

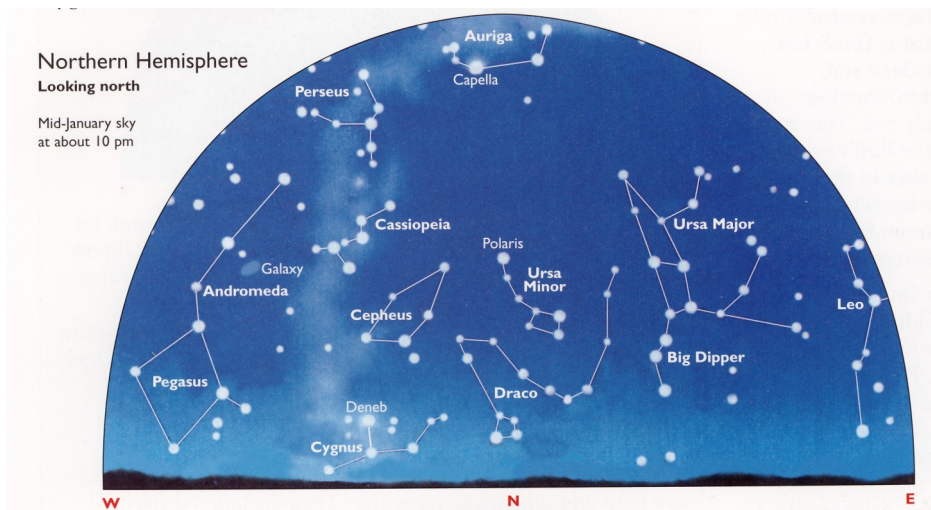
# WAGNER NATURAL AREA NEWSLETTER

Volume 20 Number 2 October 2006

Newsletter of the Wagner Natural Area Society, Management Committee  
and Volunteer Stewards of Wagner Natural Area, Parkland County, Alberta



Wagner Natural Area Society  
invites you to  
Wagner Annual Open House  
Monday, November 20, 7:30 p.m.  
in Room 8 at J. Percy Page Centre, 11759 Groat Road, Edmonton

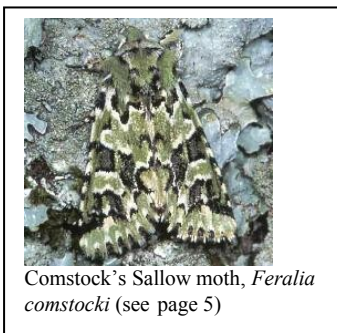


**Invited Speaker: Astrophysicist Dr. Orla Aaquist.**

A professor at Grant MacEwan College and one-time president of the Edmonton Chapter of the Royal Astronomical Society of Canada, Dr. Aaquist will serve as our guide as we take a look at the stars, and will emphasize the importance of another kind of protected area, the dark sky preserve. Dr. Aaquist also provides some unusual entertainment!

**Wagner Society President Ben Rostron** will provide a summary of the Society's year. Refreshments will follow. There will be an opportunity to obtain/renew memberships in the Society.

This event is free and open to everyone. Please access the J. Percy Page Centre via the back door.



Comstock's Sallow moth, *Feralia comstocki* (see page 5)

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Wagner Natural Area Society Newsletter ISSN No. 1712-2767

## Editorial

by Patsy Cotterill

For the first 20 years of Wagner's existence as an official natural area dogs didn't seem to be on the radar – either as transient alien fauna or as a management issue. Then all of a sudden we began to notice increasing numbers of people using the Area as a dog-walking venue, bringing in not just the odd mutt or two but in some cases a boisterous mini sled team of three and four dogs. After an incident where I stopped on the trail to watch a snowshoe hare and was joined shortly afterwards by two out-of-control dogs my annoyance began to grow: was that how people valued the Natural Area – as just another piece of public land that could be used as a dog-walking, off-leash, area? So much for our beloved nature sanctuary! Nor was it just a question of these dogs scaring the wildlife and any small children who might be on the trail; I resented the unpleasantness of having to confront irresponsible dog-owners while on my tranquil rambles. Nor did I much enjoy seeing poop, either “unwrapped”, or wrapped in squidgy plastic bags left lying on the trail or in the picnic shelter or thrown down the pit toilet, which should have gone home with the dogs and their owners.

Over this past couple of years our management committee has deliberated what to do and decided first of all to put up a notice requesting that people pick up after their pets. We were prepared to be lenient about dogs being off-leash in the big field, although not along the wooded portions of the trail, until we learned that Parkland County had a policy of “no off-leash” anywhere in natural areas. So we erected signs reflecting this. My guess is that about 50% of dog-walkers respect these signs, and the rest do not. Compliance with the

“picking up” part may be about the same, although much less than in urban areas, presumably because people think that on natural land “natural” waste is not a problem. (Yet if the number of dog visitors continues to increase it will definitely become a nuisance.)

Personally, I've had my doubts as to whether there is any place at all for dogs in natural areas. Perpetually having to restrain a dog excited by dozens of new smells does not leave much opportunity for leisurely appreciation of nature: plants or birds or the change of season. However, in struggling with this I've reflected that people and their dogs frequent pretty much only the Marl Pond Trail and it represents a very small fraction of Wagner's total area. This trail, after all, was constructed for the benefit of humans, it states as much in our management plan. If that human use entails canine companionship, well, so be it – so long as it is responsible, and considerate of wildlife and other humans. Protecting the integrity of Wagner Natural Area is paramount, but at the same time we do not want to discourage humans from using the areas that are set aside for their enjoyment. So, from now on, when I come across people with well-behaved dogs on leash on the trail I'll smile and remember that they are appreciating the Area, just as I do.\*

\*If dog-walkers would like to show their appreciation by helping out with some of the management chores committee members do on a regular basis please contact us. These (fun!) chores include garbage pick-up and weed-whacking. Donations posted through the donation box help us maintain our amenities.

### Wagner Natural Area Society

26519 Highway16, Spruce Grove, AB T7X 3L4 Visit our website at <http://www.wagner.fanweb.ca>

#### Executive 2004-2005

President	Ben Rostron (434-3839)	Directors:	Pat Clayton (456-9046)
Past President	Alice Hendry (962-4836)		Leota Cummins (447-4256)
Vice-President	Derek Johnson (436-8231)		Beth Jenkins (458-1794)
Treasurer	Pat Webb (458-3477)		Irl Miller (455-3866)
Secretary/Editor/Membership	Patsy Cotterill (481-1525)		Edgar Jones (436-5327)
			Mike Jenkins (Webmaster) (481-8695)
			Jasper Keizer (Fire Warden) (962-2745)

### Upcoming Edmonton Plant Study Group Meetings

(at J. Percy Page Centre, Edmonton, Room 8, 7.30 p.m.)

November 14, Cheryl Bradley on adaptations of prairie plants; December 11, Members' Night, and Alison Dinwoodie on reclamation in the Cheviot Mine area; January 15, Patsy Cotterill, on trees; February 12, Derek Johnson on “Wild Kakwa”; March 12, Markus Thormann on forest fungi, April 16, Joyce Gould on adaptations of alpine plants. Admission is free and open to all.

## Wagner Natural Area Biophysical Survey 1999 and 2005

by Derek Johnson

In 1999, Alberta Environmental Protection (now Alberta Sustainable Resource Development) hired a consultant to do a survey of the soils and vegetation in the Wagner Natural Area as it existed at that time. Maps of both the soils and plant communities found in the Natural Area were produced as part of this study. In addition, 18 permanent monitoring plots were established, representing all of the major plant communities found in the area. The intent was to remeasure these plots every five years to monitor the changes occurring in the plant communities, either as the result of natural succession or human-caused events. The first remeasurement should have occurred in 2004, but neither the time nor the resources were available to do this. However, the Wagner Natural Area Society was able to remeasure the vegetation in these plots during the summer of 2005, with the assistance of numerous volunteers.

The size of the monitoring plots is 20 m x 20 m in areas with trees or tall shrubs (> 2 m tall) and 5 m x 5 m in areas without trees or tall shrubs, such as the hay meadows and marl ponds. In each plot, as applicable, the vegetation was broken down by stratum, dominant trees, subordinate trees, tall shrubs, medium shrubs (0.5 m – 2 m tall), low shrubs (< 50 cm tall), forbs, graminoids, mosses and lichens. Cover was estimated to the nearest percent up to 20 percent and to the nearest 5 percent above 20 percent. Standard plot forms were provided by the provincial government and all original data resides with Alberta Sustainable Resource Development. Additionally, across the Natural Area in the treed plots, 50 trees of various species were measured for diameter at breast height (dbh), total height and age.

A comparison of the results from the original 1999 survey and the 2005 remeasurement revealed several problems. Observer bias was clearly evident in the results between the two measurements. Cover estimates often varied so widely between the two years that only the most extreme changes can be commented on with any degree of certainty. The subtle within plot and between plots changes that may have occurred are obscured. The original survey also pointed out the great difficulty of trying to estimate plant cover accurately in a 400 sq. m plot. Species misidentifications were also evident in a number of cases. (There is also some question as to whether or not the plots were accurately relocated in 2005.) None of the 50 trees sampled by the consultant in 1999 were permanently marked, so, with rare exceptions, it was not possible to determine growth rates between measurements.

Despite the problems associated with the sampling, some interesting, and in some instances surprising, results did pop up. In general, the amount of change noted was greatest in the hay meadows, with lesser changes noted in the deciduous-dominated stands. The marl ponds and conifer-dominated stands appeared to be relatively unchanged between the two measurements in terms of species composition and total plant cover.

The good news for orchid fanciers is that little changed over the six years between measurements. In fact, some species, such as the round-leaved orchid (*Amerorchis rotundifolia*) and the yellow lady's-slipper (*Cypripedium calceolus*), actually increased in cover. White adder's-mouth (*Malaxis monophylla*) was found in two plots in 1999. It was still present in those plots in 2005. The plot remeasurement in 2005 found a new location for the rare bog adder's-mouth (*Malaxis paludosa*) in coniferous forest on the north side of Jones' pond.

The most striking differences between the 1999 and 2005 measurements occurred in the three "active" hay meadows, the Atim field, the central field and the Villeneuve field. Over the six years between measurements there was a modest increase in grass cover (about 5%), primarily smooth brome (*Bromus inermis*), but what was most striking was the more than 50% decline in legume cover (primarily alfalfa (*Medicago sativa*) and red clover (*Trifolium pratense*)). No conspicuous replacement species had shown up to take their place. To the casual observer just walking through the fields, this decline would not have been noticeable. The reason for this sharp decline is not clear. Very dry years in 2000 and 2001 may be partially responsible for the changes.

The inactive hay meadow, where the permanent water level recorder was installed, and that hasn't been mowed for nearly 25 years, showed nearly the opposite result. This field had very little legume cover to start with and this did not change over the six years between measurements. However, the grass cover in this plot was down by over 50%. Here, there was some increase in forb cover, but what was most noticeable was the pronounced increase in shrub cover. No shrubs were encountered at all in this plot in 1999, but in 2005 there was almost 10% cover of Wood's rose (*Rosa woodsii*). In this plot, advancing succession following the long-term cessation of haying may be part of the reason for the change.

One other plot showed a marked change between 1999 and 2005. The plot located below the beaver dam along Atim Road has dried up considerably in recent years following removal of the beaver and draining of most of the pond. Notable changes in the cover of the sedges and willows have occurred. Willow cover is down by almost two-thirds (24% to 8%), with many of the shrubs either being completely dead or having dead tops. Sedge cover is down by more than one-third (80% to 50%), principally water sedge (*Carex aquatilis*). There were several large patches of green tongue liverwort (*Marchantia polymorpha*) present in this plot in 1999; in 2005, this liverwort was virtually nonexistent in the same plot. Spotted touch-me-not (*Impatiens capensis*) was conspicuous and widespread in this plot in 1999 (5% cover); in 2005 it was not recorded at all. Only one species showed an increase in cover of note. The cover of arrow-leaved colt's-foot (*Petasites sagittatus*) was up threefold (2% to 6%) from 1999 to 2005. (continued next page)

(Biophysical Survey, continued from previous page)

There was a decrease of about 30% in canopy cover in the two permanent sample plots in the deciduous-dominated stands in the western portion of the Natural Area. This decrease in cover appeared to be due mostly to many of the trees having dead tops, rather than trees dying outright. The aspen and balsam poplar seemed to be equally affected. Again, several dry years in a row may have been a factor in this decline. The canopy cover in the coniferous-dominated stands did not show such a marked decline, perhaps because they were moister to start with.

A permanent monitoring plot was established in one very open stand of white spruce and balsam poplar on the west side of the Villeneuve field in 1999. This stand came out as a unique community type in the consultant's analysis of the vegetation data because of its open nature and an understory highly dominated by red clover. The thought was that the unusual structure of this stand was a result of past forest clearing that opened up the canopy. The opening up of the canopy and the disturbance caused by harvesting may have allowed the red clover to establish in the understory. The cover of red clover was estimated at 20% in this plot in 1999. It was particularly surprising, therefore, when it was noted at less than one percent cover during the 2005 remeasurement. The reason for this marked decline in just six years is unknown.

In terms of changes in individual species, little can be said because of the widely divergent cover measurements, but one species did stand out. Seaside arrow-grass (*Triglochin maritima*), a common and widespread species in the wetter portions of the Natural Area, was recorded in 5 plots in 1999, but in only 3 plots in 2005. Barring catastrophic changes, this would not have been expected for such a common and generally easily recognized species. Perhaps this species was a victim of the dry years as well, but most other species occupying a similar habitat did not show such a decline.

Because of the nature of the biophysical survey, intense and covering the broadest range of community types possible, the plant species list for the Natural Area has expanded considerably. The majority of these new species would be expected to occur in the region. The identification of some still requires confirmation. Seven new vascular plant species, 12 bryophytes and 4 lichens were recorded as new to the Natural Area either directly or indirectly as a result of the biophysical survey. The new native vascular plant species are meadow sedge (*Carex praticola*), beaked hazelnut (*Corylus cornuta*), marsh willowherb (*Epilobium palustre*), western jewelweed (*Impatiens noli-tangere*), lesser wintergreen (*Pyrola minor*), late goldenrod (*Solidago gigantea*), and high-bush cranberry (*Viburnum opulus*). New bryophytes are *Brachythecium velutinum*, *Bryum caespiticium*, *Cephalozia lunulifolia*, *Dicranum flagellare*, *D. fuscescens*, *Lophocolea heterophylla*, *L. minor*, *Platydictya jungermannioides*, *Sphagnum girgensohnii*, *S. magellanicum*, *S. russowii* and *Splachnum ampullaceum*. New lichens are *Peltigera didactyla*, *P. neckeri*, *P. praetextata*, and *Usnea subfloridana*. The diversity of peat

moss (*Sphagnum*) species in the area is certainly much greater than originally assumed. *Splachnum ampullaceum* is ranked as provincially rare (S2) by the Alberta Natural Heritage Information Centre (ANHIC).

To improve the predictive or comparative value of the permanent monitoring plots, future measurements should concentrate on measuring a subset of smaller plots (say 5 m x 5 m) within the larger 400 sq. m plot. This would involve more work, but it would improve the accuracy of the cover estimates, making them more useful when doing comparisons within and between plots over time.

A biophysical survey of the lands added to the Natural Area since the original survey in 1999 was undertaken by a consultant during the summer of 2006 with funding provided by the Nature Conservancy of Canada and the Wagner Natural Area Society. This survey resulted in the establishment of 10 additional permanent monitoring plots, bringing the total to 28. Several new plant species (particularly bryophytes) were added to the list for the Natural Area as a result of this study. Results from this recent study will be commented on in more detail in a subsequent newsletter after the final report has been received and digested.

(October 2006)

*New Moss Species for Wagner*

*Splachnum ampullaceum*

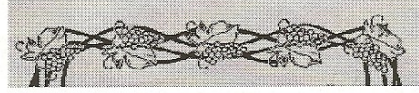


*Sphagnum magellanicum*





## The Wagner Grapevine



### Natural History Events

by **Alana Broomfield** (*Edmonton Nature Club Bug & Spider Study Group Coordinator*)

#### May 13: Spring at Wagner: Plants, Bugs & the Ferialia Moth

Dave Lawrie, Mike Jenkins and Patsy Cotterill led two small groups of 16 people through the field, woodlands and fens to find a good variety of early butterflies, aquatic insects, parasitic wasps, etc., and active leks of fairy moths in willows near the access road. Marsh marigolds were in great abundance.

Early in the evening, lights and sheets were set out to attract the moths especially, but other insect species as well. Several other members of the Alberta Lepidopterist Guild joined the earlier group around 10 p.m. as did three other couples. Two of the sites produced the *Ferialia comstocki* moth to everyone's delight. Both boreal toads and wood frogs were seen on the paths while the boreal chorus frogs serenaded the group. The evening's adventures came to an end around midnight.

#### June 28: Amphibians of Wagner Natural Area

This evening trip to Wagner was led by Wayne Roberts, a herpetologist who, besides being involved with the Museum of Zoology at the University of Alberta, has a long history of monitoring frogs and toads at Wagner. Amphibians were obviously of great interest to many in the ENC as the event attracted 27 members and their guests. Disappointingly, only one wood frog was seen but tadpoles abounded and the group received a real education in the working of fens. One local fish spider caught a lot of attention as did various birds and plants not always seen in other locales, such as the round-leaved sundew and the common butterwort.

#### August 12: The Spiders of Wagner

The Bug and Spider Group again returned to Wagner where local arachnophile, Peter Daly, led about 20 children and adults to study its spider populations. Almost everyone grabbed the nets provided and Peter could hardly keep up with the identifications and a supply of vials for the ever-increasing collection. Repeated captures of crab spiders, orb-weavers, jumping spiders (4 different species), money spiders, sack spiders, long-jawed spiders, wolf spiders and jewel spiders sharpened everyone's identification skills. Also seen were fishing spiders, funnel spiders and quite a few wood frogs. Also a big hit was Peter's silver spider belt buckle, a great attraction for the kids. Peter talked about his own collection of spiders and how to take care of any arachnids people might decide to adopt. Needless to say, more than one child or adult went home with a new pet!

### Other Events

#### Parks and Protected Areas 2006 Volunteer Conference September 15-17, in Lac La Biche

Several Wagner executive committee members attended this year's annual conference for volunteer stewards including campground hosts. Poor weather – steady rain and strong winds – sabotaged most of the field trips planned but the organizing committee, staff of the Parks & Protected Areas Division (PPAD), Northeast Area, Visitor Services Branch, did a good job of providing fill-in speakers/presentations to keep us entertained. Topics for the Saturday sessions ranged from government plans and management activities to information on successful trail development and the story of the new Boreal Centre for Bird Conservation that has opened at Lesser Slave Lake. Scott Jones, with the Heritage Protection and Recreation Management Branch in the Edmonton Office of PPAD, set forth

the Division's New Strategic Plan "Defining our Nature", designed to be "strategically aligned with the government's 20-year strategic plan" (yes, they do have one, apparently!). Some of the key foci of the plan include better delivery of services and programming in parks (including interpretive programming), and improvement of infrastructure. On the environmental side, they propose teaming up with the research community to develop management strategies that will protect or restore "environmental diversity." They will also rationalize the system of parks and protected areas by consolidating sites with common boundaries, and hone existing legislation and policy. Scott admitted under questioning that the future of some natural areas remains uncertain.

#### Stewards of Alberta's Protected Areas Association (SAPAA) Annual Meeting, October 21

Four of us from Wagner committee attended this meeting at Hastings Lake Community Hall where Doug Bowes, Policy & Land Use planner with PPAD, spoke on government efforts to lessen the industrial footprint in protected areas and Cheryl Bradley, Lethbridge biologist and conservationist, drew a "real picture" of industrial activity, with particular reference to Rumsey Ecological Reserve and Suffield. We gained some interesting insights and the discussion was lively. The take-home message was that in a province where energy rules, we should be vigilant in communicating to our MLAs our interest in the integrity of protected areas.

### Social News



Top, the picture of Emerald Award winners Eddie and Jeanne Jones that we didn't have room for in the last newsletter. Above, Glen Semenchuk and Vid Bejelik of FAN at a Faculty Club lunch we hosted in honour of FAN staff's invaluable assistance with "Project Land."

## **Calvatia species – the giant fungi among us**

*[This year we found some decaying remains of absolutely huge puffballs on our new property. We decided to ask resident mycological expert Dr. Markus Thormann to provide us with some more information on this striking phenomenon.]*

You have probably all seen them at some point – individual or small groups of giant “balls” in the meadows and along forest edges. These are species of puffballs that can grow to enormous sizes. In and around Edmonton, I have seen them the size of a beach ball, but more frequently, they are about the size of a soccer ball. From a taxonomic perspective, they are basidiomycetes that belong to the family Lycoperdaceae and to the genus *Calvatia*. In Alberta, you can find five different species of *Calvatia*: (1) *C. gigantea*, the giant puffball, (2) *C. booniana*, the giant western puffball (Fig. 1), (3) *C. elata*, the tall puffball, (4) *C. excipuliformis*, the box puffball, and (5) *C. utriformis*, the checkered puffball.

*Calvatia* species are considered gasteromycetes, or “stomach fungi”, and produce their billions upon billions of spores internally. The Gasteromycetes all have basidiospore maturation prior to the spores being exposed to the air. In addition there is no fertile layer of basidia (the structures which bear the spores), as in the Hymenomycetes, the class to which most of the familiar fungi belong. When the fruiting body is young, you can do a section through the gleba (the white interior of the fruiting body) and observe the glebal chambers, which are lined with basidia and immature basidiospores. As in most gasteromycetes, the gleba disintegrates and the spores darken from white to grayish or olive greenish as the fruiting body matures. Ultimately, the basidiospores are dispersed by some external force, usually wind, rain, bacterial or fungal degradation, or animals, such as insects. In some countries, children use the large fruiting bodies to play soccer, thereby aiding in the dispersal of the spores. Ecologically, they are all similar in that they grow in grassy areas, sometimes among mosses, in open woods, or under brush, and are involved in the decomposition of organic matter, i.e., they are saprobic in nature.



Fig.1

Fig. 2



There are several other genera and species of puffballs in Alberta. The more common ones include *Lycoperdon* (Fig. 2) and *Bovista* (Fig. 3), each with about 3-5 common species. They are all saprobic and colonize organic matter in grassy areas and forests. Some can be seen growing on wood. They range in colour from white to olive green to brown, and are much smaller than their gigantic cousins. Unlike *Calvatia* species though, these smaller puffballs often occur in clusters. The spore release mechanism is identical to that of *Calvatia*.

Lastly, many puffball species are edible when immature. Just take a knife and cut one in half. If the interior of the puffball is still solid and white, you can eat them; however, please make sure you have an edible species before indulging in this culinary adventure! usually add smaller specimens cut in half to stews and soups and bread and fry thicker slices of larger specimens in some butter or olive oil.



Fig.3

*Markus N. Thormann, PhD,  
Mycologist, Northern Forest Service, Edmonton  
President, Edmonton Mycological Society*

## Additions to Wagner's Plant Lists or, Rambling On About Plants....

by Patsy Cotterill

### Vascular Plants

In his article on the biophysical survey done in 1999, the follow-up monitoring carried out in 2005 and the biophysical of the new land done this year (pages 3–4 of this newsletter), Derek Johnson notes that seven species have now been added to our existing list of vascular plants for Wagner Natural Area. Whether these species pre-existed in the flora and were found because of more intensive and extensive exploration during the survey, or whether they are recent arrivals, is hard to say.

Three further additions were made this year, two of them on our recently acquired property, not previously surveyed, and one on the old property.

In June, Alice Hendry found northern starflower, *Trientalis borealis*, in deciduous woodland in the south-central part of the property. A member of the Primulaceae, this slender plant, which usually grows in patches, has a whorl of five or more leaves at the top of its stem (somewhat reminiscent of a bunchberry). The leaves, however, are lance-shaped and pointed, and from their centre arise one or two white, star-like flowers on delicate flower stalks. Northern starflower is an apt name, as the plant's distribution is across the boreal (northern) forest, including Alberta's boreal. The nearest occurrence I know of is at Sandy Lake, and it is very common in moist woods in the Lakeland region around Lac La Biche. A less common close relative, *T. europaea*, has more egg-shaped leaves and also occurs in the northern part of the province.

Later in the season Alice found another newcomer, yellow rattle (*Rhinanthus borealis*), this time on the Nature Conservancy's Extension Property. A population of it was growing on an old, overgrown farmer's road, cutting through mostly deciduous woods. This plant has a western distribution, being particularly common in the mountains, but also occurring in mountain outliers such as the Swan Hills and Cypress Hills. Perhaps it finds Wagner's cool, moist conditions to its liking, but how it got here is another of botany's little mysteries. It is an annual, so we will be interested to see if it can persist. It is also a semi-parasite, having structures that fasten on to the roots of nearby plants, usually grasses, allowing it to tap into their food and water. A member of the figwort or foxglove family (Scrophulariaceae), it has the family characteristic of a two-lipped corolla. Its calyx is distinctive; it forms a cup that inflates around the developing capsule, eventually creating a dry vessel in which the released seeds rattle around. The seeds, which are relatively large at 4-6 mm, are eventually tossed out by the action of wind on the flower stems. Given its yellow flowers and fruiting feature, its name is apt too.

In June, attracted by its tiny, white flowers, typical of its genus, I came across Dawson or rock sandwort, *Minuartia dawsonensis*, in fens near the south-east border of our original property. There were three or four plants of it, a delicate little thing emerging from clumps of golden fuzzy fen moss (*Tomenthypnum nitens*). It was familiar, but not

from Wagner. It is a sporadic plant, and I last saw a specimen of it three years ago in La Biche River Wildland Park. Since this is an area of Wagner that we check regularly because of its interesting fen species, it is surprising this sandwort hasn't been spotted before. Perhaps it is a genuine newcomer.



Photo: P. Cotterill

Northern starflower (*Trientalis borealis*)

### Non-Vasculars

Derek, who identified the bryophytes and lichens for both last year's monitoring and this year's new biophysical survey (we are lucky to have his expertise), has added eight new mosses, four liverworts and four lichen species to our lists. Derek's comment that there appears to be more diversity of *Sphagnum* (peat moss) species than initially appreciated is of interest. (We should all be able to recognize the genus *Sphagnum*, partly because its members are so distinct from other mosses, and partly because it is very important ecologically.) *Sphagna* are the main bryophyte components of bogs, and they thrive in and also create acidic conditions. Wagner, of course, is known for its fens, whose water is neutral to alkaline. Most of Wagner's peat mosses thus occur in hummocks, raised above the level of the fens or the ground in hummocky spruce woods, where the acidity (pH) can be a thousand times or more higher than it is in the fens. The species *S. magellanicum* that Derek mentions is one such denizen of hummocks.

Of course, some moss species are distinctive enough to be easily recognizable, or at least to attract attention. I collected the dung moss *Splachnum ampullaceum* (without knowing what it was) at the same time as I found the rock sandwort. It formed a discrete little clump, sitting on what appeared to be a patch of bare mud (not marl) in a fen. (I checked for dung, but the organic substrate was too amorphous to be recognizable as such.) The capsules of this species (shown in the photo on page 4) are characteristic, having the shape of a Greek amphora or ampulla, the cylindrical capsule proper sitting on top of a swollen base. Other *Splachna* species have this basal portion enlarged into a little skirt or parasol, which serves as a landing pad for flies, for these dung mosses rely on flies to disperse their spores to the next heap of dung. It's always a thrill to find them!

## Wildflowers of Wagner No. 27

***Picea glauca* (Moench) Voss**  
***Picea mariana* (Mill.) BSP**  
**Pinaceae**

Coniferous forest communities of black spruce, white spruce and tamarack dominate the landscape at Wagner Natural Area and its vicinity. All are characteristic of the boreal forest region, which extends in a broad swathe across northern Canada (excluding the treeless tundra of the far north). The Natural Area, where a high water table and groundwater discharging to the surface by means of springs create peaty wetlands, encompasses a pocket of boreal forest in a landscape that is otherwise parkland, agricultural or industrial land.

Both black and white spruce are evergreen trees, losing their leaves over a period of time (individual leaves may persist for five years or more) rather than all at once in the fall like deciduous trees. Batches of new leaves are produced in the spring on leaf-bearing branches generated from buds along the twigs. Both species have long narrow crowns (the part of the tree where the branches are), but white spruce usually achieves the taller growth (up to 40 m) and has a more pyramidal shape. Black spruce is narrower due to its shorter branches, and it often has a distinct club-like cluster of branches towards the top of the crown. The species differ in habitat preferences: white spruce occurs on better-drained soils (it is the spruce of our local ravines and the lower slopes of mountains), while black spruce is typical of cold, wet, nutrient-poor bogs and fens. In Wagner it is the commoner species, growing along with tamarack in the treed fens and as stunted individuals in the open fens, although in places, such as at the north end of the Marl Pond Trail, it mingles imperceptibly with white spruce. The latter is the spruce colonizing Wagner's old fields. Black spruce has an uncommon adaptation to growing in peat; it exhibits layering, a process whereby lower branches that have become covered by peat mosses put down roots and send up vertical shoots that eventually become detached and form new trees.

Both species have very narrow, dark-green leaves that are commonly known as needles. They are four-sided, with lines of tiny white dots, or stomata, on each side. (Because of this, they swivel easily between the fingers, a character that distinguishes them from the flat, two-sided needles of firs.) The shape and leathery texture of the needles are adaptations to reduce water loss, which is important for evergreen plants that continue to transpire when the ground is frozen during winter. The needles of white spruce, which at 1–2.5 cm long average slightly longer than those of black spruce, are particularly stiff and sharp-pointed, making them prickly to grasp. In both species the needles are borne on peg-like projections on the twigs (another distinguishing feature of the genus *Picea*). The twigs of white spruce are pale, hairless and shiny while those of black spruce are dark and fuzzy with tiny black hairs.

The male and female reproductive organs are borne in separate cones (technically known as strobili) in different parts of the same individual tree. Pollen is shed from the male cones (which look a bit like short catkins) in early June and pollinates the ovules in the short, reddish, immature female cones soon afterwards; however, fertilization does not take place until the fall. The mature cones of black spruce are shorter and more rounded than those of the cylindrical (ca. 2.5–3.5 cm) cones of white spruce. Black spruce cones persist on the tree for several

**White Spruce**  
**Black Spruce**  
**Pine Family**

years and release their seeds periodically while still attached; white spruce cones open in autumn and usually fall off the tree in the winter or the following spring. Each seed in the cone lies atop a thin bract that in turn is protected by a woody cone scale; it is equipped with a membranous wing for wind dispersal.

The wood of both species is commercially valuable. Black spruce is harvested for pulp for paper products and white spruce is also used for construction.



Black spruce (with tamarack) in fen in Wagner Natural Area, October 2006

All photos by P. Cotterill



White spruce twigs



Black spruce cones at left, white spruce cones at right, seed in centre



**WAGNER NATURAL AREA SOCIETY Membership / Donation Form**

The Wagner Natural Area Society membership year is January 1 to December 31. As a member of the Wagner Natural Area Society you will receive two Newsletters each year and an invitation to the field trips and other activities organized from time to time for the benefit of members.

Your Gift to the Wagner Natural Area Society will help maintain this unique Natural Area. Donations over \$10.00 will be receipted and are tax-deductible.

For more information about Wagner Natural Area and the Society, go to the website at: <http://wagner.fanweb.ca/> or contact the Membership Secretary at: [nutmeg@planet.eon.net](mailto:nutmeg@planet.eon.net).

**Please include me as a Member of the Wagner Natural Area Society!**

- Family/Organization: \$12 \_\_\_\_\_
- Individual: \$10 \_\_\_\_\_
- Student / Senior: \$8 \_\_\_\_\_

**A Gift to support Wagner Natural Area and the Society!**

Amount: \$ \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Email Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Mail this Form & Cheque/Money Order to: **Membership Secretary, Wagner Natural Area Society, 26519 Highway, Spruce Grove, Alberta T7X 3L4**

Oct'06



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Mar'06