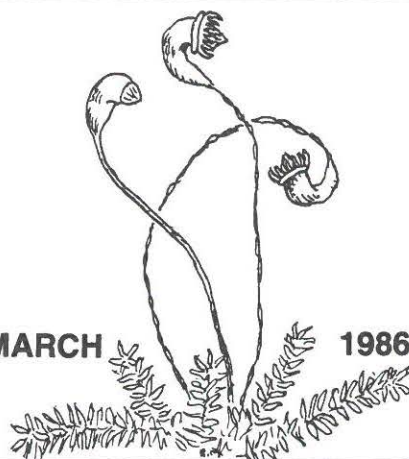


THE PLANT PRESS

FIELD BOTANY IN ONTARIO

Vol.4 No.1

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CONTENTS

NEWS	:	:	:	:	:	:	:	:	:	:	2
LETTERS	:	:	:	:	:	:	:	:	:	:	3
IDEAS											
Reznicek, A.A.											4
Botham, W.											6
Kavanagh, K.											7
McLeod, D.											10
NOTES & REPORTS											
Munro, D.											10
Stuckey, R.L.											11
Anderson, A.B. & Britton, D.M.											18
Klinkenberg, R.											20
Kaiser, J.											21
NEWS OF FIELD BOTANISTS											
Hernandez, J.											24
INFORMATION & REQUESTS											
Kirk, D.											28
ONTARIO PLANTS IN PRINT											
Shchepanek, M.J.											32
Britton, D.M.											34
Front page illustration:											

Amblystegium serpens (Hedw.) B.S.G. a common dooryard moss
in spring by Robert Muma

NEWS

WITH THANKS FROM THE BUSINESS MANAGER

Each new volume of The Plant Press signals a milestone in our brief history. We begin our fourth year with indications that interest in our chosen field of concern is still growing. Our circulation was just over 400 by the close of 1985. Subscriptions have come from British Columbia to Newfoundland and many points in between, though most are from Ontario. We have had a very positive response from many individuals south of the border, particularly in the Great Lakes states.

This is our second year of publication by The Plant Press, Inc., a non-profit, charitable corporation dedicated to the goals of this publication. Our concerns about financial problems were not realized due to the great generosity of our subscribers. You contributed nearly \$ 1500 above the cost of subscriptions alone and this enabled us to fully cover our 1985 costs.

It was with considerable trepidation that we raised our rates for 1986, but your response has been overwhelmingly positive. We thank you for your continued support and interest. We especially thank our donors for the added boost they have provided. We rely entirely upon our readers and contributors to pay for the costs of publication though we are now looking for a sponsor who can help us finance some of the improvements and projects which we know would enhance your enjoyment of The Plant Press.

We also rely upon you, our readers, for the material which we publish. Our Editor sometimes grows weary, sometimes grows anxious in her search for the material which she knows is out there but needs to be put down on paper. I would urge those who have visited interesting and/or unusual areas of Ontario, or have observed or researched unknown or little known phenomena or plant species, to share their investigations with fellow botanists and naturalists. Much of the tapestry of scientific knowledge is built of careful and detailed observations from a myriad of different sources. Just as we at The Plant Press hope that our publication makes some contribution to knowledge, we hope that our readers, as both the source and ultimate consumers of our contents,

would take the necessary time and effort to put their observations into a readable form, for our audience. Our Editor is always pleased to hear from you on almost any facet of field botany.

Jeff Kaiser

ADDITIONS TO THE EDITORIAL COMMITTEE

In the last issue we expressed need for someone to be Associate Editor of the "Ontario Plants in Print" column. We are pleased to report that Timothy Dickinson has volunteered and he will take over duties commencing with the next issue. (We are delighted to learn that Timothy will be back in Ontario for a job at the Royal Ontario Museum in Toronto - see the "News of Field Botanists" column.) Anyone interested in providing book reviews or compiling references from journals should contact Dr. Dickinson as soon as possible to ensure that there is sufficient material for this column in future issues.

We are pleased to have Rose Klinkenberg back on the Editorial Committee. Rose is actively involved in numerous botanical projects in southwestern Ontario and we hope that her knowledge of field botany and field botanists will ensure further contributions from this part of the province.

Once again, we remind you to check the back cover of the most recent issue to ensure that material is sent to the appropriate person at the correct address. We need at least 3 months to process most notes and reports and 6 weeks for letters and requests. To ensure that there is good variety of content and that each issue is mailed out on time, it is necessary for us to be working at least one issue ahead of schedule. Therefore it is sometimes necessary to hold material for longer than 3 months, but we try to publish timely material as soon as possible.

In addition to the tedious process of keeping business records, Jeff Kaiser has once again played a major role in editing this issue and keeping production on track. However, we still need someone to help with mailing. Is there anyone in the Mississauga/Toronto area who can help us out? We would be delighted to hear from you!

Jocelyn Webber

LETTERS

ALIEN PLANTS IN NATURAL AREAS

"It appears that some readers have missed an important point in your comments on naturalized species [Plant Press 3(4):115-117], having assumed either that you are concerned about plants that present a physical hazard to humans, as by causing dermatitis, or that your objections are simply puristic, i.e., that you object to all naturalized species just because they are naturalized. I recognize, however, your concern that those species that aggressively colonize habitats that would otherwise be suitable for native species must be displacing native species where the naturalized species take over. Many naturalized species, to be sure, are largely restricted to highly artificial habitats, and offer little competition to native species, but Alliaria petiolata [garlic mustard], Chelidonium majus [celandine], Hesperis matronalis [dame's-rocket], and Lythrum salicaria [purple loosestrife], for example, form dense, extensive stands in woodlands and marshes. Plant Press readers should share your awareness that such species are not just additions to the plant communities in which they occur; they inevitably represent a subtraction of many native plants that would otherwise be present."

James S. Pringle,
Assistant Director - Scientific,
Royal Botanical Gardens, Hamilton

"We were interested in remarks about weeds in The Plant Press [3(4):115-117]...We did not discern any real concern with disruptions to indigenous genotypes or ecotypes - this is over the long run the big issue, in our opinion. The worst statement we read was on page 116, 'Why worry about these [alien] species - they are here to stay.' If the Bradley sisters of Australia had adopted this attitude, they would never have tried their system of eradicating weeds (see The Plant Press 3(4):122-123).

"...we would strongly advise anyone undertaking reconstruction or restoration efforts to use local, native, indigenous seeds. We very strongly oppose any digging of wild plants, except under exceptional conditions - e.g., when a site is about to be completely destroyed. And we definitely oppose the use of 'cultivars' - largely derived from western strains of

grasses and a few forbs through selection activities of U.S. Plant Material Centers (Soil Conservation Service). The cultivars grown commercially by western nurseries and seedsmen have been introduced throughout the prairie peninsula and have pretty well messed things up genetically. So again, we go back to a major premise: use native, indigenous seeds for your prairie projects...We black-ball 'canned' seed mixes, as they usually include lots of aliens. We recommend that you produce your own supply of indigenous native seeds. Do not get in a hurry or try too many... gardeners can share."

Douglas and Dorothy Wade,
Oregon, Illinois

MR. BURCHER'S EXPERIMENTS WITH SEED

"As I grow trees, shrubs, vines, and a few flowers from seed, Mr. Burcher's study [Plant Press 3(4):132-133] was very interesting to me...I am more of the 'stratify-naturally-and-let-it-grow' school, a.k.a. as benign neglect. For example, Catalpa speciosa trees were planted as park trees beside our house. For years I did not see a single seedling. About 5 years ago, I started making a lot of seed beds around the yard. Now, C. speciosa seedlings come up regularly and in some numbers - they are really weedy. (I have extras for anyone who wants one...there are other trees too.) Congratulations to Mr. Burcher on his study. I would like to hear more!

"...As one who preaches native species but who, in my own garden, has been known to cultivate an alien species or two (why was Aesculus hippocastanum not a native buckeye!), I found the letters to be very exciting. I hope that these will provide interesting, ongoing discussions..."

Tom Atkinson, Don Mills

"I was interested to see the results of Robert Burcher's extensive study on growing native plants from seed. I would like to give encouragement to this means of bringing native plants into one's landscape. Many people do not appear to realize how quickly mature, flowering plants can be grown from seed (e.g., prairie rose (Rosa setigera) flowers in its third year; many herbaceous perennials will flower the first year). My experience is that

are often more vigorous and flower earlier than the few attempts I have witnessed of transplanting divisions or ramets of perennials (including shrubs and trees).

"I would like to add a few suggestions on handling seeds. Many seeds, especially of tree and shrub species (but some herbs as well), require a stratification period (under cool, moist conditions) to promote germination. One can see the parallels with what happens naturally. Second, seeds of many species will not survive a prolonged period of drying. Thus, fall planting, immediately after collecting, is one solution. I have grown many native wildflowers, as well as trees and shrubs, by planting the seeds in a small flat of moist soil, placing this in a cold frame, and waiting until spring, when germination often begins as the last snow melts. The seedlings are transplanted to a garden plot by late spring, and by fall, full-sized perennial wildflowers (some with flowers) are ready to be transplanted into a desired location within a wildflower landscape, after their characteristics under cultivation are assessed.

"I am especially doubtful that seeds of the tested 'difficult' woodland herbs will survive drying. I expect that germination could be achieved with many of these by following the above procedures (I have no suggestions for the orchids, but ericads can readily be germinated on the surface of moist peat, using rain water)."

John Ambrose, Curator,
University of Guelph Arboretum

TOPIC FOR A FUTURE ISSUE

"As an addition to the excellent article on A. Cosens, perhaps we could have one on H.B. Spotton, with comments from some of our seniors who may have used his 'Wild Plants of Canada' in High School. I took Grade XIII Botany, but did not see it. My first flora was 'Gray's Manual,' edition 7...At one time, every High School in Ontario probably had at least one class set of 'Wild Plants of Canada.' My set came from Newcastle High School and looks as if it was never used."

Harry Williams, Millbrook

IDEAS

CULTIVATING NATIVE PLANTS: A PERSONAL VIEW

A.A. Reznicek, University of Michigan Herbarium,
Ann Arbor, Michigan 48109-1057

Concern about the effects on our native flora of the proliferation of interest in cultivating wildflowers is becoming an important issue among botanists. Opinions vary widely, with some botanists being avid wildflower gardeners and others being strongly opposed to the entire concept of growing native plants. Opposition to the cultivation of native plants centres mostly on the increasing problem of people digging rare plants from the wild and thus both destroying colonies of plants and disrupting the habitat.

I believe that the cultivation of native wildflowers and native trees and shrubs should be encouraged. Too often our natural heritage is ignored in cultivation while European and Asian plants are grown. Increasing awareness and appreciation of our native flora to me seems highly desirable. Ideally, garden clubs should be in the forefront of efforts to preserve natural areas and our native flora, along with natural history associations and scientific societies.

Now, scientists, naturalists, photographers, and gardeners are sometimes at odds. Naturalists who enjoy looking at plants are horrified when they see that a photographer has lain on numbers of non-flowering calypso (*Calypso bulbosa*) orchids - and plucked young fruit with discoloured flowers to get good pictures. Equally dismayed are botanists who have collected large numbers of prairie fringed-orchid (*Platanthera leucophaea*) for herbarium specimens, or gardeners or nurserymen who have illegally dug dozens of these orchids from a protected site. All of the above examples have actually occurred, and I digress to mention them only to demonstrate that it is not only wildflower gardeners digging plants that do harm. Indeed, naturalists just walking through a woods in large numbers can do serious damage trampling plants and compacting the soil. As a matter of fairness, if botanists have a right to collect specimens for their herbaria; naturalists have a right to walk through woods, bogs, and fens; and photo-

graphers have a right to a good picture; then gardeners presumably also have some right to consumptively use the environment.

All these problems, however, tend to be localized. Many naturalists, photographers, and gardeners rarely venture far from a road and often do not explore new areas. Thus, their damage is often restricted in scale. Botanists only rarely collect large numbers of specimens of rare plants - and then normally only from large populations. In local areas and with certain species, severe damage can result. Realistically, however, compared with lumbering, urban development, and clearing and drainage for agriculture, collecting of plants by botanists and gardeners and trampling by naturalists and photographers has only a small impact.

Nevertheless, with the use of native plants in gardens there exists one very real problem. That is the creation of a heavy demand for wild orchids and other particularly interesting species, such as certain wild lilies, trilliums, etc. Many of these are difficult or expensive to propagate on a commercial scale and nurseries that offer them normally sell plants dug from the wild. If the popularity of growing wildflowers increases, we may well see people supplementing or even making a living by digging tens of thousands of, for example, lady's-slipper orchids and selling them to nurseries. This has already happened in the United States. How long could natural areas in Ontario withstand such pressure?

Suggestions for interest groups concerned with conservation of native plants

To remedy the problems associated with pressure on native plant populations, botanists, naturalists, gardeners, and photographers must unite to support the following policies.

1. Avoid nurseries that sell native plants which have been collected from the wild.
2. Promote legislation that outlaws the sale of wildflowers dug from the wild.
3. Promote research into the propagation of wildflowers so that commercial propagation becomes feasible and native stock is safe.

Considerations before deciding to dig

What about individuals digging one or a few plants for their own garden? In my opinion, this can be acceptable if done with common sense by following certain guidelines. These guidelines are listed below, but before deciding to dig, one should evaluate the following considerations.

1. Grow as many plants from seeds or cuttings as possible, but do not collect more than 5% of the seed crop in an area.
2. Never dig wildflowers from protected natural areas.
3. Do not rationalize. It is easy to say "this site will only be destroyed eventually, so why not save the plants." Even if the site will be destroyed at some point in the future, plants should be left because they will produce seeds that may be dispersed to other areas. Only "in front of the bulldozer" can one justifiably dig everything one can find, since then the plants will be destroyed before they can fruit one more time.
4. Do not transplant native plants to natural areas, as this is not an appropriate means of conservation.

Guidelines for digging native plants

If, taking all the above points into consideration, you want to dig a wildflower from an unprotected area, observation of the following guidelines will minimize the harm you do.

1. Never take a plant unless the species is abundant at the locality.
2. Do not be greedy. Take only one or a few.
3. Study the native flora and learn about ecological relationships by finding your own sites for plants. If everyone felt obligated to take a plant only from a new colony they themselves found, pressure on known sites would be reduced.
4. Be sure you can grow the plant. Compare and contrast the habitat you see the plant in with the site you have in mind in your garden. Do not attempt to grow plants

such as certain orchids that few or no gardeners have ever successfully grown.

5. If possible, take small seedlings, especially if crowded, from near the parent plants. They will quickly grow to maturity.
6. Treat the plant as if it were in your garden and you wanted to propagate it. Take a small division or an offshoot from the base. These will establish better in a garden than large clumps and you will leave the plant in its native habitat as well.

Ideally, one should be able to go to a site, carefully take the few plants desired, and come out without either having reduced the numbers of established plants or left signs that someone was digging wildflowers in the area. Remember to use common sense. Do not let your lust for a plant overcome your obligation to protect the heritage we all share. ♦

A NEW TRILLIUM FOR CANADA? ALAS, NO!

Wilfred Botham, R.R. 1, Cottam, Ontario NOR 1B0

On 2 May 1985 I was poking around in a Maidstone Township woodlot hoping to see some *Dicentra canadensis* (squirrel corn), when I suddenly beheld a sight that almost threw me for a loop. It was a patch of what I took to be *Trillium cernuum* (nodding trillium), a plant that had been reported in Essex County by several people, including myself. My earlier find was confirmed at CAN, the herbarium of the National Museums of Canada, Ottawa, as *T. cernuum*, but I was not fully convinced. That specimen was growing in a large patch of *T. grandiflorum* (common trillium) and there was a possibility of its being a freak of the latter, a species which usually has larger flowers.

After studying the plant books, the possibility of the Maidstone Township plants being *Trillium flexipes* (no common name) was, in some respects, even more exciting. *Trillium flexipes* has

never been recorded from Canada. This trillium grows all across southern Michigan, and in Ohio, so it would not be surprising if it were found in Essex County, Ontario. It is surprising that *T. flexipes* has not been found in Ontario before now. According to the distribution maps in Voss' (1972) *Michigan Flora*, *T. flexipes* is the one that could be expected in Essex County, rather than *T. cernuum*, which is a more northern species. One reason for either of the two species not being found more often is their habit of growth; the flower of both species is almost completely hidden beneath the leaves.

The Maidstone Township trillium patch, included about 75 plants, 45 of them with flowers. About 10 m away was a small patch of 4 plants, 3 of them with flowers, but they were not discovered until later in the week.

On 3 May I showed the patch of trillium to Michael J. Oldham, from the Essex Region Conservation Authority, but we still did not see the small patch, although we must have almost stepped on it. A day or so later Mike went in with Gary Allen, from the Ministry of Natural Resources, Chatham District. Gary spotted the small patch, but neither of them could find the larger patch! This makes me wonder how many more patches might be awaiting discovery in Essex County!

At this point Mike and I came to the conclusion that the plants were *T. cernuum*. Then, on 7 May we showed the patch to A.A. (Tony) Reznicek, from the University of Michigan, Ann Arbor. Tony thought that *T. flexipes* could not be definitely ruled out, so he took a specimen to Mr. Fred Case, of Lansing, Michigan, who has studied the genus intensively.

Two weeks later Mike heard from Tony: the plants are *T. cernuum*. Mr. Case said that the relative lengths of filament and anther are the critical characters to consider. Our specimen had anthers much longer than the filaments. It was rather large-flowered for *T. cernuum*, but flower size is somewhat variable in that species.

Now we are looking for *Trillium flexipes*! We hope that every naturalist in Essex County, and every naturalist visiting the county in the month of May, will keep this species in mind. ♦

SALVAGE OPERATIONS IN SOUTHERN ONTARIO WOODLOTS AND BACKUS WOODS: SOME GENERAL OBSERVATIONS AND CONCERNS

Kevin Kavanagh, Department of Botany, University of Toronto, Toronto, Ontario M5S 1A1

In recent years I have become increasingly concerned about the rapid disappearance of the remnant forest cover of the Carolinian Zone in southern Ontario and the resulting biological implications this holds for the many provincially and nationally rare species restricted to this Zone. In 1983 I began graduate studies in forest ecology at the Department of Botany, University of Toronto. My research involves comparing the population ecology of tulip tree (*Liriodendron tulipifera* L.) in Ontario with populations in the southern United States.

Backus Woods

It was in my preliminary field surveys in Ontario that I became acquainted with Backus Woods (Fig. 1). This 263 ha woodlot is composed of a mosaic of Carolinian forest stands, many in a mature stage of development. [See the Summer '85 issue of *Seasons* for a colourful introduction to Backus Woods.] This woodlot is generally known as the largest remaining tract of mature Carolinian forest in Ontario. I have searched for tulip tree stands extensively throughout southern Ontario and it is my opinion

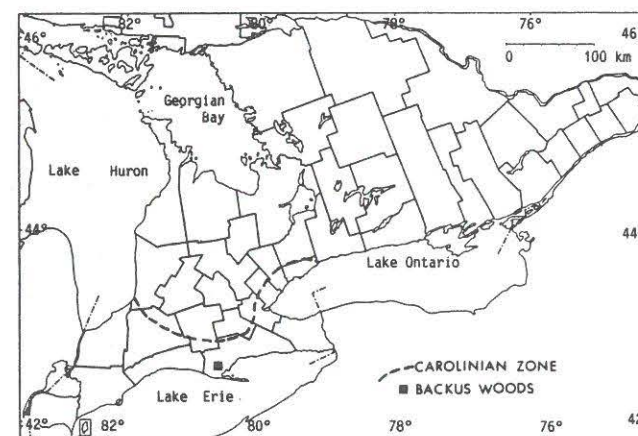


Figure 1. Location of Backus Woods in southern Ontario.

that Backus Woods is unique. It supports the best remaining old-growth stands of tulip tree on drier sites, among a wide range of other superb natural features. Backus Woods, however, is not only recognized for its biological attributes, but also for the degree of interest concerning the future management of the woodlot by a diverse group of users.

Input to a management plan for Backus Woods

A group of parties interested in Backus Woods came together in the spring of 1981 following concern from both the public and the Long Point and Region Conservation Authority that a proposed selective cut (removal of all trees larger than a certain size) and high-grading (removal of commercially desirable trees) were inappropriate given the unique status of this forest tract. As a result of this general concern, the "Backus Group" was subsequently formed. This group consists of representatives with naturalist, academic, and forestry interests. The objective of the Backus Group was to reach a consensus on a possible new management policy which would not necessarily consider fibre production, i.e., salvaging dead and dying wood, as the primary goal in management strategies.

In November 1985, following four years of negotiation, the 14-member Backus Group voted by a 10 to 4 decision to accept a policy that, in principle, would divide Backus Woods into approximately equal halves of "salvage" and "non-salvage" zones. At the time of writing [December 1985], a management plan, which will designate precisely where the divisions separating the two zones will fall, is being drafted. The salvage operations will be concerned only with leaning and downed trees and will take place during the winter months to minimize damage to the surrounding vegetation.

The salvage issue

When the November 1985 vote took place, two of the four members of the Backus Group which voted against the salvage policy, represented academic interests from the University of Toronto (Botany Research Group and Conservation Group). Their opposition to the policy centred primarily around the issue of salvage. Prior to voting on the policy, members of these two groups decided to survey academics across Canada to determine their opinions on selective salvage in parts of Backus Woods. The survey was circulated to nearly 400 researchers with

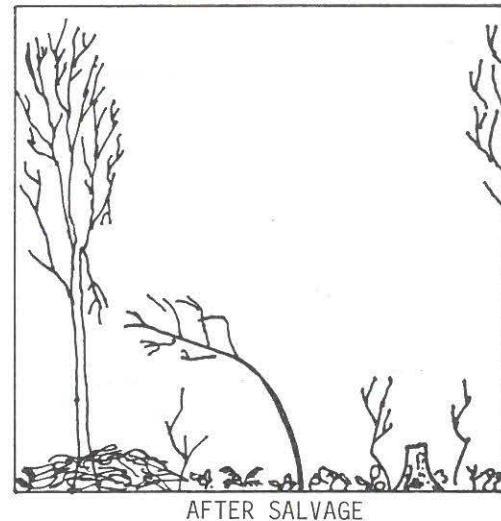
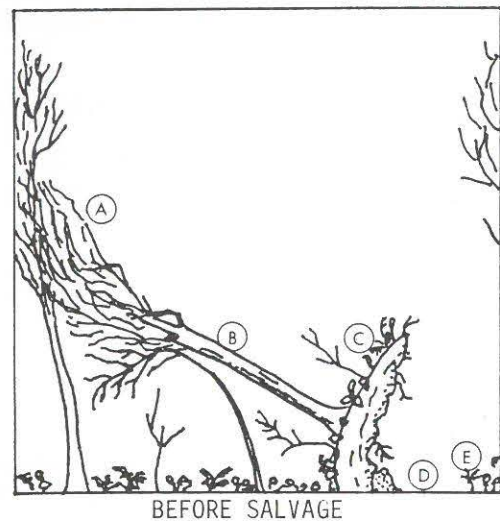


Figure 2. Changes in diversity of micro-habitat as shown by "before salvage" and "after salvage" profiles. These profiles are based on observations while conducting research on gap dynamics in the Carolinian forest. Micro-habitats which disappear after salvage are:

- A. Snag area - characterized by dense concentration of dead and dying branches.
- B. Tree stem - only remaining block of dead wood following salvage is the stump.
- C. Tip up mound - the upper part of this mound often supports light-demanding herbaceous plants. When the main stem is salvaged, this area falls back to the position it was in before the tree was blown over. This in turn eliminates habitat D.
- D. Exposed mineral soil - in this habitat, shade intolerant plants are often found. These require the removal of the litter layer and minimal competition for successful establishment.
- E. Margin between intact litter and disturbed mineral soil - exposure often results in germination and establishment of a stored seedbank.

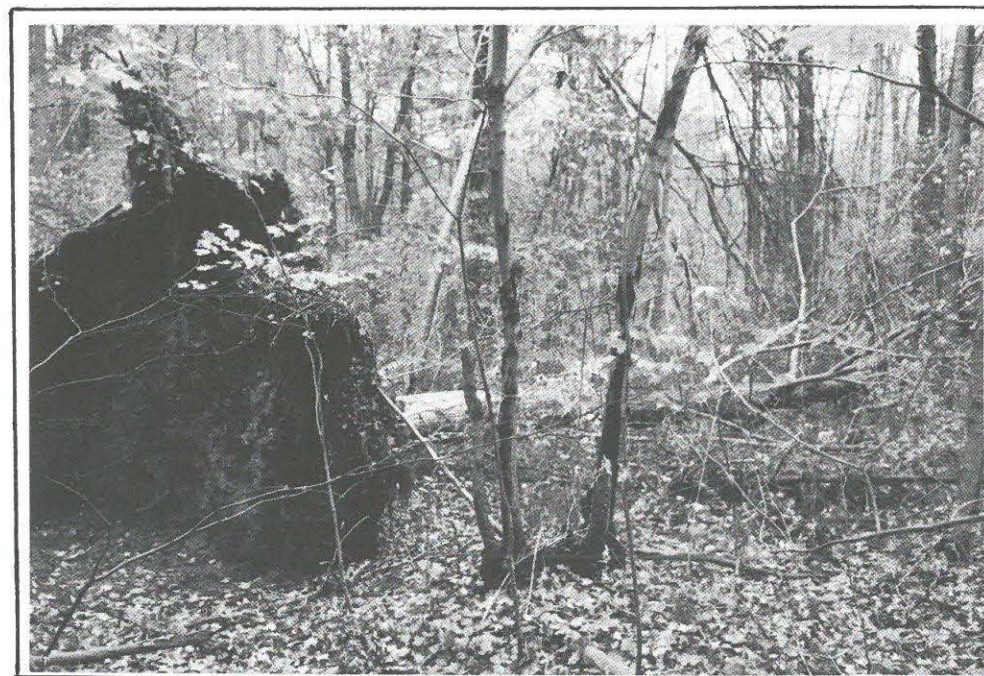


Figure 3. Windthrown sugar maple in Landon Woods, Norfolk County. Despite the horizontal position of the stem, when this tree was later cut just above the base, the entire tip up mound closed over to its original position before the tree was windthrown. The micro-habitats created by the windthrow were thereby eliminated.

170 replying as of November 1985. In addition to the responses pertaining to Backus Woods, many commented on salvage in general. After reading these replies, it seems appropriate to address this issue in more detail and to defend the stand of the University of Toronto groups.

It was quite evident from the response to our survey that those with academic interests are not against salvage of leaning and downed trees in all southern Ontario woodlots. It is generally recognized that many landowners who are fortunate enough to have a woodlot do require occasional harvest of fallen trees for firewood. When major windthrows occur, considerable financial gain is possible. However, for the most part, salvage of fallen trees is an infrequent, low intensity activity which has a relatively minor impact on a woodlot.

When salvage activity accelerates, however, the effect on the natural ecology of a woodlot may significantly alter the populations of some animal and plant species by eliminating the variety of micro-habitats available to them (see Fig. 2 and 3). In conjunction with my tulip tree research, while exploring southern Ontario woodlots, I am often surprised to find how "cleaned up" they are. Old, hollow, leaning or dead trees are sometimes entirely absent in such stands, whereas these are common in stands left in a natural state. The implications of such removal are detrimental for animals which nest in cavities and certain vascular plants, bryophytes and fungi which are dependent upon old, hollow, leaning or dead trees. Even when these dependent species are not extirpated from a woodlot, their population structures are likely to be severely altered. This point was emphasized many times among those who responded to our survey, particularly bryologists and mycologists. Also mentioned were observations that many tree species prefer decaying wood as a seedbed, two examples being eastern hemlock (*Tsuga canadensis*) and yellow birch (*Betula alleghaniensis*), both of which are uncommon in parts of the Carolinian Zone. The high nutrient content and particularly the moisture retention capabilities of decaying wood may be critical for the maintenance of such species on marginal sites.

Recently, some woodlot owners whom I have contacted have indicated a preference to leave some of the less economically valuable stems in place so that the woodlot might still support cavity nesting species such as pileated woodpecker and flying squirrel. Such encouraging statements indicate that some landowners do not see the need to salvage or "clean up" all of

the salvageable timber, but instead maintain a sufficient quantity for some of the organisms which require this resource to complete part or all of their life cycle. It is my hope that wider acceptance of this practice is adopted among woodlot owners in Ontario.

Specifically, the argument for salvage in Backus Woods is a more complex matter. Not surprisingly, a large majority of researchers who responded to our survey preferred to see this natural and scientifically valuable area left entirely untouched so that we might increase our knowledge on the natural processes which operate in the absence of any further anthropogenic disturbance. As a potential benchmark site, Backus Woods may be unparalleled in the Carolinian Zone of Ontario. Many field biologists are aware of the chronic shortage of large natural areas remaining in many parts of Canada where both objective and replicated studies can be conducted. For this reason, further division of a diverse mosaic of forest cover into salvage and non-salvage zones is unacceptable in my opinion.

The University of Toronto groups recognize that all groups participating in the Backus negotiations compromised their interests to arrive at the present management policy and plan. We are also concerned that part of the reason for support of the salvage operations in Backus was due to the need of the conservation authority to pay residential taxes on this property. Surely in Ontario the time has come to "untax nature" and to review these unfair land classifications which in turn prevent us from maintaining the integrity of our natural heritage. I think that pressure must continue to be placed on the provincial government to end this unfair taxation.

Despite casting a negative vote, the University of Toronto groups fully support the formation of committees as were struck for Backus and hope that co-operative efforts among the different groups will continue for other natural areas. In future negotiations on other sites, the academic interests may well find room for compromise, but it is quite evident, based on the response to our survey, that Backus Woods has too many important attributes for compromise in this set of negotiations.

I would be interested in hearing any other comments on salvage in general or on how it is perceived in reference to Backus Woods. All responses will be forwarded to the University of Toronto Botany Research Group and the Conservation Group. These should be mailed to the author (address above).◆

Dave McLeod, 92 Stroud Cres., #48, London,
Ontario N6E 1Y8

Recent discussions with other field botanists have revealed that some confusion surrounds the appropriate use of the abbreviation "cf." when reporting plant identifications (e.g. *Solidago cf. canadensis* for a goldenrod which is likely *canada goldenrod*). This confusion, coupled with my own uncertainties, prompted an investigation and the following suggestions for a more controlled use of the abbreviation "cf."

"Cf." is the abbreviation for the Latin word "confer," meaning "to compare." When used in conjunction with a scientific name for a plant, the intended meaning is usually that the material examined resembles most closely the description(s) given in the manual(s) and/or a correctly identified specimen of the so-named plant. At the same time, "cf." suggests that an element of doubt exists in the writer's mind as to the correct identification. We are thus given to understand that although the suggested identification be considered as only tentative, there is a high probability of its being correct.

Since neither the specific reason for, nor the degree of doubt is conveyed by the abbreviation itself, a diversity of meanings has arisen in actual practice. The abbreviation "cf." has been used to mean any of the following.

- Immature, poor quality, or insufficient material available to allow for a complete comparison, but enough to strongly favour a particular identification over all other possibilities.
- Adequate material available, with characters of the specimen closest to but not exactly as described in the manuals and/or keys, or as displayed by herbarium specimens. This situation could arise in the case of an alien plant not included in the manual or key being used, hybridization, mutation, injury, response to environmental factors, geographic variation, response to insect or microbial pathogens, or, as a remote possibility, an undescribed taxon.
- Chance of misinterpretation when identification is based on manual description alone.
- Field identification (no specimen collected) of a plant that was not identified with certainty, but was later given a name on the basis of habitat preference, local abundance, flowering time, etc.

To assess the propriety of each of the above, I suggest that the literal meaning of "cf." be accepted as the guiding principle for establishing the limits of proper use. It is therefore necessary that a close comparison be found between the material in question and the description given for the taxon to which the material is being referred, to the exclusion of all possibilities.

It likewise follows that "cf." should not be used in cases of a "best guess" in the absence of material needed for a proper comparison. Nor should "cf." be used as a substitute for having an identification of a specimen properly verified; that is, when it is still possible to remove any uncertainty. Therefore "cf." should not be used for examples (c) and (d) above. It would be better to omit such names from a list or report entirely, or to use the abbreviation "sp." if need be.

On the other hand, example (a) provides acceptable use of "cf." as long as the condition in the last clause is met. In example (b) other manuals should be checked before "cf." is used to eliminate the first reason from the list of possible reasons for the discrepancies. In addition to the actual discrepancies, any evidence in support of the other possibilities mentioned should be noted on the specimen.

I hope that by adhering strictly to the conditions in (a) and (b) that the quality of plant lists will be improved and that our understanding of "cf." will truly be a "comparison favorable," as they say in France!♦

NOTES & REPORTS

YELLOW-BUDDED BASSWOOD (*Tilia americana* L.) DISCOVERED IN EASTERN ONTARIO

Derek Munro, Biosystematics Research Institute,
Wm. Saunders Bldg., Agriculture Canada,
C.E.F., Ottawa, Ontario K1A 0C6

In November 1981, I was cutting wood near my home and noticed a 5-6 m tall tree with bright

yellow buds. I assumed it was a bitternut hickory (*Carya cordiformis* (Wang.) K. Koch) but the bark did not have the distinctive vertical ribbing pattern of that species. I was quite surprised to discover that the tree was a basswood (*Tilia americana* L.). This tree appeared normal in all respects except for light greenish-yellow first year twigs and bright yellow winter buds. There were several other young basswoods within 100 m and a single mature basswood which may have been the "mother" tree. All of these basswood trees had normal reddish to yellowish-brown first year branches and reddish winter buds.

Hosie (1979) mentioned that basswood buds are "often reddish." Blakeslee & Jarvis (1972) described basswood buds as "dark red or sometimes green," with twigs "bright red or greenish." Green buds and greenish twigs are rare on basswood, but I have seen this green variation on isolated lower branches on trees with buds and twigs of the usual colour.

I have found no literature reference to yellow buds or branches for basswood. Apparently this yellow-budded variant contains little or no anthocyanin pigments which normally contribute to blue, red, and purple colours in plants. The remaining carotenoid and flavenoid pigments have resulted in bright yellow and greenish-yellow buds and twigs.

I will provide T.J. Cole of the Ottawa Research Station, Agriculture Canada, with winter-hardened twigs next year for rooting and possible planting in the Dominion Arboretum, Ottawa. I would be interested to hear about other observations of this colour variant of basswood.

Documentation: Lanark County, North Elmsley Tp., south of Perth, from Elmgrove Road turn onto Rideau Road No. 1 and proceed 0.8 km to start of first down slope. Tree on south side of road allowance, 44°50'44" N, 76°11'12" W, 1 December 1981, D.B. Munro 2574 (DAO)

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Hosie, R.C. 1979. *Native trees of Canada*. 8th ed. Fitzhenry and Whiteside Ltd., Don Mills, Ontario 380 pp.♦

THE FIRST BOTANICAL FIELD EXPEDITION TO PELEE ISLAND, ONTARIO, FROM THE UNITED STATES IN 1904

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What is believed to be the first botanical field expedition to Pelee Island, Essex County, Ontario, Canada, from the United States was conducted in the summer of 1904. The expedition consisted of several members of the faculty and students at the Lake Laboratory operated by The Ohio State University located at Cedar Point, Erie County, Ohio. The trip was made in the Laboratory sailboat and probably took more than a day to complete, as a distance of approximately 29 km separates the 12 km-long island from Cedar Point and time would need to be allowed for plant exploration and picture taking.

Upon becoming Curator of the Herbarium at The Ohio State University in 1967, I discovered a bundle of unmounted plants with sufficient label data to verify that the specimens were collected by Harlan H. York on Pelee Island, 27 August 1904. Mr. York, who received his B.S. degree in Biology under Melville T. Cook from DePauw University, Greencastle, Indiana, was enrolled as a graduate student in the Department of Botany at The Ohio State University from 1903 to 1905, and attended the Lake Laboratory during the summers of 1902, 1903, and 1904.

York, working under the direction of Professor John H. Schaffer, completed his masters degree in Botany in 1905 by writing a thesis on the embryological life history of *Nelumbo lutea* (Willd.) Pers. (yellow water lotus), based on research begun as an undergraduate and continued at the Lake Laboratory (York 1904). He earned the Ph.D. degree in 1911 from The John Hopkins University and had a successful career teaching botany at several institutions, the last being the University of Pennsylvania. His personal herbarium was left there, and now resides as part of the herbarium of the Academy of Natural Sciences, Philadelphia, where the University of Pennsylvania herbarium was transferred in the 1970's. York was a very keen botanist and plant pathologist who made important contributions to the field of forest pathology (Snell 1962).

At the Lake Laboratory, botany was under the direction of Professor William A. Kellerman who had come to the University from the Kansas State Agricultural College, Manhattan, in 1891, and founded the Ohio State Herbarium in 1893 (Meyer 1983; Stuckey 1984). Kellerman taught courses in botany during the summers of 1900-1904 at the Lake Laboratory, and while there he prepared a flora of Cedar Point (Kellerman & Jennings 1904) and with York published a list of additions to the flora (Kellerman & York 1906). Kellerman (1901, 1904) also noted some of the interesting plants of the dunes, prairies, and marshes in the area of Sandusky and listed the plants seen on Hen and Chicken Islands, Canada.

In 1982, when the Plant Pathology Department moved to a new building on campus, 34 photographs (showing vegetation on the Cedar Point sand dunes, the Lake Laboratory building, and sites on South Bass and Pelee Islands), were discovered in the office of Professor C. Wayne Ellett. It was apparent that these photographs revealed activities associated with the Lake Laboratory program. The handwriting on the reverse side of those photographs labelled "Pelee Island" was verified to be that of Professor Kellerman, and some of the writings contained the initials "W.A.K." The camera was just coming into use as a new tool for use in documenting botanical studies (Brown 1907). Kellerman is known to have had a camera, as did his student and part-time stenographer, Clara G. Mark, and it was customary for him to take pictures during his botanical work. A good example are his photographs taken while conducting field work in Guatemala during 1908 and reproduced by Lowden (1970). On this trip Kellerman contracted a "tropical disease," died, and was buried there (Anonymous 1908).

Eleven of the 15 surviving photographs taken on Pelee Island, as well as others showing the laboratory building, the sailboat, and individuals, are reproduced here (Figures 1,2,3). Of the photographs taken on Pelee Island, one shows the group in their sailboat about to leave the island, but Kellerman is not among those in the picture. Perhaps he was on the dock and took the picture. Notes on the reverse side of the photographs reveal that the party explored sites in the "central part" and at the "upper end" or northern portion of the island. A picture of the lighthouse is further evidence that the group reached the north end of the island. Kellerman must have been most impressed with the canals as 6 of the 15 photographs are views of canals.

Figure 1. (Opposite page)

1. The Lake Laboratory building at Cedar Point, dedicated 2 July 1903 and abandoned by the University in 1918 when the biological teaching program was transferred to Put-in-Bay (Langlois 1949). The building was later razed. "Photo by 13 year old son of Professor [M.E.] Kleckner (Heidelberg College), Tiffin, Ohio. July 30 1903 (Brownie Camera)." Kleckner was a Professor of Geology and Biology at Heidelberg College.

2. Sailboat operated by the Lake Laboratory. The large lady in the centre of the boat is believed to be Lumina C. Riddle, one of Kellerman's students. The other individuals in the photograph remain unidentified. Photograph taken in 1903 probably by Clara G. Mark; the original photograph was part of her possessions now owned by Mrs. Esther G. Kiehl, Grove City, Ohio. Another photograph of this sailboat is reproduced in the paper by Kellerman (1901).

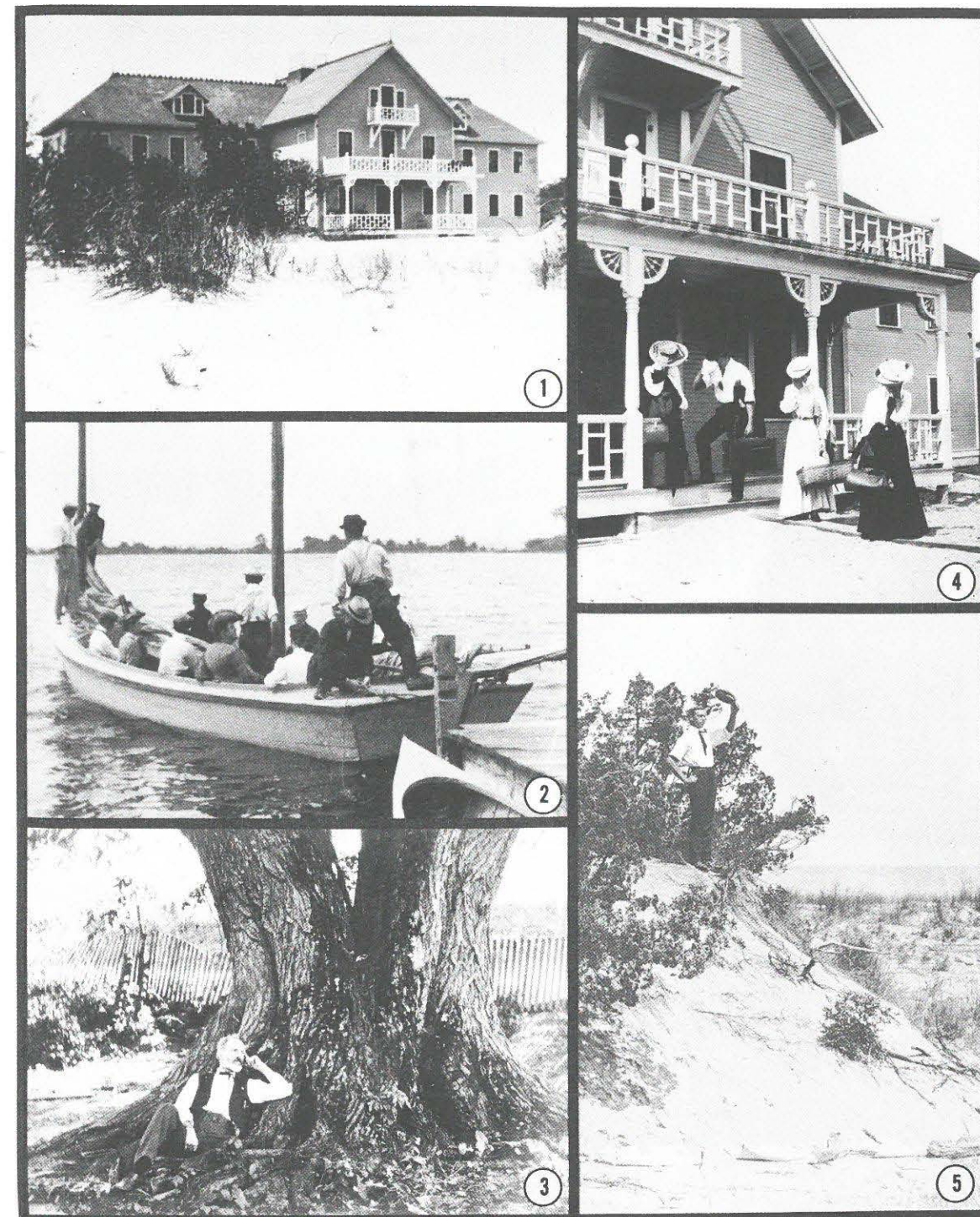
3. Professor William A. Kellerman reclining under a large tree, "Put-in-Bay" Ohio.

4. Students leaving the Lake Laboratory building at Cedar Point to go collecting plants.

5. Harlan H. York standing on a sand dune at Cedar Point.

Besides York, who was an assistant in botany, and Kellerman, it is not known who else accompanied the expedition. According to the Lake Laboratory announcement for the summer of 1905, those professors listed who had taught in 1904 were Herbert Osborn and James G. Sanders, entomologists; the students for that summer were Alice I. Bird, Charles E. Brown, Harold A. Budd, Osmer C. Ingalls, C. Floyd Jackson, Joseph E. Kewley, Clara G. Mark, Charles A. Miner, William A. Nye, David D. Stuart, Opal I. Tillman, and Frederick L. West, in addition to several investigators.

A total of 70 plants were salvaged from the bundle of plants collected by York. Labels were prepared, and the specimens were mounted and filed in the Herbarium (OS). Perhaps the specimen of most interest in the collection is *Hibiscus laevis* All. (*H. militaris* Cav.), a southern wetland species reaching its north-eastern-most limit on the islands in western Lake Erie. This record of the halberd-leaved rose mallow was reported as new for the Erie Islands (Stuckey 1968), and subsequently was the subject of a paper in *The Plant Press* by Oldham (1983), who pointed out that it is the



only record of this species known for Canada. The specimen probably came from a short-lived colony, because this species has not been found since on Pelee Island. Other specimens of plants that grow in wetland habitats and have southern or Mississippi Embayment affinities are listed in Table 1; those probably from the sandy shore are listed in Table 2. York's specimen of *Shepherdia canadensis* L. (buffalo berry) is the only known record of this species for the Erie Islands, and his specimen of *Salix lucida* Muhl. (shining willow) is the last record of that species known for the Erie Islands. The specimen of *Juniperus communis* L. var. *depressa* Pursh (ground juniper) is good evidence that the group also reached the southern tip of the Island, the only known location for this species on the Erie Islands, according to Core (1948). The remaining specimens are listed in Table 3.

Table 1. Wetland species with southern or Mississippi Embayment affinities collected in 1904 on Pelee Island by H.H. York

<i>Amaranthus tuberculatus</i>	(pigweed)
<i>Carex grayi</i>	(sedge)
<i>C. muskingumensis</i>	(sedge)
<i>Leucospora multifida</i>	(in figwort family)
<i>[Conoclea multifida]</i>	
<i>Ludwigia polycarpa</i>	(false loosestrife)
<i>Lythrum alatum</i>	(winged loosestrife)
<i>[L. dactyloides]</i>	
<i>Phyla lanceolata</i>	(fog-fruit)
<i>[Lippia lanceolata]</i>	
<i>Physostegia virginiana</i>	(false dragonhead)
<i>Strophostyles helvola</i>	(wild bean)

Table 2. Plants collected in 1904 on Pelee Island (probably from the sandy shore) by H.H. York; + indicates plants non-indigenous to Pelee Island.

<i>Ammophila breviligulata</i>	(marram)
<i>Elymus villosus</i>	(wild rye)
+ <i>Euphorbia platyphylla</i>	(broad-leaved spurge)
<i>Juniperus communis</i>	
var. <i>depressa</i>	(ground juniper)
<i>Potentilla anserina</i>	(silverweed)
<i>Shepherdia canadensis</i>	(buffalo berry)
<i>Triplasis purpurea</i>	(sand-grass)

Figure 2. (Opposite page)

6. "Upper end of Pelee Island last W.A.K." The word "last," which is difficult to decipher, may be a reference indicating that this photograph was taken at the last site visited.

7. "Pelee Island 1904" Probably a scene along the east shore.

8. "Pelee Island 1904" Probably a scene along the west shore.

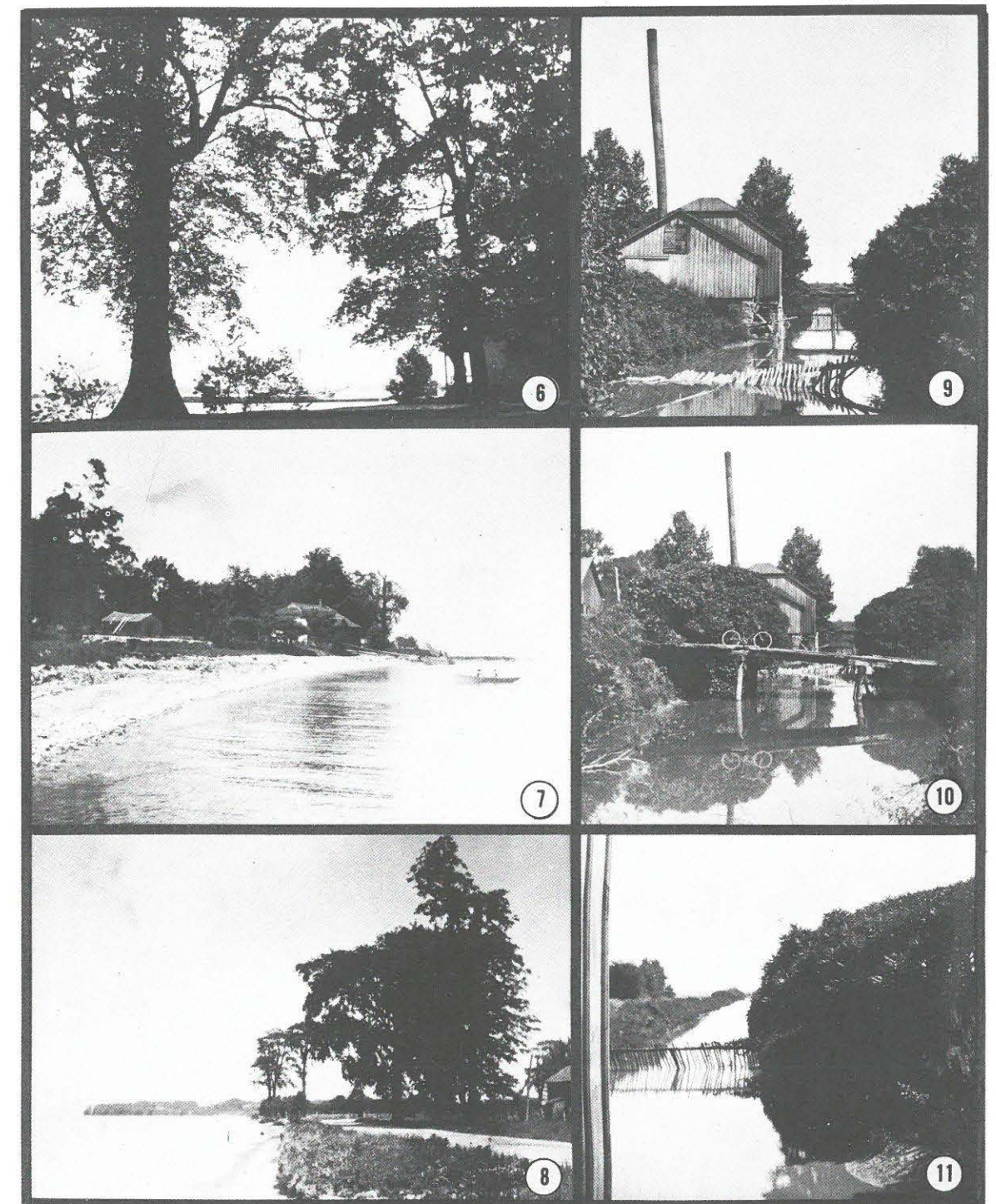
9. "Pumping station Pelee Island W.A.K. 1904" A photograph of the West Side Pumping Station appears in Ryall (1913, p. 272) and although taken from a different direction, it confirms that Kellerman photographed the same pumping station. The maps in Kindle (1936) and Knister (1933) show the locations of four pumping stations. In order to drain the 2,190-hectares of marshland in the late 1800's, canals were dug that led to these pumping stations where the water was lifted and emptied into the lake.

10. "Pumping station Pelee Island 1904 W.A.K."

11. "Pelee Island looking east from [the West] Pumping Station well 1904"

Table 3. Remaining plants collected in 1904 on Pelee Island by H.H. York; + indicates plants non-indigenous to Pelee Island.

<i>Agrimonia pubescens</i>	(agrimony)
<i>Allium tricoccum</i>	(wild leek)
<i>Amelanchier sanguinea</i>	(round-leaved serviceberry)
<i>Anemone virginiana</i>	(anemone)
<i>Arenaria stricta</i>	(rock-sandwort)
+ <i>Arenaria absinthium</i>	(absynth)
+ <i>A. biennis</i>	(biennial wormwood)
<i>Asclepias syriaca</i>	(common milkweed)
<i>Aster novae-angliae</i>	(new england aster)
+ <i>Avena sativa</i>	(oats)
<i>Carex lupulina</i>	(sedge)
<i>C. tribuloides</i>	(sedge)
<i>Carpinus caroliniana</i>	(blue beech)
<i>Carya ovata</i>	(shagbark hickory)
<i>Cornus drummondii</i>	(rough-leaved dogwood)
<i>Crataegus calpodendron</i>	(hawthorn)
<i>C. mollis</i>	(hawthorn)
<i>Cyperus ferruginescens</i>	(sedge)
<i>C. rivularis</i>	(sedge)



<i>Dryopteris spinulosa</i>	(spinulose wood-fern)
<i>Epilobium glandulosum</i>	(willowherb)
<i>Galium obtusum</i>	(bedstraw)
<i>G. triflorum</i> var. <i>asprelliforme</i>	(sweet-scented bedstraw)
<i>Iris virginica</i> var. <i>shrevei</i>	(southern blue flag)
<i>Isanthus brachiatus</i>	(false pennyroyal)
<i>Juncus dudleyi</i>	(rush)
<i>J. nodosus</i>	(rush)
<i>Lathyrus palustris</i> var. <i>myrtifolius</i>	(vetchling)
<i>Lobelia siphilitica</i>	(great lobelia)
+ <i>Morus alba</i>	(white mulberry)
<i>Panicum capillare</i>	(witch grass)
<i>P. flexile</i>	(panic grass)
<i>P. lanuginosum</i>	(panic grass)
<i>Parthenocissus inserta</i>	(virginia creeper)
<i>Penstemon calycosus</i>	(beard-tongue)
<i>Phragmites australis</i> [<i>P. communis</i>]	(common reed)
<i>Physalis heterophylla</i>	(ground-cherry)
<i>Plantago rugelii</i>	(rugel's plantain)
+ <i>Polygonum aviculare</i>	(prostrate knotweed)
<i>Prenanthes alba</i>	(white lettuce)
+ <i>Pyrus aucuparia</i>	(european mountain ash)
<i>Salix amygdaloides</i>	(peach-leaved willow)
<i>S. eriocephala</i> [<i>S. rigida</i>]	(heart-leaved willow)
<i>S. exigua</i> [<i>S. interior</i>]	(sandbar willow)
<i>S. nigra</i>	(black willow)
+ <i>S. purpurea</i>	(purple osier)
+ <i>S. pestifer</i> [<i>S. kali</i> var. <i>tenuifolia</i>]	(russian thistle)
<i>Scirpus atrovirens</i>	(black bulrush)
<i>S. pungens</i> [<i>S. americanus</i> of authors]	(bulrush)
<i>Scutellaria galericulata</i> [<i>S. epilobiifolia</i>]	(common skullcap)
<i>Sium suave</i>	(water-parsnip)
+ <i>Trifolium campestre</i> [<i>T. procumbens</i>]	(large hop-clover)
<i>Viburnum rafinesquianum</i>	(downy arrow-wood)
<i>Viola pubescens</i>	(downy yellow violet)

Figure 3. (Opposite page)

12. Lighthouse at the extreme north end of "Pelee Island." Built about 1834, it was in use until about 1900 (Hooper 1967, Chapter 15).

13. "Central part of Pelee Island" showing a drainage canal.

14. "On Pelee Island" Probably a scene along the west shore showing road, vegetation, and canal.

15. "Elm Pelee Island Aug. 1904 H.H. York." Kellerman was especially interested in trees, and several of his photographs of large trees survive in the photograph collection of the Department of Botany. Kellerman (1892, 1903) published special lists of Ohio trees and wrote on the methods and procedures for photographing trees with a kodak pocket or view camera. He argued that photographs of trees should receive their share of attention, just as much as do cats, dogs, and children (Kellerman 1906).

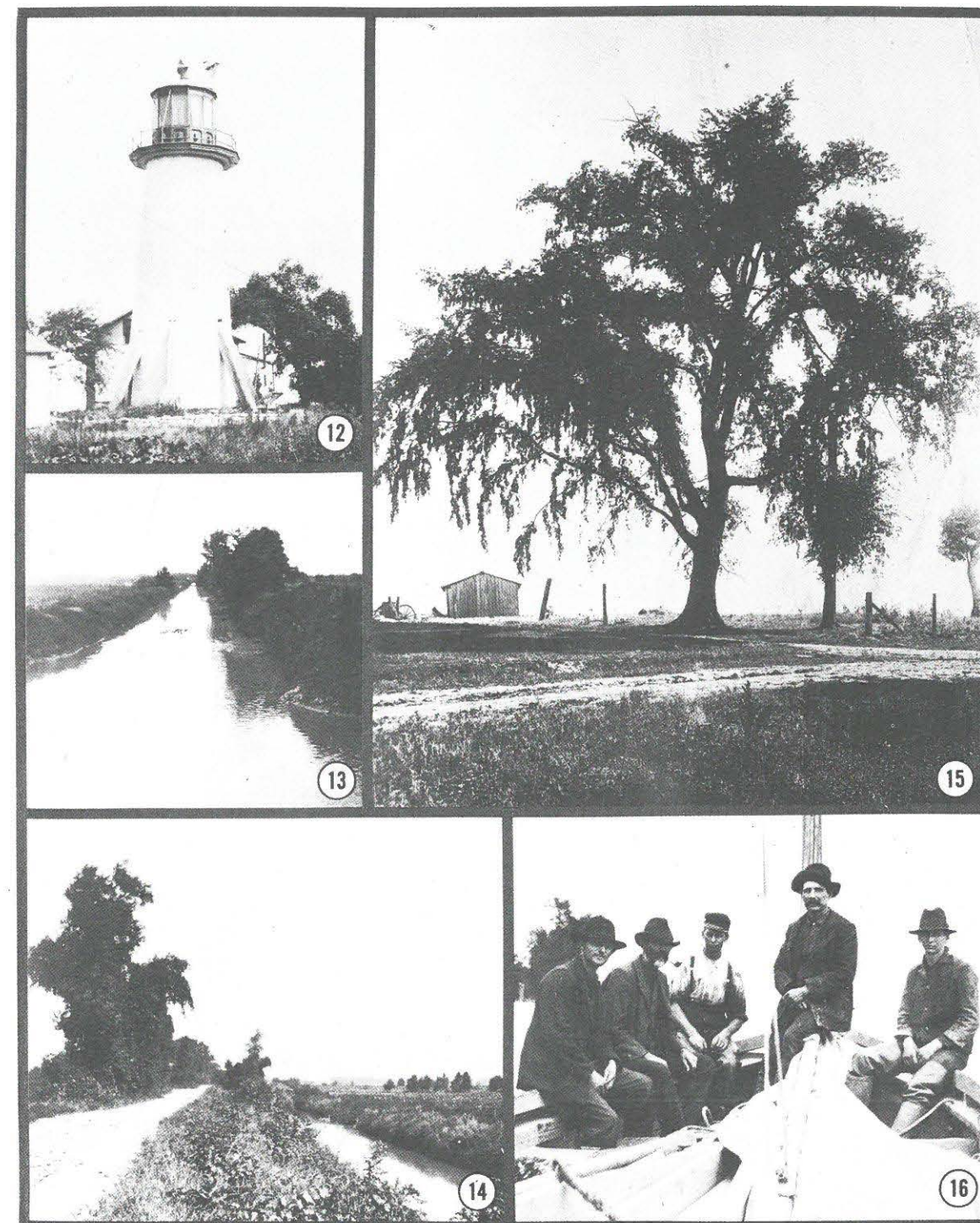
16. "Leaving Pelee Island 1904" The young gentleman in the white shirt, third from the left, is Harlan H. York. The other individuals remain unidentified.

All phrases contained within quotation marks are from the reverse side of the photographs and are in the handwriting of Professor William A. Kellerman.

Acknowledgements: Grateful appreciation is extended to Thomas Duncan for identification of the plant specimens, to Marvin L. Roberts for reading the manuscript, to A.E. Spreitzer for preparing the photographs for publication, and to Andrea M. Wilson for typing the manuscript.

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Isotria verticillata (Muhl. ex Willd.) Raf.
(WHORLED POGONIA) DISCOVERED IN
OXFORD COUNTY

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Isotria verticillata (whorled pogonia) is a clonal species producing a number of aerial shoots from an extensive underground system of roots and rhizomes (House 1906; Morris & Eames 1929). This growth habit and the larger flower size of *I. verticillata* (Fig. 1) differentiate it from the other member of the genus, *I. medeoloides* (small whorled pogonia), which is also found in Ontario (Stewart 1977). Non-flowering shoots of both species superficially resemble *Medeola virginiana* (Indian cucumber root).

On 4 June 1985, in Oxford County, we noticed a plant with a thicker, smooth stem among a patch of *Medeola virginiana*. We then realized that this discovery represents an extension of the range of the rare orchid *Isotria verticillata* for Ontario (White et al. 1982). [Ed. note: An update on the Ontario distribution is given by Klinkenberg on page 20 of this issue.] A thorough search of the Oxford County site revealed a total of 44 shoots. Only 4 of these had flowers; the ratio of flowering shoots to vegetative shoots for this colony therefore approximates the 1:12 ratio mentioned by Morris & Eames (1929).

The colony was distributed over an area of approximately 7m X 7m on a gentle, west-facing, forested slope. The orchids were more numerous but smaller near the moist base of the slope and became less numerous higher up. The 4 flowering shoots were situated near the middle of the colony.

The soil in which the orchids grew was classified as fox sandy loam. It had a pH of 5.2 with a 10 cm layer of leaf litter on the surface. This moist, rich, springy substrate supported a mixed deciduous forest with a moderately open canopy. The only tree within the limits of the orchid colony was white pine with one sapling each of red maple, yellow birch, and black cherry. The shrub layer included *Vaccinium angustifolium* (low sweet

blueberry), *V. myrtilloides* (velvet-leaf blueberry), and *Hamamelis virginiana* (witch-hazel). Other vascular plants recorded within the bounds of the colony were *Lycopodium annotinum* (stiff clubmoss), *L. dendroideum* (round-branched ground-pine), *Pteridium aquilinum* (bracken), *Maianthemum canadense* (wild lily-of-the-valley), *Smilacina stellata* (false solomon's-seal), *Medeola virginiana* (Indian cucumber root), *Tiarella cordifolia* (foam flower), *Polygala paucifolia* (fringed milkwort), *Trientalis borealis* (starflower), and *Mitchella repens* (partridge-berry).

House (1906) mentioned the "moist, soft, rich and well divided leaf mould" preferred by this plant in moist woodland habitats. This spongy mat of leaf mould interlaced with the roots of surrounding trees is an ideal substrate for fungi and may play an important role in the nutrition of the symbiotic fungus of this orchid. Without the fungus the seed of *Isotria verticillata* would not germinate and the plant would not grow. The thick mat of leaf mould is obvious at the Norfolk County and Oxford County sites of *I. verticillata* and also at the Elgin County site of *I. medeoloides*.

The Oxford County clone of *Isotria verticillata* probably started from a single seed and has gradually expanded by vegetative means over a number of years to produce the colony. If left undisturbed this clone should expand further as there is abundant similar habitat at this site. An attempt was made to pollinate the flowers, as manual pollination can enhance seed production (Mehrhoff 1983). Unfortunately, the flowers were beginning to wither and 2 of them abscised on contact. The other 2 did not produce seed capsules, as was confirmed by a later visit. The 2 abscised flowers and one vegetative shoot were collected for a voucher specimen and deposited in the University of Guelph Herbarium (OAC). In the interest of conservation of *I. verticillata* in Ontario, we have intentionally omitted location data, but this Oxford County locality is a northeastward extension of its range to 43°11' North and increases the geographical area in which to search for it.

The drastic decline in the number of plants at the Norfolk County locality and the probable extirpation of *Isotria medeoloides* in Elgin County (Stewart 1983) are at least in part due to the pressure of naturalists, photographers, and botanists. Surface layer compaction, as well as actual physical damage to the plants,

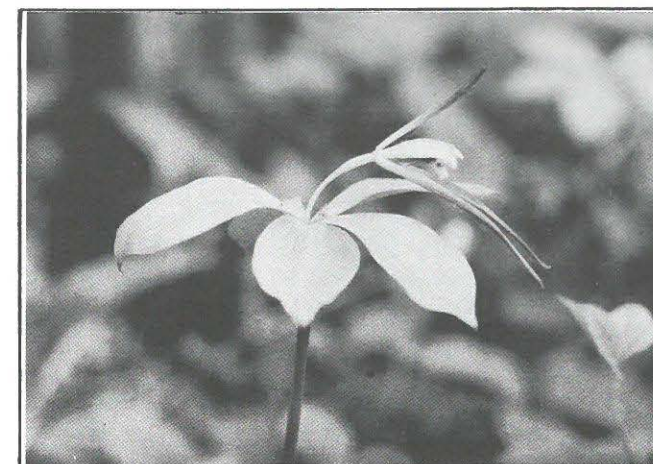


Figure 1. *Isotria verticillata* at the Oxford County site (photo by A.B. Anderson).

may have played a part in this decimation. We hope that *I. verticillata* will soon be added to the list of Endangered Species of Ontario. The Oxford County site now represents the only colony of *I. verticillata* in Canada which flowered in 1985.

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AN UPDATE ON THE DISTRIBUTION AND STATUS OF *Isotria verticillata* (Muhl. ex Willd.) Raf. (WHORLED POGONIA) IN ONTARIO

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Isotria verticillata (whorled pogonia) is a widely distributed southern or mild climate species which is endemic to eastern North America. It is found from southern Maine to southern Michigan, and south to northern Florida and eastern Texas, but does not occur in the prairie peninsula (Homoya 1977). It is very common in some areas of its range, but infrequent near the periphery (Mehrhoff 1983; Case 1964). In Canada *I. verticillata* is known only from Ontario. It is considered provincially and nationally rare (White et al. 1982) and an endangered species in Canada (Klinkenberg 1984).

When mapped for the Ontario rare plant atlas (White et al. 1982), *Isotria verticillata* was known from one extant colony in Norfolk County (Regional Municipality of Haldimand-Norfolk). This colony was discovered by Ross Brown in 1965. A second locality is documented by a specimen collected by Mrs. W.E. Saunders in 1879 from Middlesex County. This site was reported as destroyed by Morris & Eames (1929).

Since mapped by White et al. (1982), *Isotria verticillata* has been discovered at two new locations. It was found in Middlesex County by Dave McLeod in 1984 and, most recently, in Oxford County in 1985 (Anderson & Britton 1986). All known locations for this orchid in Ontario are mapped in Figure 1.

In 1985 the Norfolk County colony of *Isotria verticillata* had declined from a high of 43 plants in 1966, to 5 non-flowering plants (Anderson, personal communication). The Middlesex County colony increased from the 4 plants discovered in 1984, to 5 in 1985 (McLeod, personal communication). Although the discovery of a new location of *I. verticillata* in Oxford County (Anderson & Britton 1986) is significant, there is no evidence that any of the known colonies are spreading and its status remains endangered in Canada.

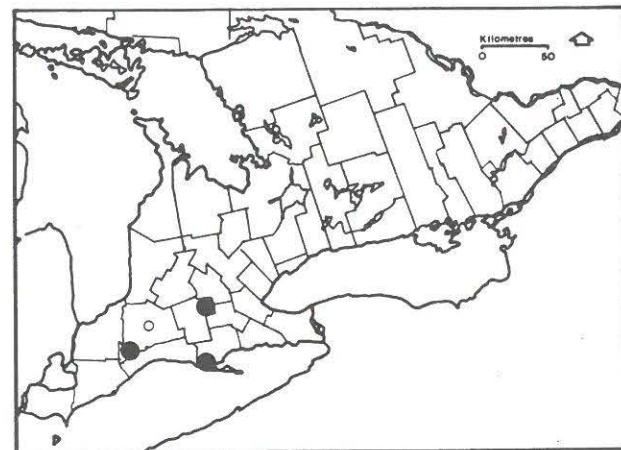


Figure 1. The known distribution of *Isotria verticillata* in Ontario as of 1985. Extant colonies are indicated by the symbol ●.

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COMPARISON OF MINISTRY OF NATURAL RESOURCES AIRPHOTO INTERPRETATION WITH FIELD DATA FROM HALTON REGION, ONTARIO

Jeff Kaiser, #408-3120 Kirwin Ave., Mississauga, Ontario L5A 3R2

Interest in natural areas in southern Ontario has grown dramatically in the last several years. The numerous county and regional studies of remnant natural areas (commonly designated "ESA's," e.g., Regional Municipality of Halton (1978) and the initiative of the Ontario Ministry of Natural Resources (OMNR) to identify important natural areas (designated "ANSI's") in their 1983 District Land Use Guidelines have contributed greatly to the interest and focused it on particular areas. However, monies to investigate such areas have always been in short supply. Planners and biologists concerned with these areas have had to react to specific issues rather than take a broad approach to data gathering and documenting the significance of such areas. As a result, a fragmented picture has been gathered of the very "fragmented forest" in southern Ontario.

The value of aerial photography for land-use and biological inventories as well as most planning projects is considerable. Without such photography much time in the field would be devoted to mapping activities requiring a great deal of equipment and manpower to match the results which aerial photographs permit. With respect to aerial photography, an under-utilized data base exists in the form of the Ministry of Natural Resources forest resources inventory (FRI) compiled by the Timber Sales Branch.

The Ministry's FRI is based on the interpretation of stereoscopic pairs of air photographs, corrected by ground truthing spot checks (OMNR 1978). The interpretation provides details of forest stands present in a given area. Tree species in each stand and the cover percentage contributed by the principal species in each stand (to the nearest 10%) are determined using such characters as crown shape, silhouette form, and stand appearance (Zsilinszky 1966). The work was begun to meet the need for forest surveys in northern Ontario but from 1978 to 1980, the work was extended to include all of southern Ontario, thereby completing coverage

of the province. To my knowledge no assessment of the accuracy of this work in southern Ontario has been published.

The Regional Municipality of Halton is located on the north shore of Lake Ontario at its western end. The southern fifth of Halton lies within the Deciduous Forest Region and the remainder lies within the Great Lakes - St. Lawrence Forest Region (Rowe 1972). In 1984, as part of an on-going collection of data from the natural areas in Halton (Regional Municipality of Halton 1978), I supervised an inventory of the forest resources of these areas using the OMNR FRI data. As a test of the accuracy of this data point-quarter surveys were performed on 19 selected stands within 11 of the ESA's (Kaiser 1984).

Comparisons of species composition

The compositional analyses of tree species in the Ministry's FRI was directly compared with the species composition determined from the field survey data, using relative density values rounded off to the nearest 10%. To facilitate comparisons for these 19 stands, the species composition was ordered by density (highest to lowest) and alphabetically where densities were identical (Table 1). Species abbreviations are those used in the FRI (OMNR 1978).

Such side by side comparison of data sets can be much improved by the use of a similarity index, a formula which computes a numerical value as a percentage (I.S.%) for the similarity of each pair of lists. Several exist, based on modifications of an index originally proposed by Jaccard (Mueller-Dombois & Ellenberg 1974, Chapter 10). One in common use is Motyka's modification which is presented below.

$$I.S.\% = \frac{\text{Sum}(2c_{mp})}{\text{Sum}(A_p) + \text{Sum}(B_p)} \times 100\%$$

c_{mp} is the smaller density percentage of the shared species multiplied by 2 for an occurrence in each list and A and B are the full complement of species on each list. In the

present instance, this index and another index, the Bray & Curtis Index, are identical. Since the Bray & Curtis Index is better known in North America, the index is referred to by that name below. However, this index does not recognize differences in list length (which reflects species diversity).

The most suitable index in the present case was based on a modification of Jaccard's Index by Spatz (Mueller-Dombois & Ellenberg 1974, Chapter 10). The Spatz Index is somewhat complex but it gives some weight to the length of the different lists being compared. This is important because a forest stand of 8 principal species is more difficult to analyze than one of only two species. Like the Bray & Curtis Index, this index also has a factor for the presence of shared (c) and unique (a, b) species in both lists as modified by their densities (indicated by the subscripts in Table 1). The formula for computation is given below.

$$I.S.\% = (R) \frac{\text{Sum}(c_p)}{\text{Sum}(a_b) + \text{Sum}(b_p) + \text{Sum}(c_p)} \times 100\%$$

In the above formula, R accounts for list length by providing a coefficient of similarity based on the number of shared species divided by the number of species in the longer list of the pair. The numerator, Sum(c_p) is the sum of the densities of the shared species and the denominator is the sum of all species densities.

The results of computation for each pair of data sets appear in the two rightmost columns of Table 1. In the first column are the values calculated using the Bray & Curtis modification of the similarity index and in the second column are the values calculated using the Spatz Index.

Discussion

The OMNR FRI is valuable in studies of natural areas in southern Ontario for a number of reasons. The majority of natural areas here are forested and the FRI permits the percentages of forest and non-forest portions of a given natural area or some larger municipal district

Table 1. Comparison of the tree species in selected forest stands in Halton Region using Ontario Ministry of Natural Resources (OMNR) FRI data and relative density from field data collected (Kaiser 1984). Two Indices of Similarity (I.S.%) have been calculated for each pair of species lists, one developed by Bray & Curtis (B&C) and one by Spatz (Mueller-Dombois & Ellenberg 1974). Species abbreviations are those used by OMNR. Ab = black ash; Aw = white ash; Bd = basswood; Be = beech; Bn = butternut; Bw = white birch; By = yellow birch; Cb = black cherry; Ce = white cedar; He = eastern hemlock; Hi = hickory (all species); Iw = hop-hornbeam; Mh = sugar maple; Ms = red or silver maple; Or = red oak; Ow = white oak; Po = poplar (all species); Pw = white pine; Sw = white spruce; Wi = willow (all species).

ESA # Stand #	Species composition & relative density (subscript x 10%)	I.S.% (B&C)	I.S.% (Spatz)
4-444	FRI: Pw ₃ Mh ₂ Aw ₁ Bd ₁ Bw ₁ Ms ₁ Or ₁ Pt-q: Mh ₃ Aw ₁ Be ₁ Bw ₁ Ms ₁ Or ₁ Po ₁ Pw ₁	70	53
4-445	FRI: Mh ₄ Or ₄ Ow ₂ Pt-q: Mh ₇ Iw ₁ Or ₁ Pw ₁	50	16
6-389	FRI: Or ₃ Po ₂ Aw ₂ Mh ₂ Pt-q: Iw ₃ Mh ₃ Aw ₂ Be ₁ Or ₁	50	26
6-391	FRI: Or ₃ Ow ₃ Aw ₁ Hi ₁ Pt-q: Mh ₃ Or ₂ Aw ₁ Hi ₁ Ow ₁	50	41
9-226	FRI: Pw ₃ Aw ₁ By ₁ He ₁ Po ₁ Sw ₁ Pt-q: Po ₃ Bw ₁ He ₁ Ms ₁ Pw ₁	30	17
10-395	FRI: Ab ₂ Ms ₂ Pw ₂ Bn ₁ Cb ₁ Mh ₁ Or ₁ Pt-q: Mh ₃ Aw ₁ Be ₁ Bn ₁ Bw ₁ Iw ₁ Ms ₁ Pw ₁	40	17
10-396	FRI: Aw ₃ Po ₃ Bw ₁ Pw ₁ Pt-q: Aw ₃ Mh ₂ Cb ₁ Pw ₁ Wi ₁	60	24
13-276	FRI: Or ₄ Mh ₂ Ow ₂ Pt-q: Mh ₃ Or ₃ Ms ₁ Ow ₁	60	33
13-279	FRI: Or ₇ Ow ₂ Mh ₁ Pt-q: Mh ₃ Or ₂ Ms ₁ Ow ₁	40	23
18-73	FRI: Mh ₄ Be ₂ Aw ₁ He ₁ Pt-q: Mh ₇ Aw ₁ Bw ₁ Ce ₁	70	34
19-88	FRI: Mh ₃ Bd ₁ Pt-q: Mh ₃ Bd ₁ Bw ₁ Ce ₁ Iw ₁	70	28
20-C14	FRI: Or ₃ Bd ₂ Mh ₂ Iw ₁ Pt-q: Mh ₃ Aw ₁ Bd ₁ Be ₁ Or ₁	40	18
20-C18	FRI: Mh ₃ Bw ₁ Pt-q: Mh ₇ Aw ₂ Bw ₁	80	53
29-651	FRI: Mh ₃ Aw ₄ Bd ₁ Pt-q: Mh ₃ Aw ₃ Bd ₁ He ₁	90	66
29-657	FRI: Mh ₃ Aw ₁ Iw ₁ Pt-q: Mh ₇ Aw ₃	80	38
30-395	FRI: Po ₃ He ₂ Aw ₁ Ce ₁ Pw ₁ Pt-q: Aw ₂ Ce ₂ He ₂ Bd ₁ Bw ₁ By ₁ Po ₁	50	25
30-398	FRI: Pw ₄ He ₃ Ms ₁ Pt-q: Ce ₂ He ₂ Ms ₂ Pw ₂ Aw ₁ Bw ₁	50	20
32-295	FRI: Mh ₃ Aw ₂ Ce ₂ Iw ₁ Pt-q: Aw ₄ Mh ₄ Or ₁ Po ₁	60	24
32-298	FRI: Mh ₃ Aw ₂ Be ₂ Bw ₁ Pt-q: Aw ₄ Mh ₃ Bd ₁ Bn ₁ Cb ₁	50	15

to be rapidly and accurately determined. The FRI is a province-wide survey of a major biological component of such areas and permits a variety of broad comparisons between the forest stands of different areas. Finally, the FRI provides a first approximation of the community associations within this important group of plants. Where a forest or woodlot is present, the trees are the dominant vegetation.

Looking at the comparison of species composition, the average of the similarity indices is 57% for the Bray & Curtis Index, ranging from a low of 30% to a high of 90%. The values from the Spatz Index are mean = 30%; low value = 15%; and high value = 66%. In neither instance is the mean similarity very high and that lack of agreement is particularly serious in light of the fact that the samples for each pair of lists come from the same forest populations. In general, the FRI data appears best limited to background studies. Airphoto interpretation is certainly useful in determining vegetation types and possible stand boundaries, but the distinction between the numerous hardwood species of the 19 stands in Halton is not particularly satisfactory.

In none of the 19 comparisons are the species lists identical (Table 1). Where the species lists are close, the lists are short and similarity is much effected by the addition or omission of a species. In a few instances, the presence percentages are nearly identical for major species but the discrepancies are considerable among the minor species. Because of the importance of list length in this comparison, I favour the values calculated from the Spatz Index, but I do find them a bit too severe. By that standard the FRI data are only 30% accurate with respect to the combination of species composition and presence percentages in Halton Region. The Bray & Curtis Index which is insensitive to the importance of list length measures average similarity at just under 60%.

Perhaps the most satisfactory measure of similarity is an average between the two indices. This would put the average similarity of the FRI data and the relative density from field data collected at about 45%. Even at 60% the similarity is too low for inventory and evaluation purposes. In other words, a field survey must be undertaken for accurate inventory information. Of course, if such an inventory

is performed by a knowledgeable botanist a great deal of botanical information can be collected in addition to tree species composition.

Despite this shortcoming, the FRI data can be used to identify natural areas or stands within such areas that merit closer attention. Even though the compositional accuracy may be limited, it is sufficiently good to flag species combinations which are regionally scarce or unusual though these will need to be confirmed by field checks. Since it is readily available at relatively low cost, it can be used as a basis for planning field work. The FRI information is presented on a photomosaic base which simplifies the identification of access routes to a natural area and permits determination of the surrounding land use.

Acknowledgements

The work upon which this paper is based was funded by Environment Canada through the Regional Municipality of Halton Planning and Development Department. I would like to thank M. Service, B. Panning and C. Fredo who performed much of the field work. Thanks also to P. Herring, Planner, Regional Municipality of Halton, for administering the study and providing a useful critique of this paper.

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- Zsilinsky, V.G. 1966. Photographic interpretation of tree species in Ontario. 2nd ed. 86 pp. Ontario Department of Lands and Forests. ♦

NEWS OF FIELD BOTANISTS

ROBERT MUMA: THE MOSS MAN OF TORONTO

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Bob Muma has been an active naturalist since childhood, when he was tutored in plant identification by a naturalist neighbour, Al Wood. (This is the same Al Wood who sent moss specimens to the National Herbarium in Ottawa and whose moss records are acknowledged in Ireland & Cain's (1975) Checklist of the Mosses of Ontario.)

At the age of 17 Bob corresponded with a number of hunters and trappers across Canada who sent him skulls of their trophies and tales of their adventures. He started making pen and ink drawings of these skulls and, on the suggestion of Al Wood, sent these to the Royal Ontario Museum. The drawings were shown to Dr. B.A. Bensley, who was so impressed that he offered Bob the job of Junior Lab Assistant under Bill Leray, the herpetologist, with spare time to illustrate Dr. Bensley's book on dental evolution. Dr. Bensley got Shelley Logier, then Museum artist, to coach Bob in the wash technique for drawings illustrating dental evolution from sharks to *Homo sapiens*. Unfortunately Dr. Bensley died just as the book was almost finished and it was never published. The fate of Bob Muma's illustrations for the book remains a mystery.

When Bob Muma was about 19, he was invited to join the Nature Correspondence Association (NCA), an organization of junior naturalists, about 50 of whom were American. Bob became the sixth Canadian. Because of his interests, Bob was made the Official Mammologist and Assistant Artist. The NCA published a journal called The Passenger Pigeon with a drawing of its namesake on the cover. This was probably Roger Torey Peterson's first published bird drawing; he was the Official Artist and Photographer. Bob says that he lost track of Peterson when he went to New York to study art and that he finally met him during his first lecture trip to Toronto.

It was not until the Federation of Ontario Naturalists' meeting at Red Bay (Bruce Peninsula) about 10 years ago, that Bob Muma began serious

study of mosses while photographing plants. After retiring from 25 years of custom book-binding in Toronto in 1975, he has spent much of his time studying, illustrating, and collecting mosses.

At present Bob Muma's collection includes mosses from around the world - more than 2,000 specimens, including 350-400 species. He has mosses from Peru, New Zealand, Bermuda, Puerto Rico, Bolivia, Africa, India, and from all over Canada and the United States. Many of these specimens were collected for him by vacationing friends. The collection has also been enriched by his participation in the members' moss exchange of the American Bryological & Lichenological Society. His bryological resources also include a well-stocked library and many slides which he takes himself.

In his workroom, mosses are identified with a dissecting microscope after being moistened to regain their natural form. After identification, the best specimen is chosen, washed, then pressed for posterity in folders the size of a post card. These folders enclose the delicate specimens which are affixed inside on the right with full documentation written on the left. The specimens are glued to the folders with methylcellulose, which is colourless, flexible, and can be removed with water. Bob finds this method decorative, as well as functional. As the specimens are not stored under light, they retain their colour. By dipping the specimens in a solution of 50% glycerine and 50% water, each expands to its natural form.

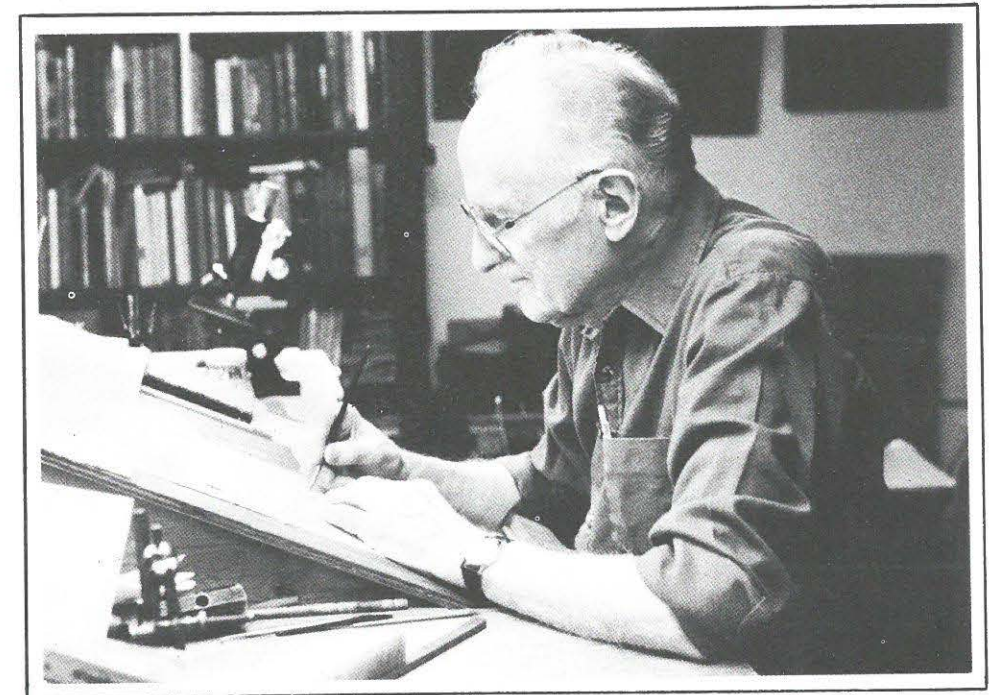
Reflecting upon 78 years of memories, Bob Muma shares the following story: "One of the strangest things in my life makes my hair stand on end sometimes. When I first started collecting mosses the only book I could find for beginners was How to Know the Mosses and Liverworts by Henry S. Conard. I had been using this book for 4 years when my wife and I were on vacation in British Columbia. Here I met someone who knew Henry Conard and I discovered that I was related to him! The weird part is that about 55 years ago, as part of an endless search for better health, I spent about a year in Pennsylvania with some of my mother's family. One of my aunts thought I was so much like the Conards that I should have the only remaining hand-cut silhouette of my great grandfather, William Conard (1801-1870). This likeness of him has hung on my wall where I work all those years. If I wish to believe in the occult, I could say it has had some silent

influence on the direction of my life. Rather it could be evidence of some genetic factors at work. There are numerous Conards in that part of Pennsylvania where they both come from. So far I have been unable to learn his parents' names, but from all I can learn from bryologists and family records, he was probably second or third cousin to my mother. There were other botanists in the family as well."

Bob Muma is happy to share his interest in mosses, and is always willing to help others with identifications. He has participated in a number of workshops for the Toronto Field Naturalists and students from the Botany Department of the University of Toronto. He has written (and very recently revised) a booklet for naturalists with an interest in mosses, A Graphic Guide to Ontario Mosses. The original booklet received a most favourable review by

Harry Williams (Plant Press 3(3):110). It is illustrated by the author and can be used by beginners to identify mosses to genus. This novel approach is most welcome due to the paucity of introductory literature for field botanists in Ontario.

If you wish to read more about mosses and Bob Muma's involvement with them, refer to the last issue of the Ontario Naturalist (before it became Seasons), winter 1979, volume 19. Bob has three articles in that issue: "Discovering the mosses," "Let's make a moss garden," and "How to grow your own moss." If you wish to contact Bob Muma, to discuss mosses or to obtain a copy of his revised booklet on Ontario mosses (\$ 2.50 postpaid or \$ 20.00 per dozen postpaid), he can be reached at 625 Rushton Rd., Toronto, Ontario M6C 2Y8. His phone number is (416) 654-5635. ♦



Robert Muma at work (photo by Walter Muma, 1985).

WM. G. DORE VISITS IRELAND
TO RESEARCH HISTORIC CANADIAN SPECIMENS

The collections of James McNab and Robt. Brown made in 1834 in the northeastern United States and "Upper Canada" have been located in the extensive herbarium of the National Botanic Gardens of Ireland at Glasnevin, near Dublin. Bill Dore, retired Ottawa botanist, has a copy of the McNab diaries of the trip from the Edinburgh archives for several years and has visited most of the original collecting sites to record if the former species still exist - generally not. The beech woods with several saprophytic orchids at Kingston is now the campus of Queen's University; the flowery "mooreland" at Brantford now has high-rise apartments and is well landscaped. The re-examination of the specimens clears up some of the questionable records. Photostat copies of all the specimens are being made to bring back to Canada.

Dr. Dore spent a month in Ireland last autumn researching these historic specimens. He notes that the specimens have been carefully selected and pressed, adequately labelled, and perfectly preserved. Originally they were kept in the family herbarium to which four McNabs, all reputable botanists, contributed. These collections did not come to the Dublin herbarium until 1970. The lack of signatures has created a puzzle as to collector.

BILL CRINS TAKES POST DOCTORAL POSITION
AT THE UNIVERSITY OF BRITISH COLUMBIA

In late 1985 Bill Crins completed a Ph.D. on the taxonomy of *Carex* Section *Ceratocystis* in North America and northern Europe at the University of Toronto. In January 1986 he went to Vancouver to begin post doctoral research with Dr. Bruce A. Bohm. Bill says he will be working on a new group of plants, Section *Mediinae* (tarweeds) of the aster family. He will also be learning new techniques involved in chemosystematics and he hopes to do field work in California and Hawaii. Bill notes that he is not the only "easterner" in Bruce Bohm's lab. Tom Wells, who recently completed an M.Sc. at The University of Western Ontario, has also taken up residence in British Columbia. Dr. Wm. J. Crins' new address is the Department of Botany, University of British Columbia, Vancouver, B.C. V6T 1W5.

TIMOTHY DICKINSON ACCEPTS POSITION OF
ASSISTANT CURATOR, ROYAL ONTARIO MUSEUM

Since completing doctoral studies on *Crataegus* (hawthorn) at The University of Western Ontario, Timothy Dickinson has been involved in post doctoral research on the genetics and genealogy of *Larix laricina* (larch) at Lakehead University in Thunder Bay and Nebraska. Recently he accepted the position of Assistant Curator at the Royal Ontario Museum in Toronto. In addition to curating the herbarium (TRT), Timothy will be working on galleries and beginning research with colleagues at the University of Toronto. As of March 1986, Dr. Dickinson's address is the Botany Department, Royal Ontario Museum, Toronto, Ontario M5S 2C6.

JOHN RILEY BECOMES REGIONAL ECOLOGIST,
CENTRAL REGION, ONTARIO MINISTRY OF
NATURAL RESOURCES

In late 1985 the position of Regional Ecologist was filled by John Riley at Central Region, Ontario Ministry of Natural Resources. Expertise in field botany was one of several requirements for this position. John's main duties will centre around the Ministry's natural areas (ANSI's) program in Central Region. Mr. Riley's address is Central Region, Ontario Ministry of Natural Resources, 10670 Yonge St., Richmond Hill, Ontario L4C 3C9.

We are very pleased to note that the provincial government now has a professional field botanist on permanent staff.

W. A. T. GILMOUR 1903 - 1986

William Alexander Turner Gilmour of Hamilton died on 11 March 1986. Mr. Gilmour was an active naturalist and was especially knowledgeable about some of the more difficult groups of plants - sedges, *Amelanchier* spp., and *Salix* spp. Bill Gilmour will be long remembered at the Royal Botanical Gardens for his collection of native trees and shrubs, slide collections and generous financial contributions. As his wife, Margaret Alice Costigan, died only a few days after him, sympathy is extended to daughters Nancy and Mary and his many friends.

INFORMATION & REQUESTS

NEW ENGLAND WILD FLOWER SOCIETY:
PUBLICATIONS FOR NATIVE PLANT ENTHUSIASTS

The New England Wild Flower Society is a non-profit organization whose chartered purpose is education and research in conservation, botany, ecology, and horticulture of native plants. The Society, which was established in 1922, has 2200 members and is governed by a 30-member Board of Trustees.

Six sanctuaries and a botanical garden are owned and maintained by the Society. The Garden in the Woods botanical garden contains over 1500 species and varieties of plants and is the largest landscaped collection of wildflowers and native plants in the northeastern United States.

The Society supports an active education program for both children and adults, sponsors conferences throughout New England, and promotes research on native plants. In addition, the Society functions as a resource centre for information about native plants and, through its seed exchange, provides seed and plant material to botanical institutions throughout the world.

Individual membership in the New England Wild Flower Society is \$ 15.00 (U.S. funds). Those wishing to join or obtain more information should write to the New England Wild Flower Society, Hemenway Road, Framingham, MA 01701. We are grateful to Mary Walker, Librarian of the New England Wild Flower Society, for permission to reprint the following titles compiled by the Society in 1984.

Wildflower identification

- Appalachian Mountain Club. 1964. Mountain Flowers of New England. Appalachian Mountain Club, Boston.
- Newcomb, L. 1977. Newcomb's Wildflower Guide. Little, Brown, & Co., Boston.
- Niering, W. & N.J. Olmstead. 1978. The Audubon Society Field Guide to North American Wildflowers: Eastern Region. Alfred A. Knopf, New York.
- Peterson, R.T. & M. McKenny. 1968. A Field Guide to Wildflowers. Houghton Mifflin Co., Boston.
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Wildflower ecology

- Davis, M.C. 1974. The Near Woods. Alfred A. Knopf, New York.
- Jorgensen, N. 1978. A Sierra Club Naturalist's Guide: Southern New England. Sierra Club Books, San Francisco.
- Scott, J. 1984. Botany in the Field: An Introduction to Plant Communities for the Amateur Naturalist. Prentice-Hall, Englewood Cliffs, New Jersey.
- Watts, M.T. 1975. Reading the Landscape of America. The Macmillan Co., New York.

Wildflower gardening

- Aiken, G.D. 1978. Pioneering with Wildflowers. Countryman Press, Taftsville, VT.
- Allen, O. 1977. Wildflower Gardening. Time-Life Encyclopedia of Gardening Series, Time-Life Books, Alexandria, VA.
- Birdseye, C. & E. Birdseye. 1972. Growing Woodland Plants. Dover Publications, Inc., New York.
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- Bruce, H. 1976. How to Grow Wildflowers and Wild Shrubs and Trees in Your Own Garden. Alfred A. Knopf, New York.
- Steffek, E.F. 1983. The New Wildflowers and How to Grow Them. Timber Press, Portland, OR.

Wildflower propagation

- Brooklyn Botanic Garden. 1982. Propagation: Handbook No. 24. Brooklyn Botanic Garden, Brooklyn, NY.
- Hartman, H.T. & D.E. Kester. 1983. Plant Propagation. 4th ed. Prentice-Hall, Englewood Cliffs, NJ.
- National Council of State Garden Clubs. 1981. Directory of Resources on Wildflower Propagation. Missouri Botanical Garden, St. Louis.
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- North Carolina Wild Flower Preservation Society. 1977. Propagation Handbook. North Carolina Botanic Garden, Chapel Hill, NC.

Wildflowers: endangered

- Crow, G. 1982. New England's Rare, Threatened, and Endangered Plants. U.S. Government Printing Office, Washington, DC.
- Mohlenbrock, R.H. 1983. Where Have All the Wildflowers Gone? The Macmillan Co., New York. ♦

STONE ROAD ALVAR: THIS NATURE RESERVE ON PELEE ISLAND STILL NEEDS FUNDING

Donald Kirk, 75 Queen Street, Guelph, Ontario N1E 4R9

The Federation of Ontario Naturalists (FON) recently acquired a portion of the most southerly part of Canada, Stone Road Alvar on Pelee Island, Essex County. The Stone Road Alvar Nature Reserve includes 43 hectares (106 acres) representing the most botanically rich part of an extensive alvar community complex at the southeast corner of the island (Fig. 1).

The vegetation of Stone Road Alvar is a mosaic of oak savanna, prairie meadow, shrub thicket, and upland forest (see Jaques & Kirk 1985 for a colourful introduction). Within the FON property the open alvar is interspersed with chinquapin oak and blue ash savannas as well as dense shrub thickets of *Zanthoxylum americanum* (prickly ash), *Cornus drummondii* (rough-leaved dogwood), *Rhus aromatica* (fragrant sumac), and *Cornus racemosa* (gray dogwood). The most conspicuous herbaceous elements of the grassland alvar are *Allium cernuum* (nodding onion) and *Ratibida pinnata* (gray-headed cone-flower), which form impressive displays from late July to late August.

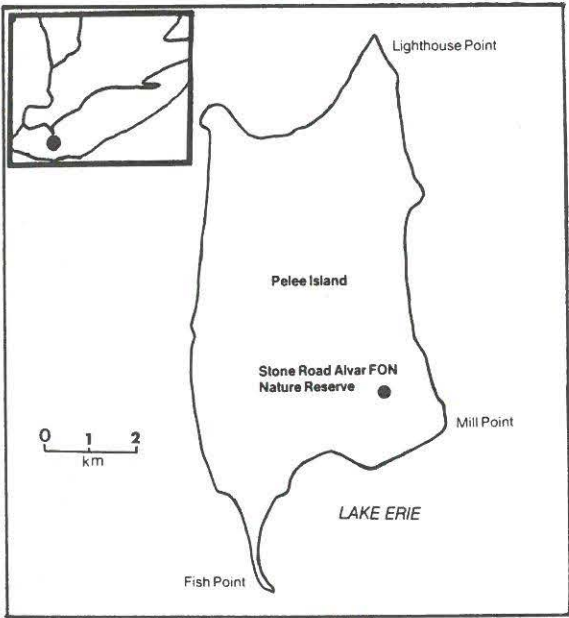


Figure 1. Location of Stone Road Alvar Nature Reserve on Pelee Island.

Table 1. Notable plants of the Stone Road Alvar Nature Reserve (after Oldham 1983). Species which occur nowhere else in Canada are indicated by an asterisk (*).

Scientific Name	Common Name
<i>Allium cernuum</i>	nodding onion
<i>Asclepias purpurascens</i>	purple milkweed
<i>Aster shortii</i>	short's aster
<i>Blephilia ciliata</i>	downy wood mint
<i>Carex gracilescens</i>	sedge
* <i>C. leavenworthii</i>	sedge
<i>C. muskingumensis</i>	sedge
<i>C. tetanica</i>	sedge
<i>Chaerophyllum procumbens</i>	creeping chervil
<i>Conoclea multifida</i>	conoclea
<i>Euonymus atropurpureus</i>	burning bush
<i>Eupatorium altissimum</i>	tall thoroughwort
<i>Geum vernum</i>	spring avens
<i>Heuchera americana</i>	alumroot
<i>Hydrophyllum appendiculatum</i>	waterleaf
<i>Lythrum alatum</i>	winged loosestrife
<i>Morus rubra</i>	red mulberry
<i>Myosotis verna</i>	forget-me-not
<i>Phacelia purshii</i>	miami mist
<i>Ptelea trifoliata</i>	hop tree
<i>Ratibida pinnata</i>	gray-headed cone-flower
<i>Rosa setigera</i>	prairie rose
<i>Sanicula canadensis</i>	snakeroot
<i>Specularia perfoliata</i>	venus's looking-glass
<i>Spiranthes magnicamporum</i>	great plains ladies'-tresses
<i>Thalictrum revolutum</i>	waxy meadow-rue
<i>Thaspium barbinode</i>	meadow parsnip
* <i>Triosteum angustifolium</i>	yellow horse gentian
* <i>Valerianella umbilicata</i>	corn salad

Rare species at Stone Road Alvar

Open grassland and savanna occupy a relatively small proportion of the entire nature reserve,

yet they are the habitats for the greatest number of nationally and provincially rare plants. A total of 91 rare vascular plants have been recorded from the alvar-savanna complex (Oldham 1983) which makes up the entire southeast corner of the island, known as Mill Point. Most of the rare plants occur on the FON property. Prairie and alvar species, many of which are restricted to Pelee Island in their Ontario distribution, are strongly represented. Notable plants are listed in Table 1.

The alvar-savanna, shrub thickets, and woodlands provide habitats for several dozen regionally rare plant species (Oldham 1983), most of which are restricted to the Carolinian region of Ontario. Several species of more northern affinity are restricted in their Essex County distribution to the nature reserve and immediate vicinity (Oldham 1983). In addition, there are 9 rare faunal species, of which the blue racer (*Coluber constrictor foxi*) is most noteworthy.

A comparison of Stone Road Alvar with other Environmentally Significant Areas (ESA's) of the Essex region (Oldham 1983) revealed that this site has unique habitat and special features. No other ESA in the Essex region, with the possible exception of Cedar Creek (Oldham 1983), has as many provincially and regionally rare plants. The extensive chinquapin oak and blue ash savannas are unlike any plant communities found on the mainland. Furthermore, it appears that Stone Road Alvar has some of the best blue racer habitat in Canada.

Acquisition of Stone Road Alvar Nature Reserve

The FON's interest in Pelee Island dates back to the early 1970's when the Nature Reserves Committee pursued the possibility of acquiring Brown's Woods, a rich swamp forest along Middle Point. As the FON could not meet the high asking price, the project was abandoned. More recently, Mike Oldham brought the significance of Stone Road Alvar to the attention of Dr. Stewart Hiltz, chairman of the Nature Reserves Committee, through his report (Oldham 1983) for Essex Region Conservation Authority.

In October 1983 the FON Nature Reserves Committee recommended that acquisition of Stone Road Alvar be expedited by a \$ 70,000 loan from the Ontario Heritage Foundation. On 30 July 1984 the FON became the owner of this property with 2 years in which to raise money to repay the loan.

Funding request

Fund-raising efforts have been encouraging to date. Generous donations have come from naturalist clubs and proceeds from the sale of surplus FON properties. However, the loan is due on 30 July 1986 with \$ 36,000 still outstanding at the time of writing [February 1986].

The FON seeks funding from corporations as well as individuals. It is my opinion that field botanists should find this nature reserve particularly interesting and I encourage individuals to make personal donations so that the loan can be paid. Donations are tax-deductible. Cheques should be made payable to the FON (please indicate on the cheque that it is for Stone Road Alvar), and mailed to the Federation of Ontario Naturalists, 355 Lesmill Road, Don Mills, Ontario M3B 2W8.

References

Jaques, E. & D. Kirk. 1985. Stone Road Alvar. Seasons 25(3):24-29.
Oldham, M.J. 1983. Environmentally Significant Areas of the Essex Region. Essex Region Conservation Authority, Essex, Ontario. viii + 426 pp.♦

4 - 7 MONTH CONTRACTS FOR FIELD BOTANISTS: ONTARIO MINISTRY OF NATURAL RESOURCES, SOUTHWESTERN REGION

applications requested by Paul Prevett, Regional Ecologist, Ontario Ministry of Natural Resources, Southwestern Region, P.O. Box 5463, London, Ontario N6A 4L6 (519-681-5350).

Again in 1986, the Ontario Ministry of Natural Resources, Southwestern Region, is looking for qualified field botanists to work out of district offices in the region on a 4 to 7 month (approximately) contract basis. Applicants should have (1) a degree in biology or plant sciences or equivalent work experience; (2) demonstrated knowledge of the flora of southwestern Ontario; (3) demonstrated ability in written and oral communication. Previous experience with botanical field inventories is an asset. Applicants should submit a resume, list of publications, and sample of work done to the address above.

WHAT QUALIFICATIONS ARE NEEDED TO CONDUCT AN ADEQUATE BOTANICAL SURVEY?

The opinions below are taken from a paper titled "Rare plant surveys: techniques for impact assessment" by California botanist James R. Nelson. This paper was published in *Natural Areas Journal* 5(3):18-30 in 1985 and the excerpt below is reproduced here with the author's permission.

"Few agencies employ qualified botanists on a full-time basis. When a proposed project requires additional information on the occurrence of rare plants, it is common practice to contract with a consultant for the short-term needs of the project.

"Deciding whether a person has the qualifications to conduct a botanical survey can be difficult. Unfortunately, discerning between the skilled and the incompetent is often a matter of experience. The problem is that the skills required to design and conduct rare plant surveys are not clearly connected to any college degree, license, or other certificate, and there are both qualified and incompetent practitioners conducting botanical field work. With this in mind, the following characteristics are offered as an indication of proper qualifications. (Whether any person uses his full capability may be an entirely different matter.)

"A qualified consultant should have the following:

- experience as a botanical field investigator, including experience in field sampling design and field methods;
- knowledge of the local flora;
- taxonomic experience and knowledge of plant ecology (while rare exceptions exist, college coursework in these areas should usually be required);
- familiarity with state and federal laws and agency policies that pertain to rare plant protection and environmental quality;
- demonstrated ability to prepare detailed technical reports with standard citations, and discussions on the setting, methodologies, results, and technical recommendations; and
- enthusiasm for field studies and the physical capability to conduct field work."

JOE JOHNSON'S REVISIONS TO THE CHART OF FLOWERING DATES FOR ORCHIDS OF THE BRUCE PENINSULA

As a result of the early spring in 1985, many of the records for earliest flowering dates (see *Plant Press* 3(2):48) were broken. Joe Johnson reports new records for the following 8 orchids: *Coeloglossum viride* - 7 May; *Corallorhiza striata* - 13 May; *Cypripedium acaule* - 25 May; *C. arietinum* - 17 May; *C. calceolus* var. *pubescens* - 15 May or earlier; *Galearis spectabilis* - 14 May or earlier; *Listera cordata* - 14 May; and *Platanthera hookeri* - 20 May.

Joe also reports that the two varieties of *Platanthera orbiculata*, var. *orbiculata* and var. *macrophylla*, differ in flowering period. The former flowers 3 weeks to one month later than var. *macrophylla*. Joe believes that var. *macrophylla* finishes flowering before, or about the same time as, var. *orbiculata* begins to flower. He has seen var. *orbiculata* flowering on Flowerpot Island in early July (7), on one occasion.

Joe estimates that the flowering period for *Platanthera orbiculata* var. *orbiculata* is early July (3-5 on Flowerpot Island), to approximately 15 August, with peak flowering approximately 25 July to 7 August.

J. Ross Brown, Tupperville

[Ed. note: Further revisions to the chart of flowering dates for orchids of the Bruce Peninsula will be presented in the form of a revised chart. Anyone with new records should contact Ross (Tupperville, Ontario NOP 2M0) and/or Joe (P.O. Box 556, Wiarton, Ontario NOH 2T0)].

ROYAL BOTANICAL GARDENS NOW HAS A ZENITH TELEPHONE NUMBER

Persons calling the Royal Botanical Gardens (Hamilton) from telephones in Area 416 outside the local calling area for Hamilton can now call the RBG free of charge. The number to call is 1-800-263-8450.

WARREN WAGNER TO ADDRESS FBO

The second annual meeting of the Field Botanists of Ontario, to be held in Midland on 13 - 15 June 1986, will feature an exciting line-up of field trips and speakers.

The indoor activities will occur in the beautiful Wye Marsh Wildlife Interpretation Centre and the field trips will radiate from there to a variety of habitats, including the sand dune country near Wasaga Beach, the granite lands of the Canadian Shield just to the north, and the rich wetlands of the Wye River valley. Field trip leaders include botanists who live in Simcoe County (or grew up there) and who are thus well acquainted with the diverse floristic components of the Georgian Bay area: Tony Reznicek, Bill Cattley, and Gord Michener.

On Friday evening, Mirek Sharp and Tony Reznicek will present slide-talks dealing with the coastal plain element and with the area's flora in general.

The keynote speaker will be Dr. Warren H. Wagner, Jr., Professor of Botany and Natural Resources and Curator of the University Herbarium, at the University of Michigan, Ann Arbor. Dr. Wagner, an internationally recognized expert in the study of ferns, will speak on "rare and unusual pteridophytes of the upper Great Lakes area." His talk, which will be given on Saturday evening, will also consider some of the pteridophytes which cause problems for systematists. One such problem group is the genus *Botrychium*; the grapeferns have provided one of the foci for his research in recent years.

Dr. Wagner has not confined his energy to fern taxonomy and evolution; he has served such organizations as the International Union for Conservation of Nature and Natural Resources, the Michigan Natural Areas Council (Chairman), the Botanical Society of America (President), and the Michigan Botanical Club (President).

Dr. Wagner combines his life-long interest in botany with a talent for communication. He enjoys sharing his fascination with ferns and their allies. The FBO is very fortunate to have such a distinguished botanist addressing its annual meeting. It is hoped that a large number of field botanists will take advantage of this opportunity to hear, and to talk with, Dr. Wagner. You do not have to brush up on your *Botrychium*, but it might make the weekend even more enjoyable.

Registration forms for the FBO annual meeting, which include details of accommodation, have been sent to FBO members. Readers of *The Plant Press* who are not yet FBO members are referred to the supplement in this issue.

Bob Hounsell, President,
Field Botanists of Ontario

PLANT CONSERVATION STRATEGIES: OPTIONS FOR THE FUTURE

This conference will be held 16 - 18 May 1986 at Lakeland Community College, Mentor, Ohio. As Mentor is just east of Cleveland, field botanists who live in southern Ontario may wish to take advantage of the proximity of this symposium. The conference brochure provides an impressive list of speakers and topics, part of which is included below.

- Stewart Udall, Former U.S. Secretary of the Interior
- Dr. John Fay, Chief Botanist, U.S. Fish and Wildlife Service
- Dr. Larry Morse, National Staff Botanist, The Nature Conservancy
- Dr. Faith T. Campbell, Research Associate, Natural Resources Defense Council
- Dr. William Jordan, III, Editor, *Restoration & Management Notes*
- habitat protection and restoration
- ex-situ species preservation
- legislation - action and opportunities

The crisis of extinction has been well stated by many and great efforts are underway to halt the rampant destruction of habitat and individual plant species. This symposium will address the major strategies for plant conservation and their regional status and implications. In addition, it will facilitate dialogue between proponents of each strategy and symposium participants so that a concerted effort can be made in this important endeavor.

Registration fees (\$ 35.00 U.S. funds) should be made payable to The Holden Arboretum and mailed to the Education Department, 9500 Sperry Road, Mentor, Ohio 44060. Registration fees should be received by 15 April 1986. More information is available from the address above. The conference is co-sponsored by the Center for Plant Conservation, The Holden Arboretum, and Lakeland Community College.

The 20th Annual International Conference on Numerical Taxonomy will be held 24 - 26 October 1986 at the State University of New York at Stony Brook. There will be three symposia: (1) Phylogenetic Inferences from Molecular Data (Organizer: Walter Fitch), (2) Numerical Taxonomy: Progress and Prospects, together with a round table discussion on phenetics and cladistics (Organizer: Robert Sokal), (3) Contrasting approaches to morphometric analysis (Organizer: F. James Rohlf). There will be one contributed paper session and a poster session.

On 24 October 1986 preceding the conference there will be a computing workshop with two sessions: (1) Numerical taxonomy on the IBM PC (F. James Rohlf) and (2) Spatial analysis (Dan Wartenberg).

For further information contact Dr. Robert R. Sokal, Department of Ecology and Evolution, State University of New York at Stony Brook, Stony Brook, New York 11794.

AN ENVIRONMENTALLY SENSITIVE AREA STUDY IN HALTON REGION, CENTRAL ONTARIO

information requested by Scott Nevin, Graduate Mailbox, Geography Department, University of Guelph, Guelph, Ontario N1G 2W1

I am currently conducting graduate research at the University of Guelph on the effectiveness of the Regional Municipality of Halton's Environmentally Sensitive Areas policies. Six case studies areas have been selected in order to field test the effectiveness of these policies. The areas under study are Grindstone Creek, Iroquois Shoreline Woods, Crawford Lake - Rattlesnake Point, Calcium Pits, Acton Swamp, and Georgetown Credit River Valley.

The methods utilized include setting up permanent sample plots to monitor long term changes in vegetation and, also, to compare the number of significant species at the time of ESA designation with that found today. Anyone interested in helping to set up permanent monitoring plots or to provide assistance with locating significant species during the 1986

field season is urged to contact me at the address above or by telephone (519-824-4120 ext. 8570 (days) or 519-823-1165 (evenings). Knowledge of the sites is not essential.

ONTARIO PLANTS IN PRINT

This column will be edited by Timothy Dickinson beginning with the next issue. Book reviews and/or reference compilations should be sent to Dr. Dickinson at the Botany Department, Royal Ontario Museum, Toronto, Ontario M5S 2C6.

AMERICAN JOURNAL OF BOTANY REFERENCES FROM 1980 - 1984

compiled by Mike J. Shchepanek, Botany Division, National Museum of Natural Sciences, Ottawa, Ontario K1A 0M8

- Schneider, E.L. & J.D. Buchanan. 1980. Morphological studies of the Nymphaeaceae. XI. The floral biology of *Nelumbo pentapetala*. 67(2):182-193. (this species, which occurs in Ontario, has a prolific floral structure that facilitates pollination by beetles)
- Wolf, S.J. 1980. Cytogeographical studies in the genus *Arnica* (Compositae: Senecioneae). I. 67(3):300-308. (based on collections from Ontario, *Arnica cordifolia* ssp. *whitneyi* was reduced to synonymy with ssp. *cordifolia*)
- Semple, J.C. & L. Brouillet. 1980. A synopsis of North American asters: the subgenera, sections and subsections of *Aster* and *Lasallea*. 67(7):1010-1026. (chromosome numbers given for species that occur in Ontario)
- &----- 1980. Chromosome numbers and satellite chromosome morphology in *Aster* and *Lasallea*. 67(7):1027-1039. (chromosome numbers and site descriptions for species found in Ontario)

- Beckmann, Jr., R.L. & J.M. Stucky. 1981. Extrafloral nectaries and plant guarding in *Ipomoea pandurata* (L.) G.F.W. Mey. (Convolvulaceae). 68(1):72-79. (this species, which occurs in southern Ontario, has pedicellar extrafloral nectaries that attract hymenopteran nectar feeders, who are in turn aggressive towards phytophagous insects)
- Downs, R.J. & J.M. Bevington. 1981. Effect of temperature and photoperiod on growth and dormancy of *Betula papyrifera*. 68(6):795-800. (site descriptions and discussions relating to seed sources from Ontario)
- Bayer, R.J. & G.L. Stebbins. 1981. Chromosome numbers of North American species of *Antennaria* Gaertner (Asteraceae: Inuleae). 68(10):1342-1349. (chromosome numbers and site descriptions for several Ontario collections; distribution map of eastern U.S.A. and southern Ontario)
- Keddy, P.A. & A.A. Reznicek. 1982. The role of seed banks in the persistence of Ontario's coastal plain flora. 69(1):13-22. (the influence of seed banks on lakeshore vegetation near eastern Georgian Bay, Ontario, is discussed)
- Schwintzer, C.R. & T.J. Tomberlin. 1982. Chemical and physical characteristics of shallow ground waters in northern Michigan bogs, swamps, and fens. 69(8):1231-1239. (includes reference to a northern Ontario bog)
- Posluszny, U. 1983. Re-evaluation of certain key relationships in the Alismatidae: floral organogenesis of *Scheuchzeria palustris* (Scheuchzeriaceae). 70(6):925-933. (study based on specimens from an Ontario bog)
- Doyle, J.J. 1983. Flavonoid races of *Claytonia virginica* (Portulacaceae). 70(7):1085-1091. (distribution maps of eastern U.S.A. and southern Ontario)
- Taylor, G.J. & A.A. Crowder. 1983. Use of the DCB technique for extraction of hydrous iron oxides from roots of wetland plants. 70(8):1254-1257. (study based on specimens from an Ontario site)
- Semple, J.C. & J.G. Chmielewski & C.C. Chinnappa. 1983. Chromosome number determinations on *Aster* L. (Compositae) with comments on cytogeography, phylogeny and chromosome morphology. 70(10):1432-1443. (chromosome numbers and site descriptions for Ontario collections; distribution maps of eastern U.S.A. and Ontario)
- Mehrhoff, L.A. 1983. Pollination in the genus *Isotria* (Orchidaceae). 70(10):1444-1453. (reproductive efficiency figures for *Isotria medeoloides* were collected from Elgin County, Ontario)

- Seavey, S.R. & D.E. Boufford. 1983. Observations of chromosomes in *Circaea* (Onagraceae). 70(10):1476-1481. (discussion and chromosome numbers for Ontario specimens)
- Kelman Wieder, R., C.A. Bennett & G.E. Lang. 1984. Flowering phenology at Big Run Bog, West Virginia. 71(2):203-209. (flowering seasons compared to an Ontario bog)
- Semple, J.C. 1984. Cytogeography studies on North American Asters. I. Range surveys of *Virgulus adnatus*, *V. concolor*, *V. georgianus*, *V. grandiflorus*, *V. novae-angliae*, *V. oblongifolius*, *V. patens*, and *V. walteri*. 71(4):522-531. (chromosome number, site description, and distribution map given for *V. novae-angliae* in Ontario)
- Barkworth, M.E. & R.J. Atkins. 1984. *Leymus* Hochst. (Gramineae: Triticeae) in North America: Taxonomy and distribution. 71(5):609-625. (distribution maps of two species occurring in Ontario)
- Taylor, G.J., A.A. Crowder & R. Rodden. 1984. Formation and morphology of an iron plaque on the roots of *Typha latifolia* L. grown in solution culture 71(5):666-675. (study based on Ontario sites)
- Whitney, G.G. 1984. The reproductive biology of raspberries and plant-pollinator community structure. 71(7):887-894. (overlap values reflecting a sharing of the potential pool of pollinators was found to be low in several southern Ontario bogs)
- McDonnell, M.J., E.W. Stiles, G.P. Cheplick & J.J. Armesto. 1984. Bird-dispersal of *Phytolacca americana* L. and the influence of fruit removal on subsequent fruit development. 71(7):895-901. (this herb, which occurs in Ontario, has sequential fruit ripening and protection from predation that results in seed dispersal by birds from August to December)
- Doyle, J.J. 1984. Karyotypic variation of eastern North American *Claytonia* chemical races. 71(7):970-978. (distribution maps of eastern U.S.A. and southern Ontario)
- Spooner, D.M. 1984. Reproductive features of *Dentaria laciniata* and *D. diphylla* (Cruciferae), and the implications in the taxonomy of the eastern North American *Dentaria* complex. 71(7):999-1005. (vegetative propagation of *Dentaria laciniata* is insufficient to distribute the species across glaciated areas to its northern limit in southern Ontario)
- Lacey, E.P. 1984. Seed mortality in *Daucus carota* populations: latitudinal effects. 71(9):1175-1182. (study includes Ontario sites; distribution map of eastern U.S.A. and southern Ontario) ♦

A Field Manual of the Ferns and Fern-Allies of the United States and Canada by David B. Lellinger. 1985. Smithsonian Institution Press, Washington, D.C. 396 pp. plus 45 pages of coloured plates. \$ 30.00 U.S. (paper).

reviewed by D.M. Britton, Department of Molecular Biology and Genetics, University of Guelph, Guelph, Ontario N1G 2W1

This large-sized paperback, which looks superficially similar to *Native Trees of Canada*, was written "to aid in identifying all of the species of ferns and fern-allies that are native to or naturalized in Canada and the United States..." The book includes 406 taxa and known sterile hybrids, although the latter are not described. In the first 40 pages there is worthwhile general information about fern names, geography, structure, life cycles, paleobotany, gardening, fern uses, etc. The largest sections include the keys and descriptions of the families, the genera, and the species. There is a large glossary, an extensive bibliography (over 10 pages), a checklist (16 pages including over 80 hybrids), and indices to both common and scientific names. The section with 402 excellent coloured photographs, grouped 9 to a page - 45 pages in all, is inserted between pages 182 and 183.

The author has undertaken a formidable task! The book includes ferns from the near tropics (southern Florida) to the Canadian arctic, and there are 406 diverse taxa delineated. One has the feeling at the start that the author is going to attempt to be semi-popular, and that if one perseveres with the keys one will be able to identify all of the taxa. I feel that this is a "lost cause." The author is in the mainstream of current pteridophyte taxonomy in recognizing lots of segregate species, e.g., *Cystopteris dickieana*, *C. tenuis*, and *Ophioglossum pusillum*. This means fine distinctions and the use of micro-characters! Not only is the book too large to take to the field easily, but one would soon be thwarted by key characters such as spore ornamentation seen at 60X or even scanning electron microscopy (for the genus *Isoetes*). I greatly enjoy the coloured illustrations and these are very artistic and excellent when you already know the taxon you are looking at. However, I feel that these illustrations are less than useful for unknowns. The illustrations have no scales, so *Botrychium mormo* appears larger than *Osmunda regalis*. Also, one photograph will not bring out the key characters as well as a good line drawing,

e.g., *Botrychium oneidense* looks atypical (too pointed), *B. rugulosum* looks like *B. multifidum* (not dissected enough), *B. lunaria* looks small and compacted, *Adiantum pedatum* is excessively drooping, *Asplenium viride* appears too "hard" or "tough" (is the rachis green?), and the stubble on *Woodsia ilvensis* is not shown.

I believe that Lellinger has carefully checked distribution records, which is a big task for all the states in the U.S. and the divisions of Canada. For Ontario, he is essentially correct, although American authors tend to "square" their states, so that "southwestern Ontario" for *Woodsia* and *Gymnocarpium* has to be translated for us to "Thunder Bay District" or what we call "northwestern Ontario." I was amazed to see Ontario cited for the climbing fern (*Lygodium*). That is an interesting "record!"

Many workers worry about names and name changes. How do the names in Lellinger compare with Britton (Plant Press 3(1):14-23)? *Ophioglossum pusillum* Raf. is recognized as a separate species for our northern adder's tongue. *Cryptogramma acrostichoides* R.Br. is recognized as a diploid segregate species. The beech ferns are considered under *Thelypteris* not *Phegopteris*. *Pellaea atropurpurea* is inflicted with a hybrid sign - *P. xatropurpurea*. *Asplenium viride* is called *A. trichomanes-ramosum* L., a change I would like to see avoided. Our northeastern lady fern is called *Athyrium filix-femina* ssp. *angustum* (Willd.) Clausen. *Gymnocarpium* is treated as prior to the work of Sarvela in 1978 and Pryer in 1981, i.e., as in Wherry's (1961) "Fern Guide." However, all in all, there are not many changes or disagreements as to modern nomenclature.

Lellinger has certainly departed from a field treatment when he expounds on possible phylogeny and evolutionary relationships. I find him most confusing when he says for *Dryopteris goldiana*, "This species hybridizes with *D. cristata* to form *D. clintoniana*, with *D. ludoviciana* to form *D. celsa*, with *D. marginalis* to form *D. xneo-wherryi*..." The last is a modern day hybrid and the others are conjectured ancient crosses important in phylogeny. He is quite consistent in always using the present tense when writing about these possible ancient crosses as well as those that are occurring today. This confusion is carried over to the checklist where Lellinger lists *Cystopteris fragilis* (*C. reevesiana* X unknown diploid); *C. tenuis* (*C. protrusa* X unknown diploid); i.e., unfounded speculations regarding species evolution mixed in with known present day hybrids

such as *C. xillinoensis* (*C. bulbifera* X *fragilis*). Also, it is not correct to equate the sterile diploid hybrid *Dryopteris expansa* X *intermedia* with the derived fertile allotetraploid species *D. campyloptera*, as Lellinger has done in his checklist. The checklist is turned into a hodge-podge of speculative phylogeny together with known extant species and sterile hybrids.

Is this a good book? I feel that it should be "user-tested." A group of keen fern enthusiasts should try it for a year and then let us know if they like it or not. Personally, I miss good line drawings or any diagrams beside the text, and dot maps for a quick picture of distributions, but the true test will be whether the book is easy and satisfying to use or not.◆

Canadian Historical Horticulture:

A NEW JOURNAL PUBLISHED BY THE ROYAL BOTANICAL GARDENS

Published by the Centre for Canadian Historical Horticultural Studies (CCHHS), Royal Botanical Gardens, Hamilton, Ontario, Canadian Horticultural History features original research papers on the history of Canadian horticulture and related disciplines. Articles span such diverse subject areas as historical garden restorations and reconstructions; biographies of Canadian horticulturists and landscape designers; histories of botanical gardens, arboreta, experimental stations, commercial nurseries, and seed firms; accounts of plant breeding work and plant explorations; comprehensive bibliographies; and ethnobotanical studies of native peoples and early settlers in what is now Canada and the northern United States. The wide range of interests in all phases of horticulture is interpreted in the broadest sense. There is no limit on the length of papers provided these are appropriate to content. Submission of book reviews, shorter communications, and announcements of conferences is also encouraged.

The first issue of Canadian Historical Horticulture was published in February 1986. It contains two papers by James S. Pringle, "Clement Charles Todd (d. 1828), an early naturalist and botanical collector in Upper Canada" and "Anne Mary Perceval (1790 - 1876), an early botanical collector in Lower Canada." Both of these papers are of potential interest to field botanists.

Each volume of Canadian Historical Horticulture will consist of four (4) issues and each issue will have between 40 - 50 pages. Subscriptions will be sold by volume, NOT by calendar year. Subscription fees are as follows:

Institutions: \$ 18.00 per volume for Canada;
\$ 20.00 for U.S.A. and overseas.
Individuals: \$ 14.00 per volume for Canada;
\$ 16.00 for U.S.A. and overseas.
Single issue: \$ 5.00.

Cheques should be made payable to the Royal Botanical Gardens (CCHHS), and mailed to: CCHHS, Royal Botanical Gardens, Box 399, Hamilton, Ontario, Canada L8N 3H8.◆

RECENT PUBLICATIONS OF INTEREST TO FIELD BOTANISTS IN ONTARIO

The Rare Vascular Plants of British Columbia by Gerald B. Straley, Roy L. Taylor and George W. Douglas has just been published by the National Museum of Natural Sciences in Ottawa, as one of the Syllogeus series on the rare plants of the provinces.

Information for 816 British Columbia rare plants is presented in the form of an annotated list. Cited references, herbaria consulted, the total range for each taxon, the range in British Columbia, the biogeoclimatic zone and habitat in which each taxon is found in the province, and a rare status designation of R1 - R4 within the province are indicated. Distribution maps for taxa in either of the first two categories of rarity are included (505 maps).

Copies of The Rare Vascular Plants of British Columbia may be obtained free-of-charge by writing to: Rare and Endangered Plants Project, National Museum of Natural Sciences, Ottawa, Ontario, Canada K1A 0M8.

Similar lists of rare vascular plants have been published by the National Museum of Natural Sciences for Alberta, Manitoba, New Brunswick, Nova Scotia, Quebec, Saskatchewan, and the Yukon, and some of these are still available. Also, the Atlas of the Rare Vascular Plants of Ontario is nearing completion, with 3 of the 4 installments now published. Part 4 should be available in the fall of 1986. Order the "Atlas" and/or any of the other provincial rare plant lists free-of-charge from the address given above.◆

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