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# Federation of Nova Scotia Naturalists

# NEWS

Volume 5, No. 1

Spring 1995

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Dutchmans  
Breeches

of *ecological integrity* varies so much with author that it should probably be defined whenever it is used. Similarly, the term "protection-oriented values", used frequently in the Interim Management Policies, requires clarification.

- *Natural Areas Legislation* - This section should also include the Wildlife Act and Conservation Easement Act.
- *Science and Management of Protected Areas* - The role for science in protected areas and the importance of protected areas for research and monitoring require further elaboration. Protected areas can and must serve as benchmarks for monitoring environmental change, as well as providing ecosystems with opportunities for accommodating environmental change. We feel it is urgent to establish a scientific advisory committee, as suggested.
- *Wilderness Recreation and Ecotourism* - This section needs elaboration. We must be monitoring the impact of these activities, since we are charting new ground; there are few good relevant data sets from elsewhere on which to draw. If we want to be world leaders in ecotourism, we must also be world leaders in developing sustainability models for it.
- *Protected Areas and Integrated Resource Management* - The first paragraph needs expanding; its intentions are not clear.
- *Partnerships and Cooperation* - The goals outlined here should be more easily realized if a Round Table model for implementing and managing the Systems Plan is put in place. We also applaud the establishment of a protected areas working group.

The summary of goal, objectives and principles in *A Protected Areas Vision for Nova Scotia* (p. 20) is essential to the plan, and requires careful thought and wording.

- Is the Goal really to "enhance the quality of the environment"? We suggest that a more careful wording be considered.
- In Objective #3, what does "managed at a high standard of environmental integrity" actually mean? In Objective #4, we would suggest that "but secondary to" be inserted before "protection objectives".
- Under the principle of *Viability*, is it really desirable to "sustain... incompatible uses"? The principle of *Permanence*, as worded, is dangerously ambiguous and requires further elaboration. Under *Planning*, "balance" implies equality of protection and use. This could also be a dangerous concept. We are pleased to see *replication, research and stewardship* as major principles.

In conclusion, we applaud and support both the initiative and the vision of the Systems Plan. It represents a major breakthrough in approach to effect protection of our Nova Scotian landscapes. The Federation of Nova Scotia Naturalists extends an offer of its varied and considerable human resources, when required, to help make the Plan a reality.



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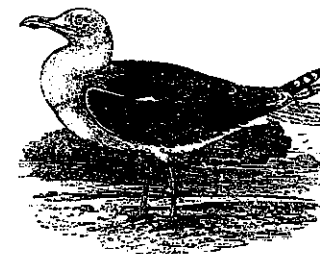
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### Did you Know?

The FNSN now has Charitable Status. Donations to help cover the costs associated with producing the newsletter or to help fund the Endangered Spaces Campaign would be greatly appreciated. Any sum over \$10 will gratefully acknowledged with a receipt for income tax purposes.

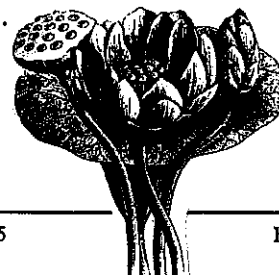


The Black-Backed Gull

The **1996 AGM** will be hosted by the Annapolis Field Naturalists in early summer 1996. Details will be available at our upcoming 1995 agm in Wolfville.

### Have you Suggestions

for future newsletter articles? Please contact me at 902-454-9909, 6360 Young Street, Halifax, NS B3L 2A1.



### The FNSN Board of Directors

is looking of volunteers who would like to serve on various committees. We are currently recruiting members for:

- Game Farming**
- Forestry**
- Mines and Minerals**
- Endangered Species**
- Aquaculture and Fundraising.**

If you have expertise in any of these areas and are interested in serving on one of these committees, please contact the president, Alice White at 467-3380 or at 4581 Clementsvale Rd, Clementsvale, NS B0S 1G0.

Ideally, a system approach would consider the entire province, rather than excluding 70% of it. This problem of exclusion is not trivial. It raises two issues that are not adequately addressed in the document:

- i) the need for integration of working landscapes (*i.e.* landscapes that we modify for our own use) into the plan, and
- ii) the need to consider more carefully integrated land use management approaches within Crown lands.

The preservation of biodiversity is central to the plan, but consideration of working landscapes is absent. As most biodiversity exists, and probably always will exist, outside protected areas, it is ineffectual to design any biodiversity conservation scheme that does not fully integrate working landscapes.



Promotion of protected areas for wilderness travel has a high profile in the plan. As "wilderness travel opportunities" (p. 7, 18-19) loom large on the economic agenda of other provincial ministries, it is essential that such terms be clearly defined. Wilderness concepts vary tremendously among different groups of outdoor enthusiasts; even within the naturalist community itself, the sense of wilderness is highly individualistic. Co-ordination and control of ecotourism will require integration of land use planning in and adjacent to protected areas. The related issue of "accessibility" in protected areas, although contentious among potential user groups, must also be addressed more thoroughly.

A call for more integrated land use management *within* Crown lands may also be appropriate. It would make the province accountable for its actions, past and present. In fact this document may be a starting point to deal with what some consider to be a crisis of mismanagement on Crown land. However, such an approach should be made with caution. Terms such as "sustainable use of the province's natural resource base" (p. 1) must be clearly defined.

Expropriation of private land is offered as a possible tool to implement the plan for particularly unusual or special features or habitats. We would support judicious use of expropriation, but only as one of a number of tools for effecting conservation of Nova Scotia's landscapes. However, it might be more publicly palatable if it were accompanied by judicious revision of existing mineral and forestry agreements on Crown land, when *they* compromise the integrity of important landscapes.



As a source of food, hides and bone implements moose were extremely valuable to Native peoples of Nova Scotia. Evidence gathered from shell heaps at various locations in the province indicate that moose and caribou were abundant in Nova Scotia and were important dietary staples of Native peoples long before the first arrival of Europeans. By all accounts they had to be abundant to withstand the exploitation that they would endure over the next 300 years beginning with the arrival and settlement of Europeans.

With the arrival of the first new settlers to this province moose quickly gained importance as an easily obtainable source of cheap food, tallow and hides. Records from the 1600s report that moose was the principle big game species for trade and that these animals abounded in the hilly interior of the province.

Through the mid to late 1700s moose was in demand not only by Natives and settlers but also by market hunters. Moose meat and hides had maintained their value as trade items because they were easier and cheaper to procure than beef. Moose nose or "mosel" was a highly sought out delicacy of this period. Following the American Revolutionary War great numbers of immigrants settled in Nova Scotia and added to the hunting pressure on both moose and caribou.

Early records from this time for the town of Liverpool speak of 20 moose being killed after one heavy snowfall. Other reports of the time tell of thousands of moose being killed in the vicinity of some settlements. If these are accurate accounts and they were happening throughout Nova Scotia, it hardly seems surprising that by the turn of the 19th century caribou was reported in some areas to be the most abundant of the big game species. Moose were reported to be virtually non-existent in Nova Scotia east of the Lahave River at this time.

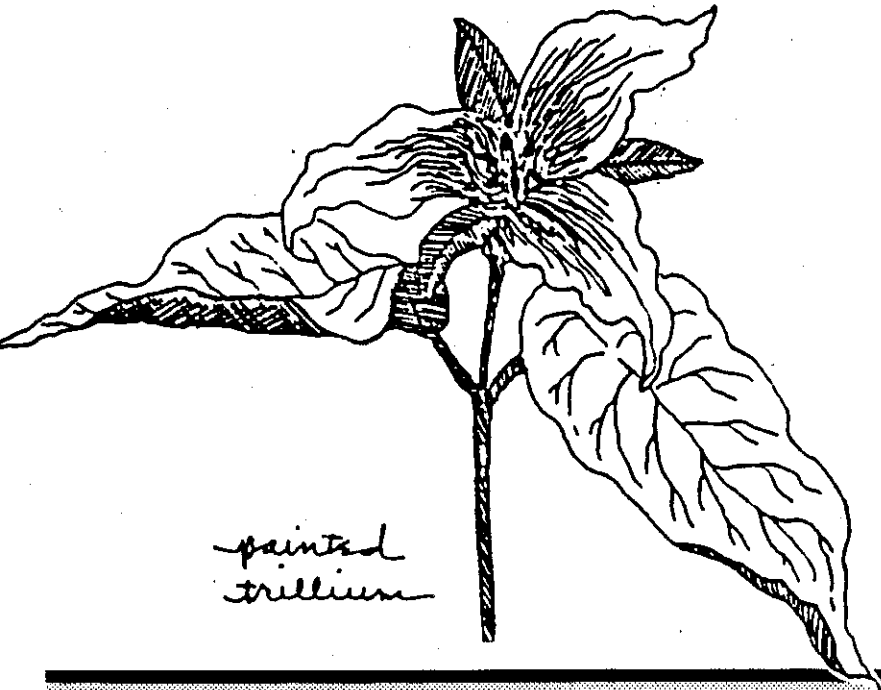
Despite the obvious impact that market hunting had on moose numbers during this period, hunting was not the only significant factor influencing numbers and distribution of moose in the province. It goes without saying that settlement brings land clearing and land clearing breeds fires. Such was the case in Nova Scotia during the 1780s and 90s in which wild fires destroyed much of the interior of the province. Whether an act of nature or man, fires have played an important role in wildlife habitat distribution for millions of years. While fire can in the right situations be helpful, large scale fires such as those experienced during the late 1700s probably did more harm than good because of the extensive loss of cover and food for both moose and caribou.

By 1825 the unrestricted killing of moose resulted in low numbers even on Cape Breton where they had once been abundant. Various references to trade at that time indicate that at one point moose were being killed solely to satisfy a growing export market for hides. Sea-going merchants of that time reported that the stench from decaying moose carcasses littered along the shore could be smelled several miles off shore. It wasn't long after this that

If you hike back into the interior of these highlands, you will soon come to the high rocky barrens. Wind-swept, these barrens are inhospitable to most plants yet lichens and other very northern plants do survive. Plants like bilberry, arctic willow, and dwarf birch that are usually found much farther north live in these rocky barrens.

Cape Breton is the northern limit for many of our southern trees and herbs. Is also is the southern limit for some of our arctic relic plants. This blending of northern and southern plants gives the amateur botanist a chance to see first hand, what soils, temperature extremes and other requirements plants need to survive. Beaches and dunes, estuaries and marshes, rocky barrens, and headlands; all these diverse conditions on one island make Cape Breton a botanist's paradise.

*David Lawley is the author of A Nature and Hiking Guide to Cape Breton's Cabot Trail published 1994, by Nimbus Publishing.*



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already begun and were to unfold over the next 35 years, altering the way we think about moose management to this day. As moose on the mainland were re-establishing themselves, white-tailed deer which had been absent from Nova Scotia for hundreds of years were making their way from New Brunswick into Cumberland and Colchester Counties. Little did anyone suspect how dominant this reinvading species would become.

Concurrent with the natural and on-going range expansion of white-tail deer into Nova Scotia was the deliberate introduction of eleven deer known as "Daley's deer" in 1894. These eleven deer were captured in New Brunswick and released near Lake Jolly in Digby County. An additional five or six deer were released in Yarmouth and Annapolis Counties in 1910, and two were released at Harrietsfield, Halifax County during the same period. It is apparent to us now that Nova Scotia was in the process of being recolonized by white tail deer as these introductions took place. The introduction of these deer only served to speed the process. In retrospect it was inevitable that with land use patterns developing the way they were, moose and caribou would yield to deer in this province.

While deer were rapidly spreading across the province during the period between 1890 and 1920, moose numbers on the mainland continued to expand. Unfortunately, somewhere along the way someone forgot about mother nature. The available moose range could not support the rapid increase in moose numbers. The carrying capacity of available habitat had been exceeded and moose reacted accordingly. During the early 1920s hundreds of moose died as their numbers dropped dramatically due to severe winters with deep snows and little food. With surplus animals naturally removed from the herd ample food and range became available for the survivors, and the population increased once again.

For the next nine years big game managers "played" with the harvest by once again protecting cows and by shortening or lengthening the harvest season without truly understanding how these changes affected range conditions and carrying capacity. Consequently, in 1937 with moose numbers apparently on the decline once again the moose hunting season in Nova Scotia was eliminated. Within ten years moose numbers on the mainland peaked and then crashed between 1949 and 1951.

The moose herd in Cape Breton did not experience these same fluctuating population levels for there were few moose to be found. Unlike the mainland, Cape Breton moose had never rebounded after the decline in numbers at the turn of the century. In an attempt to bolster the herd seven mainland moose were introduced to Inverness County between 1928 and 1929. All indications suggested that this attempt failed. Cape Breton would wait another nineteen years before a second attempt to introduce moose would be successful. In 1947 and 1948 eighteen Alberta moose belonging to a larger subspecies than our eastern moose were released. These animals along with surviving members of the eastern race eventually formed the basis for the present highland moose herd.

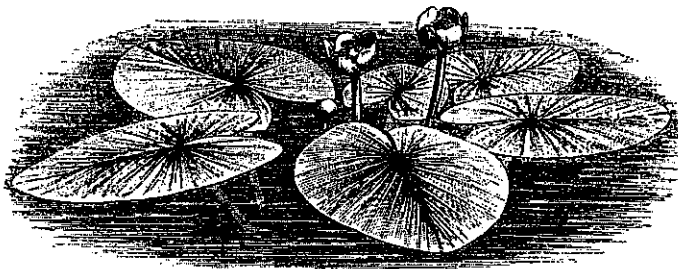
The extinction of caribou from this province was inevitable, if not from fires, logging and settlement, then surely from parasitic infections brought here by deer. Moose have fared better and while numbers may never again reach those recorded in years past, the opportunity to witness the largest of Nova Scotia's deer will hopefully always be with us.



**Editor's Note:** Because of the importance of moose in the Tobetic in the proposed systems plan the following is provided as additional information.

The Digby-Yarmouth County moose herd constitutes the largest gene pool of native moose in Nova Scotia (smaller mainland herds exist). Paul Tufts, a Department of Natural Resources Wildlife Biologist, has studied the Tobetic (or White Sands) moose herd since 1981. The survival of this Nova Scotian moose herd is due to the absence of roads which bring development, habitat destruction and poaching. Another significant factor in this herd's survival is its natural separation from the wintering deer herds. The habitat consists of brush barrens with pockets of heavy timber. Deer cannot withstand the winter rigours of the brush barrens and usually migrate to thicker cover.

This moose herd appears to be in excellent physical condition. An indication of herd health is a good reproduction rate. In the winter of 1993, a two-day aerial survey revealed 98 moose: 38 bulls, 40 cows and 20 calves. Speculation on total numbers in Tufts' delineated "moose area" runs from 200 to 300 moose.



presented at the Northeast Section of the Wildlife Society in Hartford Connecticut in 1964. There, Dr. Roy Anderson explained that individuals exhibiting signs of "moose sickness" were actually displaying neurologic symptoms caused by a nematode worm known as *Parelaphostrongylus tenuis* (*P. tenuis*). Anderson's studies showed that this nematode or "brainworm" commonly occurs in deer and is non-pathogenic; however, the parasite is almost certainly fatal to moose and caribou. Moose become infected with the parasitic brainworm if they consume an infected intermediate host, a snail. Once in the moose the nematode eventually finds its way to the nervous system where it can cause blindness, disorientation and atypical behaviours.



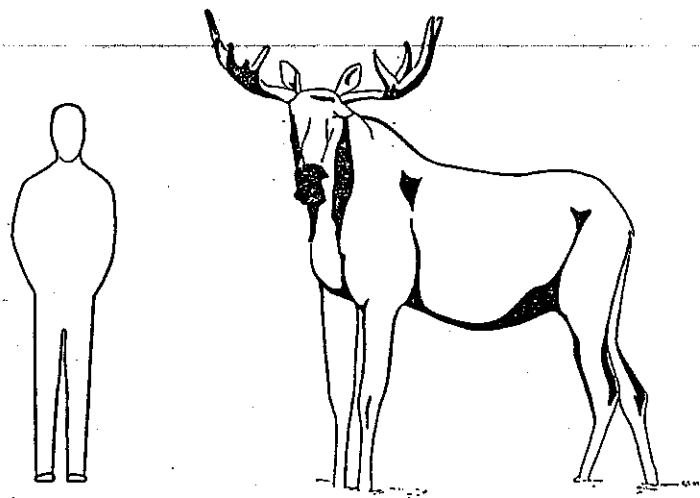
As a result of these findings wildlife managers realized that the primary factor affecting the distribution (and mortality) of moose in Nova Scotia was the presence of *P. tenuis*. With this knowledge it became apparent that the three deer species of Nova Scotia (moose, caribou and deer) could not have co-existed on overlapping ranges without one or more of the species suffering from the presence of the other. Biologists began to view deer and moose habitat in a different light. Further studies suggested that the probable reason for moose survival in specific areas was due to non-overlapping ranges during critical concentration periods. By maintaining range separation the likelihood of transfer of the parasite from deer to moose would be minimized. In Nova Scotia it appears that altitudinal differences in habitat preference between deer and moose may minimize transference of the parasite.

On the basis of the survey information gathered in 1963 a restricted experimental ten day moose hunt was proposed and accepted for the following year. Four hundred licenses were issued by lottery draw for Cumberland, Colchester, Antigonish and Pictou Counties. Hunters were not restricted to specific zones. For the first time since 1937 Nova Scotians could legally hunt moose. One hundred eighty three moose were harvested that year.

Results of the 1964 hunt and effects on the moose herd were evaluated through 1965. In 1966 the hunt was reopened on an annual basis with the inclusion of Guysborough County. Licenses issued by lottery increased to 800 in 1966 and then to 1000 for the remaining years of the hunt. Harvest

figures for this period ranged from a low of 282 in 1968 to a high of 409 in 1972. Closure of the season occurred in 1975 after various indicators suggested unequally distributed hunting pressure was adversely altering moose density patterns.

In 1977, the moose hunting season was again opened on the mainland with new regulations permitting a total of 650 licenses to be distributed amongst six designated zones encompassing the counties of Cumberland, Colchester, Pictou, Antigonish and Guysborough. Unlike previous zoned moose hunts, numbers of licenses issued per zone were based on calculated desired harvest for those areas. Successful applicants were determined by lottery draw and could apply for one zone only with all successful applicants being required to pass a safe gun handling test before their license would be issued.



This was the general format for the next four years. In 1979, Zone I was subdivided to form Zones I and VII, and in 1980 a Cape Breton Highlands (Inverness, Victoria Counties) zone (VIII) was added for the first time. Between the years 1977 and 1981 moose numbers in most mainland zones declined noticeably. Harvest figures for this period on the mainland show a drop from 229 moose in 1977 to 133 moose in 1981. Consequently, 1981 marked the last year in which moose could be legally harvested by non-natives on the mainland.

While moose appeared to be declining once again on the mainland, this was not the case in Cape Breton. The moose herd on The Highlands had continued to grow steadily since the 1949 introductions. Indications of a healthy herd were observed during the 1980 and 81 moose hunts, and with continued increases in numbers since that time a limited hunt was proposed for 1986. Twelve thousand would-be moose hunters paid \$5.00 to apply for one of 200 licenses enabling them to hunt in Victoria or Inverness Counties and kill one moose irrespective of sex or age. One hundred eighty five hunters were successful.

There has been a similar hunt each year since that time. In 1989, the Government of Nova Scotia signed a two year Conservation Agreement with the native peoples of the province. Consequently the format of the hunt was changed to allow Native hunters the right to harvest a minimum of 50 moose plus the difference (if any) between the number of moose killed during the lottery hunt and the original harvest quota of 200.

In 1991, the format changed again and remains so until this time. The Government of the time had been unable to negotiate a Conservation Agreement with Native leaders and as a result native hunters exercised their aboriginal rights by hunting any time of year with no specified bag limits. Native harvest since this time is estimated at 100 moose per year.

Reported harvest totals up to 1991 have been very consistent. Winter aerial surveys of The Highlands have indicated that while the distribution of moose has changed, overall population numbers have not declined. In fact, in areas such as Cape Breton Highlands National Park moose numbers have increased. Decreases in hunter success during the scheduled lottery hunt are in part a reflection of habitat change. In the years following the extensive bud worm damage, new softwood cover has started to mature, effectively creating shorter viewing distances and fewer opportunities to see moose. Non-native hunting success for 1994 is approximately 89%.

At present the distribution of moose on the mainland is quite variable. Areas of traditionally high moose densities such as the Cobequid Hills and Pictou Antigonish Highlands have smaller populations now than they did ten years ago. Yet, in other regions of the province such as the southwest there are areas with healthy populations. Many areas of the province however, have a scattered and/or spotty distribution of moose that probably reflects in part the consequences of settlement (forest harvesting, increased accessibility, habitat fragmentation, agriculture/silviculture, fires, illegal hunting) and the distribution of white tail deer.

Moose numbers in this province will most likely never again reach levels such as we witnessed in the early 1920s. To wish for such may be wishing for too much. Nova Scotia as a wildlife habitat has changed. White-tail deer are here to stay, despite the best efforts of coyotes, and although unfortunate, moose and deer can not successfully occupy the same range. With deer numbers in Nova Scotia presently at a low, the opportunity for increases in the size of the moose herd certainly exist. Despite the fact that many of our present land use policies and some of our wildlife management strategies do not actively promote increases in regional moose populations the future of the species in Nova Scotia is secure for now. The question remains however, can we have our cake and eat it too? Should we be content to have moose only in the highland regions of the province or are we asking too much to expect moose to be found everywhere? I think the latter. That may be all that we can expect.

By 1910, white tail deer were present in every county on the mainland. Population levels continued to climb and an open season was declared in 1916 on the mainland and all Nova Scotia by 1928. By 1935, deer herds in some areas of the province had saturated their range and experienced winter mortality.

In light of these events some officials began for the first time in 1932 to openly express concerns about the possible effects of the rapidly building deer herd on moose populations.

Their concerns were well founded for moose were dying in some areas for no apparent reason. Between 1930 and 1935 the Liscombe Game Sanctuary experienced a significant moose die-off despite ample food and relatively easy winters. "Moose sickness" was occurring outside the sanctuary as well; but in areas where deer were completely protected and abundant, moose declined quicker and their numbers remained lower longer than areas offering no protection. In areas where moose and deer were separated moose did fairly well, but when their ranges overlapped moose died. It would later be determined that in all cases the outbreak and spread of the disease was correlated with forest cutting and the ingress of white tail deer into the area.



By the early 1960s, Nova Scotians were very concerned for the future of the moose herd. For the first time since the early 1900s moose was once again the high profile big game species in the province. Air and ground surveys from the 1950s were re-examined and studies were undertaken to determine habitat choices, populations, sex and age structure and the role of deer and moose relationships.

In 1963, the mainland moose herd was estimated to be between 3600 and 4000 with most moose inhabiting the Cobequid hills of Cumberland and Colchester Counties or the Pictou and Antigonish County highlands.

While this was encouraging news for Nova Scotia and a sign of better things to come, it could not compare in significance to a professional report

## PLANT LIFE OF CAPE BRETON

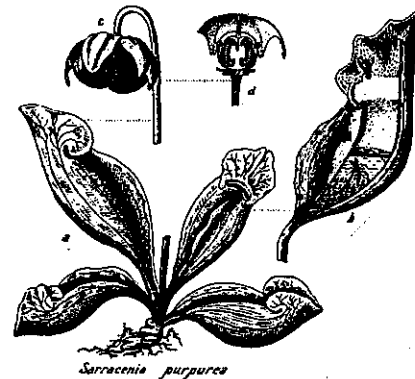
David Lawley

Plants have found a place to live everywhere in Cape Breton, from under the ocean in the form of sea weeds to the highest and driest remote areas of the highlands. Over 1600 different kinds of plants have been discovered to date.

Salt-loving plants are found all along our wind-blown beaches and headlands. The typical coastal forest is made up of white spruce and white birch trees, but as you travel inland the forest and associated plants change. Wind-swept headlands with low herbs and shrubs contrast the 36 m (120 feet) tall Acadian hardwoods of sugar maple, ash, elm, oak and white pine. Found under the hardwood trees are spring-flowering plants like trillium, solomon's seal, violets and spring beauty. They bloom in spring because the amount of sunshine is low under the canopy of these 350 year old trees during the summer. These old hardwood forests also are the home of over 30 different, and sometimes rare, species of fern.



As we climb to the top of the highlands, the trees change to a more northern forest of balsam fir, black spruce, tamarack and cherry. This northern boreal forest is interspersed with bogs and barrens. Bogs are common on the highlands. They are composed of insect-eating plants like sundews and pitcher plants. Here you will find several different orchids and lots of sphagnum moss. The highest altitudes of Nova Scotia support these bogs because the drainage is poor and the climate is usually cooler and wetter than the lower elevations.



*Sarracenia purpurea*

the harvesting of moose became a political issue in Nova Scotia. At question was the varying accounts of moose numbers being offered throughout the province. At odds were sport hunters, market hunters and settlers. Sport hunters were upset over the dogging, snaring and selling of moose meat in the Halifax market, and asked for restrictions on hunting. Market hunters and settlers fearing for their livelihood or simply a change in time honoured tradition asked to maintain the status quo. Social conscience won out and in 1843 and 1844 legislation was created enabling local governments to decide on methods for taking moose and seasons.

It would appear that the voices of concern were not immediately heeded for the Government of the time did not take advantage of this empowerment until 1856. When, in the face of an increasing moose herd, the first big game season was set from September 1 to February 1. It would appear however, that this was to be the only restrictions imposed at the time. Apparently there was no mention of constraints for bag limits, method of taking or sale of meat.

For the next several years following the adoption of a formal hunting season moose numbers were reported as both high and low depending on the source. Natives during this time contended that the relentless pursuit of moose by white men drove them into the sea. In response to the continued debate over numbers, public pressure from sporting enthusiasts out of Halifax and the fear that moose would follow the way of the caribou which by now was nearly extinct, the moose season was closed from 1874 to 1876. It was further enacted that in 1879 snaring and hunting with dogs would be prohibited. Prior to the closing of the moose season restrictions were in place protecting cows and forbidding the export of hides.



These particular pieces of legislation not only had profound implications for future populations of moose, but also for game management and enforcement in the province. With the advent of the closed season came the need for Provincial Game Wardens which were duly appointed at that time. In later years (1908) all moose killed were to be reported to the Provincial Chief Game Commissioner and thus became the first mandatory kill returns and collection of biological data. This practice was maintained annually until the moose season was closed for a second time in 1937.

Moose on the mainland responded favourably to the legal hunting hiatus and the new restrictions that came into effect with the resumption of hunting in 1877. Although no one realized it at the time, the future of moose in Nova Scotia was about to be determined by a series of events that had

## A brief on the PROPOSED SYSTEMS PLAN FOR PARKS AND PROTECTED AREAS in Nova Scotia as presented by Tom Herman, Wolfville, 22 February 1995

The Federation of Nova Scotia Naturalists (FNSN) is an umbrella organization representing 9 regional naturalists groups in Nova Scotia. Several of these groups have already submitted independent briefs on the systems plan. In this submission, we will limit our comments to the process and overall plan, rather than to specific proposed areas.

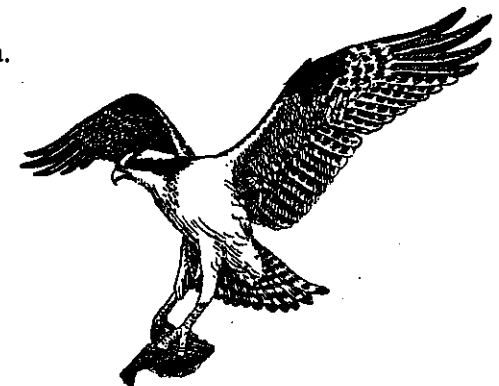


We begin by applauding this initiative from the Department of Natural Resources. It is timely and much needed. Any points of criticism that follow are intended to be constructive. In no way do we wish to detract from or diminish the importance of this document.

We recognize the limitations inherent in the approach of selecting candidate sites. The document stresses the importance of representivity. While an increase from 6 to 26 protected landscape types is a quantum leap forward, 51 recognized landscape types will remain unprotected. The concept of representivity is flawed if only Crown land is considered, since it is politically rather than ecologically based. This point is ironically brought home when the document describes Cape Split as an outstanding natural phenomenon to be protected (p. 7). Since Cape Split is privately owned, it falls outside the criteria for selecting candidate natural areas. Crown land is not a random subset of land in the province; therefore candidate areas are picked from largely unproductive (and unsettled, undeveloped) areas. As a result, for instance, coastal areas are under-represented.

The total exclusion of marine ecosystems is not unique to this plan, but rather underlines a systemic bias and shortfall of protected area plans for all coastal Canada. We cannot continue to avoid confronting this issue, as jurisdictionally sticky as it might be. The vision *must* include marine areas.

In Phase 1, the analysis was limited to parcels larger than 200 ha. This excludes long, linear habitats, such as riparian zones, and highly fragmented habitats. For instance, a 20 km stretch of 100 m wide interval habitat along a small river would simply not have been considered for designation! Such corridors may become even more important under a regime of increasingly fragmenting landscapes and changing climate.

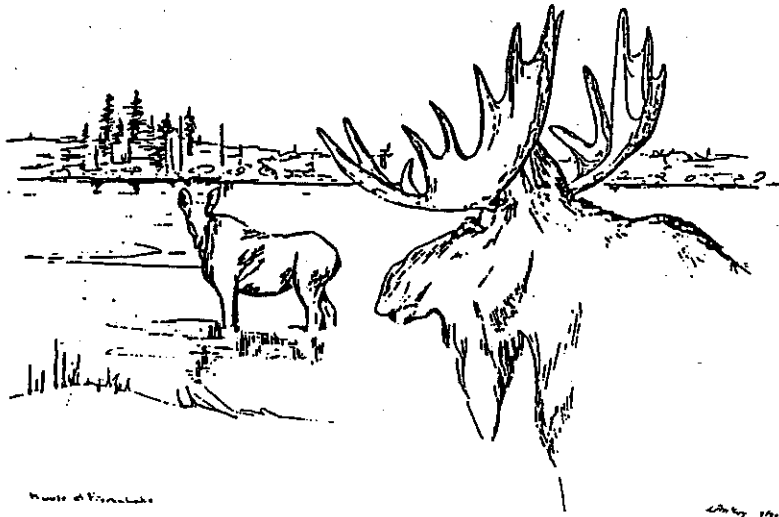




For many Nova Scotians today there are few sights more rewarding than that of a moose silhouetted against a barren plain or casually feeding in a shallow lake. In fact, any opportunity to view a moose is a special occasion in these times. Just ask any of the hundreds of curious moose seekers who travel to the highlands of Cape Breton each September hoping to catch a glimpse of this province's largest member of the deer family. It matters not that these people come for different reasons. Some merely to have the opportunity to see a moose, others to mentally stake a claim on one animal in particular prior to the opening of the hunt.

Regardless of their reasons, Nova Scotians now as in the past welcome any opportunity to experience this animal in its natural environment. There have been times however, during the past few centuries when opportunities have not always been available. Moose in this province have persisted through a number of dramatic declines brought on directly and indirectly by humans. The following account is a summary of the history of moose and moose hunting in Nova Scotia. Much of the information presented here has been taken from the 1977 Department of Lands and Forests publication, Deer of Nova Scotia by Benson and Dodds.

Moose are as much a part of the history and traditions of Nova Scotia as the first people who settled this province, Native or European. As a species moose are thought to have originated in Asia and like others migrated across the Bearing Strait into North America via an ice bridge. There they inhabited the conifer dominated boreal regions before spreading southward into and beyond their present range.



The interim management policies applied to candidate protected areas, as outlined in *Management Standards for Protected Areas* (p. 15), deserve pointed comment:

- *Minerals* - Policy #2 would appear to be a recipe for disaster; #4 seems ambiguous; #5 seems to imply that *new* mineral developments are possible in protected areas; #7 is laudable, but protected areas with existing mineral claims will *not* by definition be protected until claims run out.
- *Energy* - Policies #2 and #3, excluding hydro development and transmission corridors, are commendable.
- *Forestry* - Policy #2 seems well-reasoned and pragmatic; would it not be an appropriate approach for dealing with mineral conflicts as well? Policy #3 is highly commendable and long overdue (but it is essential that determination of allowable annual cuts be approached conservatively).
- *Wildlife* - We acknowledge the importance of recognizing traditional sustainable hunting, fishing and trapping, but if they are allowed, we would strongly urge that use of all-terrain vehicles be excluded from all candidate protected areas.
- *Recreation* - The "low impact" in policy #1 requires definition; policy #2 is essential.
- *Leases and Licenses* - It would be useful to describe the activities included here.



The section *Old Forests of Special Value* (p. 16) raises some important points. Does the figure "less than 1 percent... forests are over 100 years of age" include all forest types, or were "unproductive" sites excluded from the analysis? This could be misleading. The importance of education in fostering responsible use and encouraging stewardship, and developing value systems cannot be overstated. We applaud all points made in *An Old Forest Strategy for Nova Scotia*, particularly #5, in relation to encouraging private landowners to consider values of old forests.

The statement made in *Species at Risk* (p. 17) that "Scientists estimate that, by the year 2000, half of the earth's terrestrial species will have disappeared" is simply not true. It is essential with this issue to be accurate; to be alarmist is self-defeating.

Under *Proposed Future Actions and Priorities* (p. 18), a number of important initiatives are described:

- *Representation and Gaps* - DNR stewardship initiatives, particularly in relation to wetlands, should be recognized and applauded. The concept

The purpose of the Federation of Nova Scotia Naturalists is to further communication and co-operation among naturalists and natural history societies in Nova Scotia. We also work towards a co-ordinated effort on the provincial level to protect the natural state of our environment. Our activities include:

- Promoting the enjoyment & understanding of nature by our members and the general public by:
  - educating through publications, lectures, symposia, field trips, and other activities;
  - fostering the creation of nature centers and nature education programs, and defending the integrity of existing facilities and programs.
- Encouraging the establishment of protected natural areas, as represented in parks, nature reserves, wilderness areas, heritage rivers, and other such protected areas.
- Defending the integrity of existing sanctuaries by exercising constant vigilance against pollution and habitat destruction.
- Promoting and engaging in funding and research needed for protecting the integrity of all natural ecosystems.
- Encouraging and engaging in the protection and restoration of threatened and endangered species, with special attention to the preservation of essential habitats, by:
  - working for the inclusion of all major habitats in a system of protected areas;
  - encouraging and facilitating the reintroduction of extirpated flora and fauna to their former ranges in the province;
  - encouraging and facilitating the restoration and enhancement of essential habitats.

FNSN is affiliated with the Canadian Nature Federation and is a member of both the Nature Conservancy of Canada and the Canadian Parks and Wilderness Society.

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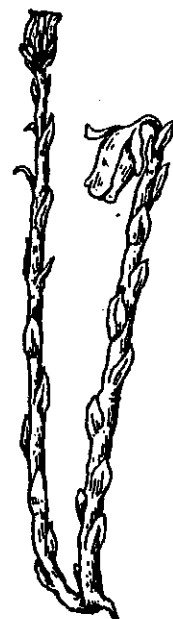


Sport and Recreation  
Commission

Bizarre Botany: Flowering Plants  
Without Chlorophyll

Randy Olson

Most flowering plants depend on photosynthesis for their nutritional requirements. There are, however, some plants with little or no chlorophyll; these species rely on alternative modes of nutrition which are usually associated with unusual physical appearances and life cycles. Probably the best known flowering plant without any chlorophyll is the Indian pipe (*Monotropa uniflora* L.) This plant is neither a true parasite nor a true saprophyte, but is considered a "mycotroph" because of its total dependence on a complex mycorrhizal relationship shared with green, photosynthetic plants. The Indian pipe is morphologically reduced to a system of roots producing aerial, flowering shoots from root buds when sexually mature. These pale shoots are characterized by the presence of scale-like leaves and single, terminal flower. Its cousin, the pinesap (*M. hypopitys* L.), has similar mode of nutrition and morphology except that its aerial shoots tend to be more yellowish and bear more than one flower. These two plants are considered especially unconventional because they exist as essentially mycorrhizal dependent roots even as emergent seedlings during seed germination.



*Monotropa  
uniflora*

Another unusual and even more cryptic flowering plant is the eastern dwarf mistletoe (*Arceuthobium pusillum*). Explosive fruits propel the sticky seeds in all directions establishing contact with an appropriate host twig. Upon germination, the seedling's radicle forms a haustorium accompanied by the establishment of an endophyte inside of the host's tissue. The endophyte lacks chlorophyll and is very morphologically reduced to a mass of cells that keeps pace with the growth of the host while draining the host of essential nutrients. When sexually mature after several years, very small separate male and female flowering shoots protrude from the host in order to begin the cycle again. The establishment of a mistletoe infection in white spruce, black spruce or larch is associated with the abnormal growth of the host branches producing the characteristic "witch's broom".



*Monotropa  
hypopitys*

The above is a précis of a presentation given at the 1994 annual general meeting held this past summer in Antigonish.