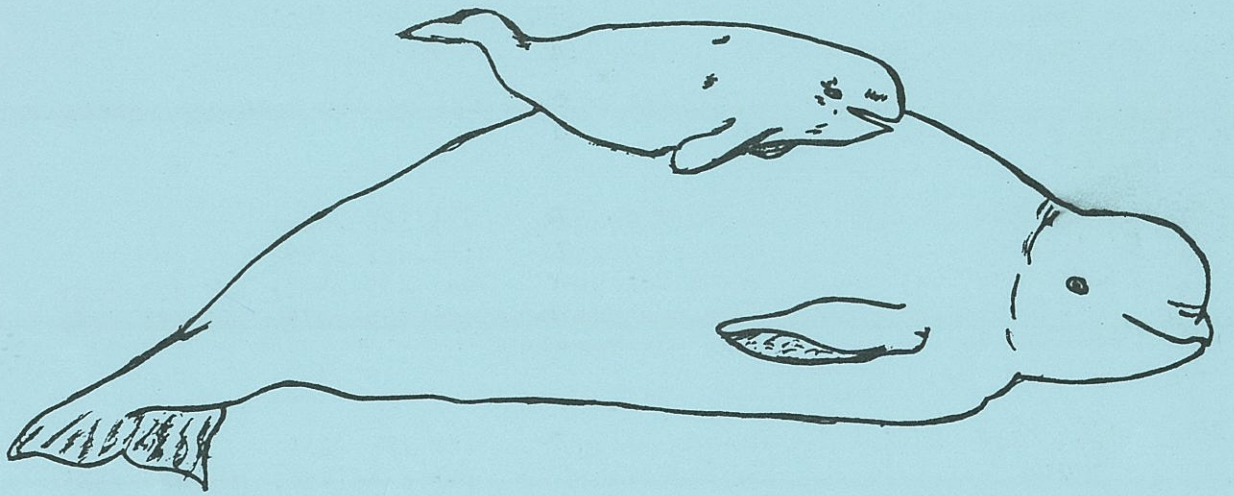
# Halifax Field Naturalists Newsletter

JUNE - AUGUST, 1986. No. 44



BELUGA WHALES

return address:
Halifax Field Naturalists
c/o Nova Scotia Museum
1747 Summer Street
Halifax, N.S., B3H 3A6

# Halifax Field Naturalists

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HFN 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: First Thursday of every month at 8.00 p.m. in the Auditorium of the Nova Scotia Museum, 1747 Summer Street, Halifax.

FIELD TRIPS: are held at least once a month******It would be appreciated if those travelling in someone else's car on field trips share the cost of 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 N.S. Museum.

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|---|---|
| Individual memberships | ..... $7.00 per year. |
| Family " | ..... $10.00 " " |
| Sustaining " | ..... $15.00 " " |

This covers our fiscal year ... JANUARY 1 to DECEMBER 31.

Members receive the HFN Newsletter and notices of all meetings, field trips and special programs.

| | | | |
|---|---|---|---|
| EXECUTIVE 1986: | President ..... | Michael Downing | (r) 823-2081 |
| | Treasurer ..... | Bernice Moores | (r) 422-5292; |
| | Secretary ..... | Leigh Mazany | (r) 455-8592; (w) 424-2026 |
| | Past President ..... | John van der Meer | (r) 455-1029; (w) 426-8276 |
| | Membership ..... | John van der Meer | " " |
| DIRECTORS: | Assistant Editor .. | Ursula Grigg | (r) 455-4818 |
| | Program ..... | Chris Corkett | (r) 479-1134; (w) 424-2565 |
| | Program ..... | Regina Maass | (r) 477-1469; (w) 424-7006 |
| | Publicity ..... | Connie Eaton | (r) 423-6971 |
| | Bird Atlas ..... | Clarence Stevens | (r) 469-6144 |
| | Director ..... | Colin Stewart | (r) 466-7168; (w) 424-3737 or 3829 |
| | Director ..... | John Strong | (r) 477-1351 |
| NEWSLETTER: | Editor ..... | Doris Butters | (r) 463-0033 |
| | Asst. Editor ..... | Ursula Grigg | (r) 455-4818 |
| | Editorial staff .... | Edna Staples | (r) 868-2919 |
| | | John Strong | (r) 477-1351 |
| | | (with the help of other members). | |

MAILING ADDRESS: Halifax Field Naturalists
c/o Nova Scotia Museum
1747 Summer Street, Halifax, N.S., B3H 3A6

HFN is a member organisation of the Canadian Nature Federation.
HFN is incorporated under the Nova Scotia Societies Act.
HFN NEWSLETTER is produced by courtesy of the Nova Scotia Museum.

# PRESIDENT'S REPORT
## on the activities of the Board of Directors.

In my message in our last newsletter, as incoming president I expressed my hopes for the club for the coming year. My priorities were to ensure the strength of our standing committees, to continue in the direction of delegating tasks to the committees and then letting the committees do them, and to generally tighten up directors' meetings. My purpose was, and is, to increase the ability of the board to direct what will hopefully be an increasing variety of club activities. Here, among several digressions I shall attempt to give a sort of progress report.

First, the standing committees are in good shape. The program committee looks very healthy, as it generally does. The newsletter has been strengthened by the addition of Ursula Grigg as assistant editor. The publicity and membership committee, now under Connie Eaton, is exploring several avenues in search of better ways to publicise our society. This committee, unfortunately, will seen be without Filip Volckaert. He is going to Belgium and his loss to us for at least a year is regrettable enough to require a paragraph of its own.

No one has done as much as Filip Volckaert for the Halifax Field Naturalists over the last few years, and as president I want to take this occasion to thank him. He managed the program committee, often doing the work entirely by himself, up until last year, and the program was superb both in content and in organisation. He then took on the chair of the newly-formed publicity and membership committee, and started it working. Last year, on his initiative, our society became a leader in planning and delivering a program of events to celebrate Environment Week for the first time in Halifax. This year he was again in the forefront as this event was planned, pushing for an even better, 'more professional' job. He has also taken on many minor tasks on the societys' behalf. He has become known to us as a quiet and likeable, but reliable and efficient director - a gentleman who gets things done.

In connection with the above, a new individual whale was spotted during the Brier Island whale-watch outing and we were invited to choose a name for it. The directors decided to name it 'Filip'.

Returning to my program report, I believe that the board as a whole understands the committee system, and that the habit of doing committee work in general board meetings is being broken. I would be less than honest, though, if I claimed that the business of the club is being run in tight, orderly meetings. The great problem now seems to be controlling the length of time spent in discussing trivial matters and side issues, without creating bad feelings within the Executive. The length of time spent on each item on the agenda has a way of increasing in proportion to any decrease in the overall length of the agenda, always leaving us short of time at the end. This will have to change if we are ever to effectively manage more business. On the other hand, let us recognise progress where it exists.

All in all, I have been sufficiently optimistic about the situation to encourage the board to revive two dormant projects, with some hope for success.

The first is the organisation of a conference on trails in Nova Scotia. Public access to such trails as Duncan's Cove and Cape Split is very important to our program, and in today's political and economic climate this access is by no means secure. Government money for a conference on Nova Scotia Trails has been available for some time, waiting for an organisation to take the initiative, and the suggestion that we do so was made as long as two years ago. We have now started the ball rolling. A steering committee involving among others, Nordic Ski Nova Scotia and the Canadian Hostelling Assocation, has been set up with Colin Stewart as chairman. The Halifax Field Naturalists have agreed to handle the financial accounting for this event. (Not providing the money - just keeping the books!). The steering committee looks strong and active to me at this admittedly early point, and I am hopeful of a good outcome.

*The second project is a major re-write of our by-laws. They are filled with contradictions and uncertainties which simply don't apply to our society. Starts have been made in the past to amend them and have bogged down. A great deal of sustained, co-operative work by the board, making decisions and one or two individuals doing the wording will be necessary before revisions are ready to put before the membership. The problem is one which has been known to occur in higher elected bodies than ours - everyone agrees that it is unclear what the current document means, but there is less agreement on what we want it to mean. The changing of the executive every year, and the fact that many directors cannot attend all our meetings, make firm decisions even harder to come by. By law revisions would have to be voted on at an annual general meeting. I am pushing to have them ready for our next one, but I am not as optimistic about this as I am about the trails conference. At least I have learned enough now to approach the by-law problem with one continuous push. Once this task has been put down for a while, the board balks at picking it up in the middle, and wants to discard the work already done, and now partly forgotten, to make a fresh start. We have wasted a lot of time this way.*

*If these two projects can be brought under control, then in the autumn the board might take another look at our long list of things which would be nice to do, and try to set some priorities. We should also get a report from the publicity and membership committee, and try to decide what, if anything, we are going to do about publicity for the society in the immediate future.*

*Michael J. Downing*
*President.*

# hfn news

FROM THE EDITOR -

First, a warm "Thank you" to all those members who help with HFN Newsletter, from contributing a one-line 'nature note' to licking the stamps at mail-out time. But we are always looking for fresh ideas or new ways of presenting old ones.

Nature-related stories, articles, artwork, verse - all are welcome. But what about expressing your feelings over controversial matters on conservation and nature? We could open an "Opinion" column. Anyone may submit an editorial - we'll print anything short of outright slander or copyright infringement.

Short write-ups of HFN trips are very valuable. By noting the common flora and fauna of Nova Scotia as it is today, we provide a record which could be used for comparison in the future. With the rapid changes taking place in our environment it is not hard to appreciate the importance of this kind of record-keeping. We trust that on every trip SOMEONE will write and send in a short report.

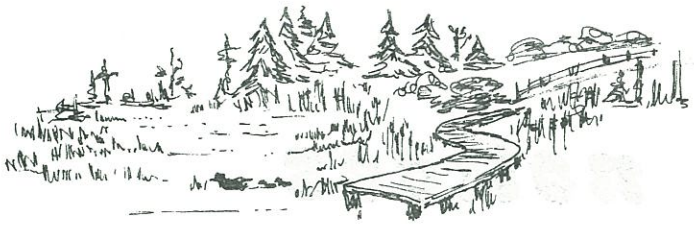
Read any good nature books lately? How about writing a review of one now and again? Share the joy.

"All contributions gratefully received".

Editor.

WELCOME TO NEW and RETURNING MEMBERS -

Eva Huber
Paul MacIsaac
Bob MacDonald
Brian Kinsman
Milton & Norma Gregg
Sheri & Neena Ismaily
C. Pearce
Lorette Gendron & Geoff Chinn.
Camille Gamblet
Donna Ferguson
Paul Duval
Ronald G. Arsenault
Theresa Rogers
Lore & Henry Buhrer
Nathalie Marsan
Dr. Keith Vaughan
Barbara Purcell
Virginia Crawford
John Maly & J. Crosbie
Allan Golding
G. Johnstone
Heather & Nick Jupp
T. & A. Manzer
Donald Lawrence
Elizabeth Twomey
Darlene Theresa Burton



TRAILS FOR TOMORROW? —

Do you sometimes wonder whether by tomorrow there will BE any hiking and ski-ing trails left? Between inadequate or weak support from government and the encroachment by ATVs and trail bikes, one can't help but wonder about the future.

HFN, Nordic Ski N.S. (NSNS) and Canadian Hostelling Association - Nova Scotia (CNHA-NS) feel that there is a pressing need to look at the various aspects of the situation and try to find practical remedies. Accordingly, the three groups are planning a two-day symposium to be held in Halifax early in the spring of 1987 to review the current status of trails, including access and liability, design, construction and maintenance, and to consider the future.

A Steering Committee has been set up with Colin Stewart as Chairman. HFN will perform the duties of Treasurer. Bernice Moores has agreed to keep the financial records and administrate an $800 grant which has been made available by government for this Symposium.

Details will be published in upcoming newsletters and via posters and flyers, etc.

CONTRIBUTION BY HFN -

At a meeting of the HFN Executive on July 29, 1986, a motion was approved that Colin Stewart send an initial donation of $25 to the Nature Conservancy of Canada, and that a further $25 be sent annually, as a contribution towards the acquisition of conservation areas.

ENVIRONMENT WEEK 1986 -

Although Environment Week 1986 was better organised, with more people involved and more activities, Filip Volckaert reports that some weaknesses were evident despite the many positive aspects. Hopefully these weaknesses will be eliminated next year.

Attendance varied - some events being well attended, others not so much so. Thirteen Government and Non-Governmental Organisations participated in the week's 22 events, but it is hoped that more groups from outside the Metro Area can be stimulated into taking part in future.

More volunteers were needed during the last three weeks of preparations, and media coverage left something to be desired. How to draw the attention of the media remains an important issue.

Nevertheless the Committee plans to continue their efforts to mount a better campaign in 1987; also to solicit more private funding. This year, with a modest budget of $600 for administration and PR purposes, they produced 200 posters and 600 flyers, which were distributed in Halifax/Dartmouth and around the province. In addition to Public Service Announcements there were two radio interviews on CBC and CKDU.

Ursula's report on the Environment Week Beach Walk to Cow Bay appears elsewhere in this newsletter.

NEXT DEADLINE

25 OCTOBER, 1986, for the NOVEMBER issue. Mail contributions to N.S. Museum, or call Editor: 422-6286.

HELP LOCATE PEREGRINE FALCON NESTS -

In order to re-establish a breeding population of falcons in the Fundy Region, the Canadian Wildlife Service and Fundy National Park have been releasing young Peregrine Falcons from two sites on the Bay of Fundy since 1982. To date 41 have been released.

In late June this year, CWS conducted an aerial survey of former nesting sites in the Fundy region to determine how many, if any, are nesting. Likely sites include Minas Basin, and the staff of CWS and Fundy National Park are encouraging individuals to report to them on any peregrines that they see. Contact:

Bruce Johnson, CWS Conservation and Protection
Environment Canada
P.O. Box 1590
Sackville, N.B., EOA 3CO ... OR:

Stephen Woodley, Fundy National Park
P.O. Box 40, Alma, N.B., EOA 1BO

Hopefully the MBBA survey will discover evidence of breeding, but this call is addressed to any person who spots the birds.

Peregrines are crow-sized, with long, pointed wings, narrow tails and small heads. They have a broad black 'moustache' from the base of the bill to below the eyes and are extremely fast flyers. Nests are usually located on ledges of high cliffs. If anyone goes near a nest the peregrine may scream a high-pitched "Cack-cack-cack" to divert the intruder.

# nature notes

.....Dorothy Morris found a round-leaved sundew in an unusual spot in Shubie Park - a dry rock-strewn slope.

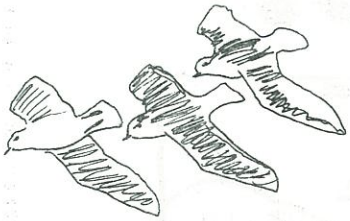
# notices

A new publication from Parks Canada, Atlantic Canada's Natural Heritage Areas, describes national and provincial parks, heritage rivers, national wildlife areas, federal migratory-bird sanctuaries, ecological reserves, wildlife refuges, etc. A handy, 94-page reference with colour illustrations, tables, charts and a large full-colour, shaded relief map. $14.95.

*(from: N.S. Hostelling Association - Spring 1986, issue. We do not have a specific address but assume the publication can be obtained from the bookstore at 1597 Hollis Street, Ph.No. 424-7580, OR by calling Parks Canada, 426-3436).*

..... The new concrete wall around Julie's Pond in Hemlock Ravine, does not appear to have affected the breeding of Yellow-spotted Salamanders. Apart from a couple of culverts, there are a sufficient number of cavities at the base of the wall to allow the salamanders to get in and out of the pond. Towards the end of April, 29 males and females were observed, breeding had taken place and there was a good supply of eggs in the pool.

John Gilhen, herpetologist, Nova Scotia Museum, and our own Clarence Stevens both feel that the salamanders of Julie's Pond are not doomed.



CHRISTMAS BIRD COUNT 1985 -

*(abstracted from CHRISTMAS BIRD COUNT UPDATE, published by American Birds, the National Audubon Society, May 1986 ... sent in by Bernice Moores).*

"We all knew it would happen. It was just a matter of time. The effervescent quality and upbeat undercurrent of frivolity that underlies the Christmas Bird Count reached an all-time high this year. The rewards of the CBC are often illusory, but in North Carolina, a couple of counters hit a real, tangible, and quite marvellous jackpot. The cold, damp, foggy predawn of December 21 looked like Frankenstein's idea of Club Med, but that failed to darken or deflate the spirits of the small group of CBCers gathered in Goose Creek Game Impoundment Area in Pamlico County. Appropriately decked out with field clothes, boots, binoculars and notepads, they gathered in an area known as "The Cathedral". The central people present, in addition to the count compiler and his wife, were a man, a woman and Reverend Rich Boyd of the First Presbyterian Church of New Bern. Kathryn McCray and Dennis Smith were there to be married. And married they were at the close of a short 20-minute ceremony. Now here we are talking about hard-core birders. Following the service, Rev.Boyd, the Smiths, and their guests spent the rest of the day counting grebes, herons, Canvasbacks, scaup, Northern Bobwhites and Killdeer, lots of gulls and woodpeckers, and towhees and sparrows. In the 86 years of the count, this is the first instance of a wedding between participants being held on count day. What a great way to begin a long-term commitment - just birding off into the sunset. Congratulations to the Smiths! "

CURRENTS OF CHANGE - a Review of the Report of the Pearse Commission -

*"An abundant supply of clean water is a basic resource that Canadians often take for granted. But the growing list of places where this invaluable commodity is not available shows that Canadians are failing to adequately protect the intricate water systems that are basic to the well-being of our land. Because of their concern about this situation, environmentalists in all parts of the country enthusiastically welcomed the formation of the Inquiry on Federal Water Policy and contributed to it their assessment of the problems and ideas for change.*

*Environmentalists view the Report that has come out of that Inquiry as a useful discussion of the issues and agree with many of the directions for reform that are presented. But at the same time they express disappointment that the Report does not provide more detail on how to solve the problems."* (from Infoetox, Vol.3, No.2, June 1986, published by Friends of the Earth).

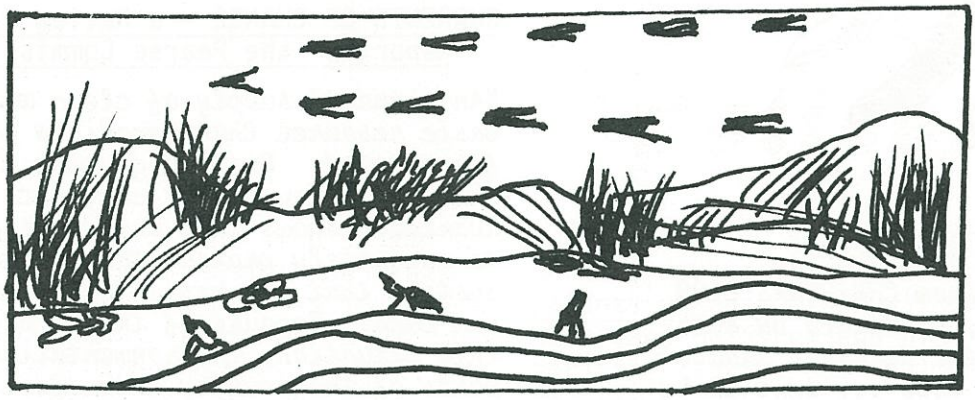
The government Inquiry on Federation Water Policy was set up in January 1984, and later that year held public hearings across the country. Over 300 submissions were received including about 40 from environmental groups.

The Report of the Pearse Commission was released in September 1985 and a federal task force set up to review the Report before making recommendations to the Cabinet. Input from the provinces, territories and environmental groups is asked for.

The June issue of Infoetox is devoted entirely to the topic of water - the main feature entitled "Currents of Change" being a review of the Report. Infoetox is available on HFN's library shelf at the NSM, but copies of the article "Currents of Change" and the 22 research reports released by the Inquiry may be obtained from:

The Enquiry Centre
Environment Canada
Ottawa, K1A OH3.

# field trips



## COW BAY FAMILY BEACH WALK

Date: Sunday, 1 June 1986 Participants: 7 adults, 5 children, and 3 dogs.
Place: Cow Bay, near Dartmouth.
Leader: Ursula Grigg
Weather: Foul; foggy, cold, breezy, threatening rain.

This, the first field event of Environment Week, was advertised as a family walk; accordingly, Connie Eaton and I took our families. Connie took three grandchildren and her fox terrier Sam; I took two daughters, two grandaughters, my corgi Brenen, and the children's eight-week old cocker collie,Barclay. We were joined by another HFN member and friend, and by a visiting Professor of Child Psychiatry, who had cycled to Cow Bay and hoped we might see whales.

The coastline at Cow Bay is eroding rapidly. The low cliff which bounds the moose's pasture has cut back at least five feet over the winter, and the turf which now forms a series of ledges below the lip is ideal for children and dogs to jump and tumble on. The barrier beach which cuts the lagoon off from the sea has always consisted of cobbles; however, where fifteen years ago it had a plateau at least fifty feet across at the near end, and supported a small stand of [illegible] only a narrow crest with a few bleached stumps. The barrier beach slopes steeply to the sea but shallowly towards the lagoon, where there are some patches of sand. The lagoon is silting up, and now has extensive sandy flats which are exposed at half tide.

We walked down the slope to the barrier beach and stopped at the pool; a sandpiper flew away unobstrusively and was probably nesting, as we saw it in the same spot when we came back. This pool has a salinity of less than two parts per thousand at the seaward side, from sea water seeping between the cobbles and from spray. Widgeon grass was visible, beginning to grow up from the bottom. The landward side of the pond is always fresh, fringed with cattails, and there were grackles nesting in the trees. We walked on to the near corner of the lagoon, a shallow backwater where there were plenty of winkles and scud. This has always been a good place to look for small crustacea,

though it used to be waist deep, with seaweed growing on the bottom.

By this time the children had made friends and so had the dogs. Young Sam was bounding about gleefully, followed by the hero-worshipping Barclay; Brenen kept a motherly eye on both. Four of us and Brenen then walked on to the end of the spit, leaving the children with their guardians, skipping stones and counting winkles. The tip of the spit has also changed; the channel, which used to run close to Hartlen Point bank, is now some way from it and a new spit has developed on that side.

There were not many birds: a few gulls and ducks sat on the sandbanks; the ospreys which are nesting on the island in the middle were mostly fishing on the far side. We had excellent views of several herons, which stood still until we were really quite close, and whenever the fog lifted we saw cormorants on some posts out in the bay. The tide was running strongly into the lagoon, and as it covered the flats the gulls stood up, looking ridiculously as if they were standing on water.

Walking on cobbles is strenuous, and we sometimes sought the low sand patches; many dogs also dislike it, so it was interesting to see Brenen walking surefooted along the crest, keeping a lookout on both sides. She dislikes tall grass and wet places, but her low body and broad paws are apparently ideal on stony paths.

We rejoined the others for the short walk back to the cars and parted. My frugal family produced plastic bags and went back to the beach for cast-up seaweed to put on our gardens. The rain held off long enough for our cyclist to reach his lodgings, then the weather shut down for a cold, wet night. However, we had found an excellent way to spend a grey, cold Sunday afternoon.

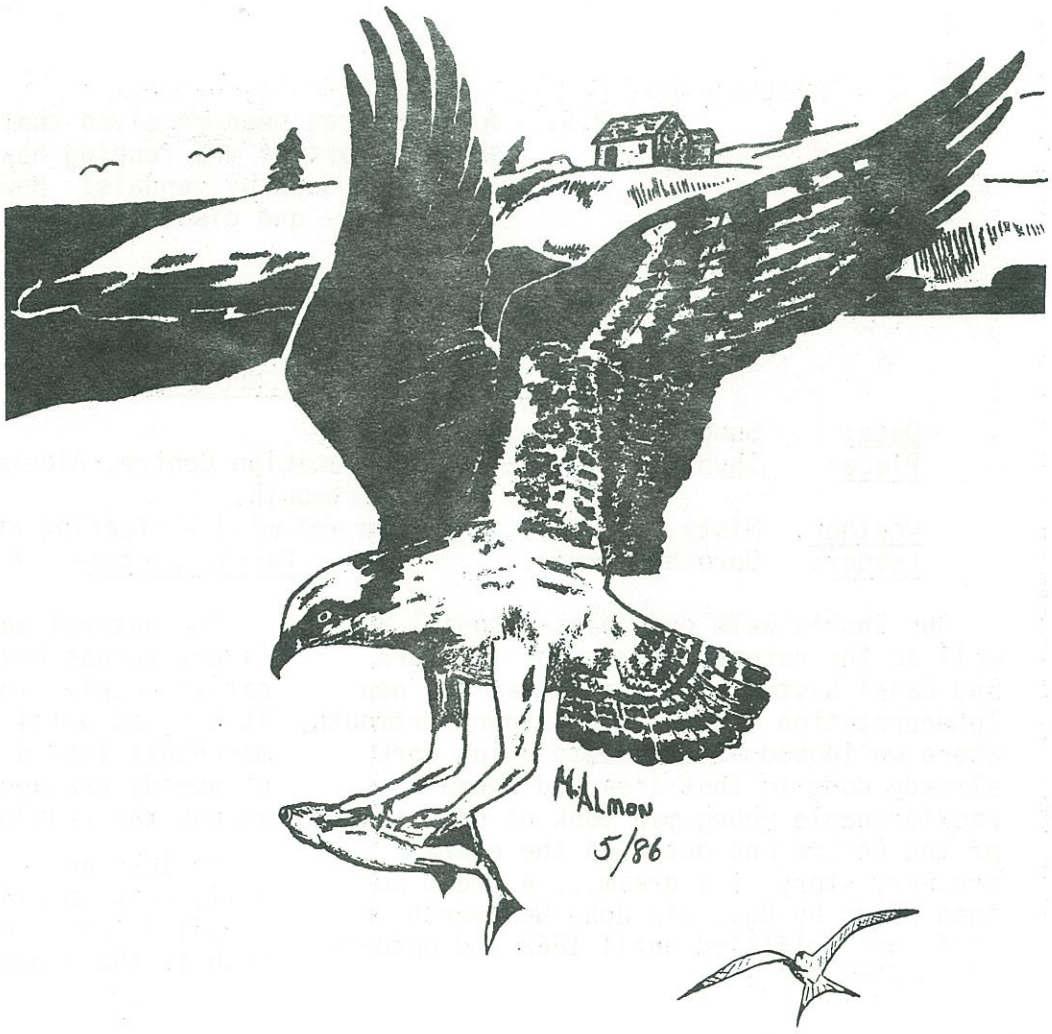
Ursula Grigg.

'ow Bay Observations:

Double-crested Cormorant
Great Blue Heron
Black-backed Gull
Herring Gull
Common Grackle
Black Duck
Osprey
Sandpiper
Crow

Periwinkle
Stone Crab
Shore Crab
Scud

Widgeon Grass
Cat-tail
Seaside Goldenrod
Beach Pea



## A FENCE-BUILDING WORK DAY AT LAWRENCETOWN BEACH

Date: Saturday, June 14, 1986 - 8 am to 4 pm.
Place: Lawrencetown Beach dunes.
Organiser: Murray Cunningham. On-site: Bob Blumsen, Dept. of Lands and Forests.
Participants: 7
Weather: Overcast - comfortable for working.

Four wide-awake HFN members met at the Museum at 8.00 am, to receive instructions and equipment from Murray. We then proceeded to Lawrencetown Beach, where we met Mr. Bob Blumsen, our Lands and Forests 'boss'. After transporting cedar posts and snow-fencing to one end of the beach, we set to work.

It wasn't long before we were joined again by Murray, and two more HFN workers. Despite heavy slogging, digging through beach rocks to make post holes, we were soon heading back to the storage hut for more materials. Several of us gained much-needed practise hammering staples into the cedar posts, to anchor the snow-fencing.

After a lunch break in the new beach building (still under construction) we continued working until about 3.00 pm., when we ran out of materials. We were joined by yet another HFNer, who arrived just in time for tea at the MacDonald house tea-room on the hill.

In total, we set up four long lengths of fencing and repaired several sections of existing fence. The fencing will help to hold the sand dunes in place, and hopefully serve to keep human traffic on the boardwalks provided.

All in all it was a very satisfying day, and we suggested a repeat performance in the fall.

Nancy Sherwin.

P.S. - A report has been received that already part of the fencing has been torn down by vandals! How maddening - and discouraging.

## AMBLING THROUGH SHUBIE PARK

Date: Sunday, 29 June, 1986
Place: Shubenacadie Canal Interpretation Centre, Alderney Drive, Dartmouth, and Shubie Park, Dartmouth.
Weather: Misty, overcast, but calm and mild - clearing and warmer after 4pm
Leader: Dorothy Morris. Participants:- 8 adults, two ch[illegible]

Our Shubie walk encompassed social as well as the natural history of the Park and Canal System. We started at the new Interpretation Centre in downtown Dartmouth, where we looked at the restoration work already done in that area and where a knowledgeable young man took us on a tour of the Centre and detailed the extraordinary story of a dream... a dream put into words by Gov. Sir John Wentworth in 1794, not fulfilled until 1862 and outdated within 20 years.

The natural waterways of lakes and rivers across Nova Scotia had been used by native peoples for thousands of years, but it was not until the early 1800s that local merchants looked at the system as a means of speedy passage for goods - or troops - across the province.

In 1824 an English engineer, Francis Hall, drew up plans (and an estimate of $53,344) for a continuous waterway system, such as those popular in England at the time;

in the following year the Shubenacadie Canal Commission was formed with many prominent people involved. Plans envisaged a canal system to connect the lakes and rivers by 19 locks designed to lift vessels a total of 95ft from sea level to Lake Charles - the highest part of the system - then lower them across country to the Bay of Fundy..... "Such stuff as dreams are made on....."

Construction began in 1826, but from the outset problems bedevilled the scheme. Money ran out and work halted in 1831, not to be resumed for over 20 years, when a Charles Fairbanks was contracted to bring the project into line with the changing times. In 1854 work began again. But more problems developed, and again - financial failure. Fairbanks' successor, Angus MacDougall,finally carried the grandiose scheme to its conclusion, in part by the use of two innovative water-powered inclined railways to replace several locks. One raised vessels from sea level to Sullivan's pond, the second was at Porto Bello.

In 1860, The company began partial use of the system to transport goods, aided by the steam paddle-wheeler "Avery", plying back and forth towing loaded barges along the waterway. But once more the company went bankrupt. It was not until 1862 that the system went into full operation, which only lasted until 1870. This time the coming of the railways and steam power brought about the final demise of the merchants' expensive dream.

Now being cleaned up and partially restored as a heritage link and recreational resource for the future, the canal system from Dartmouth, via Findlay Park, to Shubie is well worth a separate visit.

After a quick stop at the Findlay Park section of the restoration, we went on to Shubie Park itself, where three more HFNers were waiting for us. As we sauntered along the Park paths we noted not only the historical remains connected with the old project, but also the abundance and diversity of Park flora. And Shubie is surprisingly rich in flora. It is mainly mixed woodland of pine, spruce, maples, birches and oak, with an understorey of witherod, alder, spiraea, bay, honeysuckle, etc. Less usual trees included a mountain maple (*Acer spicatum*) and the black locust (*Robinia pseudoaccacia*

We noted a great deal of damage by the larval stage of the fall canker worm. One small tree was entirely denuded of leaves apart from a few on suckers. The 'loopers', or 'inchworms', suspended by silken threads, hung like Christmas tree decorations from every twig. However, we noted signs of a healthy second growth, just emerging from leaf buds. "Where are the birds?" asked a Swiss member of the group. Good question. A noisy flock of grackles, some crows, and the odd darting small bird were all we saw. However, we did hear a few chirrups and trills from the trees, indicating the presence of white-throated sparrows (*Zonotrichia albicollis*), chipping sparrows, (*Spizella passerina*) and a robin (*Turdus migratorius*)

Most of the early spring flowers were finished - coltsfoot, mayflower, wild lily-of-the-valley, clintonia, etc., but Dorothy showed us a patch of beautiful pink mocassin flower (*Cypripedium acaule*), a few late bunchberry (*Cornus canadensis*) and even a wild iris (*Iris versicolor*) at the edge of the lake, although that one was past its prime. Many common plants thrive in Shubie - goldthread, speedwell, wild sarsparilla, buttercups, bluets, hawkweeds, clovers and cinquefoil among them. By a small beach we found buckwheat, cow-wheat and a lone strawberry in flower.

Lambkill, Labrador tea, witherod, spiraea and northern bush honeysuckle bloomed wherever the light penetrated. Golden waterlilies glowed across the lake. Beside a small rushy pond we noticed yellow wintercress and a thornless rose bush with red stems and small leaves, its crown a mass of clusters of tiny buds. In a dip alongside the high ridge close to the exit, Dorothy pointed out a patch of Indian cucumber root (*Medeola virginiana*) with its strange, stringy little blossoms hiding beneath the top-shoot leaves. And on the path back to the carpark we spotted clintonia with the largest, glossiest leaves I have ever seen - looked more like aspidistra!

A patch of lady's mantle (*Alchemelia*) attracted attention with jewel-like water drops nestling in its round leaves. Medieval alchemists claimed that the drops - if gathered at dawn - had magical curative properties for whatever ailed you.

Grasses bloomed everywhere, although we only looked closely at *Rumex*, *Carex*, and a waterside sedge with graceful hanging green flowerheads. Our prettiest find of the day, spotted by our keen-eyed Swiss on a bank near the carpark, was later identified (over tea and cookies at Dorothy's) as a Sweet-William catchfly (*Silene regia*).

There were a few pesky mosquitoes, and one or two large flies with black-marked wings, otherwise few insects. The exception was an extravagantly beautiful blue-green dragonfly which hovered before our eyes then darted into the bushes, and a water-boatman skimming around in the lake. A squirrel nattered at us from somewhere in the thick canopy - our only animal.

A quietly satisfying afternoon - thanks to Dorothy. Shubie is worth more exploration and probably a mini-survey. I have only mentioned those plants actually in flower, but we saw evidence of many other species not yet in bloom.

Doris Butters.

P.S. On inspection under the NSM's microscope, Alex Wilson believes that the chewed-up bush is probably *Prunus pennsylvanica*, or possibly *P. serotina*. Be easier to tell when flowers or fruit are there. Try and catch it next year before the bugs get at it.

The rose is a garden escape - *Rosa multiflora*.

Rosa Multiflora

## EARLY SHORE BIRDS - A JOINT TRIP WITH THE BLOMIDON NATURALISTS SOCIETY

Date: Sunday, August 3, 1986
Place: Grand Prē, dykelands and east end of Evangeline Beach
Leader: Jim Wolford, Blomidon Naturalists' Society
Weather: ?

Perhaps the Halifax Field Naturalists knew we would experience lots of hungry no-see-ums and a few "greenheads" (salt-marsh deerflies). In their absence, ten of us had an uneventful but pleasant look first at the dykelands and then the east end of Evangeline Beach.

This year there are very few open fields for roosting 'peeps' and plovers. But one grassy field held a killdeer, a least sandpiper, and a flock of at least 15 whimbrels (Hudsonian curlews).

The curlews diverted us long enough so that when we finally reached the beach the tide was beginning to recede. Therefore the large numbers of 'peeps', semi-palmated plovers, dowitchers, and black-bellied plovers, plus a few sanderlings, were beginning to forage and were steadily getting farther from us. We were unable to detect any Hudsonian godwits, ruddy turnstones, or the partial-albino semipalmated sandpiper that I had seen the previous day.

We also noted flowers of sea lavender, Spartina cord-grasses, fireweed, lady's thumb or smartweed, tall white lettuce, ragweed etc. and lots of cabbage butterflies plus a few black swallowtails.

Jim Wolford
Blomidon Naturalists Soc.

# A WHALE WATCH

Date: Saturday and Sunday, July 19-20, 1986
Place: Westport, Brier Island, N.S.
Leader: Chris Corkett
Weather: Misty and calm in the mornings, clear in the afternoons, with temperature about 13°C.
Participants: About 33, including a number of guests.

We found our own way to Brier Island where we had made independent arrangements for our lodgings. The fog horn kept some of us awake at night, but we awoke early on a misty Saturday morning and our party of 19 met at the Government wharf.

The skipper, Harold Graham, uses his 41ft Cape Islander for lobster fishing in the winter but now she has been fitted out with seats to take our party. Our guide was naturalist and fisherman Carl Haycock, who has given up fishing out of Maine to run the 'Brier Island Whale and Seabird Cruises' as a business venture.

We set out at 9.30am, and our first stop was Moores Ledge, NE of Brier, where we were joined by feeding herring making little splashing sounds as they fed on krill that could clearly be seen forming pink patches around the boat. Many seabirds had joined the herring and we saw greater shearwaters sitting on the water and passing the boat in their curious flap-and-glide- flight. Flocks of red phalaropes pecked at the plankton and then flew off as the boat approached. We also saw Wilson's petrels, gannets, terns and gulls -- but no whales.

We then set off for Boar's Head, Long Island, and as we did so the mist began to clear, along the way we saw a juvenile puffin that had not yet developed the bright beak of the adult.

We did not see any whales, but it was near here that the second afternoon group of 14 saw a minke close to the boat, a 65 foot finback resting in the water and a dozen harbour porpoise. We returned along the North West ledge hoping the riptide could turn up some whales for us.

Approaching Brier Island we passed Gull Rock, where we disturbed several grey seals that had hauled out. Continuing past Peter Island, double crested cormorants held out their wings atop of the curious formation of basalt rocks and a tern colony fussed over their three-week old chicks.

Encouraged by the afternoon whale sightings, a group of 8 of us set out again on Sunday morning (if you don't see a whale your next cruise is free!) Inshore from Moore's Ledge we saw a minke in the distance and then with a cry of "Thar she blows!" we set out after a finback. It was the same individual that was seen on Saturday - clearly identified by a notch in the dorsal fin. Carl photographed the fin as the boat came alongside the huge animal, so that this individual could be entered in the record book. Whilst the identification of individual humpback and right whales has been undertaken for some time, only recently have techniques been developed to identify individual finbacks. So we now need a name for our whale and Carl gave the Halifax Field Naturalists the honour of finding a name.

Returning home we saw diving gannets, together with sooty and Manx shearwaters.

Cruises go out daily from Westport, so anyone who wishes to repeat our experience can make reservations with 'Brier Island Whale and Seabird Cruises' by phoning: (902) 839-2273.

Chris Corkett.

Footnote:

*At the HFN Executive meeting on 29 July, the matter of a name for the 'new' whale was discussed. Unanimous decision ... FILIP.... in commendation of his enthusiasm, ideas, and hard work on behalf of HFN...and his unfailing good humour.*

... & S. Staniforth, Breakwater Books Ltd., 1985

## AN INTRODUCTION TO HFN's BREEDING BIRD ATLASSING SQUARE.

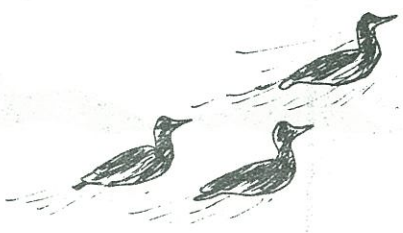
Date: Saturday, 3 May, 1986.
Place: Our Breeding Bird Atlas Square in Lunenburg County
Weather: About 5°C - heavy overcast - strong cold wind - snow flurry
Leader: Eric Cooke. Participants: 17

This was an outing for those interested in the Breeding Bird Atlas Project to familiarise themselves with HFN's square near Lunenburg.

Along the way we met our guide for the day, Eric Cooke, a much respected and well-liked 'birder'. First he led us a little way into the woods to where power lines crossed the area. Here Eric directed our attention to poles set up alongside the track which had been set up by the Power Commission to deter breeding osprey from nesting on the power poles. It seems to work quite well and we spotted two osprey and four nests on the platforms fixed to the top of the poles. Bernice told us that the nests, implemented each season by added material, had proved to be incredibly heavy; it had taken two or three workmen to lift each nest and reposition it on one of the prepared perches.

Our second stop was at Mosher's Point. Here a cormorant was spotted - "probably just visiting". Eric told us to keep this location in mind as a possible savannah sparrow breeding ground and a local hang-out for spotted sandpipers.

We were then led on a tour of Conrad Island Here we observed willets, black ducks, a kestrel, a common flicker, kingfishers, red-breasted mergansers, scoters, nesting osprey and even some passing porpoise. Eric suggested this site for finding bank swallows, savannah sparrows and warblers, later in the summer. He mentioned the piping plover which in the past has been seen nesting on the beach. In fact , a scurrying little bird attracted our attention and as we advanced slowly for a better view we barely missed treading on her nest - right in the 'line of traffic' midway between dune and ocean! We hoped that she did not leave her eggs long enough for them to get too cold.



Our next stop was at Kingsman's Beach - beautiful but bleak - where everyone was glad that they had brought along something nice and woolly. Even a local dog wore a sweater! Here we identified a pheasant, a kestrel, a cormorant and a crow. On further visits to this site one might expect to see ring-necked ducks, spotted and purple sandpipers, black ducks, and more bank swallows.

Keeping in character as dedicated bird-watchers, our ride to Hirtle's Beach was interrupted by a sudden stop and subsequent scramble to look at an indigo bunting poised for a moment on a nearby woodpile. At Hirtle's we walked along the beach where Eric pointed out eroded glacial till deposits which later in the season would probably prove to be a nesting area for bank swallows. From one of these tills a ring-neck duck was spotted.

On our way to Oxner's Beach we saw a few blue heron feeding. An uneventful walk until Eric's dog put up a pheasant to create a bit of excitement. At that point a heavy snow squall swept across - interesting to observe it coming in across the water - and our enthusiasm to continue birding evaporated rapidly. But in the shelter of Eric's garden we talked for a while of inland birds such as: barn swallows, grouse, robins, grackles and chickadees.

Our final stop was near the south side of an Indian path where we observed more breeding osprey and Filip searched for evasive mayflowers.

Special credit is to be given to Eric Cooke for the success of this outing. His bird knowledge and approachable nature acted as a catalyst for new awareness and enjoyment for us all.

Geoffrey Thomas Chinn.

There were many lambs in the nearby fields and at one point we saw the rather disturbing sight of an Alsation dog trotting along the road to a farm carrying a dead lamb in its jaws.

# Maritime Breeding Bird Atlas

MARITIME BREEDING BIRD ATLAS DAY -

The Atlas Day (June 21) outing for the Kejimkujik Region, in which the HFN square lies, took place in the Molly Upsim Lake square near Albany Cross. Perhaps because this square is quite a distance from Halifax, no Field Naturalists attended the outing. Those who did attend, however, had a good day's birding, and added significantly to the data in the square.

The weekend following Atlas Day, 6 HFN members visited the club square at Rose Bay. Fulton Lavender was Head 'square-basher', and the group recorded 59 species a good tally for a rainy, foggy day. Although no rarities or unexpected species turned up, 21 of the species observed were confirmed breeders. This indicates how productive atlassing is at this time of year, when many species are carrying food to the nestlings. Confirming that many species in one day is a terrific boost to the square coverage.

Any field naturalists who lack confidence in their bird identification skills should take part in these group outings. Spending a day with a more experienced birder is an excellent way to quickly improve your ability. This is also a great way to meet your fellow club members, and contribute to a club project. Atlas Day will be celebrated again next year, so be sure to take part.

Judith Kennedy.

Clarence Stevens - our HFN Co-ordinator - would like to remind all those who have done any atlassing to pass in their card to him, c/o N.S. Museum on Summer Street, by the 20 August, 1986.

WHAT IS A HABITAT? -

In natural history the term 'habitat' keeps cropping up!

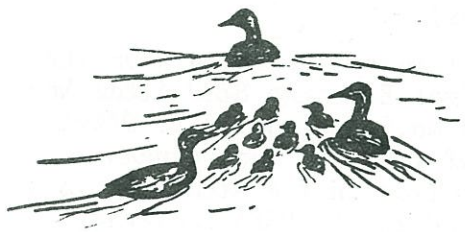
Habitat is where a species feeds and reproduces. Most field guides give a general outline of habitat requirements for each species of bird. The following summarizes basic habitats of importance to breeding birds in the Maritimes .....

SAND DUNES - sand ridges colonised by beach grass and eventually heath and bog plants (e.g. Savannah Sparrow).

SALTMARSH - found in sheltered bays/estuaries along the coast; vegetation largely grasses (e.g. Sharp-tailed Sparrow).

COASTAL FRESHMARSH - often associated with saltmarshes; bulrushes, cattails and sedges dominate (e.g. Northern Harrier).

FRESHWATER POND - small, shallow body of freshwater; plants include cattails, bulrushes, water lily and pondweed (e.g. Red-winged Blackbird, Black Duck).



*Common Eider Creche* — **Henrik Deichmann**

FRESH-WATER LAKE - open water with edges subjected to wave action; water lily, loosestrife found here, with shrubs and scrub forest at edges (e.g. Spotted Sandpiper, Common Loon).

STREAMS - stream edge vegetation such as alder, and sandy banks provide habitat for Northern Waterthrush and Belted Kingfisher.

BOG - wetland filled or covered with peat and sphagnum moss; stunted spruce at edges, good for warbler species (e.g. Nashville Warbler).

FEN - peaty wetland along lake edges and river banks; sweet gale and sedges common (e.g. Virginia Rail, Alder Flycatcher).

SWAMP - wetland with standing water; black spruce and fir, alder and other shrubs (e.g. Swamp Sparrow).

BARREN - rocky heath with dwarf shrubs and lichens; few species (e.g. Leach's Storm-Petrel on islands)

OLDFIELDS - weedy, overgrown abandoned farm fields or pastures; goldenrod, grasses, shrubs (e.g. Bobolink).

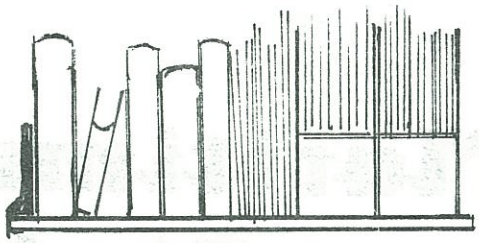
CLIFFS - steep bedrock outcroppings; sea cliffs are important for gulls, alcids and cormorants; possibly some raptors inland.

DECIDUOUS FOREST - includes maple, oak, beech, birch trees, in different associations; tree and bird species vary in wet and dry areas (e.g. Ovenbird, Red-eyed Vireo).

MIXED (DECIDUOUS/CONIFEROUS) FOREST - trees include spruce, fir, pine, maple and birch (e.g. warblers, thrushes, White-throated Sparrows).

CONIFEROUS FOREST - again species will vary in wet and dry areas; spruce, fir, pine, larch (e.g. warblers, Kinglets, chickadees).

*(This summary was taken from the Maritimes Breeding Bird Atlas Newsletter No.5, Spring 1986. Other helpful tips and much general information on the Atlassing is to be found in the MBBA quarterly newsletter; to be included on their mailing list contact Judth Kennedy c/o N.S. Museum, Halifax)*



# on the shelf

Nature Canada's Spring 1986 issue has an item on the unusual mating system of the red-necked phalarope - the females are aggressive and polygamous, the males responsible for incubating and brood-rearing. There's a look at 'Snow Eater' the Chinook of Manitoba, and a timely piece on the North American Breeding Bird Survey. Freeman Patterson's photo series for the Nature Conservancy of Canada includes a lovely shot of Hemlock Ravine.

The Summer issue of Nature Canada includes a follow-up report on the Moresby Caravan; a feature on Kiuista, the Haida village open-air classroom where youngsters discover inner resources they did not know they had, and a beautifully-illustrated article on the Great Blue Heron's remarkable survival. The main feature, however, is a look at the environmental implications in the Free Trade Talks between Canada and the U.S. So far, no environmentalists have been invited to participate in the talks.

New Brunswick Naturalist for March is particularly interesting. Articles range from owls to Australia and bird-banding to 'Bear' and Her Seven Bird Hunters, in the night skies of March.

The feature article in Catherine Traill Naturalist's newsletter for May is a detailed and well-illustrated article on *Delphinapterus leucas*, the white beluga whales in the Gulf of St. Lawrence, and the current threat to their existence. The same issue contains John Brownlie's delightful article on The Art of Discovering (reprinted from our last HFN newsletter) - and even a rundown on your editor's winter trip to Florida!

Environment Canada's quarterly Update features specific environmental topics and articles from all parts of the country in order to highlight the various services and projects carried out by the Department.

reports

## BELUGA - THE WHITE WHALE *(Part I)*

*(Abstracted from the May 1986 issue of the newsletter of the Catherine Traill Naturalists' Club).*

*Delphinapterus leucas* - beluga, the white whale.
Distribution - Northern USSR., North America, Greenland.
Habitat - - - mainly coastal; estuaries and pack ice.
Size - - - - head-to-tail: 10-16ft.
Weight - - - 1100-3300 lbs.
Skin - - - - adults: white; young slate-grey to reddish-brown, changing to medium grey at two years and white on maturity.
Diet - - - - schooling fish, crustacea, worms, molluscs.
Longevity - - 30-40 years.

The white whales, both the beluga and its cousin the narwhal, are the non-conformists among the toothed whales. A large herd of brilliant white beluga makes an impressive sight.

The beluga is noted for its well-defined neck; unusually for whales, it can turn its head sideways to a near right-angle. The beluga has no true back fin, hence its scientific name Delphinapterus - dolphin-without-a-wing, but there is a ridge along the back, from mid-body to the tail, more darkly pigmented than the body and generally scarred from ice encounters. The males are about 20" longer than the females and their flippers increasingly turn upwards at the tips with age. The flippers of the belugas are capable of a wide range of movements, and appear to serve an important function in close-quarters manoeuvering, including very slow, reverse swimming.

Belugas are capable of a wide range of bodily and facial expressions, including an impressive mouth-gape displaying 32-40 peg-like teeth which abut one another. There is considerable wear of the surfaces, sometimes to the extent that they appear to be ineffective for grasping prey. This, and the fact that the teeth do not fully emerge until well into the second or third year would suggest that feeding may not be their prime function: they may also serve an equal or greater role in visual threat displays and jawclap noise-making.

The beluga is a highly vocal animal, some of the sounds being easily heard in the air. The sound spectrum ranges from 'moos, chirps and whistles to clangs', while the underwater din from a herd is reminiscent of a barnyard and long ago earned them the name of 'sea-canary'. In addition to its vocal and echolocation skills, the beluga obviously uses vision for both communication and predation. The versatility of its expressions suggests the likelihood of subtle social communication.

Beluga are diverse feeders: a variety of schooling fish, crustacea, worms and sometimes molluscs. The beluga are capable of herding schools of fish by working closely together as a group of five or more, forcing the exhausted fish into shallow water or towards a sloping beach. They are equally adept at pursuing single prey on the bottom. The highly flexible neck permits a wide sweep of the bottom and they can produce both suction and a jet of water to dislodge prey. Small stones, bits of seaweed and mud from the stomachs of calves attest to the skills that must be learned by the young. Much of the food gathered during the feeding season is stored as fat or blubber (4-8in thick), providing insulation as well as an off-season energy supply.

Most fish-eating whales, like the belugas, have a rather fluid breeding system with mixed groups or family units (which may simply be mother-calf pairs) that aggregate on the feeding or mating grounds, and also during long-distance movements. Individuals come and go, so that the group is not stable although it may have a constant core. In belugas it appears that there is no stable pair-bond, and males are promiscuous.

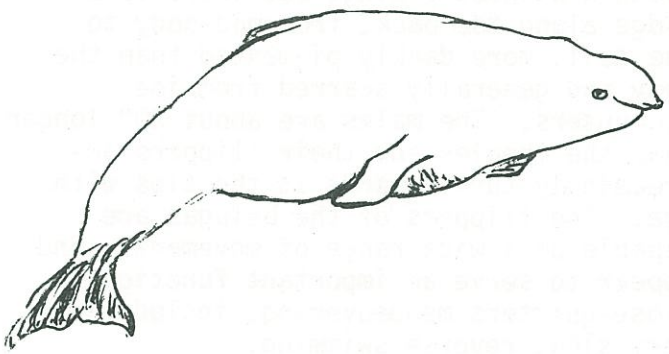
Whales usually give birth to a single young. In belugas twinning is an extremely rare event. Those that are about to calve within the estuary tend to move away from the main herd but may be accompanied by a non-pregnant or immature female. Whether this companion attends to assist the mother or is simply curious is open to question. It is possible than an older calf is attempting to maintain maternal ties.

Births have been observed to take place in isolated bays or near the shore. Initially, mother and newborn remain separate from the main herd, but may join up with other mother-calf pairs. There is a strong bond established and physical contact is maintained even while swimming - swimming so close together that the calf functions almost as an appendage to the mother's side or back. Nursing is accomplished under water, beginning several hours after birth and at hourly intervals thereafter. Lactation may last two years, at which time the mother is again in early pregnancy. The complete reproductive cycle of gestation and lactation takes three years.

Beluga appear to remain in herds for their entire life, the degree of dispersion depending on the season: being closely aggregated on the breeding ground or spread out over a larger feeding area. Within the herd there is obvious segregation by age and sex. Groups or pods of adult males can be seen as well as nursery groups of mothers with newborn and older calves. Whether the groups of adult males represent the dominant, breeding animals, or are nonbreeders excluded by some dominant bull within the herd, as yet to be determined.

Like all mammals, the belugas are warm-blooded, using part of the energy available to them to maintain a stable body-core temperature. How do they maintain a stable muscle-core temperature of 36-37°C without an insulating coat of hair, in the relatively cool environment of the sea, with temperatures usually less than 25°C? Insulation is provided by a layer of fat, blubber, lying immediately below the skin. Fat is laid down not only as blubber, the liver is also important for fat deposition and there is also significant quantities of fat in the form of oil laid down in the skeletal bones.

Belugas, like other whales, drive themselves through the water primarily by the upward stroke of their powerful tail (unlike fishes which propel themselves by a sideways movement of the tail). This movement is powered by a great muscle mass which occupies the upper region of the animal. The forelimbs of belugas, like other cetaceans, have a skeletal structure similar to that of the human arm, but modified to form paddle-like flippers which are used for steering. Whereas the rigid hull of a ship creates turbulence when it passes through the water, a beluga minimizes this by its flexible body; its blubber is not tightly fixed to the underlying muscular tissues, and there is a very well-developed system of dermal ridges beneath the skin. From the smooth, outer, cellular layer of the skin epidermis comes a secretion of tiny droplets of a high polymer of ethylene oxide. These droplets assist the shedding of epidermal cells into the water and may help to maintain a laminar flow, reducing turbulence and drag by dissipating the energy of the impeding vortices.



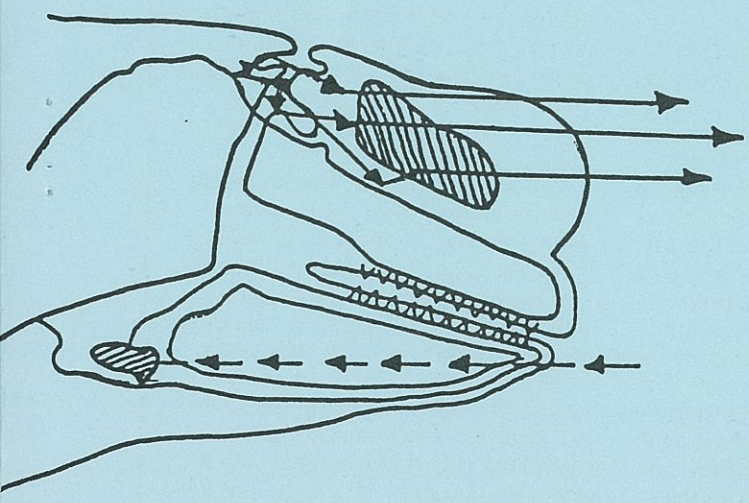
Belugas spend nearly all their lives under water, sometimes at considerable depths. Because they are mammals they breath air direct, instead of extracting oxygen dissolved in water as fishes do. They must therefore return to the surface at regular intervals to take air, and when they dive they must hold their breath. When a man dives for longer than he can hold his breath, he takes with him a cylinder of compressed air. This is necessary because the air pressure within his lungs must equal or slightly exceed the pressure of the water around him, otherwise his chest would be crushed. Under compression, the nitrogen of the air dissolves in the fluids and tissues of his body to their full capacity and when he ascends the dissolved nitrogen comes out of solution in the form of bubbles

of the gas. These may appear in any part of the body; in the joints they cause the painful condition called 'the bends'. In contrast, when a beluga dives it takes only the amount which could dissolve in the body fluids from one filling of the lungs, which is rather small. But even this small amount does not enter the blood and tissues, because as the beluga dives its lungs compress and drive the air in them into the windpipe and its branches, and into the extensive nasal passages, the thickened membrance of which prevents gas exchange to the tissues. In the belugas the chest is comparatively flexible and the diaphragm set very obliquely, so that the pressure of the abdominal viscera pushing against it on one side makes the lungs on the other side collapse.

As the beluga returns to the surface, the lungs gradually expand again, its blowhole opens wide and the foul air accumulated during the dive is expelled explosively. Sometimes this cloud of spray, known as the spout, shows clearly even in the smaller belugas. As soon as the animal has exhaled, it takes in fresh air, the air sacs of the lungs return to their expanded state for maximum gas exchange, and then it is ready to dive again. How do the muscles continue functioning since they need a supply of oxygen even in a dive? Beluga muscles contain an unusually large amount of myoglobin which combines with oxygen and serves as an oxygen reservoir so their muscles function without a fresh oxygen supply much longer than in land mammals.

There is little light deep underwater, more so in the Gulf of St.Lawrence, so belugas rely mainly on senses other than sight to inform them about their surroundings and to help locate food. They have a very highly developed sense of hearing, and communicate with each other by making a variety of sounds, and like other toothed whales, locate their prey by using sonar. This involves emitting intense, short bursts of sound in the ultrasonic range (from 0.25-220kHz). These clicks, and other sounds, bounce off objects in their path, producing echoes from which the whale is able to build up a sound picture of its surroundings. The arrangements of bones in the skull may have evolved to function like a parabolic reflector to focus the sounds.

*From: Wet and Fat, J. Lien, L. Fawcett & S. Staniforth, Breakwater Books Ltd., 1985*



Acoustic focusing

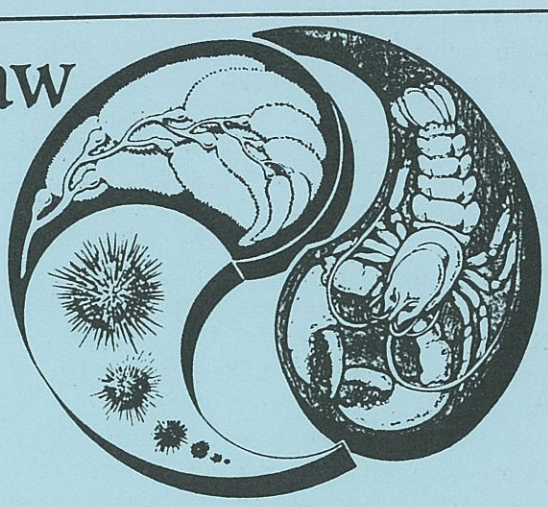
Belugas have a highly developed capacity for locating objects by means of sound (echolocation). It is thought that the melon, a waxy, lens-shaped body in the forehead focuses sounds produced in the nasal passages. Returning sound waves are channeled through oil-filled sinuses in the lower jaw to the inner ear from the skull by means of bubbly foam. Sound is thus very precisely channeled without the interference of extraneous resonance.

Reprinted from NATURE CANADA
Spring issue, 1986, courtesy of the author, Dr. Richard Brown, BIO

MERIDIAN

# The Ecological Jigsaw

## Picking up the pieces



Albert Prisner

"Ecology" is a word that has had a lot of abuse in the last 20 years. Some remarkable misdeeds have been committed in its name. Bombs have been planted to further its cause, and some companies with "Ecology" on their letterheads truck hazardous chemical wastes across the continent to the supposed safety of dump sites.

The real ecology isn't like that at all. Instead, it involves subtly unraveling an infinite number of "interrelationships" between plants, animals and their physical environment to better understand those interrelationships. Its peculiar fascination is that it gives us a glimpse of how some of the facets of our natural world are put together. It's a little like playing God on the seventh day.

The saga of the lobster and the sea urchin is as good a way as any to explain it. The lobster needs no introduction, but the sea urchin may. It's a small, hard, round animal, spiked like a porcupine, somewhere in size between a small hockey puck and a large baseball. It's distantly related to a starfish, but you won't see that at first or even second sight. If you are a very patient gourmet, you'll like the taste of their roe, but you'll have to find so many urchins first that it's hardly worth the trouble. Newfoundland fishermen call them "whore's eggs", and nobody else wants them, either.

Lobsters are quite another matter. Once upon a time, only 60 years ago, they were so common in Nova Scotia that everyone was sick of them. Lobstermen's kids used to throw them in the ditch on the way to school and go hungry, because lobsters in lunch pails meant that their dads were too poor to buy bologna sandwiches. We prize them more highly today, and that's the whole problem. Big lobsters eat sea urchins, and sea urchins graze on seaweed; but small lobsters need a safe forest of kelp in which to feed and hide while they're growing up. So the more we catch the big ones and ship them out to restaurants in New York and Amsterdam, the more sea urchins are left behind in Maine and Nova Scotia to nibble away at the kelp, and less and less seaweed is left for the small lobsters to grow up in. And so the upward spiral goes. A disease wiped out most of the sea urchins in southern Nova Scotia in recent years and, with luck, the kelp — and the lobsters — will begin to grow again. We're providentially back to square one, but if we're to keep up the lobster stock, we'll have to limit the catch. This will give the lobstermen a bad case of complaints, and push prices up as well, and so the intricate spiral of ecological consequences will spread slowly upward and outward, into economics and politics.

Unfortunately the jigsaw puzzle is so vast that we can see only one corner of it at a time, and this warps our judgment. It's a sad fact that much of our understanding of ecology has come from making a few, simple changes, and picking up the pieces afterward when they went wrong.

The classic example is the history of the Aswan High Dam on the River Nile. It was designed in the 1950s to solve two pressing economic problems: the ancient question of irrigating lower Egypt in the dry season, and the modern one of generating enough hydroelectric power to turn Egypt into an industrial economy. Naturally, there were some predictable side effects. Ninety thousand farmers had to be uprooted from their lands in the flooded valley; so, for different reasons, did the statues and temples of the pharaohs at Abu Simbel. But this was considered an acceptable price to pay, given the enormous benefits expected from the scheme.

It hasn't worked out quite like that, unfortunately. The pool behind the High Dam is nearly 480 kilometres long, and the system won't work at proper capacity until it is full. This will take longer than the designers expected, because they underestimated the rate at which water evaporates into the dry desert air. But that's the least of their problems. The still waters of the new lake are a fertile breeding ground for pond snails; these are the hosts of a parasite that, at a later stage in its cycle, enters the human body and induces bilharzia, a particularly debilitating disease of the gut, liver and brain. What's more, the damming of the river has blocked the flow of the rich silt that, from time out of mind, has made the valley of the Lower Nile the richest agricultural land in Africa. Egypt must now import fertilizer to make up the difference. And, since the silt no longer reaches the Mediterranean, the sardine fishery off the Nile Delta has disappeared, and the delta itself is being eroded away as well. It's difficult to think of a well-intentioned project whose side effects have been quite as disastrous as these.

The moral is that we can no longer afford to make these decisions on economic and engineering grounds alone. We have to include ecology in our planning as well. Not just to conserve endangered species, though that's important too, but because ecological consequences are so far reaching that we daren't ignore them. We may not always understand them, but I hope at least that we've learned enough by now to be careful

*Richard Brown*