	1.3	.4	DI			
4	0535	5.7	1.7	19	0035	1.3	.4
	1205	.5	.2		0630	5.2	1.6
SU	1810	6.3	1.9	MO	1240	1.5	.5
DI				LU	1840	5.7	1.7
5	0040	.8	.2	20	0110	1.0	.3
	0630	6.1	1.9		0710	5.3	1.6
MO	1300	.4	.1	TU	1315	1.5	.5
LU	1900	6.6	2.0	MA	1915	5.8	1.8
6	0135	.4	.1	21	0145	.8	.2
	0720	6.3	1.9		0745	5.4	1.6
TU	1350	.3	.1	WE	1350	1.5	.5
MA	1945	6.9	2.1	ME	1945	5.9	1.8
7	0225	.1	.0	22	0215	.7	.2
	0810	6.4	2.0		0820	5.4	1.6
WE	1440	.3	.1	TH	1420	1.5	.5
ME	2030	6.9	2.1	JE	2020	5.8	1.8
8	0315	.0	.0	23	0250	.7	.2
	0900	6.3	1.9		0855	5.3	1.6
TH	1530	.5	.2	FR	1455	1.5	.5
JE	2115	6.7	2.0	VE	2055	5.8	1.8
9	0405	.1	.0	24	0325	.7	.2
	0950	6.1	1.9		0935	5.3	1.6
FR	1625	.8	.2	SA	1530	1.6	.5
VE	2205	6.4	2.0	SA	2135	5.7	1.7
10	0500	.3	.1	25	0405	.8	.2
	1040	5.9	1.8		1010	5.3	1.6
SA	1720	1.2	.4	SU	1610	1.7	.5
SA	2250	6.0	1.8	DI	2210	5.6	1.7
11	0555	.6	.2	26	0450	.9	.3
	1130	5.6	1.7		1050	5.2	1.6
SU	1820	1.6	.5	MO	1700	1.9	.6
DI	2340	5.6	1.7	LU	2255	5.5	1.7
12	0655	.9	.3	27	0545	1.0	.3
	1220	5.2	1.6		1135	5.2	1.6
MO	1925	1.8	.5	TU	1805	2.1	.6
LU				MA	2340	5.4	1.6
13	0030	5.2	1.6	28	0645	1.0	.3
	0750	1.1	.3		1225	5.2	1.6
TU	1315	5.0	1.5	WE	1915	2.1	.6
MA	2025	2.0	.6	ME			
14	0130	4.9	1.5	29	0030	5.2	1.6
	0845	1.3	.4		0745	1.0	.3
WE	1420	4.8	1.5	TH	1325	5.2	1.6
ME	2120	2.0	.6	JE	2025	2.1	.6
15	0235	4.7	1.4	30	0130	5.1	1.6
	0935	1.4	.4		0845	1.0	.3
TH	1535	4.9	1.5	FR	1435	5.3	1.6
JE	2215	1.9	.6	VE	2125	1.8	.5

MAY–MAI

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0245	5.1	1.6	16	0410	4.6	1.4
	0940	.9	.3		1015	1.8	.5
SA	1550	5.6	1.7	SU	1630	5.2	1.6
SA	2230	1.5	.5	DI	2305	1.5	.5
2	0405	5.2	1.6	17	0505	4.7	1.4
	1040	.9	.3		1100	1.8	.5
SU	1650	5.9	1.8	MO	1715	5.4	1.6
DI	2330	1.1	.3	LU	2350	1.3	.4
3	0510	5.4	1.6	18	0555	4.9	1.5
	1140	.8	.2		1150	1.8	.5
MO	1745	6.3	1.9	TU	1755	5.5	1.7
LU				MA			
4	0030	.6	.2	19	0035	1.0	.3
	0610	5.7	1.7		0635	5.0	1.5
TU	1240	.7	.2	WE	1235	1.7	.5
MA	1835	6.5	2.0	ME	1835	5.7	1.7
5	0120	.2	.1	20	0115	.8	.2
	0705	5.9	1.8		0715	5.1	1.6
WE	1335	.6	.2	TH	1315	1.6	.5
ME	1920	6.6	2.0	JE	1915	5.7	1.7
6	0210	.0	.0	21	0150	.6	.2
	0755	6.0	1.8		0755	5.2	1.6
TH	1425	.7	.2	FR	1355	1.5	.5
JE	2005	6.6	2.0	VE	1950	5.8	1.8
7	0300	–0.1	.0	22	0230	.5	.2
	0845	6.0	1.8		0835	5.3	1.6
FR	1515	.8	.2	SA	1435	1.4	.4
VE	2055	6.4	2.0	SA	2030	5.8	1.8
8	0345	.0	.0	23	0310	.5	.2
	0935	5.9	1.8		0915	5.3	1.6
SA	1605	1.1	.3	SU	1515	1.5	.5
SA	2140	6.1	1.9	DI	2115	5.8	1.8
9	0435	.2	.1	24	0350	.5	.2
	1020	5.7	1.7		0955	5.4	1.6
SU	1700	1.4	.4	MO	1600	1.6	.5
DI	2230	5.8	1.8	LU	2155	5.7	1.7
10	0525	.5	.2	25	0440	.5	.2
	1110	5.6	1.7		1040	5.5	1.7
MO	1755	1.6	.5	TU	1655	1.7	.5
LU	2315	5.5	1.7	MA	2240	5.7	1.7
11	0620	.8	.2	26	0530	.6	.2
	1200	5.4	1.6		1125	5.5	1.7
TU	1855	1.8	.5	WE	1800	1.8	.5
MA				ME	2325	5.5	1.7
12	0005	5.2	1.6	27	0630	.7	.2
	0710	1.1	.3		1215	5.5	1.7
WE	1245	5.2	1.6	TH	1910	1.8	.5
ME	1950	1.9	.6	JE			
13	0100	4.9	1.5	28	0020	5.3	1.6
	0800	1.3	.4		0725	.8	.2
TH	1340	5.1	1.6	FR	1310	5.6	1.7
JE	2040	1.9	.6	VE	2010	1.7	.5
14	0155	4.7	1.4	29	0120	5.1	1.6
	0845	1.5	.5		0820	.9	.3
FR	1440	5.0	1.5	SA	1410	5.6	1.7
VE	2130	1.9	.6	SA	2110	1.5	.5
15	0300	4.6	1.4	30	0230	5.0	1.5
	0930	1.7	.5		0920	1.0	.3
SA	1535	5.1	1.6	SU	1515	5.7	1.7
SA	2215	1.7	.5	DI	2210	1.2	.4
				31	0345	5.0	1.5
					1020	1.1	.3
				MO	1620	5.9	1.8
				LU	2315	.9	.3

JUNE–JUIN

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0455	5.2	1.6	16	0510	4.6	1.4
	1120	1.1	.3		1105	1.9	.6
TU	1715	6.1	1.9	WE	1715	5.3	1.6
MA				ME	2355	1.1	.3
2	0010	.5	.2	17	0600	4.7	1.4
	0555	5.4	1.6		1155	1.8	.5
WE	1225	1.0	.3	TH	1800	5.5	1.7
ME	1810	6.2	1.9	JE			
3	0105	.2	.1	18	0040	.8	.2
	0650	5.6	1.7		0645	4.9	1.5
TH	1320	1.0	.3	FR	1245	1.6	.5
JE	1900	6.3	1.9	VE	1845	5.6	1.7
4	0155	.0	.0	19	0125	.6	.2
	0740	5.7	1.7		0725	5.1	1.6
FR	1410	.9	.3	SA	1330	1.4	.4
VE	1950	6.2	1.9	SA	1925	5.8	1.8
5	0240	.0	.0	20	0210	.4	.1
	0830	5.7	1.7		0810	5.3	1.6
SA	1455	1.0	.3	SU	1415	1.3	.4
SA	2035	6.1	1.9	DI	2010	5.9	1.8
6	0325	.1	.0	21	0250	.3	.1
	0915	5.7	1.7		0855	5.5	1.7
SU	1545	1.2	.4	MO	1500	1.3	.4
DI	2125	6.0	1.8	LU	2055	5.9	1.8
7	0410	.3	.1	22	0335	.2	.1
	1005	5.7	1.7		0940	5.7	1.7
MO	1635	1.4	.4	TU	1550	1.3	.4
LU	2210	5.8	1.8	MA	2140	5.9	1.8
8	0455	.5	.2	23	0420	.2	.1
	1050	5.6	1.7		1025	5.8	1.8
TU	1725	1.6	.5	WE	1645	1.4	.4
MA	2255	5.5	1.7	ME	2230	5.8	1.8
9	0545	.8	.2	24	0515	.3	.1
	1130	5.5	1.7		1110	5.9	1.8
WE	1815	1.7	.5	TH	1750	1.5	.5
ME	2340	5.3	1.6	JE	2315	5.7	1.7
10	0630	1.1	.3	25	0610	.5	.2
	1215	5.4	1.6		1200	5.9	1.8
TH	1905	1.8	.5	FR	1855	1.4	.4
JE				VE			
11	0025	5.0	1.5	26	0010	5.4	1.6
	0710	1.3	.4		0705	.7	.2
FR	1300	5.2	1.6	SA	1250	5.8	1.8
VE	1955	1.8	.5	SA	1955	1.3	.4
12	0115	4.8	1.5	27	0105	5.2	1.6
	0750	1.6	.5		0805	.9	.3
SA	1345	5.1	1.6	SU	1345	5.7	1.7
SA	2040	1.7	.5	DI	2055	1.2	.4
13	0215	4.6	1.4	28	0210	4.9	1.5
	0835	1.8	.5		0900	1.1	.3
SU	1435	5.1	1.6	MO	1445	5.7	1.7
DI	2125	1.6	.5	LU	2155	1.0	.3
14	0315	4.5	1.4	29	0325	4.8	1.5
	0920	1.9	.6		1005	1.3	.4
MO	1530	5.1	1.6	TU	1550	5.7	1.7
LU	2215	1.5	.5	MA	2255	.8	.2
15	0415	4.5	1.4	30	0435	4.9	1.5
	1010	2.0	.6		1110	1.3	.4
TU	1625	5.2	1.6	WE	1655	5.7	1.7
MA	2305	1.3	.4	ME	2355	.5	.2

Canadian Nature Federation
22nd Conference July 22 • 23 • 24 • 25 1993

North Okanagan Naturalists' Club
Box 473, Vernon, B.C. V1T 6M4

"From desert sands to alpine slopes"

ADVANCE NOTICE!

"From Desert Sands to Alpine Slopes"

22nd CNF Annual Conference
Vernon, B.C. on July 22, 23, 24 and 25, 1993

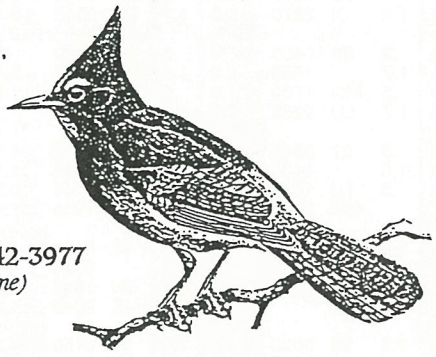
Hosted by the North Okanagan Naturalists' Club . . .
Celebrating their 42nd Anniversary.

Explore the famous OKANAGAN VALLEY, from the desert in the south to the alpine slopes in the north — join us at western Canada's well-known SILVER STAR MTN. RESORT, *a Canadian Classic!*

The CONFERENCE CALENDAR includes pre and post Conference field trips, as well as day trips, local birding and botany walks, symposiums, exhibits, a barbeque, a banquet, and children's activities — so bring the whole family.

Don't miss this chance to experience summer in the Okanagan Valley!

Registration Kits will be available January 15, 1993. For more information, write to the Secretary, North Okanagan Naturalists Club, P.O. Box 473, Vernon, B.C. V1T 6M4.



Information: (604) 542-3977
(evenings, Pacific time)

! NEXT DEADLINE !
5 May for June Issue
Contributions to the Editor, HFN
c/o NS Museum or phone 455-8160

HALIFAX FIELD NATURALISTS' NEWSLETTER

December 1992 to February 1993

No. 69

Figure 1

Field mouse literacy was important in Renaissance pest management. (Reproduced from ***Environmental Review****)*

Return address:
Halifax Field Naturalists
c/o Nova Scotia Museum
1747 Summer Street
Halifax, NS B3H 3A6

HALIFAX • FIELD • NATURALISTS

Objectives To encourage a greater appreciation and understanding of Nova Scotia's natural history, both within the membership of HFN and in the public at large. To represent the interests of naturalists by encouraging the conservation of Nova Scotia's natural resources.

Meetings On the first Thursday of every month at 8:00 pm in the auditorium of the Nova Scotia Museum, 1747 Summer Street, Halifax.

Field Trips Are held at least once a month, **and it is appreciated if those travelling in someone else's car share the cost of the gas.**

Membership Is open to anyone interested in the natural history of Nova Scotia. Memberships are available at any meeting of the society, or by writing to: Membership Chairman, Halifax Field Naturalists, c/o NS Museum. New memberships starting from September 1 will be valid until the end of the following membership year. The regular membership year is from January 1 to December 31. Members receive the HFN Newsletter and notices of all meetings, field trips, and special programmes. The fees are as follows:

Individual	$10.00 per year
Family	$15.00 per year
Supporting	$20.00 per year
FNSN (opt.)	$5.00 per year

Executive 1992

President	Colin Stewart	466-7168
Treasurer	Shirley van Nostrand	445-2776
Secretary	Steven Saunders	445-4943
Past President	Michael Downing	823-2081

Directors Lesley Butters, Tony Lock, Bob McDonald, Bernice Moores, Mary Primrose, Steven Saunders, Clarence Stevens II, Stephen Ward

Mailing Address

Halifax Field Naturalists
c/o Nova Scotia Museum
1747 Summer St., Halifax
Nova Scotia B3H 3A6

Committees

Newsletter		
Editor	Ursula Grigg	455-8160
Conservation Issues	Colin Stewart	466-7168
	Clarence Stevens II	835-0098
Publicity/Membership	Steven Saunders	1-624-9361

HFN is incorporated under the Nova Scotia Societies Act and is a member organization of the Canadian Nature Federation. It is registered for federal income tax purposes. Official receipts will be issued for individual and corporate gifts. The HFN Newsletter is printed with the assistance of the Nova Scotia Museum.

Illustrations **This Issue (No. 69):** p. 11 — tide table courtesy Dept. of Transport;; all other illustrations from copyright-free sources.

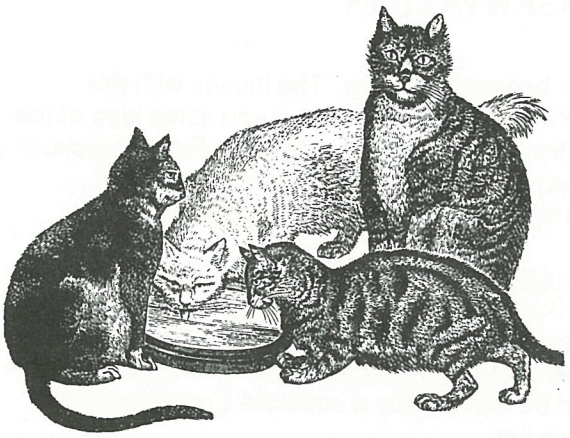
HFN NEWS AND ANNOUNCEMENTS

NOTICE OF MOTION FOR THE ANNUAL GENERAL MEETING, 1993

Proposed by Colin Stewart, seconded by Michael Downing:

"That the setting of membership rates be added to the duties and powers of the Board of Directors."

This motion was passed at a meeting of the Board of Directors in February 1992.



EDITORIAL

It's nearly New Year, and 1992 is going out on a good note. The club has many new members, and there is a great sense of enjoyment in meetings and out of doors.

This issue deals mostly with conservation, and our part in it. Some of our conservation efforts are beginning to show results; HFN President Colin Stewart reports on these on page 4.

We are looking forward to two great meetings. The Catherine Traill Club, which holds two workshops a year away from home, hopes to meet in Lunenburg in June 1993 and has asked us to take part. And there is our own invitation to the Canadian Nature Federation to hold the 1994 AGM here in Halifax. There will be more about the Cat Nats later; Bob McDonald's account of the CNF AGM in Quebec this past summer, and updated information on arrangements for 1994 are in this issue.

Doris Butters typed the text for this Newsletter before she left for Bermuda; thank you to Doris, and to contributors and the people who helped with distribution.

May everyone have a happy Christmas and a healthy, prosperous year in 1993.

Ursula Grigg

!TIME TO RENEW!

HFN memberships expire at the end of the year (except for new memberships dating from September 1st 1992) Please send renewals to the Treasurer, Shirley van Nostrand, at the Museum, or hand them to her at a meeting.

NEW AND RETURNING MEMBERS

Francis Barry
Harry Crosman
Michael Daigle
Don Dockrill
Dawna Gallagher
Marcia Hirtle
Garth and Kathy Horne
Helen Jones
Bonita Lee- Saxton
Barathi Sreenivasani
Sonia Tang

CONTENTS

SPECIAL REPORTS

OF CABBAGES AND KINGS: CONSERVATION

It's been a busy year. The inserts with this newsletter are intended to give you some idea of the many things we've been up to. The Fundy brochure is included on behalf of the Canadian Parks and Wilderness Society - it's not our project.

Endangered Species Pamphlet: We created this Nova Scotia list to help make people aware of what species are endangered HERE. We are also pointing out that such legislation as there is, is weak, and should be replaced by a separate Endangered Species Act.

We printed 25,000 English copies, and they have all been given out. Our thanks to Rhea Mahar and dozens of consultants for preparing it, and half a dozen sponsors for the funding (see the pamphlet for the list).

Conrads Beach: Have you been there lately? The old channel course is becoming vegetated, mostly beach pea nearest the water, but healthy Marram Grass towards the center. Losing the channel has really affected the marsh behind the dune. It's much fresher, and doesn't drain as low between tides. Indeed the extra flooding seems to be forming a new exit between the parking lot and the dune.

When I first went to Conrads, that ground level access through the main dune was a depression people partied in. Now there are three more large party holes along the dune to the right of it. An onshore hurricane (like the one in 1963 which formed the old channel) or a major storm could breach the dunes in four locations.

An early August work party filled the holes with a thick layer of smelly, rotting seaweed. This was used because unlike snow fence (which traps sand better) it's awkward to burn, and a pain to move out of the way. The result has been a few ugly fire remains down on the sandy beach, but a reduction in damage to the dunes.

The first intimation that the area is being protected as a significant natural site and a component of the provincial park system was signage directing horses to certain paths. Riders who have traditionally used the beach have a ministerial permit to continue, but are restricted to specific trails which incidentally, exclude the Piping Plover breeding areas.

The next indication was the posts defining the parking lot. Any of you who have been there since October will know that there is now a boardwalk from the parking lot to the beach. The height is intended to keep it safe from flooding and winter ice. As the snow plow uses the parking lot to turn in, there won't be a gate until spring; after that the parking lot will be closed at night on the same schedule as other provincial parks.

McNabs: You can't get there from here. At least not if your boat needs a large pier - as the McNabs Ferry does. In late November a large fence was erected at the end of Garrison Pier; anyone landing on the pier would have to jump into the water to get around it. Garrison Pier is owned by DND, which no longer has any active operations on the island. The negotiations for the province to take it over seem to have fallen apart, hence the fence. However, it is the pier that's closed, not the island - you are still welcome to land on the beach and explore.

You may have noted that we are among the intervenors on the Halifax Harbour Sewage Treatment Facility Environmental Impact Assessment. We believe the treatment plant should be built where it won't detract from a natural area, and we plan to show that there are alternatives which are better both economically and environmentally At writing, the Environmental Assessment Review Panel has ordered Halifax Harbour Cleanup to prepare additional documents including information on alternative sites before the hearings can proceed. Paul Calda (president of HHCI) has 'credited' the Metro Coalition for Harbour Cleanup (including HFN) with causing the extra work, expense and delay. The Review Panel received over 25 submissions, many as detailed as ours, and regardless, can only order HHCI to do work they were supposed to have done in the first place.

Point Pleasant Park: First, the city is taking applications for the Point Pleasant Park Commission (and other boards and commissions). Applications (available from the mayor or city clerk's offices) are due by the end of December.

We have, yet again, been protesting to members of the Point Pleasant Park Commission about the number of trees cut unnecessarily in the park. We'd welcome having a few more bodies keeping their eyes on the park, or joining our working group.

The Point Pleasant Park Commission has struck

a 'committee' to come up with a management plan proposal (or similar concept) for the park. We are supposed to be hearing from it, but it seems to be moribund. We have decided that instead of just criticizing the cutting in the park we'd better have ready a description of what we see for the future. The two page draft included in this mailing has been reviewed by the board, but before we actually adopt it as policy we are giving you, our members, a chance to comment on it. Please write your comments (put them in your membership renewal!) or phone me at 466 7168. Once final we'll send this off to the Commissioners and their committee members.

Piping Plover Guardian program: We are in the process of documenting this years program, (reports, reports, reports), and have just applied for another 2 years of funding for an expanding program.

First, this year's results. In PEI weather seems to have had a major effect on the bird's success. On 7 beaches 11 pairs produced 11 chicks (with no data for two other pairs). This is a success rate of 1.0, compared with 0.6 last year. This should correspond to a shift from a declining population to a stable to very slightly increasing one, on these beaches .

The Nova Scotia results are better. Weather also played a big role early on, so everything was late, but the birds did settle down and do their thing. On 10 beaches 21 pairs fledged 35 young. This is an improvement from 0.7 birds per pair (declining) last year to 1.67 birds (solidly increasing) this year. We believe the results are largely attributable to the efforts of the guardians, hence we're looking to do it again on 35 beaches in all four Atlantic provinces next year.

HFN provides most of the administration, and some of the guardians. Stephen Flemming is the scientific authority, and Island Nature Trust did a lot of the PEI end of it. In Nova Scotia we had particularly good support from the Department of Natural Resources, including Parks, Wildlife, Operation and Enforcement divisions. We'll give a more detailed thank you in the next issue. We will also be looking for a few extra volunteers who want to help but can't, or don't want to, do the beach end of it. There are tasks like coordinating the distribution of clothing, or setting up training sessions, that could use extra help.

Colin Stewart, President

THE 1994 CNF CONFERENCE COMMITTEE REPORT

As I hope most HFN members already know, our club has offered to host the 23rd Annual General Meeting and Conference of the Canadian Nature Federation (CNF). The invitation was made to the CNF Board at their March 27, 1992 meeting in Halifax, and was accepted soon after.

First, I should correct an error which I made in my commentary in the February Newsletter about past conferences. The only previous CNF Conference to have been held in Nova Scotia was hosted by the Nova Scotia Bird Society ,not the Blomidon Field Naturalists, at Acadia University in late August, 1973. This was the 2nd Annual CNF Conference and attracted over 300 delegates, clearly a smashing success. Can we be so successful?

The venue for the 1994 Conference will be St. Mary's University, and the dates, August 5-7, 1994. This overlaps with the Buskers' Festival and is the weekend before the Waterfowl Celebration in Sackville, N.B.

We held the first meeting of our organization committee on November 12 and the Conference Chair (Bob McDonald) talked about a proposed committee structure, the duties of some of the main sub-committees, and presented a possible conference overview (social events, programme, field trips). Some of the planning sub-committees still need members, so it is not too late to volunteer your services in helping to plan this important national conference.

Committees requiring additional workers include social/special events, displays, physical arrangements (meeting and residence rooms and meals at SMU.), programme, children's programme, publicity and field trips. To volunteer, or for further information on the 1994 Conference, please contact Bob McDonald, 443-5051 (h), in the evening.

Bob McDonald

SPECIAL ARTICLES

REPORT FROM THE 1992 CNF CONFERENCE

The 21st Annual General Meeting (AGM) and Conference of the Canadian Nature Federation (CNF) was held in Quebec City, 13-16 August, 1992. My family and I were among a dozen or so delegates from Nova Scotia, a healthy representation considering that conference registration was only 125 to 150.

We were welcomed to the conference at the traditional Thursday evening reception at the host site, the Loews Le Concorde Hotel. This event gives participants an opportunity to renew old friendships and make new ones. We were also able to get our first look at the extensive displays set up by federal and provincial departments involved with nature and the environment, various non-governmental environmental and natural history groups (both national and local) and corporate interests. The Alcan and Hydro-Quebec displays were both eye-catching; their participation at the conference was both surprising and controversial.

The indoor programme began on Friday morning and included four half-day sessions. Since most of the presentations were "en francais", the simultaneous translation provided was most useful and frequently entertaining for those of us who needed it. We learned about many of Quebec's natural areas and special places, from the Laurentian Highlands and the Gaspe, to the St. Lawrence Estuary, the Magdelan Islands and the Saguenay Marine Park. The problems associated with northern development including Hydro-Quebec's La Grande complex were also addressed.

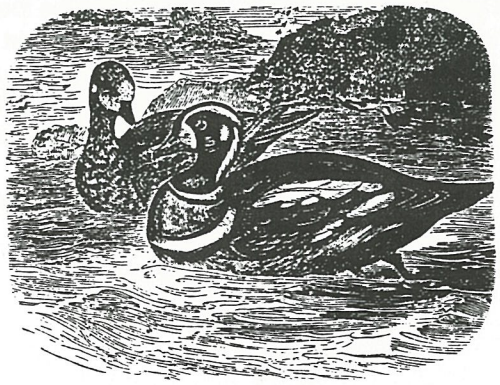
Several of the proposed field trips had to be cancelled because of the low numbers of registrants, which was in turn partly due to lack of advance publicity. One pre-conference trip which did go and in which I participated took us to Cap-Tourmente, a wildlife reserve famous as a migratory stop-over for hundreds and thousands of Greater Snow Geese and several species of ducks. We walked several km of trails birdwatching and botanizing and were able to get a good look at an active Peregrine Falcon nest (with two fledglings!). We also had a very entertaining and informative presentation on the human history of this area. Early morning field trips to the nearby Plains of Abraham, the "Dormaise de Maizerets" and Beauport Bay gave us an opportunity to view some common breeding species and a few migrating shorebirds. Shorebird migration is not as big an event in Quebec as it is in Nova Scotia. In all, my bird list totalled 60 species, not bad for mid-August.

Social events included a medoui (a French-Canadian style barbeque) held on Friday evening at a sugar shack just outside the city, and the Awards Banquet on Saturday evening, at which Diane Griffin of the Island Nature Trust received the Pimlott Award, an award given annually by the CNF to an individual for continuing and outstanding contributions to conservation matters.

Participants at the meeting also had their appetites whetted for the 1993 CNF Conference hosted by the North Okanagan Naturalists Club to be held at the Silver Star Mountain Resort near Vernon, B.C. For more information on dates and the conference address, please see the "Advance Notice" announcement elsewhere in this issue.

See you in Vernon!?

Bob McDonald



CATS AND CONSERVATION

In the course of some research on the habits of local predators, I have come across three opinions on household cats as players in the conservation game.

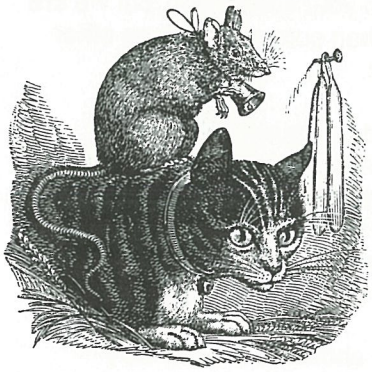
The first was reported as an opinion of Charles Darwin, author of "The Origin of Species."

He said that the abundance of clover as pasturage and hay in turn-of-the-century England was directly due to English spinsters, each of whom kept at least one cat. Country cats hunted field-mice, reducing the population considerably, and thus sparing the nests of colonial bumble bees which formed part of field-mouse diet.

This left plenty of bumble bees to fertilise the clover, which depended on seeding for its future crop, and which was fertilised principally by this species of bee.

Two other opinions of the role of cats are printed below. If Rusty knew of Mr. Darwin's observations, he would probably mention the war-like habits of *Homo sapiens* as the cause of the high population of spinsters in England at that time.

Ursula Grigg



DOMESTIC CATS; OUR IMPORTED WILDLIFE TERRORISTS

Our shop cat was just 'earning his keep' one afternoon many years ago. 'Dick' held a field mouse in his paws for a minute, then released it. Instantly the mouse scrambled off across the driveway for the grassy shelter of a nearby field. Dick tore off in hot pursuit. Returning triumphantly to the shop entrance, the cat repeated this routine several times.

I watched Dick's predatory fun with a growing sense of dismay. Finally, the field mouse refused to play the game. Standing on its hind legs and uttering a shrill scream, it attacked the cat. The fatal moment burned into my brain. I began to reconsider the nature of domestic cats, and their role as introduced wildlife predators.

House cats boated to North America with the same early European settlers who unintentionally brought the Norway rat and the house mouse. A Humane Society official recently suggested that approximately five million house cats live in Canada, about the same number as in Britain. The United States houses 56.2 million cats, with an extra 10 to 28 million homeless or feral cats. Each household cat consumes more beef per year than the average Central American person. For some, wildlife is just frosting on the predatory cake.

Over the years researchers have rarely studied wild food items eaten by domestic cats. Most food studies involve examining excrement or the stomach contents of dead animals. Excrement analysis is painstaking, unpleasant work that is difficult to quantify. Gut contents can only be extracted from dead animals. This might prove to be an unpopular method with pet owners.

Cats do have inclinations useful for research purposes. Well-fed and apparently happy cats like to kill wildlife. Feeding has no influence on their predatory instincts. Cat owners often find their tabby dragging the latest prize home. Studies in the United States and Britain capitalized on this trait to gain some insight about the victims. Owners or researchers dutifully collected wildlife remains from their cats for proper scientific identification.

Urban, suburban and rural cats may have differing wildlife species at their disposal. Some prey items may be favoured because they are more tasty, offer 'Garfield' more of a challenge, or are easily caught. Most cats are opportunists, jumping wildlife that is available or vulnerable. Shrews, for example, are not eaten because of poison glands, but are killed anyway. Others develop particular tastes, one cat preferred to hunt bats.

What do existing studies show? One well-fed cat in Michigan brought in 1660 mammals and birds in an 18-month period. Farmstead studies show that free-ranging cats always hunt, and commonly kill rodents, rabbits and birds up to the size of pheasants. In Britain, which has about the same cat population as Canada, a study multiplied the annual catch per cat in one village by population in the country and came up with an estimated 70 million wildlife deaths. An American study found that cats brought home only about half of their total catch. If this is the case,the

annual British (or Canadian?) kill could be estimated at about 140 million wild animals. Researchers in Britain found that between a third and a half of all sparrow deaths were attributable to cats. Depending on the cat's urban or rural situation, 30 to 50 percent of the total 140 million wild animal mortality involved birds. If the British findings are similar to what is occurring in Canada, our cats may kill 42-70 million wild birds each year. Projecting these figures from two other countries is admittedly arguable. But there may well be more hunting opportunity in Canada. Whatever the case, while we rightly fret about overwintering songbird habitat disappearing with the rain forests of South America, we turn a blind eye to what our cats do to the same birds while they are here during the vulnerable breeding season.

What about rodents? Field mice, the native species that Dick caaught, should be eaten by native predators such as red fox, coyote, bobcat, saw-whet owl, barred owl, northern harrier, and sharp-shinned hawk. A significant part of their food resources may be eliminated by competition from domestic cats. In the natural world, prey abundance determines predator numbers. Put another way, lynx populations drop shortly after rabbits become scarce, and increase again after the rabbits start to come back. If home-fed domestic cats substantially reduce the numbers of wild animals available to native predators, populations of foxes, hawks, owls and other species will decline.

As a cat owner many times over in the past, I realise that some owners may be shocked and offended by these suggestions. Responsible owners restrain their pets from free-ranging in the wild. Raised in houses, and prevented from roaming outdoors, many cats live contented indoor lives without becoming wildlife killers. In rural areas, and in some towns and cities, domestic cats serve a useful role in keeping down imported mice and rat populations. In my community, a new batch of young barn cats is banished into the fields and woods each autumn by poorly fed older cats with an urge for survival that forces them to retain the barn "resources" for themselves. I meet these young cats stalking up the driveway, intent upon my neighbours, the chipmunks and chickadees.

Even in towns, cat life may not be as idyllic as we think. When a friend lost her cat in a South Shore community, she enlisted the local dog catcher's assistance. That night he took her to a local goldfish pond. A flashlight revealed about 150 pairs of eyes around the edge - cats fishing for a meal. Were they hungry and homeless, or angling for fun?

What can be done? Once allowed to roam, cats do not like to be confined indoors. Usually, happy house cats are ones that have never experienced what they are missing. Both sexes should be neutered, whether they are in a barn or a condominium. Bells and claw removal may save some wild animals and furniture, but will not diminish a cat's predatory inclinations. Leashes are resented, but might be a compromise. Dogs in my old neighbourhood used to "control" cat populations. Cat lovers were morally outraged. Now cats are being "harvested" by coyotes. Is this nature's justice? It sounds fair to me. If you care for wildlife and love your pet, keep it home.

From an article by Bob Bancroft, in Conservation: Winter 1990

THERE WAS A REPLY:

TO THE EDITOR:

I have just read your article titled Domestic Cats - Our Imported Wildlife Terrorists.

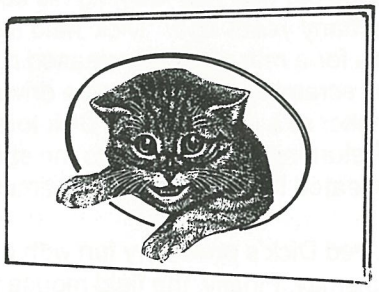
Being a cat I have taken strong exception to the suggestion that we should be, for all intents, locked up.

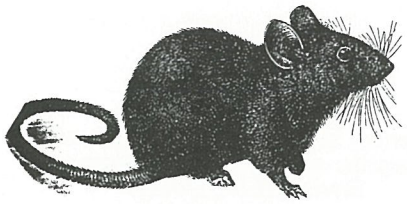
I shamefully admit to your accusation, but we are a very minor predator when compared to one other very dangerous creature.

Who has devastated the rainforests, waged horrendous wars with his fellow creatures, polluted the earth, air and oceans and is responsible for the disappearance of many species of wildlife and fauna? Where does the finger point? *Homo sapiens*. (*Homo* I can take, *sapiens* is a blatant misnomer.)

Your last paragraph should make you very uneasy.

True friend, Rusty the Cat, Baddeck, N.S.





THE HISTORY OF PESTICIDES

Since the beginning of recorded history, pest control has used (in roughly chronological order) superstition and social practices, plant extracts with pesticidal action, inorganic chemical preparations, and products from the synthetic organic laboratories of the chemical industry. The history of pest management stretches over several millenia; a few highlights are described here.

A method first mentioned in the GEOPONIKA (a 6-7th century collection of agricultural practices from Greek and Roman times) was used until the late 19th century for getting rid of field mice. The farmer was to write on a piece of paper: "I adjure the mice taken in this place, that you do me no injury yourself, nor suffer another to do it; for I give you the ground [the field or area]; but if I again take you on this spot I take the Mother of Gods to witness I will divide you into seven parts,"

The paper was to be taken to the infested field before dawn and placed under a stone with the writing visible (see figure on page1)

No mention is made of the degree of mouse literacy required for pest management success.

The ferocious nature of an animal was sometimes used without the living animal actually having to be present. Pliny noted that mice could be kept from stored grain by sprinkling it with the ashes of a cat or weasel, or with the water in which one of these had been boiled. He warned, however, that the odour of this preparation might taint bread made from the grain.

The use of salt as a soil sterilant dates from biblical times. "And Abimelech fought against the city all that day; and he took the city, and slew the people that was therein and beat down the city, and sowed it with salt". (Judges 9:42).

Xenophon (4th Century BC) and the Romans (146 BC) used salt on the fields of vanquished enemies, believing that crops could never again be grown there. The 9th century Arabic writer, Ibn Qutayba, noted that equal parts of salt and duck excrement would kill vegetable crops. . In the 17th century, several authors observed that salt had herbicidal effects but in some instances, it would also strengthen grains and pulses. The concept of the application rate (dose) determining the overall benefit or damage was noted in Scottish writing from the 18th century. During this period salt was used as an insecticide in preparations of botanical extracts combined with brine. Similarly, combinations of salt with both inorganic and biologically-derived material were employed to control fungi on seed grain

FATE AND TYPE OF PESTICIDE

Table 2 shows the general trend from inorganic and botanical pesticides to botanical and organic chemical ones.

The fate of pesticides is determined to a great extent by their physical and chemical properties. In general, the oxidation state of the inorganic pesticides listed can change, but they cannot degrade. Botanical and synthetic organic pesticides usually degrade, the rate of degradation determining whether the pesticide will persist.

If a pesticide persists long enough, it can migrate to other parts of the environment. Vapourisation of a pesticide allows it to be moved as drift to contaminate nearby land or distant ecosystems. Runoff and movement within the soil can transport residues to ground and surface waters. Thus, longer-lived pesticides may affect forms of life and ecosystems never considered when the pesticide was originally registered. Shorter-lived pesticides can undergo chemical, photolytic, and/or metabolic degradation before translocation becomes a problem; however, vapourisation and runoff may occur shortly after the pesticide has been applied.

Table 3 lists a diverse selection of pesticides and their environmental fate

CONCLUSION

Pesticides have widely varying properties causing them to impact pests and other life-forms in many ways. Clearly only some pesticides accumulate in food chains, but these are of concern to organisms at the top of the food chain, and in the Arctic. Many pesticides now available do not accumulate, but are excreted quickly, or are degraded after use rapidly enough to be of little environmental concern.

A combination of the ingenuity of the chemist in conjunction with that of the entomologist, the weed scientist, the soil scientist, the plant or animal pathologist, and the ecologist is enabling the development of integrated pest management systems

which are increasingly environmentally friendly. In agriculture, which necessarily involves the manipulation of the natural environment to yield a sustained food supply, the enlightened use of the best pesticides available will cause few serious direct environmental impacts.

Adapted from "PESTICIDES; ORIGINS AND CHALLENGES' by G.R.Barrie Webster, for The Canadian Chemical News,August 1991. Appeared in Catherine Traill Naturalists' Club Newsletter, May 1992.

Table 2
Pesticide Development and Type

Date	Pesticide Development	Type
1200 BC	use of **salt**[a]	I[b]
100	Romans use **hellebore** against rodents and insects	B
25	seed treatment with **nitre** and **amurca**	I/B
900 AD	**arsenic**[a] used by Chinese against garden insects	I
1649	**rotenone** used to paralyse fish in South America	B
1690	**tobacco extracts** as contact insecticide	B
1787	**insecticidal soap**	A
1800	**pyrethrum** used against lice	B
	whale oil used against scale	A
	lime and sulphur for insects	I
1867	**Paris green** (As_2O_3 + $Cu(OAc)_2$)	I
1883	**Bordeaux mixture** ($Ca(OH)_2$ + $CuSO_4$)	I
1892	K salt of 2,4-dinitro-*o*-cresol (**DNOC**) as insecticide	O
1931	**thiram**[a] fungicide	O
1936	**pentachlorophenol**[a] wood preservative	O
1938	**TEPP** insecticide discovered	O
	Bacillus thuringiensis insecticide	M
1939	**DDT**[a] discovered to be insecticide	O
1942	**2,4-D**[a] herbicide	O
1950	**malathion**[a] insecticide	O
1956	**carbaryl**[a] insecticide	O
1960	**trifluralin**[a] herbicide	O
1975	**methoprene**[a] insect growth regulator	O
1982	**abamectin**[a] anthelmintic insecticide and fungicide	M

[a] *These pesticides commented on in Table 3.*
[b] *I = inorganic, B = botanical, A = animal derived, O = organic, M = microbiologically synthesized product*

Table 3
A Historical Selection of Pesticides with Comments on Their Persistence and Environmental Fate

Pesticide	Environmental Fate	Rating[a]
NaCl	elements remain in system	R
As and Cu	elements remain in system	R
thiram	hydrolysis to CS_2 and diethylamine	D
pentachlorophenol	photochemical degradation	W/C
DDT	dehydrohalogenation	R
	reductive dehalogenation	R
2,4-D	microbial metabolism, hydroxylation	D/W
malathion	oxidation, hydrolysis	D
carbaryl	hydrolysis, hydroxylation	D
trifluralin	oxidative *N*-dealkylation, reduction	D/R
methoprene	oxidation, metabolic processes	D
abamectin	hydrolysis, oxidation	R/D

[a] *R = residue remains for years; D = degrades to innocuous products within days to weeks; W = residues remain in contaminated water for years; C = persistent contaminants (dioxins).*

ALMANAC:

Most of the information for this space is not available. We will find another source for astronomical data.

Information for the 1993 Annual Meeting of CNF will be available in January (see back page); and for the Catherine Traill Naturalists' workshop, probably in the next newsletter.

Almanac is for dates of events which are not found in our programme; for field trips which members might like to attend, or natural happenings such as eclipses, comets, expected migration dates, blooming dates and so forth. Please suggest some suitable items.

HALIFAX AST Z+4

TIDE TABLES

1993

JANUARY–JANVIER

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0110	5.4	1.6	16	0155	5.8	1.8
	0800	2.0	.6		0915	1.4	.4
FR	1340	4.7	1.4	SA	1430	5.0	1.5
VE	1955	2.1	.6	SA	2125	1.6	.5
2	0200	5.3	1.6	17	0300	5.6	1.7
	0855	1.9	.6		1015	1.3	.4
SA	1440	4.6	1.4	SU	1550	4.9	1.5
SA	2045	2.2	.7	DI	2230	1.8	.5
3	0255	5.3	1.6	18	0410	5.6	1.7
	0950	1.8	.5		1115	1.1	.3
SU	1545	4.6	1.4	MO	1705	5.0	1.5
DI	2145	2.2	.7	LU	2330	1.8	.5
4	0355	5.4	1.6	19	0515	5.7	1.7
	1045	1.6	.5		1210	.9	.3
MO	1645	4.7	1.4	TU	1800	5.2	1.6
LU	2245	2.1	.6	MA			
5	0455	5.6	1.7	20	0025	1.7	.5
	1145	1.3	.4		0605	5.8	1.8
TU	1740	5.0	1.5	WE	1300	.8	.2
MA	2345	1.9	.6	ME	1850	5.4	1.6
6	0545	5.9	1.8	21	0110	1.6	.5
	1235	.9	.3		0655	6.0	1.8
WE	1830	5.3	1.6	TH	1340	.7	.2
ME				JE	1935	5.6	1.7
7	0040	1.7	.5	22	0155	1.5	.5
	0635	6.2	1.9		0740	6.1	1.9
TH	1320	.6	.2	FR	1420	.7	.2
JE	1920	5.7	1.7	VE	2015	5.7	1.7
8	0130	1.4	.4	23	0230	1.5	.5
	0725	6.5	2.0		0820	6.1	1.9
FR	1410	.3	.1	SA	1455	.7	.2
VE	2010	6.0	1.8	SA	2050	5.8	1.8
9	0220	1.3	.4	24	0300	1.5	.5
	0810	6.6	2.0		0900	6.1	1.9
SA	1455	.1	.0	SU	1525	.9	.3
SA	2055	6.3	1.9	DI	2130	5.9	1.8
10	0310	1.3	.4	25	0335	1.6	.5
	0900	6.7	2.0		0940	6.0	1.8
SU	1540	.1	.0	MO	1555	1.1	.3
DI	2145	6.4	2.0	LU	2205	5.9	1.8
11	0405	1.3	.4	26	0405	1.6	.5
	0950	6.6	2.0		1015	5.8	1.8
MO	1630	.2	.1	TU	1625	1.3	.4
LU	2230	6.5	2.0	MA	2235	5.8	1.8
12	0505	1.4	.4	27	0440	1.7	.5
	1040	6.4	2.0		1050	5.6	1.7
TU	1725	.4	.1	WE	1655	1.5	.5
MA	2320	6.5	2.0	ME	2310	5.7	1.7
13	0610	1.4	.4	28	0525	1.8	.5
	1130	6.0	1.8		1130	5.3	1.6
WE	1825	.7	.2	TH	1735	1.7	.5
ME				JE	2345	5.6	1.7
14	0005	6.3	1.9	29	0615	1.8	.5
	0710	1.4	.4		1205	5.0	1.5
TH	1220	5.7	1.7	FR	1815	1.9	.6
JE	1920	1.1	.3	VE			
15	0100	6.1	1.9	30	0020	5.4	1.6
	0810	1.4	.4		0705	1.9	.6
FR	1320	5.3	1.6	SA	1250	4.8	1.5
VE	2020	1.4	.4	SA	1905	2.1	.6
				31	0105	5.3	1.6
					0805	1.9	.6
				SU	1340	4.6	1.4
				DI	2005	2.2	.7

FEBRUARY–FEVRIER

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0200	5.2	1.6	16	0345	5.2	1.6
	0910	1.8	.5		1050	1.3	.4
MO	1445	4.5	1.4	TU	1645	4.8	1.5
LU	2110	2.2	.7	MA	2310	1.9	.6
2	0305	5.2	1.6	17	0455	5.3	1.6
	1010	1.6	.5		1145	1.1	.3
TU	1600	4.6	1.4	WE	1750	5.0	1.5
MA	2215	2.1	.6	ME			
3	0415	5.5	1.7	18	0005	1.8	.5
	1115	1.3	.4		0555	5.5	1.7
WE	1710	4.9	1.5	TH	1235	1.0	.3
ME	2320	1.9	.6	JE	1835	5.3	1.6
4	0520	5.8	1.8	19	0050	1.6	.5
	1210	.9	.3		0640	5.7	1.7
TH	1810	5.3	1.6	FR	1320	.9	.3
JE				VE	1915	5.5	1.7
5	0020	1.6	.5	20	0130	1.5	.5
	0615	6.2	1.9		0720	5.9	1.8
FR	1300	.5	.2	SA	1355	.9	.3
VE	1900	5.8	1.8	SA	1950	5.7	1.7
6	0110	1.3	.4	21	0205	1.4	.4
	0705	6.5	2.0		0800	6.0	1.8
SA	1345	.1	.0	SU	1425	.9	.3
SA	1950	6.2	1.9	DI	2025	5.9	1.8
7	0205	1.0	.3	22	0235	1.3	.4
	0755	6.7	2.0		0840	6.0	1.8
SU	1435	–0.1	.0	MO	1455	1.0	.3
DI	2035	6.6	2.0	LU	2055	5.9	1.8
8	0255	.9	.3	23	0305	1.2	.4
	0845	6.8	2.1		0915	5.9	1.8
MO	1520	–0.1	.0	TU	1520	1.2	.4
LU	2125	6.8	2.1	MA	2130	5.9	1.8
9	0350	.8	.2	24	0335	1.2	.4
	0935	6.7	2.0		0950	5.7	1.7
TU	1610	.1	.0	WE	1550	1.3	.4
MA	2210	6.8	2.1	ME	2200	5.8	1.8
10	0445	.9	.3	25	0410	1.3	.4
	1025	6.4	2.0		1025	5.5	1.7
WE	1705	.4	.1	TH	1620	1.5	.5
ME	2255	6.6	2.0	JE	2235	5.7	1.7
11	0545	.9	.3	26	0445	1.4	.4
	1115	6.1	1.9		1055	5.3	1.6
TH	1800	.8	.2	FR	1655	1.7	.5
JE	2340	6.3	1.9	VE	2305	5.5	1.7
12	0645	1.1	.3	27	0530	1.5	.5
	1205	5.7	1.7		1130	5.1	1.6
FR	1900	1.2	.4	SA	1735	1.9	.6
VE				SA	2340	5.4	1.6
13	0030	5.9	1.8	28	0625	1.6	.5
	0745	1.2	.4		1210	4.9	1.5
SA	1300	5.2	1.6	SU	1830	2.1	.6
SA	2005	1.5	.5	DI			
14	0125	5.6	1.7				
	0850	1.3	.4				
SU	1405	4.9	1.5				
DI	2110	1.8	.5				
15	0230	5.3	1.6				
	0950	1.3	.4				
MO	1525	4.7	1.4				
LU	2210	1.9	.6				

MARCH–MARS

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0025	5.3	1.6	16	0200	5.0	1.5
	0730	1.7	.5		0920	1.3	.4
MO	1300	4.7	1.4	TU	1455	4.7	1.4
LU	1935	2.2	.7	MA	2150	2.0	.6
2	0115	5.2	1.6	17	0315	4.9	1.5
	0835	1.7	.5		1020	1.4	.4
TU	1405	4.6	1.4	WE	1620	4.8	1.5
MA	2045	2.2	.7	ME	2250	1.9	.6
3	0220	5.1	1.6	18	0430	5.0	1.5
	0940	1.5	.5		1115	1.3	.4
WE	1525	4.7	1.4	TH	1720	5.0	1.5
ME	2155	2.1	.6	JE	2340	1.8	.5
4	0340	5.3	1.6	19	0530	5.2	1.6
	1040	1.2	.4		1200	1.3	.4
TH	1645	5.0	1.5	FR	1805	5.3	1.6
JE	2300	1.8	.5	VE			
5	0455	5.6	1.7	20	0025	1.6	.5
	1140	.8	.2		0615	5.4	1.6
FR	1745	5.5	1.7	SA	1245	1.2	.4
VE				SA	1840	5.5	1.7
6	0000	1.5	.5	21	0105	1.4	.4
	0555	6.0	1.8		0700	5.6	1.7
SA	1235	.4	.1	SU	1320	1.2	.4
SA	1840	6.0	1.8	DI	1915	5.7	1.7
7	0055	1.1	.3	22	0140	1.2	.4
	0650	6.4	2.0		0735	5.7	1.7
SU	1325	.1	.0	MO	1350	1.2	.4
DI	1925	6.5	2.0	LU	1950	5.9	1.8
8	0150	.7	.2	23	0210	1.0	.3
	0740	6.6	2.0		0815	5.7	1.7
MO	1415	.0	.0	TU	1420	1.2	.4
LU	2010	6.8	2.1	MA	2020	5.9	1.8
9	0240	.4	.1	24	0240	.9	.3
	0830	6.7	2.0		0850	5.6	1.7
TU	1500	.0	.0	WE	1450	1.3	.4
MA	2100	6.9	2.1	ME	2055	5.9	1.8
10	0330	.3	.1	25	0310	.9	.3
	0920	6.6	2.0		0925	5.5	1.7
WE	1550	.2	.1	TH	1520	1.4	.4
ME	2145	6.8	2.1	JE	2125	5.8	1.8
11	0425	.4	.1	26	0345	.9	.3
	1005	6.3	1.9		0955	5.4	1.6
TH	1645	.6	.2	FR	1550	1.5	.5
JE	2230	6.6	2.0	VE	2200	5.7	1.7
12	0520	.5	.2	27	0425	1.0	.3
	1055	6.0	1.8		1030	5.3	1.6
FR	1740	1.0	.3	SA	1630	1.7	.5
VE	2315	6.2	1.9	SA	2235	5.5	1.7
13	0620	.8	.2	28	0505	1.2	.4
	1145	5.6	1.7		1110	5.1	1.6
SA	1845	1.4	.4	SU	1710	1.9	.6
SA				DI	2310	5.4	1.6
14	0000	5.7	1.7	29	0600	1.3	.4
	0720	1.0	.3		1150	5.0	1.5
SU	1240	5.2	1.6	MO	1810	2.1	.6
DI	1945	1.7	.5	LU	2355	5.3	1.6
15	0055	5.3	1.6	30	0705	1.4	.4
	0820	1.2	.4		1240	4.9	1.5
MO	1340	4.9	1.5	TU	1920	2.2	.7
LU	2050	1.9	.6	MA			
				31	0045	5.2	1.6
					0810	1.4	.4
				WE	1340	4.8	1.5
				ME	2035	2.2	.7

NATURE NOTES

Everyone reports that this year's cranberry crop was excellent.

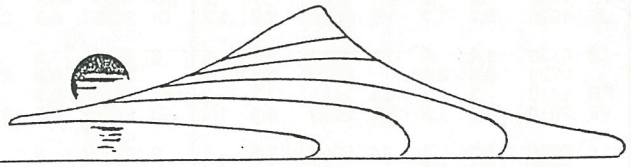
Regina Maass reports that phytoplankton in the North West Arm is prolific.

It's also been a good fall for unusual birds:
Bill Freedman saw a yellow-billed Cuckoo.
Clarence Stevens has seen or heard of:
Northern Oriole, Indigo Bunting, Fox, Clay-coloured, and Vesper Sparrows, Dickcissels and Rufus-sided Towhee.

Definitely a time to watch the bird feeders!

Canadian Nature Federation

22nd Conference July 22 • 23 • 24 • 25 1993



North Okanagan Naturalists' Club

Box 473, Vernon, B.C. V1T 6M4

"From desert sands to alpine slopes"

Registration Kits will be available January 15, 1993. For more information, write to the Secretary, North Okanagan Naturalists Club, P.O. Box 473, Vernon, B.C. V1T 6M4.

! NEXT DEADLINE !
5 February for March Issue
Contributions to the Editor, HFN
c/o NS Museum or phone 455-8160