AGM-HFN-March

HALIFAX FIELD NATURALISTS' NEWSLETTER

December '91 to February '92 No. 65

Flowers & nuts

GHOST GUM, Eucalyptus papuana

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 1991

President	Colin Stewart	466-7168
Treasurer	Shirley VanNostrand	445-2776
Secretary	Doug Linzey	445-4943
Past President	Michael Downing	823-2081

Directors Richard Ballard, Kent Hodges, Bob McDonald, Bernice Moores, Mary Primrose, Steven Saunders, Clarence Stevens II, Stephen Ward

Mailing Address

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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. 65** p. 11 — tide table courtesy Dept. of Transport; all other illustrations from copyright-free sources.

HFN NEWS AND ANNOUNCEMENTS

NOTICE OF AGM AND MOTION

Our Annual General Meeting will be held as part of our regular monthly meeting on March 5, 1992, at 8 pm in the Nova Scotia Museum Auditorium.

We have a motion for a bylaw change: Colin Stewart moves and Michael Downing seconds "that the setting of membership rates be added to the list of duties and powers of the board of directors."

EDITORIAL

This newsletter departs from previous ones by printing accounts of two field trips taken outside Canada. Shirley van Nostrand went dancing through Scotland, which is rather similar to Nova Scotia (especially in having many plants of the heather family); Ruth Miller and Bernice Moores went to Australia and were astonished by the eucalypts.

Regina Maass has kindly offered to coordinate the tea tray at meetings; she would appreciate help with tidying up afterwards.

Thanks to everyone who has helped with the newsletter, and especially to PCPC, who let us set it on the demponstration Macintosh in their St. Mary's University office.

And a Happy Christmas and prosperous New Year to everyone!

Ursula Grigg

PIPING PLOVER T-SHIRTS

The sale of Piping Plover t-shirts this summer produced $4,986 for the Piping Plover protection fund. Thanks to the Nova Scotia Department of the Environment and the Liquor Commission

Colin Stewart

FEDERATION OF NOVA SCOTIA NATURALISTS

The Federation is planning to hold the next Annual General Meeting in Annapolis Royal on May 22-24th 1992. Watch for announcements on the program - it will include some worthwhile field trips.

Mary Primrose.

! TIME TO RENEW !

HFN memberships expire at the end of the year (except for new memberships dating from September 1st 1991). Please send renewals to the Treasurer, Shirley van Nostrand, at the Museum, or hand them to her at a meeting.

NEW AND RETURNING MEMBERS

Brian Bartlett
Michael Gillis & Sandra Wagner
Andrew and Angela Hill
Robert & Carolyn Lake
Eric & Colleen McKee
Rick Peckham
Rodney Vaughan

CONTENTS

SPECIAL REPORTS

SURVEYS, NEWSLETTERS, AND DUES

Your board has spent most of its term working on getting the focus and strength of HFN back to natural history. This isn't a repudiation of other issues we've tackled, but a recognition that our main business has slipped a bit. In the center you'll find a survey that is intended to take us to the next step. We'd appreciate it if you could fill it out. We'd especially appreciate lots of comments.

I've dug out some of my 1988 newsletters. They have a 57 cent stamp, the printing was compliments of the Nova Scotia Museum, though we did contribute paper (10 cents) and the programs cost maybe 3 cents each. The total to produce a year's worth of newsletters for one subscriber- $2.80.

In the past year the press the museum used has died and we've been offered an alternative, through the Queens Printer, that's less recycled, not recyclable, and a different format. Cost would be 42 cents, the program about 5 cents and stamps 63 cents, with tax on everything (12.7 cents) for $1.23 per issue or $4.91 a year. Alternatively, keeping our format and recycling level costs 83 cents (the program and stamp cost the same but there's tax on that extra) for $6.84. (Because we fold twice we don't need glue or staples. It doesn't fall apart in the mail and you can recycle it - or better yet - give it to a friend.) There's space for you to comment on the newsletter format in the survey.

That's an unexpected144% increase for the Newsletter in 3 years. Membership dollars, which pay for the Newsletter and also tea, complimentary mailings, membership in groups like the Federation of Nova Scotia Naturalists and the Canadian Nature Federation, and miscellaneous administration matters (like bank charges), no longer cover expenses.

Our Annual General Meeting will be held as part of our regular monthly meeting on March 5, 1992, and we have a motion for a bylaw change. Michael Downing and I move that "the setting of membership rates be added to the list of duties and powers of the board of directors ." At present, if we need to change the rates we do it by a vote of the membership at the AGM. In March of '91 we were unable to predict some of the increase in printing costs, so by March of '92 we'll have paid extra for 6 issues, at quite a cost to our savings. If the proposed motion were in effect now we'd have announced a fee increase in 1992 to cover costs, and we'd have only dipped into savings for the last two issues of this year. Our membership rates increased from $5 to $7 in 1983 (stamps were 15 cents) and to $10 in 1989.

We're not the only ones feeling the pinch. World Wildlife Fund, Canada, and the Canadian Parks and Wilderness Society aren't shy about admitting they're feeling the drop in donations. The Canadian Nature Federation is a bit more reticent, but I'm sure the difference is only in degree. Lastly, to mention all the national groups we support, I don't know whether the Nature Conservancy of Canada is suffering administratively, but with land properties down, and a few people willing to sell that otherwise won't, I'm sure their acquisition side could use cash.

(Remember that HFN is also a charity - we can issue tax credits too.)

Colin Stewart, President

Colin Stewart

CNF ANNUAL MEETING IN HALIFAX IN '94?

At their last two meetings, HFN Directors discussed the possibility of inviting The Canadian Nature Federation to hold its 1994 Annual Meeting and Conference in Halifax. HFN, a CNF affiliate, would probably be the major conference sponsor. Incidentally, the '91 meeting was held in Red Deer, Alberta, the '92 meeting will be in Quebec City, and the '93 somewhere in B.C.

The CNF Conference has been held in Nova Scotia before; the Blomidon Field Naturalists sponsored it in '74, at Acadia University, Wolfville. Other Atlantic venues since then have been Charlottetown (twice), Sackville, N.B., and St. John's. So we think it is past time for the conference to come back to Nova Scotia, the logical location is Halifax, and the CNF national office would welcome an invitation from us.

This message is appearing now because planning must begin at once and we shall need lots of help from our members.

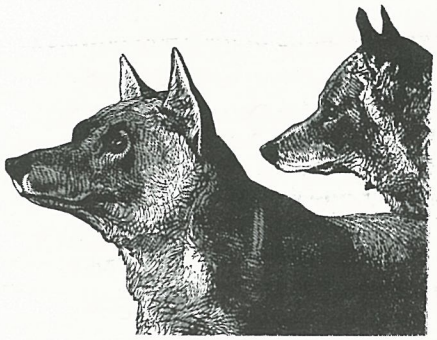
To begin with, we need a conference theme. Some suggestions already offered include: Special Places in Nova Scotia; our marine resources, including islands; the Acadian forests; seashores. But we need more ideas from you.

We need to choose the time of year; traditionally, the conference has been held during the May - August period, because it's the field season, and economical accommodation is available on University campuses. Either Dalhousie or St. Mary's could accommodate a meeting of this size (about 400 delegates), but both are filling their conference calendars for 1994 already, so we need to set dates.

We also need some suggestions, or offers for speakers (in keeping with our theme) and pre- and post-conference field trips, both local and province-wide.

So you can see that we need your help to make this conference a success. Please let us have your ideas and suggestions; send them to Bernice Moores or Bob McDonald, c/o Halifax Field Naturalists, at the Nova Scotia Museum, (address on page 2) or phone Bob at 443-5051 (evenings). We would also like an indication of your willingness to help in planning and/ or running the conference.

Bob McDonald



SPECIAL ARTICLES

DECLINES IN CANADIAN AMPHIBIAN POPULATIONS: REPORT FROM A WORKSHOP TO DESIGN A NATIONAL MONITORING STRATEGY

On October 5 and 6 I attended a workshop in Burlington, Ontario, to discuss and develop a national monitoring strategy to address declines in Canadian amphibian populations. The event was jointly sponsored by the Canadian Wildlife Service and the Metropolitan Toronto Zoo, and was attended by approximately 60 people. All provinces except Newfoundland, P.E.I. and Saskatchewan were represented. Participants came from museums, universities, federal and provincial government agencies and the private sector. Despite their diverse backgrounds, all shared a common concern for the wellbeing of our native amphibians.

Saturday was devoted to formal but brief paper presentations on a variety of topics. Jim Vial, coordinator of the International Union for the Conservation of Nature (IUCN) Task Force on Global Amphibian Declines, described the IUCN programme to document the apparent decline worldwide in many amphibian species.

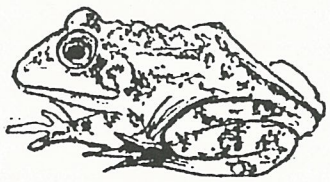
Regional status reports from coast to coast were presented. In B.C. there has been a disturbing decline in Spotted Frogs, Spadefoot Toads, Leopard Frogs, Pacific Giant Salamanders and Tailed Frogs. Spotted Frogs, Spadefoot Toads, and Leopard Frogs have also apparently declined in Alberta. There is also evidence of decline for the latter two species in Saskatchewan. Manitoba experienced a tremendous die-off of Leopard Frogs in the mid-70s and numbers have never fully recovered. In Ontario local reductions in Fowler's Toad and Blanchard's Cricket Frog (this species had a very restricted range to begin with), as well as a possible wide-spread decline in Bullfrogs, were reported. In Quebec, Striped Chorus Frogs and Pickerel Frogs seem to be declining, while Leopard Frogs appear to be holding their own. No evidence of declines in any species

were reported from the Maritimes.

While some declines are without apparent cause, others can be easily explained. The most obvious cause is degradation or wholesale destruction of habitat. Drainage or modification of wetlands, contamination of aquatic habitats from air- or water-borne pollutants, introduction of exotic predators for sportfisherpersons, and disturbance by all-terrain-vehicles have all contributed. Diseases have been implicated in some of the more mysterious declines, like those of the Leopard Frog.

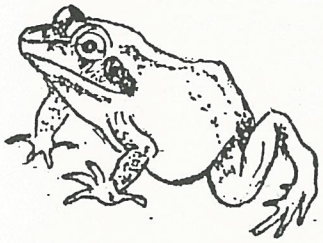
Perhaps most disturbing is our almost total ignorance of the population dynamics of any of our native amphibian species. This quickly became clear during the workshop. If Canadian amphibians, like some species elsewhere in the world, are declining, how would we know? How could we distinguish a sustained decline from normal population fluctuations? Of all our vertebrate groups, we have the least population information on amphibians.

In light of this, we spent the remainder of the workshop discussing ways to quantify amphibian populations across the country, and approaches for establishing a national monitoring network. This network would include extensive and intensive monitoring, as well as an analysis of the historical data base for our amphibians, lifestyles and distributions. They include: Bullfrog, Mink Frog, Green Frog, Wood Frog, Gray Treefrog, Tailed Frog, Redback Salamanders (Eastern and Western), Newts (Eastern and Roughskin), and Mudpuppy. In addition, a number of protected sites suitable for such intensive monitoring were suggested. In the Maritimes, Kejimkujik National Park was identified as a candidate site.



Bullfrog

Extensive monitoring would involve broad-scale (many species and habitats) and largely non-invasive sampling of abundance by natural resource agencies and volunteer groups. This might include surveys of singing males (in some frogs), permanent roadside transects, egg mass and larval counts in selected ponds, Mudpuppy bycatches, etc. It could also involve establishment of herpto-faunal atlas projects (like the Maritime Breeding Bird Atlas) across the country. Such a project has been underway in Ontario since the mid-1980s, and has been tremendously successful.

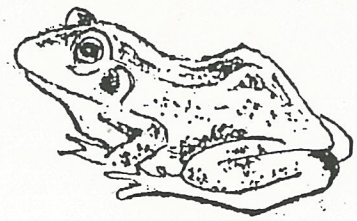


Wood Frog

Common Tree Frog

By the end of our workshop, much remained unresolved. The thorny problem of funding came up more than once in our discussions. However, in two short days we accomplished a lot. We established a Canadian Task Force on Amphibians, developed an information network for amphibian enthusiasts, identified the major gaps in knowledge, and designed a workable scheme for filling those gaps. We plan to meet again next year in Montreal to report progress and maintain the momentum. Proceedings of the workshop should be out before Christmas. If you are interested in a copy, let me know.

Tom Herman, in the Blomidon Naturalists' Society Newsletter.



Green Frog

WETLANDS DON'T MUCH INFLUENCE THE GREENHOUSE EFFECT

Humans may be more responsible for global warming trends than was formerly believed, an international study has concluded.

The study, involving dozens of researchers from Canada and the United States, measured how much methane and carbon dioxide are released and absorbed by northern wetlands. It found the wetland vegetation is neither as big a source of 'greenhouse gases', nor as big a sink (removal mechanism for them) as scientists originally thought.

Greenhouse gases keep the earth warm by trapping heat radiation in the atmosphere. Scientists are trying to trace their source, because concentrations have risen steadily for more than 100 years. If trends continue, average global temperatures could be substantially higher within half a century.

In the northern wetlands study, scientists from 10 Canadian universities, several government departments, NASA and other U.S. institutes converged on the Hudson Bay Lowland, a huge area encompassing most of northern Manitoba and Ontario. as well as part of Quebec. Only one other wetland area, in western Siberia, is larger.

The investigation centred primarily on methane, a gas that's increasing in the atmosphere at a rate of one to two per cent a year. Before the study, scientists had estimated the annual contribution from wetlands vegetation at about 20 per cent of total global methane emissions. The idea was to verify this figure by monitoring wetlands methane production over a long period of time, using a variety of different techniques.

All the measurements were made during the summer of 1990. The researchers took readings from the ground, from a 20-metre tower and from aircraft. Depending on ground cover, daily methane production ranged from six to 35 illigrams per square metre. Over the whole region, that translates into between one and two billion kilograms per year - a tremendous amount, yet less than half of what the scientists had expected.

If this surprising finding also applies to Russia's wetlands, then other methane sources are more important than was thought, says Dr. George Thurtell, a professor in the department of land resource science at the University of Guelph. Besides wetlands, methane is produced by a number of sources related to human activities, including rice paddies, cattle, landfills, coal mining and oil and natural gas production.

The researchers had suspected that wetlands play a relatively minor role in removing greenhouse gases from the atmosphere. According to Thurtell's colleague at Guelph, Dr. Ken King, they found that the average square metre of Lowland vegetation sucks up less than half a gram of carbon dioxide a day. By comparison, forests suck up three grams of carbon dioxide a day, and crops suck up six grams. Extrapolated over the whole northern wetlands, the annual uptake of carbon dioxide is only 1/200th of the amount produced by the burning of fossil fuels.

John Eberlee, from Canadian Science News, Vol. 10, No. 11.

FIELD TRIPS

CRANBERRY TRIP TO CLAM HARBOUR

On a misty, foggy but warm (16 degree) morning, grasping our empty bags and buckets, about 20 of us followed Bernice Moores out on beach and marshes with visions of cranberries in our heads.

Few birds or plants were seen, much less studied, while Bernice's careful classification of cran- and -like berries was quickly forgotten as the berries began to appear, seemingly everywhere.

The group quietly splintered off to gathering on hands and knees, gorging every receptacle with the red ripe berries. A few of us wandered further along the barrens shore; most scurried away with containers overflowing, wondering where was that favourite recipe for sauce, squares, bread or...

Richard Peckham

21 people included children & 1 dog.
Bernice says they saw Common Loon, Common Eider, Herring Gull, Great Blackbacked Gull, Belted Kingfisher, Savannah Sparrow - all winter birds .

EUCALYPTS

I worked in Australia from late August 1990 to July 1991 at the Warrnambool, Victoria, campus of Deakin University, exchanging with an University librarian there for that year. Bernice Moores joined me in June, and we travelled in Victoria and Queensland before returning to Canada. We are both members of Halifax Field Naturalists; I also belong to the Chignecto Naturalists' Club. We were both very interested in exploring this new worlld.

The natural history of Australia is very different from that of Canada. I had been told that and I had read about it but it still came as a bit of a shock when I arrived. Nothing was familiar to my Canadian eyes, not even the weeds in the gardens.

The wildflowers are much more numerous than ours; Western Australia alone has over 7,000 species. Yes, they do bloom primarily in their spring and summer, which is September through February.

The shrubs all seem to have blossoms; landscaping can be made attractive all year round as many of the shrubs bloom in autumn and winter. The campus where I worked had some shrubs as well as trees in flower all year.

But it was the trees which captivated me. Most of the trees are endemic to Australia; even their genus names are seldom heard in Canada - *Banksia, Hakia, Metaleuca, Baobab, Casuarina, Karri, Eucalyptus.* Often their common names are more revealing - Bottle-brush, Wattle, Tea Tree, Gum, Paperbark, Ironbark, Pencil Pine, Stringybark, She-oak, Black Boys, Coolabah.

Australia is not a country of forests. Only about 5% of the land is forested, compared to 50% in Canada; in New Brunswick and Nova Scotia it is over 75%.

It was the eucalypts or gum trees which particularly fascinated me; there are over 500 species. They are hardwoods, and very important to the Australian economy, for furniture, construction, paper pulp, fuel and essential oils used in medicines and perfumes. The largest species, known as Mountain Ash, grows to 100 metres, exceeded in height only by the California Redwoods.

Generally speaking, gum tree foliage gives an open lacy look compared to the denser appearance of our Canadian hardwoods. The leaves tend to be grey green or blue green in colour, their texture is leathery or wax-like and they hang straight down. This latter phenomenon reminds me of the old-fashioned White Lilacs in my back yard. Because the leaves hang straight down, eucalypts offer very little shade. On some species, the leaves will turn so their edges, not their surfaces, face the sun. This protects them from the heat and conserves moisture.

Gum trees are not deciduous, as indeed no native tree in Australia is. This means there is no display of fall colour - something I really missed.

Juvenile foliage is often very blue in colour; it is interesting to see the sharp contrast between young and old foliage on the same tree.

All eucalypts bloom at some time during the year. The blossoms can be white, yellow, orange and all shades of pink, rose, coral and red. There's no more stunning sight than a gum tree in full bloom. The flowers are not scattered throughout the foliage but carpet the green leaves.

Considering that eucalypts comprise over 90% of the trees of Australia, I thought their identification would be fairly simple. In Canada we have little trouble identifying a maple by its leaves, a birch by its bark, an elm by its shape. Not so in Australia: the leaves of eucalypts can be long and pointed or almost round. They may or may not have stalks. The bark may be hard and persistent, fibrous and in long strips, smooth and shedding in long ribbons, or short and flaky. The tree may be tall and straight, crooked and twisted, or many-stemmed. You can only identify the eucalypt by its flower, which is in the gum nut (also known as the flower cup).

A gum nut, despite its infinite variety of sizes, is always cup-shaped and covered by a cap. The word 'eucalypt' is of Greek origin (eu = well, kalyptes = covered). The cap, formed by fusion of the petals and sepals, falls away to allow the flower to open, and it is the massing of stamens inside which gives the flowers their 'fluffy broom' look.

When the flower has finished blooming and the seeds are fertilised, the gum nut hardens, the final step before the seeds are shed. Many gum trees do not shed their seeds every year; often the gum nut is

so hard that the intense heat of wildfire is needed to burst it.

Koalas choose only 14 species of gum trees; they hang from the branches by all four feet, feeding on the leaves for hours. Although they are slow-moving (probably due to the limited nourishment in the leaves) they are capable of considerable agility.

Most eucalypts are prodigious nectar producers. Bees living near them produce huge amounts of honey - the colour ranging from brown to almost white, according to the eucalypt species.

Birds too make use of the eucalypts; one family of nectar feeders, the honeyeaters, have beaks of differing shapes and sizes designed to extract nectar from the many different gum tree flowers.

Ruth Miller, with Bernice Moores

Yellow mallee, flowers & nuts
E. incrassata

VISITING SCOTLAND

In late August - early September I had the good luck to realise a childhood dream of a trip to Scotland, the home of my ancestors. While the focus of the trip was Scottish Country Dancing, I took every chance I could to look at the countryside. We toured through the area north of Edinburgh, then through the Highlands to Skye, finishing in Ayreshire, south of Glasgow.

We were blessed with three weeks of glorious weather. The heather was at its grandest. I marvelled at how it grew in such varying habitats; covering the hillsides and mountains with its purple grandeur, spreading throughout the woodlands and in roadside ditches.

The countryside is ideal for the enjoyment of biking and exploring; there are so many different flowers, animals and birds to see.

On the way north to Inverness through the Highlands there is a Nature Reserve where I would have liked to spend more time. This was by Loch Rannoch and Loch Tummel, and was provided with camping areas, programs and nature trails.

Towards Inverness, just outside Boat of Garten there is another Nature Reserve where Osprey nesting is observed and protected. The Ospreys were a little late migrating, so my friend and I hiked out hoping to see them, but once again time did not allow.

Then we reached the mystical Isle of Skye where we had a day on our own. The Isle of Skye is a beautiful place, with the Cuillen Hills for the more ambitious hikers and the Trotternish Hills which we enjoyed. As we set out into the Trotternish Hills the mystical mist was present, then through the mist a mountain appeared. Each level we climbed afforded a different vista. At one high point we could see the mist below with the village of Staffin peeking out. All this area was heather covered and the sheep roamed freely over it.

For camping, locals seem to use mainly 'caravans' as they call them - small camping trailers. Perhaps because of rainfall or maybe the pesky 'midges' tenting seemed to be less common in the areas I saw. I'm told midges are worse than blackflies - was this the origin of the Highland Fling?

Scotland offers so many beautiful areas and wilderness for the naturalist to explore - I hope I can go back some time and I know just where to go.

Shirley 'McVan' van Nostrand

NATURAL HISTORY

THE CITY IN WINTER

Natural history in winter means birds at feeders, tracks in the snow and skies, mostly through windows. The five gardens which make up my particular park have all stopped putting out bread, so we don't see many starlings. Perhaps because of this, there are more species around the feeders than usual. Withholding food from a particular species in winter may seem wrong, but the starlings seem to maintain their numbers at about 50 in our local flock. They have several habits which give them the edge: they sit close to warm chimney stacks, and roost in the street lights, which they enter from the stem end, so to speak. Every street light has its nest in spring too, which means that chick mortality is low until the young fly. Starlings have trouble with swaying perches; they can't keep a balance on the wires of a Planet suet feeder, while the bulkier Evening Grosbeaks sit there for ages, and chickadees revel in attacking the suet ball from every angle.

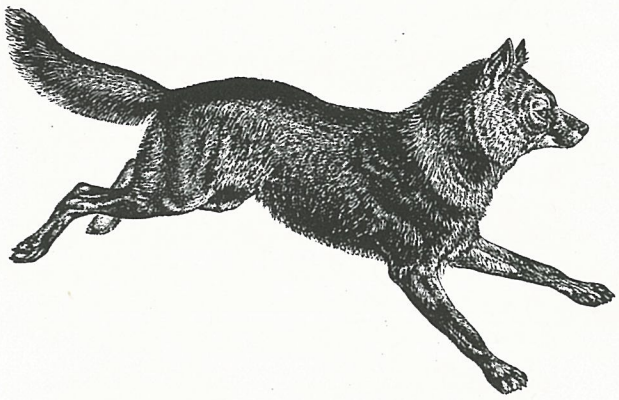
Keeping the numbers of House Sparrows low is no problem; the number drops during the first long cold spell in the new year. When sparrows appear about half an hour after dawn, a few hang back; a day or two later, the flock is smaller by that number. Meanwhile, the sight of them around the feeders seems to attract other birds.

Cat territories change over the autumn too; borders have been adjusted to give each cat access to the feeder tree. We had one cat all summer, from the house behind us. Now the red cat which patrolled the street is a frequent visitor and there are two black Persians. At least they keep us free of rats.

The annual movements of House Mice around the buildings are always interesting; this year we have only had one invasion. Perhaps the weekly visit from a house cat has deterred them.

Quirks & Quarks' Jay Ingram reported recently that rangers in Fundy National Park take strategic positions on moonlit nights and wail their sirens briefly, then listen for the local coyotes' reply. They use the response for clues to the health and composition of the pack, and through them to the state of the park. A scout leader told me of hearing coyotes howling as his troop hiked in the dark towards a winter camp, near Blue Mountain; he said he's never found it so easy to keep boys together! It would be interesting to play tapes of sirens from cars in various locations and see if coyotes would respond. Anyone living in Halifax could make such a tape very easily.

Ursula Grigg



ALMANAC

Sunrise and sunset on winter Saturdays:

Dec. 14	07 43 16 34
Dec. 21	07 48 16 36
Dec. 28	07 50 16 40
Jan. 4	07 51 16 46
Jan. 11	07 50 16 54
Jan. 18	07 46 17 02
Jan. 25	07 41 17 12
Feb. 1	07 35 17 22
Feb. 8	07 25 17 31
Feb. 15	07 15 17 41
Feb. 22	07 04 17 51
Feb. 29	06 52 18 00
Mar. 7	06 40 18 10
Mar. 14	06 27 18 19
Mar. 21	06 14 18 28
Mar. 28	06 01 18 32

December 21st and 22nd are equal in length, the shortest days; evenings begin to draw out on December 17th, but mornings don't start getting lighter until January 8th.

HALIFAX AST Z+4

TIDE TABLES

1992

JANUARY–JANVIER

Day	Time	Ht. /ft.	Ht. /m	Jour	Heure	H. /pi	H. /m
1	0505	5.7	1.7	16	0405	5.7	1.7
	1205	1.1	.3		1110	1.3	.4
WE	1755	5.1	1.6	TH	1655	4.9	1.5
ME				JE	2315	1.9	.6
2	0015	1.9	.6	17	0510	6.0	1.8
	0555	5.8	1.8		1210	.8	.2
TH	1250	.9	.3	FR	1800	5.3	1.6
JE	1840	5.3	1.6	VE			
3	0100	1.8	.5	18	0015	1.6	.5
	0640	5.9	1.8		0610	6.3	1.9
FR	1330	.8	.2	SA	1300	.4	.1
VE	1925	5.4	1.6	SA	1900	5.7	1.7
4	0140	1.8	.5	19	0115	1.3	.4
	0725	5.9	1.8		0705	6.6	2.0
SA	1405	.8	.2	SU	1355	.0	.0
SA	2005	5.5	1.7	DI	1950	6.1	1.9
5	0210	1.7	.5	20	0205	1.1	.3
	0805	6.0	1.8		0800	6.8	2.1
SU	1440	.8	.2	MO	1440	-0.2	-0.1
DI	2045	5.6	1.7	LU	2045	6.4	2.0
6	0240	1.8	.5	21	0300	1.0	.3
	0845	6.0	1.8		0850	6.8	2.1
MO	1510	.9	.3	TU	1530	-0.2	-0.1
LU	2120	5.7	1.7	MA	2130	6.6	2.0
7	0315	1.8	.5	22	0355	1.0	.3
	0925	5.9	1.8		0940	6.7	2.0
TU	1540	1.0	.3	WE	1620	.0	.0
MA	2155	5.7	1.7	ME	2220	6.7	2.0
8	0345	1.8	.5	23	0455	1.1	.3
	1000	5.8	1.8		1030	6.5	2.0
WE	1610	1.2	.4	TH	1715	.3	.1
ME	2230	5.7	1.7	JE	2305	6.6	2.0
9	0425	1.9	.6	24	0555	1.2	.4
	1035	5.6	1.7		1120	6.1	1.9
TH	1645	1.3	.4	FR	1810	.7	.2
JE	2305	5.7	1.7	VE	2350	6.3	1.9
10	0510	2.0	.6	25	0655	1.3	.4
	1110	5.4	1.6		1210	5.7	1.7
FR	1725	1.5	.5	SA	1905	1.1	.3
VE	2340	5.7	1.7	SA			
11	0605	2.0	.6	26	0035	6.0	1.8
	1150	5.2	1.6		0750	1.4	.4
SA	1810	1.7	.5	SU	1300	5.3	1.6
SA				DI	2000	1.5	.5
12	0015	5.6	1.7	27	0125	5.6	1.7
	0700	2.0	.6		0845	1.4	.4
SU	1230	4.9	1.5	MO	1400	4.9	1.5
DI	1855	1.9	.6	LU	2100	1.9	.6
13	0100	5.5	1.7	28	0225	5.4	1.6
	0755	2.0	.6		0945	1.5	.5
MO	1325	4.8	1.5	TU	1515	4.7	1.4
LU	1950	2.0	.6	MA	2200	2.0	.6
14	0150	5.5	1.7	29	0330	5.2	1.6
	0900	1.9	.6		1045	1.4	.4
TU	1425	4.7	1.4	WE	1630	4.7	1.4
MA	2055	2.1	.6	ME	2300	2.1	.6
15	0255	5.5	1.7	30	0440	5.3	1.6
	1005	1.6	.5		1135	1.3	.4
WE	1540	4.7	1.4	TH	1730	4.9	1.5
ME	2205	2.1	.6	JE	2350	2.0	.6
				31	0535	5.4	1.6
					1225	1.2	.4
				FR	1820	5.1	1.6
				VE			

FEBRUARY–FEVRIER

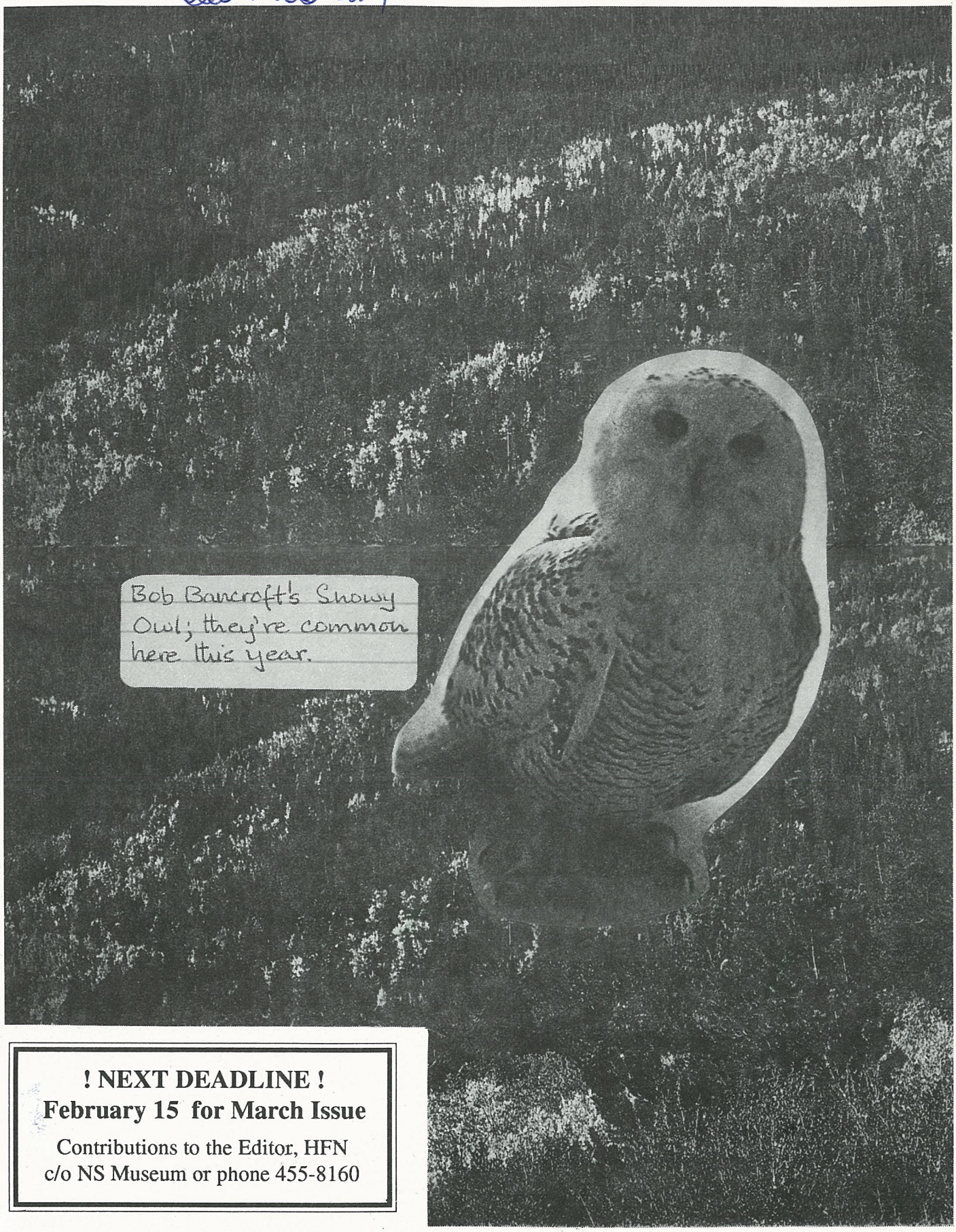
Day	Time	Ht. /ft.	Ht. /m	Jour	Heure	H. /pi	H. /m
1	0035	1.9	.6	16	0005	1.6	.5
	0625	5.6	1.7		0555	6.2	1.9
SA	1305	1.1	.3	SU	1245	.4	.1
SA	1905	5.3	1.6	DI	1845	5.9	1.8
2	0115	1.8	.5	17	0100	1.2	.4
	0710	5.8	1.8		0650	6.5	2.0
SU	1340	1.0	.3	MO	1335	.0	.0
DI	1945	5.5	1.7	LU	1935	6.3	1.9
3	0145	1.6	.5	18	0155	.9	.3
	0750	5.9	1.8		0745	6.7	2.0
MO	1415	.9	.3	TU	1425	-0.1	.0
LU	2020	5.6	1.7	MA	2025	6.6	2.0
4	0220	1.6	.5	19	0245	.7	.2
	0825	6.0	1.8		0835	6.8	2.1
TU	1445	1.0	.3	WE	1510	-0.1	.0
MA	2055	5.8	1.8	ME	2110	6.8	2.1
5	0250	1.5	.5	20	0340	.6	.2
	0900	5.9	1.8		0925	6.7	2.0
WE	1510	1.0	.3	TH	1600	.1	.0
ME	2125	5.8	1.8	JE	2150	6.8	2.1
6	0325	1.5	.5	21	0430	.7	.2
	0935	5.8	1.8		1010	6.4	2.0
TH	1540	1.1	.3	FR	1650	.5	.2
JE	2200	5.9	1.8	VE	2235	6.6	2.0
7	0400	1.5	.5	22	0525	.8	.2
	1010	5.6	1.7		1055	6.1	1.9
FR	1615	1.3	.4	SA	1740	.9	.3
VE	2230	5.8	1.8	SA	2315	6.2	1.9
8	0440	1.6	.5	23	0620	1.0	.3
	1045	5.5	1.7		1140	5.7	1.7
SA	1650	1.4	.4	SU	1835	1.4	.4
SA	2300	5.8	1.8	DI			
9	0525	1.7	.5	24	0000	5.8	1.8
	1120	5.3	1.6		0715	1.2	.4
SU	1730	1.6	.5	MO	1230	5.2	1.6
DI	2340	5.7	1.7	LU	1930	1.8	.5
10	0620	1.8	.5	25	0050	5.4	1.6
	1200	5.1	1.6		0810	1.4	.4
MO	1820	1.9	.6	TU	1325	4.9	1.5
LU				MA	2030	2.0	.6
11	0020	5.5	1.7	26	0145	5.1	1.6
	0725	1.8	.5		0905	1.5	.5
TU	1250	4.8	1.5	WE	1430	4.6	1.4
MA	1925	2.0	.6	ME	2130	2.2	.7
12	0110	5.4	1.6	27	0250	4.9	1.5
	0830	1.7	.5		1005	1.6	.5
WE	1350	4.7	1.4	TH	1550	4.5	1.4
ME	2035	2.1	.6	JE	2225	2.2	.7
13	0215	5.4	1.6	28	0405	4.9	1.5
	0940	1.5	.5		1100	1.5	.5
TH	1510	4.6	1.4	FR	1705	4.7	1.4
JE	2150	2.1	.6	VE	2320	2.1	.6
14	0335	5.5	1.7	29	0510	5.1	1.6
	1050	1.2	.4		1150	1.4	.4
FR	1640	4.9	1.5	SA	1755	5.0	1.5
VE	2300	1.9	.6	SA			
15	0450	5.8	1.8				
	1150	.8	.2				
SA	1750	5.3	1.6				
SA							

MARCH–MARS

Day	Time	Ht. /ft.	Ht. /m	Jour	Heure	H. /pi	H. /m
1	0005	1.9	.6	16	0540	5.9	1.8
	0605	5.4	1.6		1220	.4	.1
SU	1230	1.3	.4	MO	1830	6.1	1.9
DI	1835	5.2	1.6	LU			
2	0045	1.7	.5	17	0050	1.0	.3
	0645	5.6	1.7		0640	6.2	1.9
MO	1310	1.2	.4	TU	1315	.2	.1
LU	1915	5.5	1.7	MA	1915	6.5	2.0
3	0120	1.5	.5	18	0145	.7	.2
	0725	5.7	1.7		0730	6.4	2.0
TU	1340	1.1	.3	WE	1405	.1	.0
MA	1945	5.7	1.7	ME	2000	6.7	2.0
4	0155	1.3	.4	19	0230	.4	.1
	0800	5.8	1.8		0815	6.5	2.0
WE	1410	1.1	.3	TH	1450	.2	.1
ME	2020	5.9	1.8	JE	2040	6.8	2.1
5	0230	1.2	.4	20	0320	.3	.1
	0835	5.8	1.8		0905	6.4	2.0
TH	1440	1.1	.3	FR	1535	.4	.1
JE	2050	5.9	1.8	VE	2120	6.6	2.0
6	0300	1.1	.3	21	0405	.4	.1
	0910	5.7	1.7		0950	6.2	1.9
FR	1515	1.1	.3	SA	1620	.8	.2
VE	2125	6.0	1.8	SA	2205	6.4	2.0
7	0340	1.1	.3	22	0455	.6	.2
	0945	5.6	1.7		1035	5.9	1.8
SA	1545	1.3	.4	SU	1710	1.2	.4
SA	2155	5.9	1.8	DI	2245	6.0	1.8
8	0415	1.2	.4	23	0540	.8	.2
	1020	5.5	1.7		1120	5.5	1.7
SU	1625	1.4	.4	MO	1800	1.6	.5
DI	2230	5.8	1.8	LU	2330	5.6	1.7
9	0500	1.3	.4	24	0635	1.1	.3
	1055	5.3	1.6		1205	5.2	1.6
MO	1705	1.7	.5	TU	1900	2.0	.6
LU	2310	5.7	1.7	MA			
10	0555	1.4	.4	25	0015	5.2	1.6
	1140	5.1	1.6		0730	1.4	.4
TU	1805	1.9	.6	WE	1255	4.9	1.5
MA	2355	5.5	1.7	ME	2000	2.2	.7
11	0705	1.5	.5	26	0105	4.9	1.5
	1230	4.9	1.5		0825	1.5	.5
WE	1915	2.1	.6	TH	1355	4.6	1.4
ME				JE	2055	2.3	.7
12	0045	5.4	1.6	27	0210	4.7	1.4
	0815	1.5	.5		0915	1.6	.5
TH	1335	4.7	1.4	FR	1510	4.6	1.4
JE	2035	2.2	.7	VE	2145	2.3	.7
13	0155	5.2	1.6	28	0325	4.7	1.4
	0920	1.3	.4		1010	1.7	.5
FR	1500	4.7	1.4	SA	1620	4.7	1.4
VE	2145	2.1	.6	SA	2240	2.1	.6
14	0315	5.3	1.6	29	0435	4.8	1.5
	1025	1.0	.3		1055	1.6	.5
SA	1630	5.0	1.5	SU	1715	5.0	1.5
SA	2250	1.8	.5	DI	2325	1.9	.6
15	0435	5.5	1.7	30	0530	5.0	1.5
	1125	.7	.2		1140	1.6	.5
SU	1735	5.6	1.7	MO	1800	5.3	1.6
DI	2355	1.5	.5	LU			
				31	0010	1.6	.5
					0615	5.2	1.6
				TU	1225	1.5	.5
				MA	1835	5.6	1.7

WITCH-HAZEL

Ursula Quigg Mon 7-9
2560 Joseph St.



! NEXT DEADLINE !
February 15 for March Issue

Contributions to the Editor, HFN
c/o NS Museum or phone 455-8160