

THE HALIFAX FIELD NATURALIST



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Return address: HFN, c/o NS Museum of Natural History, 1747 Summer Street, Halifax, NS, B3H 3A6

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FEES 2008/2009	
Individual	\$15.00 per year
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GRAPHICS All uncredited illustrations are by H. Derbyshire or from copyright-free sources. **Front & Back Covers** - Purple stemmed Asters and Seaside Goldenrod - Bob McDonald; **Tide Table** - Canadian Hydrographic Service, Fisheries & Oceans Canada.

HFN NEWS AND ANNOUNCEMENTS

EDITORIAL

— S. ROBERTSON

What a wonderful summer for plants and animals! Lots of rain for roots, waterfowl, fruits, trees, and leaves. Our back-garden Spy apple tree was so laden with fruit that one of the largest and most productive branches broke with the weight; the apples have ripened nicely on the back deck in a bucket; they are delicious and full of juice.

Point Pleasant Park was especially verdant with all the precipitation. The Comprehensive Plan for the Park, carried out jointly by Ekistics Planning of Dartmouth and NIP Paysages of Montreal, was shared with HFN on June 5th (followed by an HFN field trip there June 16th), and with the general public on June 25th. It is a plan that is truly ecological in scope, aiming towards a balance of recreational activities and historical features in a restored, nurtured, and protected Acadian forest setting. This will be implemented over time by an 'adaptive management' approach (see the report, p. 7, by David Patriquin).

With this issue we are launching explanatory articles about taxonomy – the naming of species and the ordering of them in relation to evolution and to each other; this bears upon our field trip species lists, and why they are arranged as they are.



FOR OUR BIRDS; 15/16 NOVEMBER

A groundbreaking conference entitled "For Our Birds" will focus on: increasing communication about the science and conservation of birds; engaging new people in bird conservation; and increasing public awareness and action for birds.

The keynote speaker will be Dr. Janis Dickinson, Director of Citizen Science at the Cornell Laboratory of Ornithology, Cornell University. It will be presented at the Rowe Management Building, Dalhousie University, University Avenue, Halifax, Nova Scotia, from 9:00 a.m., Saturday, November 15th to 1:00 p.m., Sunday, November 16th.

Be sure to register early: The first fifty registrants will be entered into a draw for two gift certificates from the For Our Birds store in Mahone Bay! To register and for more information, contact Mark Butler, Ecology Action Centre, 429-5287; birds@ecologyaction.ca; or www.ecologyaction.ca/coastal/birds.

This event is sponsored by the Nova Scotia Bird Society, the Ecology Action Centre, Dalhousie University, and Bird Studies Canada.

THANK YOU

Late last year HFN member Akhtar Abbasi alerted our Board to Pesticide Free Nova Scotia's campaign against cosmetic and non-agricultural pesticide use throughout Nova Scotia. Subsequently, Bob McDonald wrote a letter to support their proposed province-wide ban. Following is Helen Jones' reply:

"August 6, 2008

Dear Bob,

I am sorry it has taken me so long to write to tell you and everyone in the Halifax Field Naturalists how much your support is appreciated for a province-wide ban on the use of cosmetic pesticides in Nova Scotia. Thanks to all of you! It means a great deal to our growing coalition to have an endorsement from an organization such as yours.

HFN has a long and impressive history of documenting and cherishing Nova Scotia habitats and all the diverse flora and fauna they support. Reducing and eliminating pesticide damage to sensitive community environments, urban and rural, is a goal we all are committed to. When Akhtar shared the news with all of us in Pesticide Free Nova Scotia, we were delighted and elated to hear it.

Welcome aboard!

Sincerely,

Helen Jones, MSc., Hon. Zool (UBC), Ed.D. (Col. Univ.), for Pesticide Free Nova Scotia; past member Pesticide Bylaw Advisory Committee for HRM; board member, Real Alternatives to Toxins in the Environ-



GREAT BACKYARD BIRD COUNT

Planning is now underway for the Cornell 2009 Great Backyard Bird Count, sponsored by the Cornell Lab of Ornithology and the National Audubon Society. Because a goodly amount of lead-time is needed for various nature publications, they're sending out this news release now, so that people can start thinking about and planning their participation.

They are also sharing more than 4,000 digital photos submitted for their annual photo contest! You can view some of these at their online photo gallery: <http://www.birdcount.org/gallery>. Additional background information is available on the GBBC web site: <http://www.birdcount.org> (check out the FAQ section).

For more information, contact Patricia Leonard, pel27@cornell.edu.



NEW AND RETURNING

Judy Keating
Helen Smith

SPECIAL REPORTS

A NATURAL RESOURCES VISION

Following is David Patriquin's July 31st, 2008 submission to Voluntary Planning (VP), the Citizen's Policy Forum on Nova Scotia's Natural Resources, volplan@gov.ns.ca, regarding the stewardship and sustainability of our provincial natural resources, on HFN's behalf:

WHAT IS YOUR VISION FOR BIODIVERSITY, FORESTS, MINERALS AND PARKS IN NOVA SCOTIA?

The government achieves its goals of protecting 12% of the total land area by 2015. It sets new goals, recognizing that the target of 12% of protected land must be applied to all landscape types, and that 12% is not an end but a waypoint; that much larger areas must be protected to avoid precipitous losses in biodiversity.*

A network of core protected areas, large patches of forest land on long rotations, and corridors encompassing 30% of the land area is developed that spans the province and continues through Chignecto Isthmus into New Brunswick. This is achieved on private lands through a combination of land purchases, easements, land use zoning, tax credits, and other incentives.

Forests occupy almost 80% of the land area, thus their management is key to biodiversity conservation. In the 21st century, selection cutting becomes the norm, making use of much smaller, more fuel efficient machinery (than used in 2008), as well there is some revival of horse logging. Clearcutting is restricted to 10 hectare lots, and requires an environmental assessment. Whole-tree harvesting is not permitted. There is no clearcutting on crown land. Strategies and regulations are developed to achieve at least 15% old growth forest (with natural gaps in earlier successional stages) in all currently forested landscape types by 2100 (compared to ~0.3% in 2008, 8-9% in the 1950s and perhaps 50% in pre-European times); also for reintroduction of forested land on 15% of deforested landscapes. In addition to conserving biodiversity, these measures rescue the forest resource from irreversible declines in productivity due to undermining of the soil base by industrial forestry, increase the value of forest products per unit harvested, employ more people, and improve the capture and storage of water.

A minimum requirement for one hundred-metre wide riparian buffer zones along 80% of watercourses is implemented. These serve as wildlife corridors and habitat, in addition to their stream protection function (which might be satisfied by narrower zones).

Road needs are re-evaluated and a long term plan to reduce road intensity is introduced. Detailed specifications for wildlife passageways across roads are developed. One hundred-metre or wider natural habitat buffer zones are required adjacent to major highways.

Wetland protection is enhanced. Amongst the new provisions: wetland regulations are extended to treed bogs, a major wetland type in Nova Scotia that is not covered by current wetland regulations; a minimum 5:1 compensation ratio is set for any wetlands that are significantly impacted by development.

Peat excavation operations and draining of peatlands are not permitted in Nova Scotia.

A coastal zone management/conservation act is introduced. It includes strong restrictions on development within 100 metres of shorelines and steps in order to allow half of dyked land to return to natural salt marsh. At the federal level, several Marine Protected Areas are established.

The mining act is changed to forbid all mining exploration in environmentally sensitive areas. The moratorium on uranium mining is made permanent. Open pit/quarry type operations are restricted to areas of 20 hectares and less in environmentally least-sensitive areas. Environmental impact assessments for mining require assessment of the net economic benefits (or losses) to local communities and the province over a period of 150 years, using GPI (Genuine Progress Index) type accounting.

In the energy sector, exploitation of geothermal energy replaces the focus on wind power, because it (geothermal energy) offers more opportunity for reducing demand on traditional energy sources, and is more environmentally and human friendly. Small scale sustainable cutting of wood for energy is permitted by individual property owners for their own purposes, but large scale harvesting of wood for energy is not permitted; rather biomass fibre crops such as switch grass, fertilized with municipal wastes, are grown on recently reclaimed land as an initial stage in their reclamation.

The landscaping and horticulture industry turns native, introducing more native species to older neighborhoods and developing techniques for maintaining the local native landscape character in new developments.

Biodiversity conservation is introduced into the school curriculum. Students go on field trips to learn about the natural history of their area and work on native landscape reconstruction projects on school grounds and in their communities.

*NOTE: How much is enough?

We have a reasonably good record in Nova Scotia for setting up protected areas and the government should be commended for committing to 12% protected area by 2015 (up from approximately 8.2% currently). However, fragmentation of natural habitats at large continues pretty well unabated. Habitat fragmentation is responsible for more than 80% of biodiversity losses. Hence, at best, protecting 12% of habitat while larger areas continue to degrade will help only to stem the tide, not to stop it or reverse it.

We are only just at the beginning of large scale species losses associated with fragmentation of habitat. The alarm bells about species loss were raised in the 1980s because of losses that had occurred until then and, more so, because a better theoretical understanding of species biodiversity predicted huge losses to come with continuing destruction and fragmentation of habitats. E.O. Wilson's rule of thumb predicts that a tenfold reduction in habitat results in approximately 50% reduction in the number of species an area can support. Many or most species may hang on in a remnant habitat for a while, but are lost as they become locally extinct



and cannot be replaced by immigration from other, still extant populations in other suitable habitats. So, in addition to conserving as much intact habitat as possible, we need to reconstruct a network of habitats and wildlife corridors across the whole province in order to maintain the natural immigration and gene flow between populations in different regions.

Ideally, under the provincial scheme for protecting land an equivalent proportion of land would be protected in each of the 80 natural landscapes. Currently, nineteen of the 80 natural landscapes of Nova Scotia are not represented at all in Protected Areas, and 62 have less than 12% of their area protected.[1] Thus as we move towards the 12% target for 2015, priority should be given to the most poorly represented landscapes.

The 12% figure, however, should be seen as a way-point, not an endpoint.

This figure has its origin in The World Commission on Environment and Development Report: Our Common Future (1987).[2,3] The report called for at least tripling the expanse of protected areas which then stood at about 4% globally. Tripling seemed politically feasible, but this target was cited as a minimum and was not based on formal considerations of the area required to sustain species and ecosystems. A recent study by Karen Beazley and associates in the School for Resources and Environmental Studies at Dalhousie used a GIS and modeling based approach to estimate conservation needs in Nova Scotia[1]. They concluded that “~60% of Nova Scotia, including 32% in core areas, should be managed for conservation objectives to maintain genes, species, and ecosystems over time.” Similar estimates have been forthcoming from other studies. In practice this means that much larger areas than 12% of the province need to be managed for biodiversity conservation, regardless of whether they are in private or public hands.

1. Beazley, K. et al. 2005. Biodiversity considerations in conservation system planning: a map-based approach for Nova Scotia, Canada. Ecological Applications 15(6): 2192-2208

2. Report of the World Commission on Environment and Development: Our Common Future. (1987). Transmitted to the General Assembly as an Annex to document A/42/427 – Development and International Co-operation: Environment. Retrieved from <http://www.un-documents.net/ocf-06.htm>.

3. Wiersma, Y. F., & Nudds, T. D. (2005). On the fraction of land needed for protected areas. Chapter 7 in N. Munro et al. (eds). Making ecosystem based management work: proceedings of the fifth annual conference of the Science and Management of Protected Areas Association, 2003. Science and Management of Protected Areas Association. Retrieved from http://www.mun.ca/biology/ywiersma/wiersmanudds_sampaa.pdf.

WHAT ARE THE STRENGTHS OF THESE FOUR AREAS OF NATURAL RESOURCES?

- Biodiversity: our 80 diverse landscape types in a small province, and their associated biodiversity. Protecting and enhancing biodiversity at all levels (genetic, species, population) is our best preparation for climatic change, whatever turn that takes.

- Mining: some valuable resources for small scale, environmentally-sensitive mining for many centuries.
- Parks: truly exceptional.
- Forests: the Acadian forest, potentially.

WHAT BARRIERS OR ISSUES AFFECT THESE RESOURCES?

- Currently, there seems to be a general lack of recognition that the 12% protected area target was conceived (by conservationists, at least) as a starting point, not an end-point in protecting land for biodiversity conservation.

- We have some very good human resources and good scientific and economic bases for pursuing the vision described above (examples: 3 detailed land classification systems for N.S.; GPI accounting; universities, community colleges)

- Climatic changes may not materialize as we anticipate (it could get colder for a period, warmer faster than we anticipate, or change more slowly); hence our best strategy is conservation of biodiversity at all levels (genetic, species and ecosystem).

- Only 30% of land in Nova Scotia is crown land, a low proportion compared to the rest of Canada.

- The crisis in the forest industry is an opportunity to change our way of thinking about the use of forests. Amongst the factors leading to change: high costs and shortages of fuel; increased value of higher value wood products because of shortages of wood globally; decline in the demand for newsprint; new demand for certified wood; evidence that clear-cutting has contributed to erratic stream flows, decline of fish populations and declining water quality in the province; increased value of carbon credits; and increased importance of eco-tourism.

- Increased fuel costs should reduce vehicle use and need for new roads in the province.

- Changes in the economy at large will lead to changes in economic thinking and money markets to favour smaller scale, sustainable operations.

- On the whole, Nova Scotians share a deep appreciation of our natural resources.

WHAT DO YOU SEE AS YOUR COMMUNITY'S PRIORITIES FOR THE FUTURE IN THESE FOUR AREAS?

- Biodiversity: the need to think beyond 12%, and to apply the concepts to all landscape types.

- Forests: reduce the annual allowable cut to 1/3 of the current value; reduce clear cutting drastically; protect existing older growth forest; implement longer rotations.

- Mining: permanent moratorium on uranium mining; strong restrictions on open pit/quarry type operations.

- Parks: public education to value the role of parks in biodiversity conservation and to appreciate the sensitivity of biodiversity to human actions.

WHAT VALUES ARE ESSENTIAL TO GUIDE THE HEALTH AND SUSTAINABILITY OF THESE FOUR AREAS?

- Respect for our land and respect for each other.
- Transparency of public processes.
- Application of Precautionary Principle.

– David Patriquin



SPECIAL ARTICLES

TAXONOMY

— URSULA GRIGG

A wee while back, when I asked past editor Ursula Grigg whether she had received the summer /08 issue, her reply was, "Yes, and the ordering of the Arnell Lands Species list was awful!". Ruefully, I remembered I had neglected to send it off to her for editing before including it in the newsletter, as taxonomically speaking, species must be arranged in a certain sequence when making up a list for publication (correct taxonomic order has long been one of Ursula's interests and obsessions). Further conversation resulted in the realisation that we should write an explanatory article about this important topic (next issue). Here is a brief review of our basic reference work, and the reorganised list of those latest-identified Arnell species from the May /08 biota survey there (*ed.*).

The basic taxonomic arrangement we use is set out in the book *The Five Kingdoms of Life: an Illustrated Guide to the Phyla of Life on Earth*, third Edition, 1998, New York, Freeman and Co., L. Margulis and A.V.Schwartz. It lays out a clear scheme by which any organism, living or fossil, can be placed in a logical taxonomic position in relation to any other. It also lays out the reasons why they are so ordered. This scheme is founded on the research of many countries, over many generations, and that research includes the descriptions of anatomy, physiology, and molecular systematics of many organisms, plus details of geographical distribution and occurrence through time. Even habitat and behaviour patterns are noted, for allied species often show similar habits – bird-watchers and pet-owners can appreciate this!

The Five Kingdoms scheme is built upon the Swedish naturalist Linnaeus's introduction of the binomial system (by which every organism has two Latinised names), plus the English naturalist Darwin's Theory of Evolution (which suggests a means by which they can be related).

These developments gave organisms universal names which could be used in discussions by people wherever they lived, or whatever language they spoke, and led to the scientific studies of genetics, biochemistry, and molecular systematics.

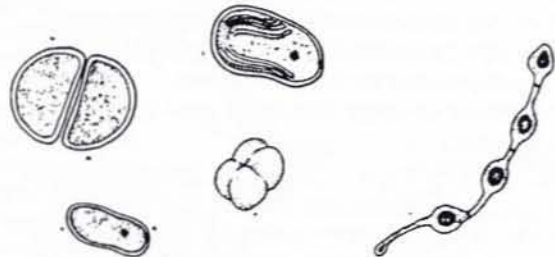
There are two Superkingdoms. The first is **Prokarya**, for those organisms whose cells have no organised nuclei and are without reproduction involving sex. Prokarya contains a single Kingdom, Bacteria. The second is **Eukarya**, for those organisms having both nuclei and sexual reproduction. Eukarya contains the Kingdoms Protocista, Fungi, Animalia, and Plantae.

Protocista contains apparently simple one-celled organisms, often with ancient fossil histories, and also includes those 'exceptional' organisms which cannot be classified satisfactorily in any other scheme (these are the delight of exam-setters, but the plague of Biology students, who have to learn them individually by rote).

The Kingdom Fungi contains the lichens as well as the true fungi. Lichens are composed of a body (thallus) of

a fungus plus green or blue-green algal cells, and the reproductive parts of lichens are also fungal, with a few cells of the alga included.

The Five Kingdoms of Life is well illustrated, and includes details on important fossil sites (including our cliffs at Joggins, Nova Scotia). It also supplies website addresses where more information and illustrations may be found.



(SUPERKINGDOM EUKARYA)

(KINGDOM FUNGI)

Fungi

Bracket Fungus (on White Birch)

Lichens

Concentric Ring Lichen	<i>Arctoparmelia centrifuga</i>
Horsehair lichen	<i>Bryoria trichodes</i>
Fishnet Cladonia	<i>Cladonia boryi</i>
Ball (Olive) Lichen	<i>Cladonia strepsilis</i>
Tube Lichen	<i>Hypogymnia</i> sp.
Bottlebrush Shield Lichen	<i>Parmelia squarrosa</i>
Varied Rag Lichen	<i>Platismatia glauca</i>
Crumpled Rag lichen	<i>P. tuckermanii</i>
Map Lichen	<i>Rhizocarpon</i> sp.
Rock Foam Lichen	<i>Stereocaulon saxatilis</i>
Beard Lichens	<i>Usnea</i> sp.
(2 types – long/hanging, and short/bushy)	

(KINGDOM ANIMALIA)

Insects

Spring Azure	<i>Celastrina argiolus</i>
Water Strider	Order Hemiptera
Lady Beetle (species unknown)	
Daytime Firefly	
Bumblebee	
Ants – red and black	

Amphibians

Spring Peeper *Hyla crucifer*

Birds

Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Broad-winged Hawk	<i>Buteo platypterus</i>
Herring Gull	<i>Larus argentatus</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Swainson's Thrush	<i>Catharus ustulatus</i>
Song Sparrow	<i>Melospiza melodia</i>
Purple Finch	<i>Carpodacus purpureus</i>
Pine Siskin	<i>Carduelis pinus</i>

(KINGDOM PLANTAE)

Moss

Sphagnum Order Cataraena

Liverworts

Ferns

Rock Polypody *Polypodium virginianum* L.



