McArthur/Bishop
P. O. Box 1916, Sussex, N. B.
E0E 1P0

N.B. Naturalist
Le Naturaliste du N.-B.

July/juillet 1986

N. B. NATURALIST / LE NATURALISTE DU N.-B. ISSN 0047-9551

This magazine is published quarterly by the New Brunswick Federation of Naturalists, 277 Douglas Avenue, Saint John, N. B. E2K 1E5. Second Class Mail Registration No. 7078. Return postage guaranteed. Send notices of change of address to preceding address. Subscription rates: in Canada $10; other countries $12.50; single issues available for $2 a copy, plus postage.

N. B. Naturalist carries articles and reports pertaining to the natural history of New Brunswick. Articles are invited in either English or French, and will be printed in the language in which they are received. The opinions expressed are those of the authors. Contributions should be sent to:

N.B. Naturalist
277 Douglas Avenue,
Saint John, N. B. E2K 1E5

Deadlines for submission of articles, notes and illustrations are January 1, April 1, July 1 and October 1. Line drawings and cover illustrations should be in black ink.

Deadlines for sightings and observations for "Nature News" are December 1, March 1, June 1 and September 1.

Advertising rates available on request.

LE NATURALISTE DU N.-B. ISSN 0047-9551

Cette publication trimestrielle est éditée par la Fédération des naturalistes du Nouveau-Brunswick, 277, avenue Douglas, Saint John, N.-B. E2K 1E5. Courrier de la deuxième classe – Enregistrement no 7078. Abonnements: au Canada $10; aux autre pays $12.50. On peut se procurer cette revue à $2 l'exemplaire plus les frais postales.

On peut lire dans *Le Naturaliste du N.-B.* des rapports touchant l'histoire naturelle du Nouveau-Brunswick. Les articles seront acceptés dans français ou anglais pour être reproduites dans la langue d'origine seulement. Les opinions exprimées sont celles de leurs auteurs. Prière d'envoyer vos articles à:

Le Naturaliste du N.-B.
277, avenue Douglas
Saint-Jean, N.-B. E2K 1E5

Dates limites de présentation de vos articles, réflexions, avis et dessins: les 1er janvier, 1er avril, 1er juillet et 1er octobre. Les dessins au trait doivent être préparés à l'encre noir.

Dates limites pour toute observation destinée à la rubrique "Nature News": les 1er décembre, 1er mars, 1er juin et 1er septembre.

Tarifs publicitaires disponibles sur demande.

Contents

Cover Illustration
Black-crowned Night-Heron,
Drawing by Halton Dalzell.

Illustration de la couverture
Le Bihoreau à couronne noire,
Dessin par Halton Dalzell.

From the Editor

In springtime I often see bird feeders that have been carefully tended all winter but, with the snow vanished, have been abandoned by their owners and of course by the birds. I know the philosophy behind that practice – "from now on the birds can fend for themselves," and indeed they can. However, for two reasons I advocate continued feeding until least the middle of May.

First, there are occasional "coldsnaps" when the requirement for energy-giving supplements may be essential for birds which have used up much of their reserves in migration. My second reason might be termed selfish because it benefits mostly the feeder's owner. But what a nice reward! In addition to the regular visitors, new and exciting arrivals – many of them colourful songsters – appear. It starts with the first blackbirds. I welcome the change and admire the lovely iridescence of their plumage. Soon the first song of a Song Sparrow rings in the frigid air. Each day brings new species and colours, heightening my anticipation. A flock of Purple Finches mingles with the yellow of Goldfinches. Jays sprinkle patches of blue into the hungry multitude. From time to time special visitors make a brief appearance – a Rose-breasted Grosbeak, a Baltimore Oriole or something so unusual that we pull out our books and telephone other birders. All are pleasures that those who have discontinued their bird feeding will be missing.

The coming of spring promotes another activity with our feathered friends in mind. Nesting boxes are built and erected in every shape, size and colour. Often however, they are little more than an ornament of no value to the birds. There are several reasons. Often bird houses are built without consulting some reliable book or expert. I often see boxes with holes that either would only be good for hummingbirds (which do not nest in boxes), or so big that a squirrel or starling could enter to rob the eggs and drive away the desired species. Bird boxes are sometimes erected in improper habitat or too close together. One should remember that not all birds live in close company with each other. While, for example, Purple Martins do, Tree Swallows don't. If the location for a martin house is not suitable (They require open spaces, relatively warm locations not prone to strong winds) then the house will most likely be taken by a single pair of Tree Swallows who will keep away every other pair.

Bird baths and hummingbird feeders are another great bird attraction. Both can be easily made. Any shallow container makes a good bath. An inverted garbage can lid is a dandy; a rock placed in the middle provides a landing spot and weighs the lid down. A hummingbird feeder can be made from an upside down bottle with a cork and a glass or plastic tube. Sugar solution should not be too strong (about one

teaspoon of sugar to a quarter cup of water). You can add some red food colouring to help attract the birds. It is important that some red colour be attached to the tip of the tube. I use red plastic tape. Hopefully those tips will help you derive pleasure watching birds all year round.

There are a number of good books on nest boxes and bird feeders. Some of them are available from the Nature Canada Bookshop. Good luck and good birding.

Mary Majka

From the President

FEEDBACK

With this issue we have enclosed two loose sheets; one for reporting nature observations and another for comments and questions. I hope you will take advantage of this opportunity to help provide more information about our provincial flora and fauna, including first blooming dates, bird arrival dates, new or interesting records for plants or animals, unusual sightings of any kind. I would like you to become more a part of the Federation and to realize how very important your input is to the success of this organization and our magazine.

This is also your opportunity to ask the experts about natural phenomena which have puzzled you. If your question concerns the name of a plant, please try to press and thoroughly dry a small piece with a leaf and flower or fruit, and also include a description of its habitat. For animal life, carefully describe field marks, behavior and habitat. Photographs are always helpful and will be returned if so indicated.

I am also asking you to indicate your favorite area for pursuing your interest in nature and/or areas you feel are special and should never be developed. This information will help with decisions concerning significant natural areas and their protection in our province.

Please use these sheets (expanded where necessary) to send us your observations, comments and questions. We need your **FEEDBACK**.

Hal Hinds.

TEN GRASSES YOU CAN KNOW

Joe Harvey*

Grasses are a strange group in that, while they provide the majority of food for humans including (indirectly) beer, beef, milk and eggs, as well as obvious things like bread and spaghetti, they are *terra incognita* as far as recognizing the wild species is concerned. The reason most people do not know the grasses is obvious – they (the grasses that is) are wind pollinated, have no brightly coloured leaves ("petals") and so do not draw themselves to the eye. In fact the necessity to adopt a "stripped down" flower structure to allow free pollen movement by the wind, means that grass flowers are very small and abbreviated things indeed. However, for all their small size they are quite complicated and are so different from "normal" flowers that a whole lot of new terms have to be used to describe them, e.g., glume, lemma, awn. So not only are the flowers not attractive but the techniques used to describe them are positively repulsive.

North America has approximately 1500 grass species, Nova Scotia has about 100 so it is reasonable to expect a naturalist to know ten of the common ones and that is the aim of this article.

1. MEADOW FOXTAIL (*Alopecurus pratensis*). A tall grass which shares the false spike type of inflorescence with timothy grass with which it is easily confused at a few feet. However, close inspection of a head reveals a profusion of tiny bristles (awns) on the florets which are missing from timothy (*Alopecurus* has awns – get it?). Foxtail is just about the first grass in the province to flower, starting in early May in sheltered places, but sweet vernal grass may beat it.

2. TIMOTHY (*Phleum pratense*). One of our commonest pasture and roadside grasses and much favoured by farmers because of the heavy hay crop it produces; most of the milk you drink is made from timothy. Like foxtail, timothy has a dense spiky head and may grow from a few inches to several feet high. It got its name from Timothy Hanson who took a trip to France in 1720 and collected grass seeds of various kinds. The one which grew best he advertised so enthusiastically it got called timothy. It is now the prime pasture grass of the whole northeast. It flowers about six weeks after foxtail and the heads persist long into winter, sticking out of the snow.

---

* Reprinted with permission from Halifax Field Naturalists' *Newsletter* No. 39, pp. 8-10, March–May 1985.


1
2
3
4
5
6
7
8
9
10
jh

3. SWEET VERNAL GRASS (*Anthoxanthum odoratum*). This vies with one or two others for the place of the first grass to flower in the spring. The "sweet" in the name comes from the scent of the leaves which on drying give off a pleasant, almost vanilla odour of coumarin. It shares this with another Nova Scotia grass, holy grass (*Hierochloe odorata*) found at the head of salt marshes. Sweet vernal grass used to be looked on favourably by farmers because of the scented hay it produces, but coumarin is bitter-tasting and somewhat poisonous. The plants are short and tufted and the secret of identifying them is to pick a stalk and look at the junction of the leaf blade and the leaf sheath. The presence of both a membranous ligule and a tuft of hairs is diagnostic. If you find it pick some, let it dry and the next day get a sniff of the fragrance.

4. COUCH or TWITCH (*Agropyron repens*). A common weed which is the terror of the flowerbed and the farmer's ploughed field. Couch develops an extensive underground system of rhizomes which break on being pulled. Each fragment of rhizome can reproduce a whole plant so getting rid of it is no mean feat. Almost every roadside in every town has this grass on it. The spikes are of a very simple, straight structure unlike any other grass except the much smaller ryegrass (*Lolium*). Like all the grasses, except the last two, described in this article it was introduced from Europe where co-existence with agricultural man seems to have raised a group of vicious weeds as well as some useful species. There is a native Nova Scotian couch (dare I call it the Nova Scotian twitch?) which occurs on riverside, cliff and coastal areas, but this lacks rhizomes and never invades a man-influenced area.

5. KENTUCKY BLUEGRASS (*Poa pratensis*). Common in lawns, roadsides and pasture. Its name is a misnomer, the bluegrass of western Kentucky, which Daniel Boone and other early explorers reported as coming to the belly of their horse, was *Andropogon*. However, as soon as intensive cattle and then horse ranching got under way the *Andropogon* could not stand the grazing pressure and was displaced by various European grasses, chiefly *Poa* and the name was transferred to *Poa pratensis* which excels in the hot but humid Kentucky climate. Fairly dwarf strains which are easily grown commercially are highly touted for lawns, but in truth tend to be somewhat coarse growing. A common variety is "Merion". The related annual poa (*Poa annua*) is common in flowerbeds and along footpaths where it is able to withstand trampling better than most plants.

6. RED FESCUE (*Festuca rubra*). The needle leaves of this grass are the result of a rolled shape taken up by the blade; quite a few other grasses do this, it helps in minimizing water loss. Sheeps fescue is a smaller version of the same basic

pattern and tends to grow on dryer, more rocky areas than red fescue which is common in lawns and roadsides. Used in the finest lawns.

7. COCKSFOOT, (*Dactylis glomerata*). Like timothy this is a tall pasture grass common along roadsides and in waste land. The clumped, one-sided arrangement of the spikelets (the "cocksfoot" of the name) is quite distinct. This grass is also called orchard grass in the United States and is widely grown for hay.

8. BENT (*Agrostis tenuis*). A small, fine-leaved grass which is probably the most abundant lawn and roadside species in the Maritimes. The open panicle of very small, single-flowered spikelets is a common sight along roadsides and when in flower or with dew on them gives a distinct misty effect when you are driving along the road. Good as a lawn grass.

9. MARRAM (*Ammophila brevigulata*). The grass responsible (with wind) for the formation of our coastal sand dunes, its very extensive rhizome system binds the sand which the leaves have collected around their base. This way the grass has been responsible for building dunes over 200 feet high. The growth of the rhizome is stimulated by having sand dumped on it – dune growth is thus automatic. In addition to having remarkable rhizomes, the leaves of this plant exhibit to an extreme degree the protection of the (upper) surface by the rolling of the leaf blade into a tight cylinder. This encloses the stomata, thus saving them from sand blast and drying winds.

10. CORD GRASS or SALT HAY (*Spartina alterniflora*). Performs the same binding task on estuarine mud that marram does on sand. Its rhizomes possess air channels which allow the roots to respire aerobically in notoriously stinky (anaerobic H_2S) mud. It is a coarse plant standing erect on the marsh. There is a dwarf fine-leaved relative (*S. patens*) on the landward side of the cord grass zone and a taller species (*S. pectinata*) which grows to 1.5 m in salt-free portions of the upper marsh.

MAPPING BIRDS: A LABOUR OF LOVE

Judith Kennedy

For many birdwatchers, the summer months are distinctly anti-climactic. Birding excitement begins in mid-March with the arrival of the first Red-winged Blackbirds and builds steadily through the raptors and waterfowl of April to the frenzied peak of May's returning warblers. By the end of May, however, migration has slowed down, and so have a lot of birders.

Starting in 1986, however, summer is going to be different for hundreds of birders in the Maritimes. In fact, the latest avian pastime reaches its zenith in June and July, providing a two month extension to the birding season. This has been accomplished by focusing attention on the reproductive cycle of birds, a process which has gone relatively unnoticed among amateur birdwatchers in the past. But a new project, the Maritimes Breeding Bird Atlas, is bringing nesting into the limelight.

While a breeding bird atlas is new for the Maritimes, the concept itself has existed for several years. The first atlas project was undertaken in 1968 in Great Britain, and was published in 1976. Since then, the atlas egg has hatched in many countries, including Canada and the United States. In North America there are 38 atlas projects in various stages of completion. These include Ontario (1981-1985) and Quebec (1984-1988), with organization beginning for projects in some of the western provinces.

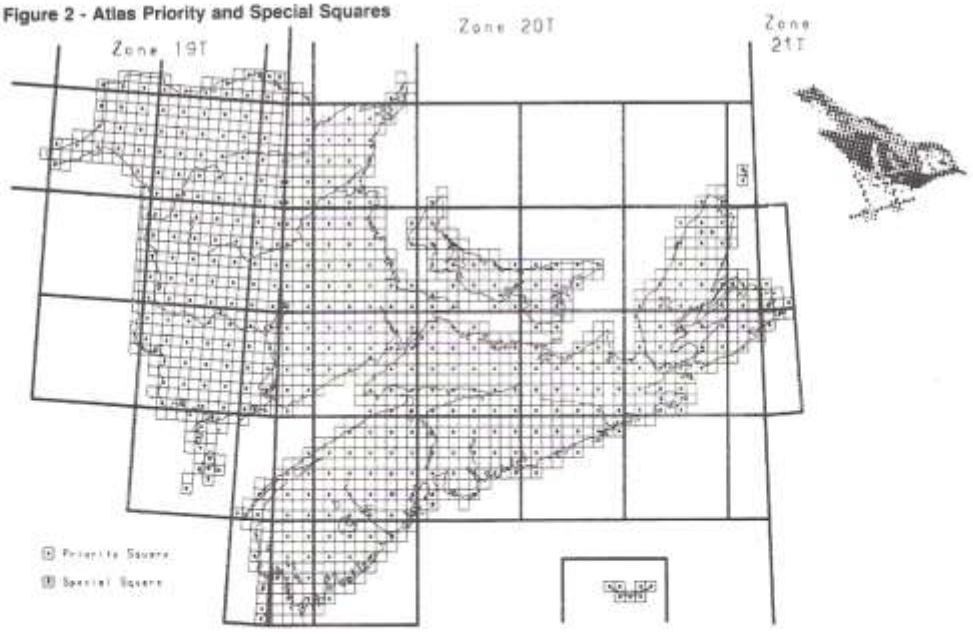
The end product of a breeding bird atlas project is a book of maps. Each species of bird which breeds in the Maritime Provinces will have a map showing its distribution. Although many field guides contain range maps with similar information, they are usually compiled from scattered records and "best guesses" by the author. An atlas map is composed of actual evidence recorded by volunteers specifically looking for breeding in their area. This means that the maps in an atlas are much more accurate than those in a field guide, and have a great deal of scientific merit.

The data collected for the breeding bird atlas has many conservation applications. After determining which birds are where, it is possible to pinpoint areas that are ecologically significant and should be given high priority for preservation. It also documents the distribution of rare, threatened and endangered species which will facilitate assessment of their status. Because atlas methods are standardized, the procedure may be repeated at some point in

the future to monitor changes in bird distribution. Equally important, an atlas is an excellent way for participants to improve their knowledge of the natural history of birds.

In order to get records which are evenly spread across the Maritimes rather than clustered around population centres, observers are asked to work within the bounds of a grid cell. Canadian topographic maps have the Universal Transverse Mercator (UTM) grid printed on them. That grid delineates squares, 10 km to a side, each with a unique number/letter code for identification. It is ideal for atlas purposes as it provides a standard grid readily available to volunteers, and the data from each square can be computerized using the UTM square codes. There are roughly 1600 10 km x 10 km squares in New Brunswick, Nova Scotia and Prince Edward Island – quite a task to get a birder in each one. The initial goal of the Maritimes atlas is to completely cover one quarter of those squares (Fig. 1), and increase our expectations upon achieving that level of coverage. Fieldwork is spread out over five seasons (1986 to 1990 inclusively), so an atlas volunteer completing a square in less time would have the opportunity to work in a new square. Although we would be hard pressed to find 1600 volunteers, by encouraging people to record in new squares, we may be able to achieve full coverage.

Figure 2 - Atlas Priority and Special Squares



Once a volunteer has located their square, the first step is to determine the different habitat types present. A general overview of the habitat may be obtained from the topographic map, but a map cannot provide specifics such as the difference between deciduous and coniferous forest types, for example. Driving through the square or exploring it on foot will make these differences apparent. Surveying the various habitats will reveal most species to be expected in a square, while eliminating the need to explore the whole area. This will help save considerable effort in squares with relatively uniform habitat, particularly if the road access is poor.

A square is completely surveyed when two criteria are met: at least 20 hours have been spent in the square over the 5 year period, and breeding evidence has been recorded for 75% of the species expected to breed in the square. The time factor is an estimate based on the results from previous atlas projects. In general, it will take an experienced observer 20 hours at the height of the breeding season to meet the expected species totals. The number of potential species are estimated using a formula which predicts a given number of species for each different type of habitat. The British found that even a top-notch birder could not find every breeding species in a square in 100 hours. These figures are applied as a guideline to help volunteers know when to devote most of their energy to a new square.

The fun part, however, is looking for breeding evidence. Nests themselves are often difficult to find, as they can be built high up in the tree canopy or hidden in the centre of shrubs. Fortunately, birds indicate breeding activity through behavioural means as well, so it is not necessary to find a nest in order to record evidence. The males of many species sing to attract mates, and by identifying the species a birder can record evidence for the "possible" category. "Probable" records, the next level of evidence, constitute observations such as a male-female pair of birds, courtship displays, and agitated behaviour. The highest category is "confirmed" records, for instance birds gathering materials for nest-building, fledged young birds, adults carrying food for the young, and, of course, a nest containing eggs or young. Because confirmed records have the highest degree of certainty, atlas volunteers are encouraged to collect evidence in that category for as many species as possible. There are a few tricks one can employ to confirm breeding, but one of the easiest is to visit a square in the latter part of the season to look for adults carrying food.

The other parameter of interest is abundance. It would be virtually impossible to count actual numbers of a species, but it is relatively simple to make an estimate. The categories for abundance are based on a logarithmic scale (eg. 1

pair, 2–10 pairs, 11–100 pairs, etc., up to more than 10,000 pairs). Estimates are made by assessing the amount of suitable nesting habitat for each species within the 10 km square. Having a general idea of the abundance of a species will be particularly useful as a reference in the future. Knowing that a breeding colony has declined from 101–1000 pairs to 2–10 pairs provides much more insight into the status of the species than merely knowing that it is still there.

The completed atlas will provide the first comprehensive look at the status of breeding birds in the Maritimes. Amateur naturalists can make a tremendous contribution to the base of scientific knowledge. As governments restrain their spending, more and more of the responsibility to assess the health of our environment may fall on interested volunteers. It isn't necessary to be an expert in order to provide useful information. Anyone with a moderate ability to identify birds is welcome to participate. Keep your binoculars out this summer; spring migration is only the opening act.

For more information please contact Maritimes Breeding Bird Atlas, c/o Natural History Section, Nova Scotia Museum, 1747 Summer Street, Halifax, N. S. B3H 3A6, telephone (902) 429-4610.

NO LONGER HYPOTHETICAL!

Cecil Johnston

As ordered by Jim Wilson I had been keeping a close eye on Saints Rest Marsh. His final words had been, "One never knows what will show up there in the spring, so don't be the means of us missing a good one by goofing off."

At 5:35 p.m., April 15th, I looked through my telescope, to scan that portion of the marsh visible from my home. Almost immediately I spotted a group of birds consisting of a Great Blue Heron, two Black Ducks, two Herring Gulls, and an unknown white bird, all together in a small pond. The day had been a warm one, and the resultant heat shimmer caused such distortion, that my identification of the heron, ducks and gulls, was done more through general familiarity than observation of specific field marks. Such was not the case with the white bird however. The rapid movements of the feeding bird, and the heat distortion, did not permit definite identification. The best I could do at the distance involved, almost three quarters of a mile, was to determine that I was looking at a white bird, smaller than a Herring Gull, with a long neck, and what appeared to be an orange beak and legs.

Since I couldn't say what it was, I tried to decide what it wasn't. It wasn't an immature Little Blue Heron because there was no trace of darker coloration on the folded wings, and the legs appeared orange, rather than greenish. It wasn't a Snowy Egret because the beak and legs were orange, rather than black. I was almost convinced I was looking at a Cattle Egret, but I was not happy with that conclusion. It was not the right habitat for a Cattle Egret, the posture was not right, and the dowitcher-like method of feeding was unlike a Cattle Egret. Also, every once in a while, when the heat shimmer permitted, the bird's bill appeared somewhat down-curved. Unfortunately, at that time, I had to leave to put on a slide presentation at a nursing home. On my return, it was too dark for further observation.

The next morning, at 7:30 a.m., I again went to the telescope, and much to my delight, on the same pond, in the same company of birds, I saw not one, but two unknown white birds. Viewing circumstances were much different. Although it was a bright sunny day, the air had not yet had time to warm up, and was crystal clear. The picture I saw through the eyepiece was razor sharp and rock steady. The two white birds, smaller than Herring Gulls, with long necks, had long decurved red beaks, red faces, and long red legs. A quick glance at my field guide, and the identification was complete. Not one, but two White Ibises. Pausing only long enough to phone Jim Wilson's home, I headed for Saints Rest Beach, in order to get a closer look.

Just short of the beach, a clearing through the roadside shrubbery permitted a good look at one of the birds. Plainly visible at that closer distance, the bird appeared somewhat off white in coloration, rather than the brilliant white of a Snowy Egret for instance. Two photographs were taken before my attempts to get closer caused both birds to fly to the other side of the marsh. Jim Wilson met me at the tourist bureau on the throughway, but we had to return to the original area to get a good look at one of the birds. We then separated to set the rare bird alert in motion. Everyone who went to the marsh, saw either one or both of the ibises. Peter Pearce and a friend saw one ibis, a Snowy Egret, and an American Bittern. Molly Smith saw both ibises and the Snowy Egret. The sighting of White Ibis raised to 232 the total number of bird species seen on or around Saints Rest Marsh since we started keeping records.

The only previous New Brunswick record of this bird is considered hypothetical. W. Austin Squires in *The Birds of New Brunswick* reports that, "A bird seen from the tower at the Saint John airport by two traffic controllers on July 1, 1968, was almost certainly this species."

As a point of interest, one of the ibises was accompanied everywhere by a Herring Gull. The ibis ignored the gull, which kept a close eye on the ibis' feeding habits. The gull would approach, watch the ibis feed for a few moments, and then attempt a couple of pecks at the marsh surface to imitate it. Failing to come up with anything worth eating, the gull would look at the ibis almost with disgust, but nevertheless continue to follow it about the marsh, from time to time attempting to feed ibis-style. Perhaps someone more knowledgeable than me, could explain this "Odd Couple" behavior.

Editor's Note: One of the ibises remained at Saints Rest till at least May 1. Another White ibis appeared at Keirstead Mountain, Kings County, on April 13 (Gesner Clarke) and was seen be many observers as it fed in a field there until at least April 28. DSC.

SOME DETAILS OF THE NESTING OF THE AMERICAN ROBIN IN NEW BRUNSWICK

Richard Blacquiere, Sara Griesbach and Mike Morris

The American Robin *Turdus migratorius* is a widespread and well-known bird throughout much of North America. Its habits of feeding on lawns and nesting in backyards make it obvious to even the most casual observers. For many, the robin is the harbinger of spring, arriving in New Brunswick as bare ground begins to appear through the melting snow. Its song is loud, pleasant and easily recognized. Commercial blueberry growers know the robin well, too, as a potential competitor for the valuable fruit.

Familiarity, however, does not guarantee that the robin has been well studied. In fact, it does not seem to be a favourite of researchers. Perhaps being so common makes robins unfashionable. Mounting an expedition to your own backyard doesn't carry much prestige. In addition, their habit of not having well-defined territories and sometimes feeding far from the nest site make them difficult to follow. Ornithological studies in recent years have tended to adrress individuals rather than groups of birds, and robins present some problems in that regard.

One aspect of robin breeding biology which is amenable to study is nesting. Their nests are large, distinctive, and fairly easy to find just by looking in trees and shrubs in backyards or along the edges of fields. The adults themselves, being large and noisy, may even attract attention to the nest location. The ease of finding their nests resulted, from 1960 to 1980, in more than 1300 New Brunswick records of Robins being deposited in the Maritimes Nest Records Scheme (MNRS), a file system maintained by the Canadian Wildlife Service in Sackville, N. B.

From that large source of information, we examined all the New Brunswick cards for robins for the 21 nesting seasons from 1960 to 1980. There were 1293 cards with some form of data useful for our particular purpose which was to calculate survival of the eggs and nestlings. While examining the cards we extracted other data which we summarized and also present here.

The geographical origin of reported nests probably reflects more the distribution of the most active contributors, rather than of robins. Over 49% of the cards were from just two counties, Kings and Westmorland.

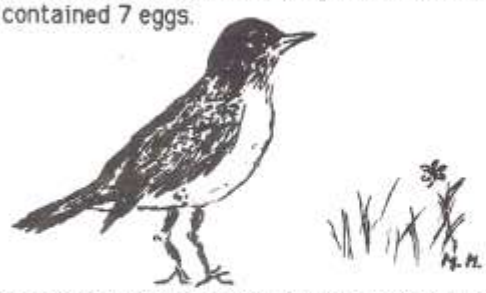
Because of the different ways habitats were described only a general impression of nesting habitat can be gained. We divided habitat into three broad categories: woodland, edge-farmland, and suburb. Of 1286 cards the breakdown was as follows: edge-farmland, 50%; woodland, 29%; suburbs 21%. Placing a description of the habitat in one of those divisions was sometimes difficult, so the results should be considered an approximation. There may also be an observer effect, partly reflecting where people looked, rather than where the robins were.

Nest sites were divided into four categories, there being the same problems in interpretation of data as with habitat. They were: ground, man-made structure, tree, and shrub. (The distinction between trees and shrubs is one of size; a shrub becomes a tree when its stem diameter at breast height is greater than 25 mm.) From 1259 cards with relevant data, we determined 76.2% of nests were in trees, 11.8% were on man-made structures, 11.4% were in shrubs, and 0.6% on the ground. It thus seems that robins prefer larger trees but will occasionally nest in shrubs, or on a window sill. Robins almost never nest on the ground. The height of the nest above ground also reflects the preference for trees. Mean nest height (1250 cards) was 2.1 m, most ranging between 0.6 m and 4.5 m. One exceptional robin nested 15 m above the ground.

Analysis of nest contents is limited by the number of observer visits and the point in the nest cycle when the nest was examined. The number of eggs a bird

lays, the clutch size, can be determined only when 2 or more visits to a nest are made during incubation and the number of eggs does not change. There were 196 cards with information on clutch size (see box). Two birds laying in the same nest may account for the single nest that contained 7 eggs.

Clutch Size	% occurrence
2	9.2
3	54.1
4	33.7
5	2.6
7	0.4



By making a number of assumptions about what point during incubation a nest is at, it is possible to backdate to the day the first egg was laid[1]. The estimated dates of laying of the first egg in a clutch illustrate the seasonal nature of the breeding cycle. The laying period, for the first eggs ranged from April 22 to July 30, based on 1119 nests. (Yearly differences in weather can cause the initiation dates to vary). The data, broken into 5-day periods are illustrated in Figure 1. The peak (first egg) laying period occurred 12-16 May and a second, lesser peak 16-20 June, representing second nests, a common trait of robins in New Brunswick. The second peak may be less prominent than the first because of re-nestings of birds that lost their nests prior to young fledging.

Knowing the date of laying of the first egg, it is possible, using a mathematical technique called corrrelation analysis, to look at seasonal trends in clutch size. There is a slight, but not statistically significant, trend toward a smaller clutch with advancing season. In other words you would be a little more likely to find a 3-egg clutch in July than a 4-egg clutch.

Calculation of the survival of a nest and its contents is based on a method developed by Mayfield (1961, 1975) and modified by Johnson (1979). It provides a relatively easy way of calculating reproductive success in terms of either the

1 For example, a nest with 4 eggs is found on May 14. It is assumed that that day is exactly the mid-point of the incubation period. Taking the incubation period to be 13 days (Howard 1967), May 14 would then be Day 7 of incubation. Back dating to the beginning of incubation would put the date at May 8. Incubation is generally considered to begin the day the last egg is laid, so the fourth (and last) egg was laid on May 8. Allowing one day per egg, the first egg was laid on May 5. Complications with that method arise if more than two visits are made, if there is a change in nest contents, or the eggs have hatched. But the exercise can be useful, any calculation of a first egg date being earlier than it actually is probably being balanced by another which is later.

individual young in a nest, or of the entire nest without regard to the individual nestlings it contains. The approach taken depends on the kind of information needed and on the species involved. Here we present the data with the young treated as individuals[2].

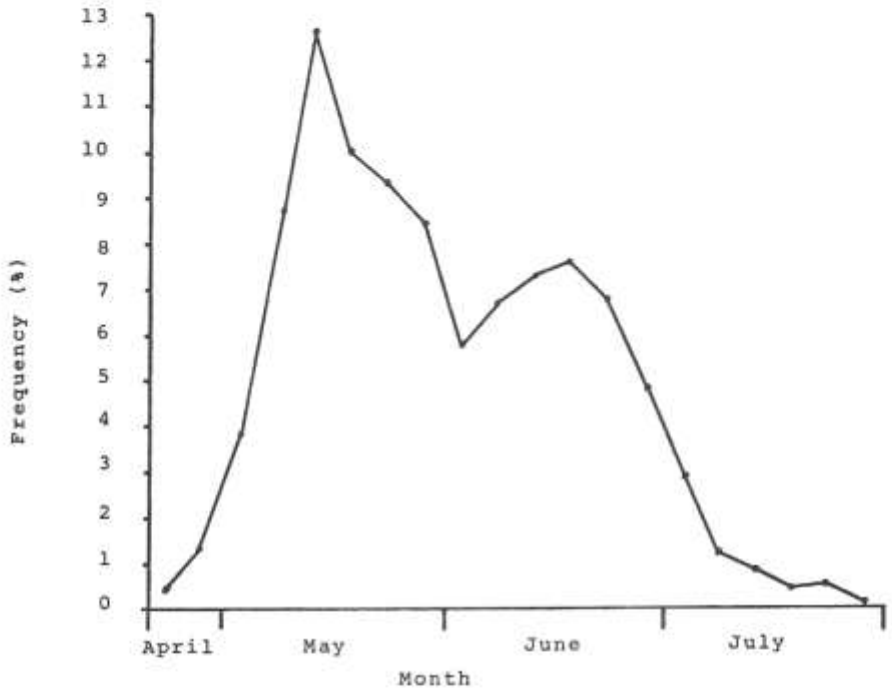


Figure 1. Percent frequency of American Robin initiations (first egg laid) over the nesting season. Combined data from 1960-1980 inclusive.

2 The method depends on at least 2 visits to a nest to record contents. An example should help explain the procedure. Suppose a nest is found with 4 eggs. It is visited again 2 days later and the same 4 eggs are there. (The female has flushed off the nest so we know it has not been abandoned). Those 4 eggs are known to have survived, then, for 2 days each, giving a total of 8 egg-days. If the nest had been empty (preyed upon) the assumption would have been that they had survived for one day only, for a total of 4 egg-days. As with calculating the date of laying, the midpoint is assumed when the actual time is not known. The reasoning is that the nest could have been robbed a few minutes after the first visit or a few minutes before the next visit 2 days later. The midpoint is thus used, in expectation that the underestimations will balance the overestimations.

The actual mathematical procedures are not important: suffice it to state that they involve the number of eggs lost, the number of days all the eggs have been exposed, and the length of the incubation period. We determined the probability that an egg will survive through the incubation period to be 0.6454. Therefore, a little better than 6 eggs out of 10 will survive from laying to hatching. The hatch rate is calculated simply by dividing the number of eggs hatched by the number of eggs in the nest immediately prior to hatching. Of 760 eggs in the nest, 728 hatched, giving a probability of hatching of 0.9578. Thus, close to 96% of robin eggs that were left in the nest to hatch, actually did hatch. The young are treated, as the eggs were, using losses, exposure, and nestling period to calculate a probability of fledging. That calculation is not as precise as for eggs because young can leave the nest early if disturbed. But using a nestling period of 13 days the probability that a nestling survives to fledging is 0.7478, i.e. nearly 75% of nestlings actually fledge.

What are the chances of an egg surviving to hatch, and the nestling to fledge? It is simply a matter of multiplying the three probabilities together (0.6454 x 0.9578 x 0.7478) to get a combined probability of 0.4623. Thus, only about 46% of the eggs laid will actually produce a young bird that will leave the nest. Despite that apparently low success rate there is no cause for concern: healthy populations always seem to produce many more young than will survive to be reproductive adults.

We thank A. J. Erskine, A. D. Smith, and H. Anderson, of the Canadian Wildlife Service, who provided information on, and access to, the Maritimes Nest Records Scheme. Meda Adair was able to sort through the handwritten scratches to type the manuscript, and we are grateful to her.

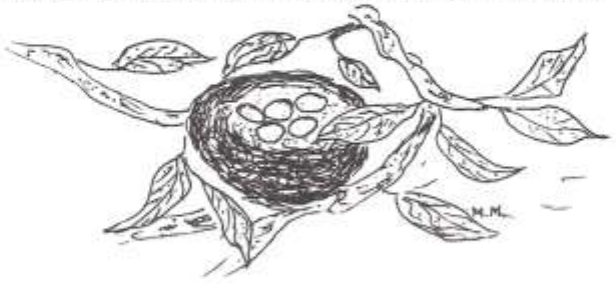
References

Howard, D. 1967. Variation in the breeding season and clutch size of the Robin in northeastern United States and the Maritime Provinces of Canada. Wilson Bull. 79:432-440.

Johnson, D.H. 1979. Estimating nest success: the Mayfield method and an alternative. Auk 96:651-661.

Mayfield, H. 1961. Nesting success calculated from exposure. Wilson Bull. 73:255-261.

Mayfield, H. 1975. Suggestions for calculating nest success. Wilson Bull. 87:456-466.



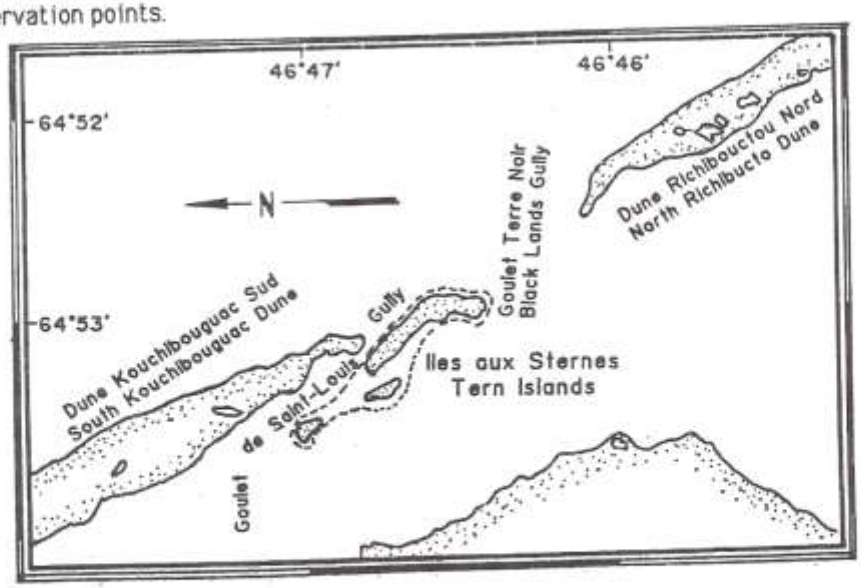
Tern Islands Protected

Harry Beach

In last summer's *N. B. Naturalist* (Vol. 14, No. 2) I wrote a short note about the largest Common Tern colony in New Brunswick. In addition to 7000 tern nests, Tern Islands, a small group of islands in Kouchibouguac National Park, also host about 100 Red-breasted Merganser nests. It seems the swarming terns provide protection from predators for the mergansers. Occasionally we also record Piping Plovers nesting on the islands. With so much action it is clear that the site is one of the most important wildlife habitat resources on the northeast coast of New Brunswick.

Being located inside a national park, the site is protected from disturbance to some degree. However, in recent years park staff have been troubled by increasing use of the islands by humans. Because the first responsibility of a national park is to protect natural resources for future generetions, the park superintendent has now closed the islands to all human visitors from April 15 to September 30 each year. The park service wants the breeding birds to be able to get on with what breeding birds do without having to worry about dogs or people stepping on their nests.

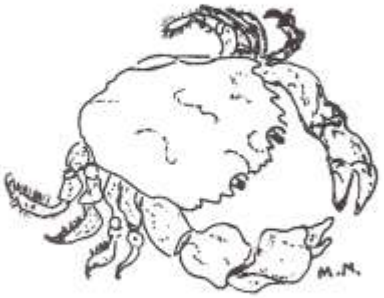
Interested naturalists will still be able to observe the action on the islands but only from a distance. Ask at the Information Centre for directions to the best observation points.



Seashore Strolls

Nocturnal Wanderings

Bob Rangeley



One of the more active and excitable intertidal animals is the shore crab (or green crab), *Carcinus maenas*. That decapod crustacean is the only Bay of Fundy crab you will encounter well up on the shore, Other crabs one might see, in tide pools or at the low water mark, are hermit crabs, the rock crab and possibly the toad crab. The shore crab is found in salt marshes, in the drainage channels of mud flats and on rocky intertidal shores where wave action is not too severe.

The shore crab is a common intertidal animal found along both coasts of the North Atlantic. It is a European native which has become very numerous in northern New England and in Canada since the 1940's and 1950's, as it spread from south of Cape Cod in the late 1800's. Adults migrate onshore and during the day they will hide under rocks while the tide is out. Their diet includes some algae and other plant material and various intertidal annelid worms, crustaceans and molluscs, particularly clams, mussels, dogwhelks and periwinkles.

On the rocky shore the crab's mottled green carapace provides perfect camouflage among the long algal fronds of the knotted wrack, *Ascophyllum nodosum*, and the other rockweeds. While there may be thousands of crabs on a shore, they are not easily seen during the day. You will likely find some under rockweeds but they are most abundant where they congregate in rock crevices and under loose boulders. Try turning over a large flat rock and you may be surprised to find up to 20 or even 50 crabs of all sizes scurrying to get back under cover.

While looking for these crabs under rocks can be fun and interesting, the best way to see them is when they're out hunting – at night. A stroll on a rocky shore at night is a guaranteed exciting activity although not without its hazards! I would recommend that you go to a familiar shore or at least arrive while it is still light so that you can check out the terrain. A shore with a gentle slope with lots of cobbles and away from an exposed headland will likely have many resident crabs. For the crabs to be active the air temperature must be at least 8° to 10° C, and preferably much warmer. Each observer must have a good flashlight, otherwise walking will be treacherous. If you intend to photograph the crabs, and

they make good subjects, it is best to observe them and focus the camera lens under red light. A direct beam of white light often causes them to run away or stop feeding. The easiest solution is to colour a piece of sandwich wrap with a red felt marker and place it over the glass of the flashlight.

Wait until at least a couple of hours after sunset, and while your eyes are getting used to the dark, the time may be enjoyably spent by star gazing or by feasting on a late supper of barbecued periwinkle-kabobs. Once the crabs have emerged from their daytime refuges they will forage over most of the shore. The larger crabs will tend to be lower on the shore than the smaller crabs which can be observed clinging to a sheer rock reef while feeding on barnacles. All will prey on various shelled gastropods, each selecting the largest that they can crush in their claws. The largest crabs can crush large periwinkles and dogwhelks so keep your fingers clear! Crabs are best handled if you grasp the carapace from above and behind it using your thumb and forefinger. Very small crabs are docile when handled but the large ones will wave and snap their claws menacingly when approached. The large males, up to 8 cm carapace width, may even counter-attack!

To distinguish a male from a female, hold it as described and turn it over. The triangular-shaped abdomen, which is kept folded flush with the under surface, is narrow in males and wider and rounder in females. Also, around the abdomen females have a fringe of feather-like pleopods which are used to carry the eggs. The females are more orange beneath and many will be "berried". You may also see a male and female coupled. A larger male will carry a female beneath him for a few days until she moults, at which time they are able to copulate. He will continue to carry her for a few more days until her new shell hardens.

A night-time seashore stroll can be a rewarding experience. There is a certain eerie atmosphere on a black, starry night with the sound of the sea nearby and with hundreds of crabs scurrying about. There is also the added bonus of encountering a whole host of New Brunswick animals that only come out at night.

ERRATA

Please accept our apology for the somewhat greater incidence of typographical errors than usual in Volume 15, Number 1. The spelling mistakes were understandable but you may wish to correct your copy by writing in two omissions. In paragraph 2 on page 37, the juvenile Baird's Sandpiper at Castalia was seen Sept. 20-21, while the "Save South Moresby" petitions, referred to in the next to last paragraph on page 39, were to be presented to the British Columbia Legislature. DSC.

Rare New Brunswick Plants

Rare and Elusive Violets of New Brunswick

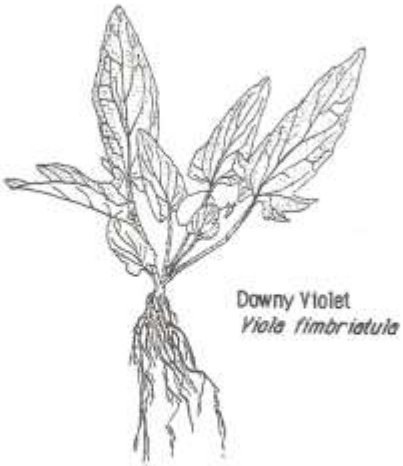
Hal Hinds

Sixteen different kinds of violets are known to occur in New Brunswick. Of those, one (*Viola fimbriatula*) is very rare and possibly endangered, one (*V. canadensis*) is quite rare and believed restricted to two counties, and two (*V. novae-angliae* and *V. labradorica*) are very uncommon.

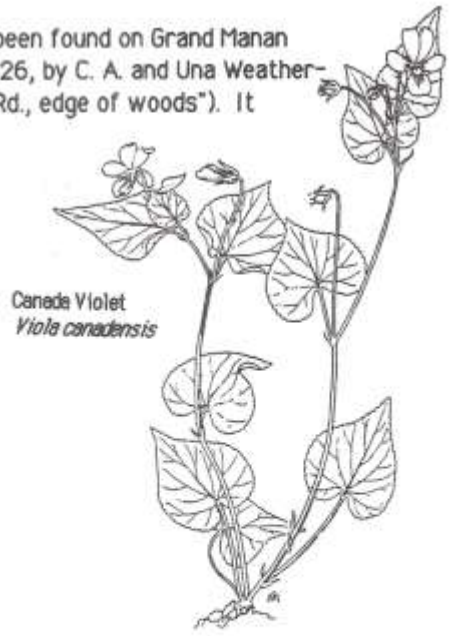
The identification of violets is often difficult because of the general similarity of their leaf shape and flower colour. It is important to check the special characteristics of the leaves and flowers in order to name these species correctly. Habitat is also a very helpful aid in their identification.

The Canada Violet (*V. canadensis*) is found from Ontario to Nova Scotia and south to Alabama and South Carolina. It is a tall multi-stemmed species growing in moist, fertile soils under hardwoods. The flowers are white within and pale violet on the back. It is our only white-flowered violet that has a leafy upright stem with flower stalks arising from the base of the leaf stalk (petiole). It is most common in Carleton County near Woodstock, but has also been found in Victoria County.

The Downy Violet (*V. fimbriatula*) has only been found on Grand Manan Island. Specimens were collected August 15, 1926, by C. A. and Una Weatherby from Mill Brook ("back road to Dark Harbour Rd., edge of woods"). It



Downy Violet
Viola fimbriatula



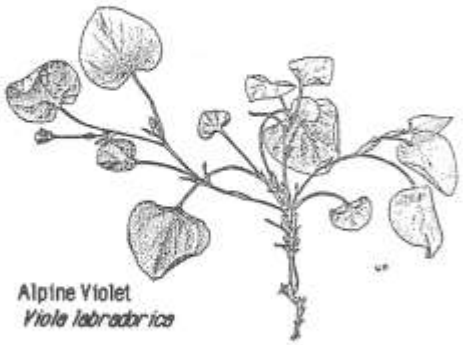
Canada Violet
Viola canadensis

is a plant of dryish, open ground and occurs from southern Ontario to Nova Scotia south to Oklahoma and northern Florida. The Downy Violet differs from all our violets in having leaves mostly oblong or long egg-shaped with sharply toothed "ears" at the base. The whole plant is downy and the flowers are dark blue or violet with a prominent white, hairy centre. The leaf stalks come directly from the rootstock, not from an upright stem. I have never seen Downy Violet on the island, but hope to locate it this spring to validate that it is still a part of our flora. [Ed. Note: In mid-May Hal found it still growing in the area reported by the Weatherbys. DSC)

The New England Violet (*V. novae-angliae*) was first discovered in Maine and later found to range from Minnesota and eastern Manitoba to Maine and New Brunswick. It occurs on gravelly and sandy shores and wet ledges. It differs from the last species in having more triangular leaves without the larger teeth or "ears" at the base. The habitat is also very distinct. Many specimens of the New England Violet have been collected from the rocky shore of Lake Utopia in Charlotte County, as well as from the Southwest Miramichi River in Northumberland County .

The Alpine Violet (*V. labradorica*) has been collected in rock crevices along swift streams in and near Fundy National Park and at a few sites in the north of the Province. It ranges from Greenland to Newfoundland, the Gaspé Peninsula, New Brunswick and the mountains of Maine, New Hampshire and New York. With us the Alpine Violet is a relatively small species with leaves borne at long intervals along the sprawling stem. The leaves are mostly smooth, bluntly heart-shaped and less than 3 cm wide. It is similar to the Dog Violet (*V. conspersa*) which grows more upright in moist, open woodlands and meadows, has leaves usually wider than 3 cm and flowers pale blue.

On your outings this spring watch for these elusive violets. They are worth noticing. And if you do find them please let me know!



Alpine Violet
Viola labradorica

New England Violet
Viola novae-angliae

FROM THE PAGES OF THE JOURNALS

Christopher Majka

Since this is my debut in this publication I would like to take the opportunity to say hello to my readers and to thank the editors for inviting me to join you. Well, well, well – a new column – and what, you might ask, am I going to do in these pages?

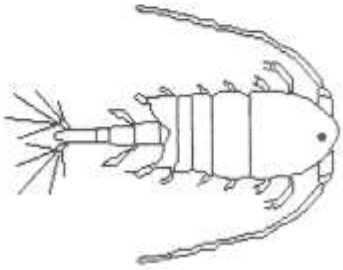
Every month sees a flood of scientific publications on subjects far and wide. As I peruse some of them, I often notice articles which I think would be of interest to naturalists but which, because of technical language or limited circulation, never reach their attention. I would like to discuss particularly interesting ones which I think might intrigue, inspire, or simply interest you. Read on, McDuff.

This issue's article deals with ecology and evolution in the world's oceans. In the latter part of the 20th century there has been an extremely productive cross-pollination between ecological and evolutionary thought. Many people are familiar with the term "niche" and have an understanding of how different species of animals have their own characteristic combination of environmental requirements which together constitute their particular and unique "ecological niche". What many people may not realize is how that concept developed.

When biologists, who since the time of Darwin have known that plants and animals did evolve, began to wonder how and why they did so, they developed the idea of competition between species as a major driving force for evolution. Living creatures, in their attempts to best "succeed" in their environment, compete for food, space and other resources with other species. In response to that competition each species has developed its own particular adaptations to the environment and is able to exploit some small section of it better than any of its brethren. Voilà, the concept of the niche is born! It is niches which are responsible for the diversity of life in biological communities and allow many different plants and animals to co-exist in the same habitat. The idea of "competitive exclusion" has come to be one of the pillars of the modern science of ecology. Many experiments in different communities have shown its applicability and validity.

But like all scientists, ecologists are not content to let sleeping dogs lie. They search out unusual conditions in which to test their ideas, since if a principle is true it ought to be valid in all circumstances. That brings us to the subject of our present essay.

One community which biologists have always found to be very diverse (although its members usually are not very abundant) is the planktonic community which lives in the central portions of the world's oceans. That "oceanic" community is different and distinct from the coastal one such as found in the Bay of Fundy and the Gulf of St. Lawrence. The puzzle is that if there are so many species[1], where are all the niches? How can animals adapt to specific conditions (and thus avoid competition) when all there is is water, water, everywhere and nary a drop to drink? John McGowan and Patricia Walker of the Scripps Institute of Oceanography at La Jolla, California, have puzzled over just those questions and have set out, in a series of ingenious studies, to try and find the answers.



In 1979, in a paper entitled "Studies in the Copepod Community of the North Pacific", published in the journal *Ecological Monographs*, they suggested that since there is a strong stratification of light, salinity, temperature and nutrients[2] in the vertical dimension of the water, that gradation could prove to be the basis of a similar vertical separation of copepod species[3] into a series of niches. Each kind would have its own preferred conditions in the water column.

However, when they studied the community to test that idea they found precisely the opposite! There was no vertical separation of different copepods and, indeed, many species believed to have the same ecological requirements repeatedly occurred together. Nice try but no cigar!

All is not lost, however. There is an alternative model of how different species can co-exist within a habitat. Called, rather complexly, "The Disturbance-Perturbation Model of Community-Structure Maintenance" (take a breath), it states that in some circumstances, although there is competition for resources and although species are capable of outcompeting their neighbours, that does not lead to a reduction of diversity because local, erratic and sporadic changes in the environment keep the community in a mosaic, each segment of which is experiencing different conditions and changing in different ways. The animals are always playing catch-up to changing circumstances in the water which favour some of them more than others. That theory sees the ocean not as a homogeneous body but as composed of very many locally different "patches". That

1 McGowan and Walker found 175 species of copepods within an area of the North Pacific.
2 The most important being nitrates and phosphates.
3 Tiny crustaceans which are very abundant in the oceans of the world.

is also well-established, particularly concerning so-called "benthic" or bottom dwelling communities. O.K. – take two!

McGowan and Walker step out again in a paper published in the same venue and entitled "Dominance and Diversity Maintenance in an Oceanic Ecosystem". Well, despite hopes to the contrary, they arrived at the same result. Although they sampled carefully over distances ranging from a few meters to more than a thousand kilometers and over time scales ranging from 30 minutes to 16 years apart[4], they found no sign of such "patchiness". What they were searching for was for different species of copepods to be more or less dominant at different times and places. In fact, the "dominance order" of those copepods remained mostly constant over all the time and space scales – hmmm?

Where does that leave us? Is there something very peculiar about the ecology of the open ocean? Is "competitive exclusion" a simplistic or mistaken notion? Why is there such a diversity of species in that environment and what maintains that complexity? Why don't some species simply outcompete and eliminate others?

Well, who knows? The court is now free for a biologist or theorist to volley an idea or explanation which might make sense of what is happening. It is a kind of situation entirely typical of modern science where, as often as not, the results of one's studies can go in completely unexpected directions refuting the theories one sets out to prove. McGowan and Walker conclude their article by saying,

"Because there were episodes of significant variability, and because of the long term species equilibrium and constancy of dominance, we believe our highly diverse community to be resilient and robust rather than fragile. The regulating forces are strong and almost certainly biological, rather than physical, but we cannot identify them."

Perhaps you have an idea...?

4 Choosing the correct time or space scale is a very important requirement in that type of study.

Nature News

Winter 1985-86

David Christie

Winter tends to be a quiet time for nature reports. Many plants and animals are dormant and perhaps hidden for the duration, and many birds and some other creatures, have migrated elsewhere. Naturalists, too, are generally less active during the winter except for the intense activity of the Christmas Bird Count (CBC), which gives the best indication of our winter bird populations. So it is that here I report principally observations that supplement the picture reported in the list of counts published in last issue.

A feature of great astronomical interest was the presence of Halley's Comet in our winter skies. However, its pale "fuzz-ball" image was easily outclassed by the flashy aurora borealis of February 7 and 8, when the famous comet was invisible because it was closest to the sun. We should have been present for the comet's brilliant appearance in 1910. Our younger readers will have a chance to see it again in 2061.

Before proceeding to the bird reports I must touch briefly on mammals. Jill Malins reports that Norway Rats seem to be experiencing a population explosion on Grand Manan, where they were seen very frequently during the winter. The report of a Harbour Porpoise seen off Point Lepreau Feb. 23 (S.J.N.C.) shows that at least few individuals of that species may remain in the bay during late winter.

Birds

Gone from the area before CBC season were a male Ring-necked Duck in the Shepody River at Harvey, Albert County (Rob Walker), and a single Dunlin at nearby Mary's Point (DSC), both on Dec. 1.

The adult male King Eider noted on the CBC remained at St. Andrews all winter, being reported in early March by Jim Goltz and Owen Washburn. An female was also found there early in the winter (Peter Hicklin).

Bald Eagles continued to be reported in the usual locations, but one was also seen on the Coverdale River, near Nixon, Albert County (Doug Whitman), an area where Ed and Barbara Swinamer report seeing eagles regularly the last three summers. Perhaps an unknown nest is in the area. In addition to the CBC areas

reporting Sharp-shinned Hawks, there was one at Woodstock (reported at V.N. January meeting). Jean and Paul Carmichael had a Northern Goshawk make appearances around their bird feeder at Williamstown, near Centreville, during January and February. An adult Golden Eagle at Shepody, east of Riverside-Albert, Jan. 31 and Feb. 1 (Mary Majka & DSC) was unique for the winter.

Missed on the CBCs was Common Black-headed Gull, an adult of which was seen at Saint John March 2 and 9 (Finne). An immature of the similar Bonaparte's Gull was also there March 1 (Finne). Four Common Murres were at Campobello Island Feb. 1 (Charles Duncan).

The amazing numbers of Mourning Doves on the CBC's continued to be reported through the winter. During February Harriet Folkins and Margaret Broomhead were sharing a flock of 60 doves at their bird feeders in Sussex. Feeder flocks elsewhere included 20 at Stony Creek, near Hillsborough (Mary Fownes), 12 at Oakland, near Florenceville (Ansel & David Campbell), 32 at Millbank, near Chatham (Flora Whiston), and from 10 to 12 during December at Grande Anse in Gloucester County (Luc Lemieux). Mrs. Whiston reports that she had 14 at her feeder in the winter of 1983-84 and 4 or 5 in 1984-85 (*fide* Harry Walker).

Although Snowy Owls were not found on the CBC's, various observers reported one on the Kingston Peninsula and another in Saint John later in the winter (SJNC *Bulletin*). Barred Owls continued to be reported more frequently than usual. In addition to several more observations in the Riverside-Albert area (Mike Majka, Rob Walker *et al.*), there were reports from Rothesay (Alice Strover & John McIntyre), near Bayswater (Frank Withers) and Milledgeville (DSC & Mary Majka) in the Saint John area, at Bloomfield (Betty Black) and Deerville (Sandra McCartney) in Carleton County, and at Chatham from Dec. 1 through Jan. 18 (Lemieux). A Great Gray Owl reported at Milledgeville March 9 (Kevin Halcrow) could not be relocated.

A Boreal Owl, found dead at Douglastown Jan. 19, was saved for the New Brunswick Museum (*fide* H. Walker). More often found dead than reported alive in recent years, that retiring, northern species may be more regular in the province than records suggest. There have been only casual attempts to relocate it in the Grand Manan archipelago, where the late Robie Tufts discovered seven nests in the 1920's and 1930's. There also should be some suitable breeding habitat in northern New Brunswick. The intensive "owling" efforts that will accompany fieldwork for the Maritimes Breeding Bird Atlas in the next five years may produce some current nesting records. Our common small owl, the Saw-whet, was also found dead in the Miramichi area, one at Wayerton, 25 km NW of Newcastle (*fide* H. Walker).

The Belted Kingfisher that had been reported in the Florenceville area during CBC period remained at Williamstown through Jan. 24 (Jean Carmichael). Kingfishers can survive in winter as long as there is sufficient open water with accessible small fishes.

Almost everyone who feeds birds in New Brunswick feeds Black-capped Chickadees, but only those living close to coniferous forest also have the common, yet more retiring Boreal Chickadee visit regularly. One of those fortunate people, Marcel David of Saint-Simon, had 5 Borealis attending his feeder this winter, one less than last year.

At Caraquet Dec. 31, Luc Lemieux saw a Golden-crowned Kinglet, a species missed by the only CBC in that northeastern corner of the province. The only Ruby-crowned Kinglet noticed into the winter months was one at Saint John West Dec. 7 (Cecil Johnston). An out-of-season Gray Catbird was discovered by Rob Walker at Alma Dec. 6.

The good numbers of Bohemian Waxwings noted on the CBC's continued to be seen throughout the winter. Flocks of 50 were seen at Saint John Feb. 4 (Faith Coughlin) and Stony Creek Feb. 23 (Mary Fownes) and there was still a flock of 200 at Fredericton in March (May Bartlett, *fide* Pearce). Near the Bay of Fundy they were seen more frequently in February and March than earlier. Bohemians were reported from the following areas where they were not seen on the CBC's: Richibucto (50 – Harry Beach), Hartland (Florence Britton), Woodstock (McCartney), Lakewood, east of Saint John (Ed Ferris), and, in Albert County, at Alma (v.o.), West River (R. Walker), Mary's Point and Rosevale (DSC & Mary Majka). A small flock at Grand Bay in early December included a partial albino that was white except for its black mask and the yellow tip of its tail (Johnston). A few Cedar Waxwings were at Stony Creek in early December (Fownes), augmenting the single bird reported on the Fredericton CBC.

Plentiful observations of Northern Shrikes included one at Glassville (Marjorie Martinson) and one at Charleston, which was "trying to do a weasel out of a mouse" (Vera Dewitt)! The weasel was the winner.

In addition to the two species of warblers reported on the CBC's, a late Yellow-breasted Chat was at St. Andrews Dec. 4 (David Clark) and a Cape May Warbler at Memramcook Dec. 8 (Reid McManus).

Northern Cardinals missed during the CBC were single males during January at Gondola Point (*fide* Win MacAndrews) and Rothesay (Geoff Sayre). There was also a female at Renforth then (Diana Morris).

In addition to the two CBC records, a Fox Sparrow appeared at Stella MacLean's feeder in Alma Jan. 8. Florence Britton's White-crowned Sparrow of the western race *gambelii* visited her Hartland feeder until Jan. 19, when she suspects it was caught by a cat.

Further Rusty Blackbird records included one all winter at Stony Creek (Fownes), one at the Juniper dump during January (V.N.) and one at Jean Carmichael's Williamstown feeder Jan. 18.

Many Pine Grosbeaks and Common Redpolls but few American Goldfinches were seen in Carleton County during the winter (Carmichael). Further south goldfinches were somewhat more numerous but still rather scarce, as were Pine Siskins. Most feeder operators catered to lots of Evening Grosbeaks. Several Red Crossbills, not found on the CBC's, were seen 3 or 4 times during March in the area of Odell Park, Fredericton (Pearce) and a female Hoary Redpoll was spotted in a flock of Commons at Mary's Point Feb. 4 (DSC & Mary Majka).

Even before the return of migrants from the south, the coming of spring is indicated by plumage and behavioural changes of our winter birds. For instance, a pair of Rock Doves was observed copulating at Sackville Jan. 11 (Tony Erskine – who thereby contributed the very first breeding evidence for the Maritimes Breeding Bird Atlas), Black-capped Chickadees were singing "fee-bee" at Nictau Jan. 19 (DSC), Great Cormorants had assumed their breeding plumage at Campobello Island by Feb. 1 (Charles Duncan), and Common Ravens were carrying nest material at Saint John Feb. 12 (David Smith).

Apparently returning Horned Larks [a few individuals do overwinter] were noted Feb. 28 at Centreville (Joanne Upton) and March 1 at Mary's Point (Mike Majka). American Crows and European Starlings were on the move about the same time. An American Kestrel at Saint John March 1 (Finne) may have been an overwintering bird rather than a migrant. March 18-19 were good days for new migrants, for example 6+ Canada Geese (Mary Majka), 25 Red-winged Blackbirds and four Common Grackles (DSC) at Mary's Point and the first Song Sparrow in David Smith's backyard at Saint John on the 18th, and the first Red-wings at Hammond River (Charlie Wilson), Florenceville and Oakland (V.N.) on the 19th.

A week and a half later bird migration was getting underway in earnest, as described by Peter and Theresa Pearce:

"Appropriately enough, spring really began for us this year on Easter Sunday, March 30. We decided to take a morning drive from Fredericton to Lower Jemseg and to return by the same route. It was our first birding excursion for a while and

we had not yet seen much in the way of returning migrants at home. Although there had been a 27-cm snowfall on March 27/28, there were bare patches in the fields. The Saint John River was still frozen except for a few open leads at Fredericton and elsewhere. The Jemseg River was wide open.

"It was soon apparent that there had been a significant arrival of spring birds and that we were in for an enjoyable time after yet another seemingly endless winter. Robins were scattered everywhere, there being one nice flock of ten in and below a flowering crabapple tree at Maugerville. They seemed to be relishing the bountiful crop of somewhat decayed apples. We saw several flocks of mixed blackbirds, one in a cornfield numbering about 500 individuals, a refreshing sight as the birds drifted from and back to the roadside.

"Early waterfowl were starting to assemble at traditional spots near Jemseg. We counted 200 Canada Geese, 50 Black Ducks, four Wood u, a Green-winged Teal and an American Wigeon. Not far away there were nine immaculate male Ring-necked Ducks. Waterfowl always seem to look so fresh at that time of year! At the Lower Gagetown ferry about a dozen Song Sparrows were busily working their way through some low shrubs. Nearby, a party of juncos were gleaning food in some roadside alders. It was good to welcome back all those old friends! On the Grand Lake meadows we counted six Rough-legged Hawks, all light phase, and two Red-tailed Hawks. That was considerably more than had been there through the winter. On the return drive we encountered three separate Killdeers, for us one of the signs of spring. By mid-morning the sun had broken through. As a lone Great Blue Heron flapped by high overhead and with joyous music by Gabrieli on the car radio, we approached Fredericton. That was a really pleasant start to spring birding."

Abbreviations
CBC — Christmas Bird Count
DSC — David Christie
S.J.N.C. — Saint John Naturalists' Club
V.N. — Valley Naturalists
v.o. — various observers

Environment
it's up to all of us!

L'Environnement
je m'en occupe!

Book Reviews

Bogs of the Northeast. By Charles W. Johnson. 1985. University Press of New England, Hanover and London. 5 1/2 x 8 1/2. xiii + 269 pp. $US 11.96 (paperback), $US 25.00 (hardcover).

Reviewed by Peter A. Pearce

"I can't remember exactly what I saw the first time I went to a bog, but I do recall my wonder at the strangeness of it all. Suddenly I had entered a new world. Perhaps my sensations were primed by what I had read about bogs, but most came as original revelations. And most of what impressed me was sensation: the spongy undulations of the mat, the subsidence of each of my steps, the subtle yet arresting colors of rain-glazed sphagnum mosses, the gnarled forms of seemingly ageless plants. Nor was my imagination cheated: The day was noiseless and draped with storm clouds; a fog will-o'-the-wisped up and over a leaden pond; the place seemed to throb with deep energy, buried under a gray mantle of solitude. Some strange gods had to be living there."

So begins the preface of this fascinating book by an author obviously in love with his subject. Vermont State Naturalist, he is also author of the well-received *The Nature of Vermont: Introduction and Guide to a New England Environment.*

In Canada, which shares three-quarters of the world's peatland with the Soviet Union, the word "muskeg" is a familiar one. Yet it is only recently, with the development of parts of the north, that the value, beauty and fragility of peatland ecosystems is beginning to be appreciated. While the northern muskeg presents horizon-to-horizon scenery, in the region addressed by this book - the six New England states, New York, New Jersey and Pennsylvania - smaller peatlands are "...scattered as enchanting nuggets about the land."

Early chapters introduce basic terms and definitions. (To my knowledge, there is no universal agreement on this although the trend seems to be toward adoption of European terms, much pioneering work having been done in Finland.) The interplay of coolness and wetness in the mechanisms by which peatlands develop is described. Two chief peatland types are examined in detail: bogs are atmospherically fed, poor in water flow and minerals, acidic, and poor in species diversity; fens receive surface and groundwater, are richer, less acidic, and are characterized by a much higher species diversity.

A state-by-state description of the different types of peatland is given, perhaps not of immediate interest to New Brunswick readers. Maine has the greatest diversity and number, many being similar to ones in New Brunswick, especially coastally.

In a chapter on survival strategies many examples are given of the ways plants respond to the physiological challenges posed by high water, oxygen deficiency, nutrient depletion, acidity and unstable substrate. High acidity is thought to be the main reason for the relatively depauperate fauna to be found in bogs. It is surprising to learn that in the region addressed there may be over 50 species of Sphagnum, the predominant peat maker in bogs: a fascinating glimpse of the beauty, environmental sensitivity and biology of different sphagna is given.

No discussion of the natural history of bogs would be complete without some attention being paid to carnivorous plants and orchids. Among the former, the pitcher plant, sundews and bladderworts are examined closely. Of the 30 or so orchids associated with regional peatlands, most are found in wooded and herbaceous fens rather than in acidic bogs. Orchids are highly dependent on insects for their propagation, the flowers having become highly adapted to ensure cross-fertilization, as exemplified by pink lady's slipper and grass pink. (In New Brunswick, one wonders whether some of our rarer orchids have suffered as a consequence of the widespread use of chemical pesticides, some known to be highly toxic to pollinating insects.) Sedges are even more typical of some peatlands than Sphagnum, being most pronounced in fens, giving rise to a firm, fibrous peat. There are many species, some difficult to identify, many excellent indicators of site conditions. In contrast to the sedges, heaths are characteristic of bogs, about two dozen species, all woody shrubs, occurring in regional peatlands. They include the familiar Labrador tea, sheep laurel, leatherleaf and a variety of others which produce berries attractive to a variety of fauna including man. Comments on the ability of bogs to preserve records of the past, from ancient pollen grains to more recent chemical contaminants of the environment, are most informative.

In the section on insects and other invertebrates, it is pointed out that soft-bodied forms are intolerant of high acidity and thus not found in bogs, although they may occur in the more benign fens. For the same reason fishes and amphibians are unlikely to be found in the highly acidic waters typical of bogs. Curiously, mink and wood frogs seem to be exceptions. (One wonders to what degree acid rain may have rendered bog environments even more hostile to some of our indigenous fauna.) The author points out that many birds make passing use of bogs, perhaps the Palm Warbler and Lincoln's Sparrow being most closely

associated with them as nesting species. Among the mammals, the northern and southern bog lemmings are intimately linked with typical Sphagnum-heath peatlands.

In a chapter on human exploitation of peatland, many examples of several hundred uses for peat worldwide are given. They range from the historic use for heating hearth and home to the generation of electricity in giant power stations, from cranberry and blueberry husbandry to biomass production and sewage treatment. The Soviet Union and Scandinavia, where studies of peatlands are most advanced, have been particularly innovative in developing new uses for peat. (Northeastern New Brunswick has, of course, for some time been a major source of peat for horticultural use. A peatland resources survey of New Brunswick has been completed, some 140,000 ha having been identified, mostly in coastal bogs of the northeast. Maps are available from government sources.)

A conservation message that threads through the text is reinforced in the final chapter, entitled "Preservation or obliteration?" To accommodate urban expansion and society's need for energy, it is feared that whole landscapes may disappear. Although public interest in Northeast peatlands is stated to be fairly new, some important starts have been made at preserving some particularly good examples. (We would do well to question what progress has been made in New Brunswick in preserving critical bogs and fens for posterity. Of several recent conservation battles involving peatland exploitation, one might mention two, both in Scotland, that are of particular interest. The planned draining and harvesting by whisky distillers, of an area serving as the wintering ground for several thousand Greenland White-fronted Geese has raised the ire of local citizens, and intentions for the afforestation of a large peatland elsewhere have caused concern for the welfare of several species of birds that breed there.)

A bibliography of 117 titles will be useful to readers wishing to pursue this subject. A 27-page appendix identifies 78 significant or representative peatlands in the region, together with contacts and sources of further information: it probably will be of limited value to the New Brunswick naturalist. More useful are three additional appendices which list the herptiles, birds and mammals to be found in regional peatlands, according to whether open bog, open fen, shrub thicket or forested peatland.

This book is well illustrated with a number of diagrams showing peatland formation and physiognomy, by nearly 50 photographs (twelve in colour), some by the author himself, and by about 30 sensitive line drawings of selected flora and fauna by Meredith Edgcomb Young. Some helpful maps and unobtrusive tables also support the text.

There can be few so attractive, non-technical books on regional peatlands, covering the subject so comprehensively in such a readable style. The compleat New Brunswick naturalist should not be without a copy.

Reports

Early Spring Birding, Grand Manan Style

Peter A. Pearce

A nodding of naturalists, about 25, gathered on Grand Manan Island on 2 May for a weekend of birdwatching led by five members of the "300 Club" (*N. B. Nat./Le Nat. du N.-B.* 14(4):150-152). The event, in a sense the first of its kind, was organized for the Grand Manan Tourism Association by Frank Longstaff, of The Shorecrest Lodge, and had received some advance publicity through the good offices of the CBC. In addition to allowing for stops at the choicest birding spots, the planned itinerary provided a good introduction to the geography of the island for those visiting for the first time. Despite unseasonably cold, gusty weather, the visit was to be a successful one, as birdwatching trips to that southern rampart of New Brunswick usually are.

Raptors were in evidence at several places. Ten species were identified, including a Peregrine Falcon at Southwest Head, Merlins at the Swallowtail, a Cooper's Hawk at Long Pond, in the migratory bird sanctuary, and several Bald Eagles (we learned that a pair was back again at the traditional eyrie at Money Cove). Among the eleven species of ducks seen, Common Eiders, the males resplendent in breeding plumage, were omnipresent. A Green-winged Teal of the Eurasian race was a surprise find at Great Pond. Southern herons provided much of the excitement of the weekend: there were a Great Egret and a Little Blue Heron at Castalia marsh, and a Snowy Egret at Whale Cove, all appearing magnificently clear and near through Cecil Johnston's Questar telescope. A pause at a feeder near Seal Cove yielded several Brown-headed Cowbirds, Dark-eyed Juncos and Chipping Sparrows, a Rose-breasted Grosbeak, two Indigo Buntings and a Vesper Sparrow. Comic relief was provided by a female Purple Martin trying to get into Tree Swallow nest boxes, too small for the robust martin; eventually she did succeed in squeezing through the hole of one deteriorating box. Other passerines of note were a seemingly early Field Sparrow at the Whistle and an expected Northern Cardinal near North Head where a pair bred last year and where

individuals of that species are daily visitors to a feeder throughout the year. There was also a sprinkling of Yellow-rumped and Palm Warblers but it was generally quiet on the songbird front: as expected, the major thrust of spring migration had not yet taken place.

Elsewhere there were a lingering Iceland Gull and two Great Cormorants. In addition to the rarities, there were of course a number of the more familiar species, which Jim Wilson was particularly careful to point out and describe to the less experienced observers present. On the Saturday evening, participants repaired to Grand Harbour, first to enjoy the sight of about 350 Brant (down to about a tenth of the concentration there earlier in the spring), then to hear Cecil Johnston give a fine, illustrated talk linking birds with particular habitats, which nicely complemented David Christie's following presentation on the Maritimes Breeding Bird Atlas project.

In a pleasant social aside, enormously delicious (and deliciously enormous) cakes, made by Mary Majka, were presented to three members of the "300 Club" in delayed observation of their earlier inauguration into that still-exclusive body.

And so, on Sunday an uneventful crossing back to the mainland and the cares of the world. A rearguard party was successful in noting an additional three species – Black-crowned Night-Heron, Northern Saw-whet Owl, and Cliff Swallow – bringing the aggregate species count to a satisfying 85. It had been a most enjoyable weekend for novice and old hand alike, definitely to be planned for again.

Federation News

Project Updates – A Pat on Our Own Shoulder

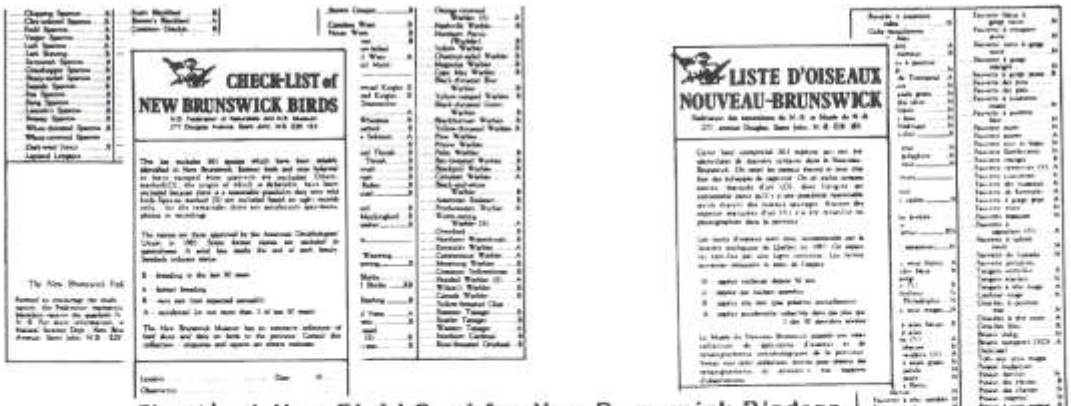
The New Brunswick Federation of Naturalists can be well pleased with its modest but continuing successful ventures. Next year will mark 15 years of our existence and at that time we will really whoop it up and make a fuss about our accomplishments. For the time being it is a pleasure to report that the two trails which, with the help of a job creation program, we built in 1984 in cooperation with the Canadian Wildlife Service have been visited and appreciated by hundreds of people. On rainy days many Wood Duck and a few Tree Swallow nest boxes were built by the workers.

One of the trails in Shepody National Wildlife Area, near the Village of Riverside-Albert, affords a comfortable walk (boardwalk over muddy areas) skirting the Germantown marsh and is frequently visited by birders and duck hunters. The other much shorter trail, leading to an observation platform and C.W.S. exhibit at Mary's Point, permits visitors easy access to the beach where, during migration, shorebirds gather. Many interesting comments are recorded in the visitor book. The following are excerpts from last year:

- "An educational and beautiful area — truly one of nature's greater creations."
- "Beautiful, incredible, must be preserved at all costs."
- "Incredible! A solid 'carpet' of birds."
- "Back to a spot where I played as a child."
- "We love the place and the path is in a gorgeous spot. What a beautiful set-up."
- "Great. Don't let it be spoiled."
- "A great place for birds. About 75,000."
- "My count was 75,001."
- "Absolutely fascinating. Never seen so many birds in my life!"
- "If everyone walked this palette of Nature's 'Goodness', perhaps some badness would ebb with the tide."
- "We-re back for the third time."
- "Thank you for preserving the place of my childhood."
- "I could spend endless hours watching the birds and other wildlife."
- "It was pretty good, but I ruined by good white shoes in the idiotic Mud."
- "Thanks for such a rare opportunity; we enjoyed watching the birds. Your efforts here are very appreciated!"
- "Couldn't hear a peep from the sandpipers! But...
  I'm looking over a beach of plovers
  that I've never seen before. [Sung to 'I'm looking over a 4-leaf clover']"
- "La Baie de Fundy est un site formideble. Nous-mêmes intéressés dans l'étude et la protection des limnicoles européens, nous envions la facilité avec laquelle les oiseaux se laissent approcher. Amitiés."
- "Nuke the mosquitos!"
- "Gardez bien cet endroit."
- "More elephants."
- "At least one elephant."

To mark the one hundredth anniversary of National Parks, last year our federation planted a hundred trees in each of the province's national parks. We are happy to report that with few exceptions the trees in Fundy National Park survived the winter in good shape and we have been able to replace those that did not. Alas, in Kouchibouguac National Park, where survival was equally successful, some vandals started a grass fire and most of the trees were destroyed. We hope to replace those trees in the future. In recognition of our organization's contribution to the celebration of the national parks centennial a certificate was received from Tom McMillan, Minister of the Environment (p. 80).

Mary Majka.



Check! - A New Field Card for New Brunswick Birders

At the two-a-year rate at which new species have been added to the New Brunswick avifauna in the last decade, and because of the revised status of others, an updating of the last (1975) published check-list was due. Now, after careful research by several Federation members, the 1985 version of the check-list is available. Uncramped spacing on a double-folded card facilitates the quick finding of names. The names of 363 species reliably reported in the province are listed. Excluded are extinct birds and those believed to have been escapes. Two formerly accepted species were rejected because evidence of their occurrence in New Brunswick did not meet the tightened acceptance criteria. Just 16 species were included based on sight records only. Breeding status is indicated, and very rare and accidental species are identified. The list uses the names and taxonomic sequence adopted recently by the American Ornithologists' Union.

Ce document est aussi disponible en francais. Comme dans le dépliant intitulé "Observation des oiseaux, Nouveau-Brunswick, Canada" les noms français suivent ceux proposés par la Société zoologique de Québec.

Generous financial assistance was afforded the Federation by the New Brunswick Department of Tourism, Recreation and Heritage, through its product development financial incentives program, and also by the New Brunswick Museum, which helped defray printing costs. A chickadee checkoff emblem was used in the design through the courtesy of the Kansas Fish and Game Department. We are grateful to such friends.

The check-list costs 25 cents, and may be obtained from the New Brunswick Museum. It is hoped that local naturalists' clubs will serve their members by ordering in quantity. Other outlets will be announced when identified.

P. A. Pearce.

Annual Meeting Planned for St. Andrews

The federation's 1986 annual meeting will be held in St. Andrews at Sunbury Shores Arts and Nature Centre, sometime in late August or early September. Watch for more details and plan to attend to learn more about the fascinating natural history of the Passamaquoddy Bay area. – DSC.

Federation Programs Recognized

The certificate reproduced here was received from Hon. Tom McMillan's office in recognition of the federation's programs to celebrate the centennial of national parks – tree planting projects at Fundy and at Kouchibouguac National Parks, and an issue of the *N.B. Naturalist / Le Naturaliste du N.-B.* devoted to national parks.

▲ NATIONAL PARKS ▲
CENTENNIAL AWARD

In grateful recognition
of the special contribution made by

New Brunswick Federation of Naturalists

to the celebration of the
National Parks Centennial,
this certificate is awarded.

The Honourable Tom McMillan
Minister of the Environment

Club News

Fredericton

The Fredericton Field Naturalists' Club was launched a quarter of a century ago, the first such enterprise in New Brunswick in recent times. It had "...all the elements of scientific, aesthetic and sentimental appreciation of nature needed for viability and fellowship." It enjoyed fair sailing for a considerable period, charting some unknown territory. Unfortunately, in the late 1970's it became somewhat becalmed in the doldrums, one or two old salts trying valiantly, and successfully, to keep it afloat. Now, with a fresh breath of wind, it is under weigh once more. Under a new flag (not yet unfurled) and with a new crew at the helm it will soon be under full sail for exciting new horizons. Home port is: Andy Didyk, 88 Crown Street, Comp. 86, Site 9, SS3, Fredericton, N.B. E3B 5W9. Local naturalists will be welcome aboard. Bon Voyage! – Peter Pearce.

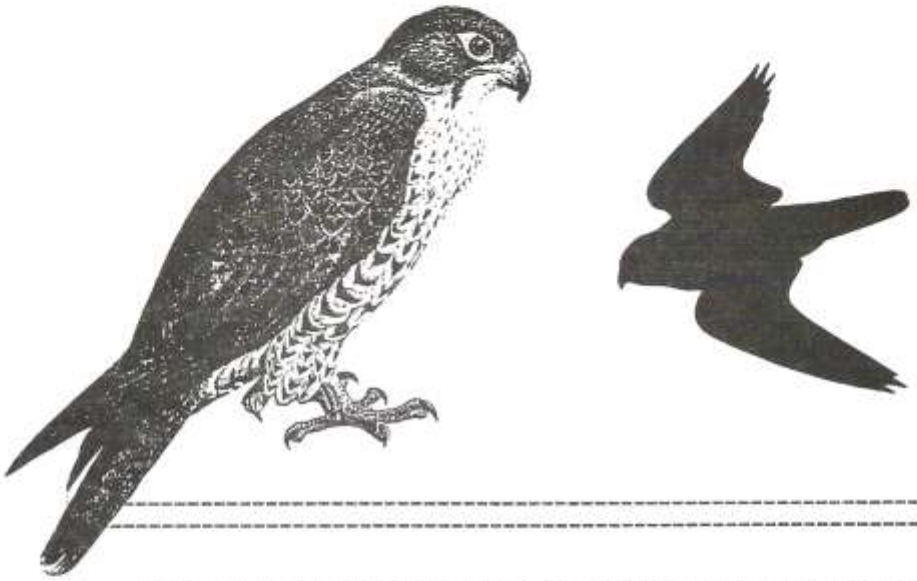
"I Told You So" – Mary's Travel Hints

While you are planning your vacation this year save at least a few days to visit our own backyard. I can assure you you will not reget seeing a number of beautiful and interesting places in New Brunswick and probably you will spend much less time and money to get there.

I have previously suggested Grand Manan. There is another beautiful and as yet little explored island with easy access. Miscou Island is just as different from Grand Manan as Northumberland Strait is from the Bay of Fundy. Each has a very different character and is unique in its own way. To a birdwatcher, botanist, or photographer Miscou is exciting territory. On the way there, by all means do not miss the Shippagan Marine Centre. As the brochure says, it is a "fascinating complex, exploring underwater life and the world of fishing in the Gulf of St. Lawrence". Whether you are young or old you will enjoy that very beautiful and well-designed complex.

Want to get away from islands and seashores, then head for the mountains. Did you know that Mount Carleton in north-central New Brunswick is the highest elevation in the Maritimes? The provincial park there is a perfect spot for a marvelous canoe vacation, to experience nature at its best and recharge one's batteries. So before you buy a ticket to Disneyland or Expo take my hint. Those places are hard on your pocketbook, shoes and patience. Have fun on your vacation and remember, I told you so. – M.M.

WE NEED YOUR HELP
TO LOCATE NESTING PEREGRINE FALCONS



Since 1982, the Canadian Wildlife Service and Fundy National Park have been releasing young Peregrine Falcons from two sites on the Bay of Fundy. These birds formerly nested around the bay but were eliminated by the pesticide DDT. We hope that some of the released falcons may nest this year. Most likely sites include the Minas Basin, Cape Enrage to Cape Spenser and Grand Manan, but the birds may turn up anywhere.

Nests are usually located on ledges on high cliffs. Peregrines are crow-sized birds with long pointed wings, narrow tails and small heads. They are extremely fast flyers and may scream a high pitched "cack-cack-cack" if you are around their nest.

If you see peregrines dont disturb them, please contact:

Bruce Johnson
Canadian Wildlife Service
Sackville, N.B.
506-536-3025

OR

Stephen Woodley
Fundy National Park
Alma, N.B.
506-887-2000

Environment Canada Environnement Canada Canada

NEW BRUNSWICK FEDERATION OF NATURALISTS
277 Douglas Avenue, Saint John, N. B., Canada E2K 1E5 Tel.: (506)693-1196

LA FEDERATION DES NATURALISTES DU NOUVEAU-BRUNSWICK
277, avenue Douglas, Saint-Jean, N.-B., Canada E2K 1E5 Tél.(506)693-1196

The federation is a non-profit organization formed in 1972 to facilitate communication among naturalists and nature-oriented clubs, to encourage an understanding of nature and the environment, and to focus concern for the natural heritage of New Brunswick.

La fédération est une organization sans buts lucratifs formée en 1972 pour faciliter la communication entre les naturalistes et entre les divers clubs axés sur l'étude de la nature, pour encourager une meilleure compréhension de la nature et de l'environnement, et pour éveiller le souci pour le patrimoine naturel du Nouveau-Brunswick.

BOARD OF DIRECTORS/CONSEIL D'ADMINISTRATION

Past president/Ancien président:	Mary Majka	RR 2, Mary's Point Road, Albert, N.B. E0A 1A0
President/Président:	Hal Hinds	Biology, UNB, Bag Serv. 45111, Fredericton, E3B 6E1
Vice-president/Vice-président:	Angus MacLean	P.O. Box 95, Alma, N.B. E0A 1B0
Secretary/Secrétaire:	Ruth Rogers	Apt. A-9, 8 Wilmot Court, Fredericton, N.B. E3B 2M8
Treasurer/Trésorier:	Harriet Folkins	P.O. Box 12, Sussex, N.B. E0E 1P0
Directors-at-large/ Membres généraux:	David Clark	P.O. Box 232, St. Andrews, N.B. E0G 2X0
	Wilma Miller	RR 1, Nictau, Plaster Rock, N.B. E0J 1W0
Representative directors/ Membres représentatifs:	Paul Bogaard	(Chignecto Naturalists' Club)
	David Christie	(Moncton Naturalists' Club)
	Harriet Folkins	(Kennebecasis Naturalists' Society)
	Lionel Girouard	(Grand Lake Naturalists' Club)
	Erwin Landauer	(Valley Naturalists)
	Donald McAlpine	(Saint John Naturalists' Club)
	Peter Pearce	(Fredericton Field Naturalists' Club)
	Harry Walker	(Miramichi Naturalists' Club)
Director of CNF (Nature Canada)/ Conseiller de Nature Canada:	David F. Smith	149 Douglas Avenue, Saint John, N.B. E2K 1E5

FEDERATED CLUBS/CLUBS FÉDÉRES

Chignecto Naturalists' Club	P.O. Box 1590, Sackville, N. B. E0A 3C0
Fredericton Field Naturalists' Club	5 Shamrock Terrace, Fredericton, N. B. E3B 2S4
Grand Lake Naturalists' Club	c/o Lionel Girouard, RR 1, Minto, N. B. E0E 1J0
Kennebecasis Naturalists' Society	c/o Jim Thomson, RR 1, Penobsquis, N. B. E0E 1L0
Miramichi Naturalists' Club	276 Heath Court, Newcastle, N. B. E1V 2Y5
Moncton Naturalists' Club	771 Mountain Road, Moncton, N. B. E1C 2R3
Saint John Naturalists' Club	277 Douglas Avenue, Saint John, N. B. E2K 1E5
Valley Naturalists	P. O. Box 95, Florenceville, N. B. E0J 1K0

MEMBERSHIP/SUBSCRIPTION RATES

Annual dues, 1986:

Individual or family	$10.00
Student (to age 18)	$5.00
Sustaining	$20.00

Membership privileges include subscription to N. B. Naturalist.

Please make cheques payable to:
N. B. Federation of Naturalists
Mail to: Harriet Folkins, treasurer
P.O. Box 12,
Sussex, N. B., Canada
E0E 1P0

COTISATIONS DE MEMBRES/TARIF D'ABONNEMENT

Cotisations annuelles, 1986:

Individu ou famille	$10.00
Étudiant jusqu'à l'âge de 18 ans	$5.00
Membre soutenant	$20.00

Chaque membre recevra un abonnement à la revue Le Naturaliste du N.-B.

Veuillez faire votre chèque à l'ordre de
La Fédération des naturalistes du N.-B.
et postez-le à: Harriet Folkins, trésorier
C.P. 12,
Sussex, N.-B., Canada
E0E 1P0