Blomidon Naturalists Society

Summer 2002 – Volume 29 Number 2

Blomidon Naturalists Society

The primary objective of the Society shall be to encourage and develop in its members an understanding and appreciation of nature. For the purpose of the Society, the word "nature" will be interpreted broadly and shall include the rocks, plants, animals, water, air, and stars.
(from the BNS constitution)

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The Blomidon Naturalists Society is a member of the Federation of Nova Scotia Naturalists, the Nova Scotia Trails Federation, and the Brier Island Ocean Study (BIOS). The society is an affiliated member of the Canadian Nature Federation.

The Blomidon Naturalists Society is a registered charity. Receipts (for income tax purposes) will be issued for all donations.

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<www.go.ednet.ns.ca/~bns/home.htm>

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Illustrations by Mary Pratt (cover and pages 6, 7, 8, 19, 28, 31)

The *Blomidon Naturalists Society Newsletter* is published quarterly – in March, June, October, and December – by the Blomidon Naturalists Society, PO Box 127, Wolfville, NS B0P 1X0.

Contributions to the BNS newsletter are always welcome. Members are encouraged to share unusual or pleasurable nature stories through the pages of the BNS newsletter. If you have a particular area of interest, relevant articles and stories are always welcome. Send them to Mike McCall by mail, RR 3, Centreville, NS B0P 1J0; by e-mail, <mikemccall@ns.sympatico.ca>; or by fax, 902 678-1812.

Upcoming newsletter deadlines
Fall, September 29, 2002; Winter, January 5, 2003
Spring, March 27, 2003; Summer, June 26, 2003

Printed in Canada. For subscription information, see the membership fees form at the back of this newsletter. Please notify us at the above address if you change your address.

Editor's Notes

The annual general meeting of the Federation of Nova Scotia Naturalists was held at Mount Saint Vincent University on the weekend of May 31. Ninety-three attendees representing fourteen naturalist organizations in the province spent the weekend socializing, listening to a number of excellent presentations, and taking part in field trips and walks.

Seven speakers entertained and informed the group on a wide range of topics, all on the theme of Environmental Change – The Good the Bad and the Ugly. Some of the news was good, but the burden of the talks – and I speak only for myself – seemed to be that we are going to hell in a handbasket and that all is lost: the world's most dominant species, the human race, is wrecking the joint. Clearly, we have made some egregious errors as we try to balance the needs of humans with those of other creatures and have been downright reckless in our exploitation of this planet's resources. In short, there's a lot of bad news.

In the very long term, however, landforms have been changing for millions of years, ice ages come and go, oceans rise and fall, and species appear and disappear as nature takes its course. Our own species will disappear one day and this will be because of the "natural" evolution of the planet – not because of our impact on it. Global warming is the current bogeyman. However, analysis of Greenland ice cores has shown wide temperature swings, and rapid climate changes have occurred in the past and will undoubtedly occur again; they are not entirely man-made phenomena.

The news isn't all bad, by any means. Many groups are active in opposing apparently mindless activities that are detrimental to our environment and have achieved some success: witness the recovery of the Peregrine Falcon, the California Condor, and the Whooping Crane. As well, we now have many protected species, and the advent of environmental assessments has surely been beneficial. And while we decry negative impact on some species because of the introduction of non-native species, I am sure that there are instances in which such initiatives were averted. The problem is, we can't measure our bounty, only its loss.

Mike McCall

Blomidon Naturalists Society
Summer 2002

Meetings

Unless otherwise noted, all meeting are held at 7:30 p.m. in the Beveridge Arts Centre, Room 244, Acadia University. The arts centre is across Main Street from the Atlantic Theatre Festival parking lot, just west of downtown Wolfville.

Monday, September 19, 2002 – TBA

Field Trips

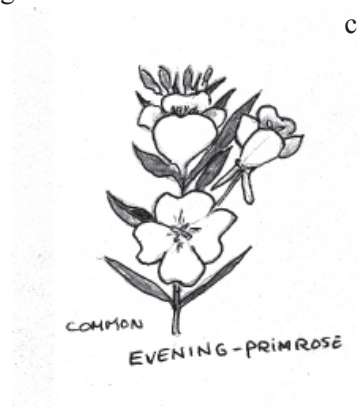
Unless otherwise indicated, all field trips begin at the Robie Tufts Nature Centre (RTNC) on Wolfville's Front Street (look for the weird chimney in the NS Liquor Commission parking lot). Additional field trips may be announced at BNS meetings.

Saturday, August 17, 2002 – Kingsport Mud Flats and Wellington Dyke. This is a joint Halifax Field Naturalists/Blomidon Naturalists Society trip. Meet at 1 p.m. at the RTNC. Bring rubber boots or very old shoes, shore field guides, shovel, small jar or pail, etc. Emphasis will be on intertidal worms, snails, crustaceans, fossil tree stumps, and shorebirds. Leader Jim Wolford (542-7650) <jww.triv@ns.sympatico.ca>.

Non-native Plant Species
by Marian Munroe

Presented to the Federation of Nova Scotia Naturalists annual meeting, June 2002.

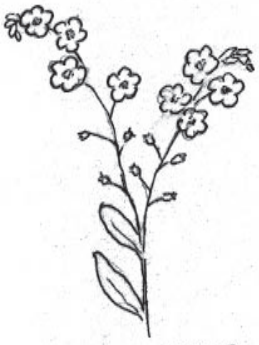
Most of our flora (plants of the province) were invasives, in that they started to colonize 12,000 years ago as the glaciers melted and the ice cap receded northward. In other words, the plants came from elsewhere, often from further south on the continent. Very few species present today were native here before the ice covered the province. Eighteen thousand years ago the tree line reached north only as far as the Gulf of Mexico. The landscape prior to invasion by southern tree species would have resembled the present-day tundra, with grasses, sedges, and dwarf shrubs dominating. Those plants known to have been established here pre-glaciation are the arctic-alpine species that found refuge in isolated pockets atop nunataks. Some of these species are now considered to be disjunct: species whose populations are widely separated geographically. In other words, their range is not continuous. Plants such as Primrose (*Primula laurentiana)*, common on the basaltic headlands along the North Mountain is one such species. The same may be said for the Milk-vetch *Astragalus robbinsii* and the similar *Oxytropis campestris* of Cape d'Or. The dwarf birches and dwarf willows now primarily found only in Cape Breton, are typical tundra-like shrubs.



In the truest sense, then, most of our 1,560 plant species are non-native and therefore would have been invaders in order to have become established here. Most North American plant species had reached their present limits by 6,000 years BP. In the current sense, non-native plants are said to be those that came to Nova Scotia post-settlement of the Europeans. We have more than 400 species of exotic plants – or 31% of our total vascular flora.

Non-native plant species fit into one or more categories:

They may be **introduced**. These plants, usually associated with human activities, are intentionally brought from elsewhere for gardens or farming or forestry. Many of our introductions arrived during the nineteenth century as a result of colonization and trade. This means that most came from Europe. Settlers wanted to recreate the European farming landscape, so they brought wheat, barley, rye, and oats (the cereals). Apples and pears populated the orchards, as they still do. Vegetables such as carrots, lettuce, and beans are all European crops brought over with early settlers. Tomatoes, another introduced horticultural crop, are actually New World natives, but were not introduced from the south. Rather, the Spanish explorers who discovered their aboriginal use exported them to Europe, where in some areas they had difficulty becoming accepted as a food source. Their introduction to North America was by way of later European settlers. Each of these plants was an intentional introduction for food.

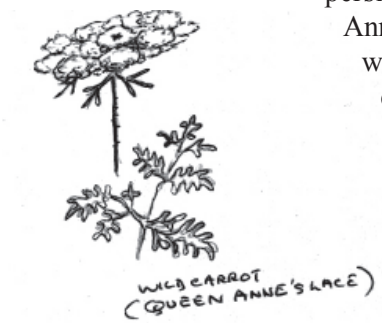


The Europeans also brought many other garden plants, such as columbines, barberries (*Berberis vulgaris, B. thunbergii*) for hedgerows, Dame's Rocket (*Hesperis matronalis*) for its sweet fragrance, forget-me-nots (*Myosotis* sp.), Scotch Broom (*Cytisus scoparius*) for its herbal use, sweet clover (*Melilotus* spp.) for forage, and Dyer's Greenwood (*Genista tinctoria*) for the yellow-green dye extracted. Daphne (*Daphne mezereum*), which is frequently found now in rather pristine habitats, is associated with past French settlements. It is still a popular ornamental shrub.

Other plant species introductions were not intentional; in other words, they hitched a ride over in ships' ballast. Species such as St. John's-wort (*Hypericum perforatum*), nightshade (*Solanum* spp.) and Lamb's-quarters (*Chenopodium album*) fit this category. These plants are called **adventives**.

New species still arrive, but on automobile tires or by trains from other parts of the continent, where they may be native or yet again immigrants from other continents. Lupines (*Lupinus polyphyllus*) are an example of these kinds of non-natives. They are native to the Rocky Mountains and moved eastward with trains and as garden plantings. Lupines are still sold as an "eastern wild flower" in seed packets and more recently are being introduced from Atlantic Canada into the New England states.

Because so many of our agricultural crops are the result of many decades of plant breeding, they usually do not persist in fields after cultivation. The Wild Barley (*Hordeum jubatum*) frequently seen in roadside ditches is actually native to North America. On the other hand, horticultural crops may persist and escape. An **escape** is a species that reproduces after it is left to grow wild, without human help. It is also an introduction because it came from somewhere else. Carrots persist and spread, in the form of Queen Anne's Lace (*Daucus carota*), the European wild carrot and a parent for all modern cultivars. Roses are able to spread from the original planting site, especially the tall bristly ones all around the coast. Rugose Rose (*Rosa rugosa)* is commonly used as a rootstock for many of the less hardy cultivars. Multiflora Rose (*Rosa multiflora*), a native of China, has the potential to become a serious threat to native habitats. Lilacs (*Syringa* spp.) will persist at old house sites but do not spread from original plantings.



Colonists may be brought by people, or they may arrive without help. These are the fast-growing short-lived species that keep moving to fresh territory. They may be native (early-successional) or non-native species. Raspberry is a good example of a native colonist species, favouring land that has been deforested by cutting or fire. Many of our more recent

introductions, the "campground weeds" such as Sweet Whitlow-grass (*Draba verna*), fit into this category.

Invaders are a type of colonist, but their spread is so vigorous they may overcome or swamp native plants. A good local example is the Norway Maple (*Acer platanoides*) planted all over Halifax. It is now invading outside the city in habitat where Red Maple grows. The potential is there for it to overcome Red Maple (*Acer rubrum*) and replace it. Invaders are commonly found in disturbed areas. They are not as common in pristine areas. But all habitats are open to invasions.

Weeds. This is not a biological or ecological word. A weed is merely a species somebody doesn't want. Dandelion (*Taraxacum officinalis*) comes to mind. Weeds typically have high seed productions and fast growth rates, are strongly competitive, survive nasty growing conditions, and grab all available gaps within a plant community. Weeds are generally associated with negative economic impacts, although they may be native or non-native plants. Cat-tails are native species that many cottage owners have come to despise, especially on lakeshores.

Negative impacts of introduced plants

1. Introductions may replace native species. For example, Water Weed (*Elodea canadensis*), brought in as an aquarium species, is now colonizing watercourses as people empty aquariums into these fragile habitats.

2. Generally, non-natives do not provide food or nesting sites for native animals. Purple Loosestrife (*Lythrum salicaria*) is a garden perennial species, whose rampant spread has threatened many a wetland. An insect control has only recently been found successful.

3. They may have harmful health effects on humans and their livestock. The barbed surfaces of ragweed pollen are notorious for causing respiratory allergies. Jimsonweed (*Datura stramonium*) is highly toxic to livestock that ingest the herbage and to people who seek its dangerous hallucinogenic effects. It has now been banned as an ornamental, after enjoying a brief recent popularity under the trade name Angel Trumpet. The health problems it can cause date back to the American Civil War, when mass illness struck soldiers stationed in Jamestown. The name eventually was corrupted to reflect in the English name of this plant.

4. They can reduce value of targeted species of plants or animals by contaminating harvest. Cattle that graze on Tansy Ragwort (*Senecio jacobaea*) suffer a neurological disorder called Pictou disease, a form of staggers named for the northwestern county on mainland Nova Scotia where it was first found in 1906.

5. They increase potential for the introduction of harmful insects and diseases: Dutch elm disease and chestnut blight were both diseases of European origin and have now spread to native North American trees. Many of us are aware of the loss of mature elms, native and non-native, from our urban centres as a result of Dutch elm disease. North America has lost the bulk of its American Chestnut (*Castanea dentata*) population to chestnut blight, a fungal disorder.

Which will be our next invasive plant species? Certainly the recent discovery of Garlic Mustard (*Alliaria petiolata*) in Grand Pre is worrisome. Most of the roadsides in central Canada are overrun with this one. The Buckthorns (*Rhamnus cathartica* and *Frangula alnifolia*) are of serious concern in central Canada as well as in New England. The known Nova Scotia populations of these species bear watching.

We must remember, too, that a plant community with a high species richness, or greater biodiversity, will have more resistance to the effects of introductions and invasions than species-poor communities. This may mean reducing the opportunities for monocultures in agriculture and forestry, and even on our personal properties.

Note: The control and monitoring of non-native plant species falls under both the federal and provincial jurisdictions. The Canadian Food Inspection Agency monitors plants and products entering the country for trade, including plant material sold in nurseries.

The Nova Scotia Department of Agriculture and Fisheries administers the *Weed Control Act*. The department maintains a list of targeted species considered noxious under legislation. Contact Rick Hoeg, provincial weed inspector, for more information.

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—BNS FIELD TRIP REPORT—

Local Ponds, April 28, 2002

by Jim Wolford

A sunny day – though windy and cool – brought out 25–30 participants.

As usual we caravanned from pond to pond. Canning's Greater White-fronted Goose was a natural objective, so I thought we should go there first. On the way it was easy to show the Canard Bald Eagle nest in the flooded Muskrat Farm marsh, and several scopes showed an adult eagle facing us on the nest.

At the Canning riverside park, only ten Canada Geese were visible, along with a Green-winged Teal, Mallards, a Red-tailed Hawk, and a harrier (latter seen by James Hirtle). We walked the riverbank lane west to the Legion, from which we found the mother lode of 120 Canada Geese in the grass adjacent to the river. Among them was a sleeping Greater White-fronted Goose, and then someone noticed a *second* one that was up and grazing! The two white-fronts were not together in the flock, but both had orange beaks and presumably belong to the Greenland race.

Still in Canning, I saw an adult raven and a second black head (nestling?) in the nest above Main Street. At Canning's Harris' Pond, we saw the following: two (m./f.) Blue-winged Teal (not seen by everyone), four Green-winged Teal, ten Ring-necked Ducks (mostly males), 150 Tree Swallows acting like they were getting emerging midges near the pond surface, grackles and Red-winged Blackbirds, two Downy Woodpeckers (one in the fresh top cavity of a stump riddled with holes), one White-breasted Nuthatch, and two Yellow-rumped (Myrtle) Warblers. A big surprise came when an Osprey flew right over the pond and us. (Ospreys are rarely seen in coastal Kings County).

After a pit stop in Canning, we drove southeast to Saxon Street. A flock of about 30 ravens (probably all yearling non-breeders) were near an flock of 100+ gulls (no notable species) in a large open field.

Saxon Street Pond delivered a single drake Wood Duck, two Ring-necked Ducks (m./f.), 75 Tree Swallows, two uncooperative little "flitters" that hid from us in some shrubbery, and lots of road-edge horsetails that were producing spores. A few spring peepers were calling, and there was a repeated quite different call – a Sora (rail) – north of the road.

Kidston's Pond along Church Street held eight Green-winged Teal (6 m./2 f.).

At Starrs Point the new artificial pond held three Double-crested Cormorants. Van Nostrand's Pond produced ten Tree Swallows and a single Barn Swallow (my first for this year), ten Green-winged Teal, two Blue-winged Teal (?) (seen by 2 observers), five Mallards, grackles and Red-winged Blackbirds with a single female Red-wing (again my first for this year), a few leopard frogs giving their long motorboat snores, lots of honeybees foraging for pollen at open willow catkins, a Black-capped Chickadee, a moaning Mourning Dove, and Blue Jays.

Most of us saw a lovely cock pheasant in an open field near Starrs Point, another at Port Williams, and several were heard elsewhere during the trip. Also, Jean Timpa saw a mockingbird fly by the caravan at the corner of Highway 358 and High Street/Starrs Point Road (Port Williams).

We were very pleased that the Port Williams sewage ponds still held a pair (m./f.) of Northern Shovelers (in good light, too) plus six Mallards, two Black Ducks, three Tree Swallows, and the only muskrat seen today.

Finally, several of us at Hennigar's Farm Market saw four Green-winged Teal, two Yellow-rumped Warblers, a Ruby-crowned Kinglet, and a Merlin, plus domestic ducks and geese; lovebirds, cockatiels, budgies, and a family of zebra finches inside the market (for atmosphere, not for sale); and caged peacocks and domestic rabbits.

I almost never keep a trip list of bird and other species seen by the whole group, or by myself, but I invite participants to add to or correct this report.

Thanks to all participants for helping to make the day productive and a lot of fun.

Sable Island — Update from Zoe Lucas

In November 2000, Zoe Lucas spoke to BNS members about Sable Island. She recently sent the following letter and accompanying abstract.

April 2, 2002 – Sable Island

Dear Blomidon Naturalists Society:

I really enjoyed visiting, in November 2000, to give the presentation about Sable Island. And I greatly appreciated the donation of $500 to support work done on the island. I put it to good use. I stocked up on specimen bags, scalpel blades, field notebooks, postage stamps, rubber boots, and a secondhand laptop and a new muffler for the ATV.

Enclosed, just in case anyone is interested in this topic, is a paper on the shark predation study. This paper deals with the impact of predation on the Sable Island harbour seals. I'm presently working on a second paper (with Lisa Natanson, a researcher with the Apex Predator Group, National Marine Fisheries Service, Rhode Island) which deals with the sharks themselves, the perpetrators – all the usual suspects.

Birdwise, it has been a quiet winter on the island. A Snowy Owl and a Northern Mockingbird have been here during most of the winter, and last week I saw a Lesser Black-backed Gull (3rd winter). There were four Lesser Black-backed Gulls on the island last autumn.

Thanks again for inviting me to speak. You are a kind, supportive, and interesting audience.

Best wishes, Zoe

"Shark-inflicted mortality on a population of harbour seals (*Phoca vitulina*) at Sable Island, Nova Scotia" (by Z. Lucas and W.T. Stobo, *J. Zool.* London (2000), 252: 405–414)

ABSTRACT

Shark-inflicted mortality on harbour seals *Phoca vitulina* on Sable Island, Nova Scotia, was studied from 1980 to 1997, based on carcasses washed up on shore. During this period, pup production declined dramatically from over 600 in 1989 to 40 in 1997. Between 1980 and 1992, pup deaths only were recorded, and only during the May-June pupping period, while deaths in all age groups were recorded year-round between 1993 and 1997; 458 pups, 23 juveniles and 241 adults were found. Shark-inflicted mortality in pups, as a proportion of total production, was under 10% during 1980-93, roughly 25% in 1994-95, and increased to 45% in 1996. Shark-inflicted mortality occurred in all months except December, January and February, with c. 80% of the pups killed during the pupping period, and 97% of the adults killed outside the pupping period. The decline in pup production was not only a result of reduced recruitment owing to pup mortality. A greater proportion of reproductive females than males was killed. We estimate that shark-inflicted mortality on pups and adult females reduced pup production on Sable Island by 43 to 154 pups annually between 1993 and 1997. Our results indicate that sharks are having an impact on Sable Island harbour seals, possibly to the extent of limiting population growth, or contributing to the observed population decline. Potential reasons for this increased mortality are discussed.

Eastern Annapolis Valley Weather – Spring 2002
by Larry Bogan, Cambridge Station, NS

	Mean temperature (deg.C)	**Snowfall** (cm)	**Total precipitation** (mm)	**Sunshine** (h)
March	-0.2	37	78	131
(41 yr. average)	(-0.9)	(46)	(109)	(133)
April	5.7	3	97	142
(41 yr. average)	(4.5)	(15)	(83)	(151)
May	11.3	0.4	85	274
(41 yr. average)	(10.6)	(2.2)	(79)	(202)
Season	5.6	40	260	547
(41 yr. average)	(4.7)	(63)	(271)	(486)

Source: Food & Horticultural Research Centre, Kentville, NS.

Our warm weather of winter continued into the spring. This is indicated by a mean temperature nearly 1°C above the 41-year average temperature. Actually, I thought the spring cool, but I am sure that I am remembering last year when we had an unusually warm and early spring. To illustrate the temperature trends this spring, I have included a graph of the daily temperatures (see p. 18). March was uniformly below freezing until late in the month, when the average temperature jumped up almost 10°C and stayed that way through April. The first of May saw a smaller jump, but then at mid-month the temperatures climbed continuously until we had high 20s by the end of the month. These high temperatures did not continue, as reflected in the frost on June 7–8, when many gardens (including mine) showed the result. Typical last frost is usually mid-May.

Precipitation this spring was near normal. There were some variations, but in general the precipitation was evenly distributed over the season. In April rainfall was 16 percent above average (compared to only 71 percent of the norm in March). Snowfall was present in every month,

but we had two-thirds of the usual amount. Snow lay on the ground only from March 20 through 27, with a tiny bit at the end of April. The only snow in May was a trace on the first of the month.

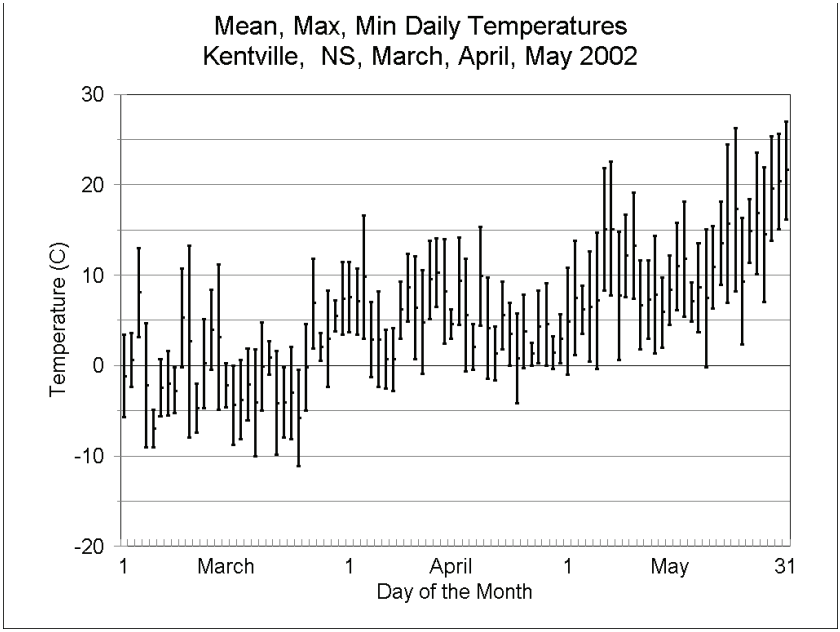
It was a sunny, cheerful spring. Every month had average or above average bright-sunshine hours. May was the brightest month, with only two days with fewer than four hours of bright sunshine and 14 days with more than ten.

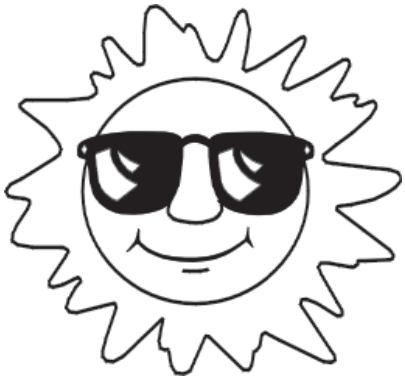
The North American Migratory bird count occurred on May 11 this year. If you were out that day, you will remember the sunshine, wind, and cool temperatures. On my count, I found a few warblers, but the bulk of them arrived the following week when the temperatures started rising.

The spring winds are worth commenting on. The table below shows the maximum and mean wind speeds for the three months of spring 2002.

2002	**Mean wind speed** (km/hr.)	**Maximum wind speed** (km/hr.)
March	11.4	26.1
April	12.2	22.2
May	12.2	19.7

Note that the mean wind speed for the three months does not vary significantly, but the maximum windspeed decreases as the season advances. On May 11, the mean wind speed was 19.3 km/hr, the second highest for the month.


Mean, Max, Min Daily Temperatures
Kentville, NS, March, April, May 2002
Temperature (C)
30
20
10
0
-10
-20
1
March
1
April
1
May
31
Day of the Month



The Maritime Shrew, a Maritime Endemic

by Kimberly Dawe

The northeast-southwest orientation of Nova Scotia and the insular nature of land joined to mainland Canada via a single narrow isthmus has resulted in a disproportionate array of species in the province being geographically separated, or disjunct, from the rest of their ranges. These species, such as Blanding's Turtle and Southern Flying Squirrel, are attracting increasing attention due to their potentially unique genetic diversity, their susceptibility to global climate change, and the unusual number of them that are also designated "at risk" nationally. The Maritime Shrew (*Sorex arcticus maritimensis*) was thought to be such a disjunct subspecies of the Arctic Shrew (*S. arcticus*). Genetic analysis has now confirmed, however, that it is a species in its own right, likely a result of the extended separation of the Maritime populations from those in the rest of Canada (Stewart et al., 2001). Found only in Nova Scotia and New Brunswick, *S. maritimensis* now represents the only mammal endemic to Maritime Canada, and only the second endemic to Canada as a whole.

Very little information is available on this new species, despite growing fears for its survival. Family characteristics provide a basic knowledge of its natural history, and the ecological behavior of the closely related *S. arcticus* serves as a source for educated assumptions surrounding this species' behaviour. Detailed species-specific research is required, however, to ensure that the Maritime Shrew is safe from extinction.

Shrews are insectivores that belong to the family Soricidae (van Zyll de Jong, 1983). They are the smallest animals of the class mammalia and thus encounter a unique suite of physiological constraints. Small body size results in high rates of energy expenditure and rapid heat loss due to a small surface-area-to-volume ratio, necessitating an unusually high metabolic rate and a 2- to 3-hour feeding cycle to fuel metabolic processes (Churchfield, 1990). Neither hibernation nor torpor are possible, as low degrees of fat storage and high energy demands require continuous activity periods throughout the 24-hour cycle (ibid.). Instead, behavioral alterations are seen in colder seasons with increased sub-nivean and fossorial activity (ibid.).

Ontological and reproductive patterns vary widely across species. Soricine shrews do not demonstrate paternal care (ibid.). Rather, the female builds the nest and cares for the young while the male continues to search for additional mates (ibid.). The Maritime Shrew is expected to have a breeding season from April to August, a gestation period lasting between 13 and 21 days, and a lactation period between 20 and 24 days based on that observed in Arctic Shrew populations (Kirkland and Schmidt, 1996). There have been records of Arctic Shrews reproducing in their birth year; however, young of the year generally do not reproduce until the following breeding season, when they may produce several litters of young (Churchfield, 1990; van Zyll de Jong, 1983).

The life span of the Maritime Shrew is thought to be similar to that of the Arctic Shrew: approximately 15 months (Kirkland and Schmidt, 1996). Predation likely contributes more to the overall fluctuation in shrew populations, however, than does senescence. Owls, other birds of prey, and weasels prey on shrews for a small portion of their diet (Churchfield, 1990). Domestic cats, although they rarely eat shrews (likely due to their strong odour and unpalatable taste), do hunt and kill them regularly (ibid.). The effects of high predation on the Maritime Shrew population, like most of its natural history is not known. Without this information, neither population viability estimates can be made nor conservation strategies designed.

Species knowledge is the most powerful tool available to any species protection effort. The Maritime Shrew is found in moist areas on the edges of marshes and flood plains, habitats that are highly fragmented

throughout the Maritimes (van Zyll de Jong, 1983; Herman and Scott, 1992). Our limited knowledge of the species indicates that it is a habitat specialist that cannot or will not move beyond these fragments (Herman and Scott, 1992). As temperatures increase, and water tables and isotherms shift, the ability of the species to move into adjacent habitats will be essential for its survival (ibid.).

Help wanted

I am a graduate student at Acadia University working with Dr. Tom Herman. I am interested in determining which habitat types discourage movement of *S. maritimensis*, what distances they travel in particular habitats, and what differences exist in their travel paths in each habitat type. Investigation of individual movements in *S. maritimensis* will facilitate broader predictions about dispersal potential, and vulnerability of the species to climate change.

Readers can contribute to the conservation effort by providing information that could clarify the distribution of this maritime endemic. The Maritime Shrew is a medium sized shrew, approximately 100–125 mm in total length (Kirkland and Schmidt, 1996). It is visually distinguished by its tri-colored pelage: dark brown back, light brown sides, and light gray underside (Smith, 1939). It is the only tri-colored shrew in the Maritimes.

If your cat drops one on your doorstep, please place it in a baggie, freeze it, and contact me to arrange for pickup. In addition, owl pellets can be analyzed for remnants of the species. If you discover owl pellets anywhere in Nova Scotia, please put them in a baggie and send them to Acadia University for analysis. Please be sure to record the date and location of any items you collect. Despite being "only a shrew" this is an important mammal in Nova Scotia and it is our responsibility to protect it. Your samples would be a great contribution to the effort.

Please send your owl pellets to:
Owl Pellets
c/o Kim Dawe and Stephen Petersen
Department of Biology, Acadia University
Wolfville, NS B0P 1X0

Contact Kim Dawe
E-mail: <053209d@acadiau.ca>
Tel: (902) 542-0374

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North American Migration Count
May 11, 2002
by Judy Tufts

For the general interest of BNS readers, this report carries the Spring 2002 North American Migration Count reports for only the three local provincial counties involved in the Blomidon Naturalists Society membership.

My heartfelt thanks go out to the 113 parties consisting of 152 individuals who went out into the field looking for birds on May 11, 2002, while 107 Feeder Watchers checked out 87 feeding stations around their homes. It was another great effort in spite of weather less than cooperative in much of the area, with high gusty winds bedevilling many of us, curtailing hours out in the field for some and sending many birds for cover, thus depriving us of their songs for identification or location. No doubt this also shortchanged us in reaching the true number of species out there. But then, this has been a most unusual spring, hasn't it? And we do live in Nova Scotia!

Special thanks and much credit for their contribution go out to the two Hants County coordinators – Roslyn MacPhee and Bev Shanks – and to Sheila Hulford, who coordinates and recruits volunteers for the overlapping areas of Kings and Annapolis counties in the Kingston area. Many long hours are put in behind the scenes to gain maximum coverage of these areas, adding to the overall provincial picture of migration. Annapolis County has yet to have a county coordinator, which is a shame as there are many areas not covered. Any volunteers out there?

Some interesting highlights of the day's count:

• 206 species were counted for the province.

• We added four new species to our provincial NAMC listing: Tufted Duck and Little Gull (Pictou Co.), Clay-coloured Sparrow (Cape Breton), and a Black Vulture in Hants East.

• For the second year in a row a Eurasian Whimbrel has turned up for the count in Cape Breton. Other possible returnees included a male Great-crested Flycatcher to Coldbrook, Kings Co., and a pair of Brown Thrashers and one American Oystercatcher tallied on Cape Sable Island.

• Three species of egrets visited our shores: one Great (Halifax), two Snowy (Cape Breton and Digby) and a Little Egret (Cape Breton).

With Turkey Vultures noted this year in nine counties – though some may have crossed boundaries to be tallied in more than one county – evidence of this species' spreading throughout our province is increasing each year. In the last few years several sightings per year take place along the North Mountain and in the Annapolis Valley. Many Northern Gannets had not yet dispersed to their breeding grounds; over 2,000 were seen, mostly in Shelburne and Cape Breton counties. Gray Partridge were not tallied in the Truro area this year, but a single bird was spotted in Hants East (could this be a truly wild bird or an escape from breeding stock?). There was a Eurasian Wigeon in Halifax County, five (no less) Dickcissels came to various provincial feeders, a Blue-gray Gnatcatcher made it to Cape Breton County, and one Northern Shrike lingered on Long Island, Digby County.

Other local birds of interest included one American Coot in Canning and one Short-eared Owl in Belleisle Marsh, while the largest invasion for a spring count of Ruby-throated Hummingbirds – 50 percent of the province's tally – was found throughout the Annapolis Valley. And surprisingly early were 54 Chimney Swifts, who turned in for the night at the Robie Tufts Nature Centre chimney in Wolfville. Unfortunately, no-one was checking out the Middleton Regional High School chimney that evening or we might have discovered more.

Large increases in some species were noted this year: 33 mockingbirds (24 of which were found in the mockingbird hotspot Kentville/Wolfville area this year), up from 25 in 2001; 34 cardinals (Shelburne and Yarmouth counties sharing the honours with 25, up from 12 in 2001); 55 Northern Orioles this spring were up from the 2001 tally of 22 birds.

And how about this for an exotic surprise – a pair of Hants County birders checking out a wet meadow in the Shubenacadie area, looking for a

yellowlegs species that had been there in previous days, found instead two very colourful Mandarin Ducks resting on a bank of a ditch full of water. The ducks then disappeared upstream to join some Mallards. The two counters believe these Mandarins have probably escaped from the Shubenacadie Wildlife Park, where some have been residing in recent years. Finally, to add a bit of colour, and humour, to the the "exotic" class, Jim Wolford (Kings Co.) spotted a family of flamingos – "a trio of adults and two half-grown youngsters" – at an Evangeline Beach cottage – the pink plastic kind!

Thank you everyone for all your help. For those who'd like to see the total provincial county tallies, Sherman Williams has very thoughtfully made them available on his website: <www.glinx.com/~sherm/>.

North American Migration Count —

Species	Anna	Hants	Kings
Common Loon	3	11	5
Pied-bill. Grebe	-	2	
D-cr. Cormorant	6	52	102
Great Cormorant	-	2	-
Cormorant sp. *	-	-	2
Am.Bittern	4	11	-
Gt.Blue Heron	2	1	23
Turkey Vulture	1	-	2
Canada Goose	73	84	36
Wood Duck	7	2	10
American Wigeon	5	11	7
Am. Black Duck	14	373	192
Mallard	9	48	114
Mall.xBlk Duck hybrid *	-	-	5
Blue-winged Teal	13	2	6
N. Shoveler	2	2	2
Green-winged Teal	-	2	23
Ring-necked Duck	81	56	15
Common Eider	33	-	28
Surf Scoter	4	18	-
Black Scoter	5	25	22
Bufflehead	55	-	-
Common Goldeneye	4	-	-
Hooded Merganser	2	-	2
Common Merganser	5	20	-
Red-Br Merganser	2	-	-
Osprey	1	26	-
Bald Eagle adult	-	28	23
Bald Eagle imm *	-	14	3
Northern Harrier	2	13	8
Sharp-shin. Hawk	4	4	8
Northern Goshawk	-	1	2
Broad-wing Hawk	-	3	-
Red-Tailed Hawk	7	12	35
American Kestrel	-	7	5
Merlin	-	3	8
Gray Partridge	-	1	-
Rng-nk Pheasant	14	81	152
Ruffed Grouse	2	25	11
Spruce Grouse	-	1	-
Sora	2	3	3
Anerican Coot	-	-	1
Killdeer	4	33	8
Great. Yellowlegs	-	10	11
Lessr. Yellowlegs	-	-	1
Willet	-	9	14
Spotted Sand.	3	8	13
Purple Sandpiper	-	-	1

Species	Anna	Hants	Kings
Peep sp. *	-	18	8
Common Snipe	10	39	8
Am. Woodcock	4	24	1
Ring-Billed Gull	2	163	86
Herring Gull	54	223	713
Grt. Blk.-bk. Gull	16	41	385
Gull sp. *	8	9	48
Common Tern	-	1	-
Black Guillemot	-	-	2
Rock Dove	39	310	146
Mourning Dove	77	344	286
Grt. Horned Owl	-	3	-
Barred Owl	-	6	25
Short-eared Owl	1	-	-
Chimney Swift	-	-	56
R.-thr. Hummingbird	8	27	26
Belted Kingfisher	4	11	11
Yel-bell. Sapsucker	2	11	4
Downy Woodpeckr	19	74	88
Hairy Woodpecker	14	41	36
Blk-back. Woodpkr	-	3	-
Northern Flicker	27	179	74
Pileated Woodpkr	2	10	10
East. Wood-Pewee	-	-	1
Least Flyctchr	2	7	4
Empidonax sp. *	-	-	1
Eastern Phoebe	6	-	2
Gt. Crst Flyctchr	-	-	1
Blue-head. Vireo	18	43	28
Red-eyed Vireo	2	4	1
Vireo sp. *	6	2	-
Gray Jay	-	1	1
Blue Jay	67	278	278
American Crow	126	798	921
Common Raven	9	169	266
Tree Swallow	305	291	385
Bank Swallow	4	-	10
Cliff Swallow	-	-	10
Barn Swallow	30	81	86
Blk-cap Chikadee	98	472	425
Boreal Chickadee	1	4	2
Red-brstd Nthtch	8	14	40
Wh.-brstd Nthtch	7	7	19
Brown Creeper	4	5	5
Winter Wren	1	8	-
Gld-crwn Kinglet	9	56	9
Rby-Crwn Kinglet	1	210	37
Veery	2	-	1

** unidentified or subspecies*

— Results for the Valley

Species	Anna	Hants	Kings
Swainsons Thrush	-	-	1
Hermit Thrush	8	82	11
American Robin	145	870	487
Gray Catbird	-	-	1
N. Mockingbird	-	-	24
Eur. Starling	183	868	1726
Bohemian Waxwing	-	-	1
Cedar Waxwing	-	-	66
Nashville Warb.	6	23	3
Northern Parula	3	14	19
Yellow Warbler	10	3	34
Chstnt-side Warb.	1	1	-
Magnolia Warbler	3	4	4
Blk.-thtd. Blue Wrb.	1	-	-
Yellow-rump Wrb	43	205	134
Blk.-thtd. Grn. Wrb.	16	61	39
Blackbrnian Warb	2	-	2
Palm Warbler	6	41	8
Blk-&-Wht. Warb.	22	62	31
Amer.Redstart	-	-	2
Ovenbird	9	6	30
North. Watrthrsh	2	11	11
Com. Yellowthrt	-	2	-
Am. Tree Sparrow	11	14	2
Chipping Sparrow	8	37	69
Savannah Sparrow	21	54	56
Fox Sparrow	-	-	1
Song Sparrow	83	306	374
Lincoln's Spar.	-	-	1
Swamp Sparrow	10	69	3
Wht-throat Spar.	30	285	93
Wht-crown Spar.	3	5	12
Dark-eyed Junco	81	428	206
N. Cardinal	-	-	2
Rose-br. Grosbeak	2	5	7
Bobolink	5	2	14
Red-wing Blkbrd	352	389	339
Rusty Blackbird	1	6	17
Common Grackle	447	617	559
Brn-head Cowbird	6	20	22
Pine Grosbeak	-	3	-
Purple Finch	48	381	165
House Finch	1	-	-
Red Crossbill	-	1	-
Wh-w. Crossbill	-	4	-
Common Redpoll	-	3	-
Pine Siskin	8	20	23
Am Goldfinch	71	496	669
Eve. Grosbeak	37	216	92
House Sparrow	17	183	207
Black Vulture	-	1	-
Mandarin Ducks**	-	2	-
Plastic Pink Flamingos	-	-	2.5
Total	3064	10791	11016

Total: 140 species for the Valley

Time Start	0600	0450	0515
Time Stop	2100	2200	2230
Owling			
Time (hr.)		2.25	
Distance (km)		30	
Parties (#)		2	
Observers (#)		5	
Regular			
Foot (hr.)	22	85.5	84.6
Car (hr.)	10	51.75	51.75
Boat (hr.)		6	
Bike (hr.)			3
Other (hr.)		1	9
Foot (km)	41.5	110	135
Car (km)	232	860.25	760.5
Boat (km)		6	
Bike (km)			17
Parties (#)	10	54	43
Observers (#)	13	71	61
Stationary			
Time (hr.)	8.5	4	0.5
Parties (#)	3	2	1
Observers (#)	3	2	2
Feeder watching			
Time (hr.)	23	80.5	136.25
Feeder watchers (#)	11	44	52
Feeder stations (#)	10	34	43

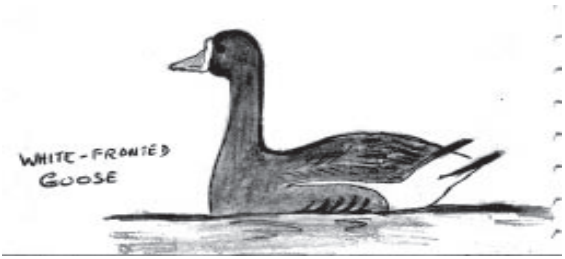
** *possible escapes*

Bird Notes from Field and Feeder
Spring 2002
by Mike McCall

On the morning of Apr 17 Judy Tufts saw the single Snow Goose with lots of Canada Geese along the Habitant River in Canning.

On Apr 8 Brenda & Bill Thexton saw a single Snow Goose with about 175 Canada Geese on the new artificial pond adjacent to Van Nostrand's Pond at Starrs Point.

The artificial pond held only about 80 Canada Geese; however, among them was a treat, a Greater White-fronted Goose with an orange beak. I have to wonder if it could be the same goose we saw at Lakeville for several weeks last fall?



On Mar 29 the Giffens reported a stunning Hooded Merganser pair at the Ducks Unlimited site, Old Cranberry Bog near Margaretsville Elementary School. On the same day at Margaretsville they sighted Purple Sandpipers, Red-necked Grebe, Red-throated Loon, Common Eider, Surf Scoter, and Common Merganser.

The Hendricks were greeted Apr 14 at Port George with a floating mat of 200+ ducks. Most of the mat was a mix of Black and Surf Scoters with a group of Common Eider (20+) on the perimeter.

Further up the beach were five Brant walking on the rocks at the surf's edge. Still further, five Harlequin Ducks (2 m.), one Red-necked Grebe,

four Red-breasted Mergansers. A Great (Common) Egret flew over the observers and along the beach.

On Apr 27 Brenda & Bill Thexton found at Saxon Street Pond three lovely male Wood Ducks, and a pair of Ring-necked Ducks. Above the pond were about 100 Tree Swallows (on a cold, windy day sure to yield few insects).

At the Port Williams sewage ponds Jun 4 two separate pairs of Northern Shovelers were seen, plus numerous Mallards, one Mallard brood, and one Black Duck brood. But the female Wilson's Phalarope seen there Jun 1–2 by George Forsythe was not present.

Judy Tufts' presence on a neighbour's lawn Mar 29 caused two Killdeer to protest (loudly) her presence in "their" territory.

At high water at Margaretsville, also on Mar 29, Pat and Barb Giffen became aware of movement just off the grass: 20–30 Purple Sandpipers about six feet away were milling about on the rocks, vocalizing, quite unconcerned about their human visitors.

Displaying Common Snipe flew overhead at Saxon Street Pond Apr 18, descending rapidly only feet apart into the field adjoining the pond (rivals for the ladies' attentions?).

A kingfisher is regularly seen on a powerline above a small pond on Church street between Chipmans Corner and Highway 341.

On Apr 12 Bernard Forsythe reported that Barred Owls this year are a bit late in laying their eggs, compared with some other years.

Two Great Horned Owls overwintered in a woodlot adjacent to Prescott House at Starrs Point; in early spring they occupied a former Red-tailed Hawk nest perched precariously in the top of a fir tree, and the female was seen presumably sitting eggs. The nest was subsequently blown down in one of those fierce blows that have been too common this spring.

Judy Tufts spotted her first Osprey of the year Apr 18 just north of Kentville trying to balance itself atop a cluttered hydro pole full of wires.

Bernard Forsythe reports a previously unnoticed Bald Eagle nest at White Rock, west of the village in the Gaspereau River Valley and about even with a gravel pit along the Canaan Road from White Rock. It was viewable from the top of White Rock Mountain. To get there drive up past the Sunken Lake Road to where there's an open field on the west-northwest side of the road. Find the gravel pit on the other side of the valley, and look a bit west of that.

Jim Wolford reports on a tour of the five Bald Eagle nests to which he can drive. The nestling count is probably on the low side, since it is often difficult to be sure of how many there are:

- Greenwich, north of Noggins Farm Market: two large nestlings
- Starrs Point (not a poplar tree, but it is deciduous): at least two large nestlings
- Muskrat Farm Marsh (Canard Road): one large nestling with an adult
- White Rock Pond: two big "babies"
- Wallbrook Ravine (Stirling property): at least one big "baby"

A light-phase Rough-legged Hawk was hovering/hunting Apr 8 south of the Port Williams sewage ponds.

The saga of the Acadia Red tailed Hawks began early in the year, involved one change of location and several occasions on which the beginnings of a nest were blown from the ledge above Convocation Hall. In mid-June a sort of nest was visible, but the birds – adults or young – could not be seen.

P.C. Smith reports May 6 that a pair of vocal, territorial Merlins are hanging out on the Irving project property, mainly near the tallest spruce on the property. (This would likely be a second pair, besides the Merlins above Willow Park along King Street.)

On Apr 18 Judy Tufts found a single Cliff Swallow with ~70 Tree Swallows swooping back and forth over the Port Williams village pond in the afternoon.

The Chimney Swift counts by Ted Wokowski, Jim Wolford, and others

tell a happy tale of very robust numbers night after night at the Robie Tufts Nature Centre (Wolfville), Middleton Regional High School, the Nova Scotia Agricultural College at Bible Hill, and New Glasgow's Temperance Street school. Some indication of the health of this population can be gained from the maximum numbers of birds observed entering the several chimneys between Jun 6 and 12: Wolfville, 526; Middleton, 712; New Glasgow, 705; Bible Hill, 480.

[The Swifts refuse to enter the various chimneys in an orderly, easily counted fashion and thus the numbers are deemed accurate to within 50% nineteen times out of twenty. Or something like that. – Ed.]

Mike McCall reported that "his" returning Ruby-throat arrived right on schedule on May 8. As of Jun 24, seven or eight females fight for spots at his two feeders; only occasionally does a male join the fray.

Ruffed Grouse crossed the road in front of a car near Black River Apr 17.

Angus MacLean divided his time May 30 on Butler Road (Southern Kings Co.) between looking for birds and fighting off black flies. Notable birds were three Olive-sided Flycatchers and three or four Yellow-bellied Flycatchers. Black flies not notable.

Loud and very familiar buzzy calls coming from trees near a house on Kent Avenue in Wolfville Mar 28 attracted Judy Tufts' attention and turned out to come from a large flock of elegant Bohemian Waxwings – around 120 of them, no Cedars – sitting up in the top branches, cheerfully twittering in the sunshine.

Sherman Bleakney had a pair of House Wrens building a nest in an empty Tree Swallow nest box in his back yard Jun 13.

Pairs of ravens were seen interacting as in courtship in several places on Apr 17. The ravens at the nest at the east edge of Wolfville's Main Street are nesting for the

first time, and therefore late when compared to established pairs, which had been on nests for several weeks. Angus MacLean saw four Gray Jays along Butler Road on May 30. The Northern Mockingbird present in Wolfville in the big field by the lawn-bowling club along Wickwire Avenue was seen Apr 7. On May 6 the Thextons saw two mockingbirds together along Marsh Hawk Drive in Wolfville.

Three Brown-headed Cowbirds (1 m., 2 f. or imm.) were seen Apr 21 at Grand Pre feeders, along with lots of grackles and eight male Red-winged Blackbirds. Angus MacLean saw a Rusty Blackbird on Butler Road.

The three most common thrushes found in Nova Scotia – Swainsons, Hermit, and Veery – have all been heard at various times of day from the deck at Mike McCall's place in Halls Harbour.

Sherman Boates reported Jun 3 that he knows of a nestbox that now has a completed nest with three eggs from a pair of Eastern Bluebirds in Kings County. This nestbox was inhabited by a pair of tree swallows, but a cat got the female, and soon after that, in late May (26, 27,or 28), a male bluebird showed up followed soon by a female The pair moved in, built a nest, and very quickly had eggs. Sherman said the estimate for the number of bluebirds in Nova Scotia is 30.

Judy Tufts reported on May 23: "We had the delightful pleasure of seeing a pair of Eastern Bluebirds on our property early Thursday morning, who were obviously looking for a home to set up shop. Unfortunately for them (and us?) the box they spied and showed great interest in (across the road from our home on Wolfville Ridge) had been taken over by a pair of Tree Swallows who were away feeding. There are several other nest boxes around our property, and from the direction the bluebirds came they would have easily seen these other boxes, but obviously locations were not suitable.

"The male Bluebird spent much time on top of the nest box or close by. The female was seen entering the box on one occasion. We observed them for more than half an hour. However, on the return of the Tree Swallow pair, the immediate response was that the swallows asserted their claim, and the bluebirds took off. I relocated one of my other boxes further along the fence line later, in the hopes the bluebirds might come back, but sadly

we have not seen them since."

Red-eyed Vireos are in good supply in all parts of Kings county, contributing to the happy din of the woodlands.

Mike McCall's usual warblers are about on his Halls Harbour property: Yellow-rumped, Northern Parula, Yellow, Black-throated Green, Magnolia, and Blackpoll. But he was puzzled by the appearance Jun 8 of a bird he finally identified as a Yellow-throated Warbler, well north and east of its usual territory in the northeastern United States. It has not made a second appearance.

Angus MacLean reported one Cape May Warbler on Butler Road May 30.

The morning of May 24 Sheila McCurdy heard a singing cardinal in the woods south of the old Wolfville hospital (now health clinic). As far as I know, this is the first report of a cardinal for Wolfville since late winter.

On Mar 25 a flock of 100 Common Redpolls in New Minas flew across Hwy 1 near the old Horton High School, and the Tufts report a few redpolls coming to their backyard finch feeders (Wolfville Ridge). A visiting Sharpie has been stirring things up around the feeders.

Gerry Trueman on Wolfville's Chestnut Avenue had a single Fox Sparrow at her feeders Apr 13, 14, 15. Judy Tufts, alerted by its singing, reported a Fox Sparrow busy scuffling leaves near her feeders Mar 25.

What's In The Sky?
by Roy Bishop

New Moon: July 10, August 8, September 7, October 6
Full Moon: July 24, August 22, September 21, October 21
Autumn begins on Monday, September 23, at 01:55 (ADT)

An Expired Rare Display of Planets
In April and early May there was a rare grouping of all five naked-eye planets in the western evening sky. Not since 1940 had the bright planets been so closely grouped. However, the spectacle meant that this summer will be planet-poor. The three outer planets – Mars, Jupiter, and Saturn – move more slowly in their orbits than Earth and have fallen behind and disappeared behind the Sun. Saturn, Jupiter, and Mars pass behind the Sun on June 9, July 20, and August 10, respectively. They slowly emerge into the pre-dawn sky but will not be well-placed for observing until autumn.

The inner planets – Mercury and Venus – travel faster than we do, and this is why Venus has had no trouble keeping up to us and remaining in our evening sky. Unfortunately, Mercury travels too fast: it rushed toward us in the evening sky and on May 27 dove between us and the Sun to reappear in the morning sky in late June. Venus will do this, too, but not until October. Next winter Venus will be a spectacular object in the pre-dawn sky.

Venus
As mentioned, Venus is the only planet left in our evening sky this summer. Venus is bright but will sink lower in the western twilight as the weeks pass, becoming difficult to see by late September.

Galactic Spectacle
Each year I urge readers to look at the summer Milky Way. The luminous fog of countless stars interspersed with dark dust lanes that arches across the late evening sky in July and August is the most awesome view available to the unaided eyes. A clear, transparent, moonless sky is necessary. Also, you must remove yourself far from the glaring lights of

cities, towns, and farmyards. Then gaze upward at the Milky Way and remind yourself that this is an immense edge-on galaxy – a vast, three-dimensional, edge-on, island universe of dust and stars, containing for a time in one of its arms the Sun, Earth, and White-throated Sparrows. The Milky Way galaxy was there before the Sun and Earth formed, and will be there long after the Sun has vaporized Earth.

Perseid Meteors
This annual shower will be at its best on the evenings of August 11 and 12. A fat crescent Moon will set in late evening, leaving a dark sky for the meteors. The standard recipe for enjoying the Perseids involves

- a clear sky,
- a dark location (get out of town, and away from yard lights in the country),
- a good view of the sky (avoid trees and buildings),
- reclining lawn chair, hat, coat, blanket, thermos of hot chocolate, and
- a nap after supper so you do not fall asleep in the lawn chair.

Harvest Moon
The cool, pleasant evenings around the third weekend of September will be decorated with the Harvest Moon. At our latitude, full Moons that occur in late summer and early autumn rise only a little later on several successive evenings, with the result that the light of the full Moon is available to aid farmers in their harvest in September (hence "Harvest Moon") and hunters who hunt illegally after sundown (hence "Hunter's Moon," on October 21 this year).

Lunar Phases, Seasons, Calendars, and an Unusual Birthday
If you plan to read further, shift your mind into a quantitative state. Some arithmetic follows, but it is interesting and will sharpen your appreciation of lunar phases and the calendar.

Note how the dates of the lunar phases at the beginning of this article drift backward through the months, occurring about one day earlier each successive month. The calendar months average $365 \div 12 = 30.4$ days, whereas the cycle of lunar phases is 29.5 days, almost one day shorter. In a year there are $365 \div 29.5 = 12.37$ cycles of lunar phases (12 cycles

+ 0.37 of a cycle).

There is a Full Moon on July 24, so the Full Moon in July of next year will occur 0.37 x 29.5 = 11 days earlier, on July 13. Since this is close to the day of the month that New Moon occurs this July, the Full Moon and New Moon dates approximately reverse from one year to the next. There is a Full Moon near this year's autumn equinox, so in 2003 there will be a New Moon near the autumn equinox.

Last year the autumn equinox occurred about 8 p.m. on September 22 (check your old 2001 BNS calendar). This year the autumn equinox is six hours later, about 2 a.m. on September 23. Each successive year the beginning of each of the seasons shifts about 6 hours later on the calendar. This is why in every fourth year an extra day (February 29) is inserted to get the calendar back in step with the seasons. It was Julius Caesar who introduced leap years, and a calendar in which every fourth year is a leap year is called a Julian calendar. The Julian year averages (365 + 365 + 365 + 366) ÷ 4 = 365.2500 days.

However, our calendar is not a Julian calendar. It is a Gregorian calendar, an improved version of the Julian calendar introduced by Pope Gregory in 1582. In the Gregorian calendar, century years that are not multiples of 400 (for example: 1700, 1800, 1900) are designated *not* to be leap years. Thus, in a 400-year period our Gregorian calendar has three fewer days than the Julian one does, for an average of ((365.2500 x 400) – 3) ÷ 400 = 365.2425 days per year. Earth requires an average of 365.2422 days to return to successive autumn equinoxes, so the Gregorian calendar is a much better match to what is happening in the heavens than is the Julian calendar.

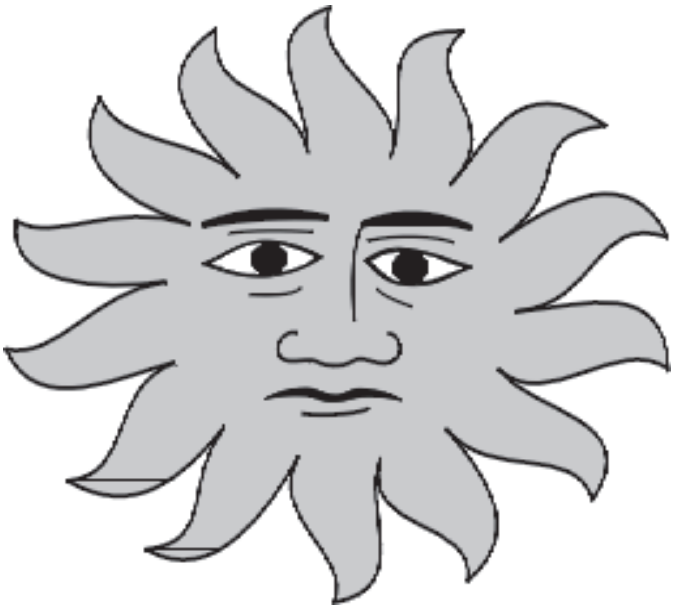
The Julian calendar gets out of step with the heavens by 365.2500 – 365.2422 = 0.0078 days per year, or one day every 1 ÷ 0.0078 = 128 years. When Pope Gregory signed his calendrical papal bull in 1582 he deleted 10 days from the calendar (October 4, 1582, was followed by October 15, 1582) to get the spring equinox shifted back to March 21. Our Gregorian calendar gets out of step with the heavens by 365.2425 – 365.2422 = 0.0003 days per year, or one day every 1 ÷ 0.0003 = 3,000 years.

Anglican England did not adopt the Catholic calendar until 1752, when

11 days had to be deleted (up from 10 days, since 1700 was a leap year on the Julian calendar, but not on the Gregorian calendar).

Note that since 2000 was a leap year (the first century leap year in 400 years), we are effectively on a Julian-type calendar from 1901 until 2100. This is why the usual date of the autumn equinox shifts from September 23 (as in 1900) to September 22 (as in 2099). Finally, in 2100 the Gregorian correction kicks in and the usual date of the autumn equinox shifts back to September 23.

One consequence of the slow drift of the calendar relative to the seasons is particularly meaningful to Roy Bishop. I was born in the summer of 1939, on September 22 at 7 p.m. All my birthdays up to and including my 36th were also in the summer. My 37th birthday, however, occurred in the autumn because, for the first time in my life, the time of the autumn equinox occurred before 7 p.m. on September 22. Since then I have had a sequence of one autumn birthday followed by three summer birthdays. Beginning in 2008 the pattern will change to two and two – all because the Julian-type year is not a good match to the astronomical year!



Blomidon Naturalists Society

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