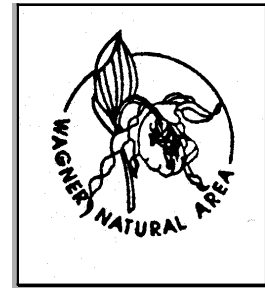


# WAGNER NATURAL AREA NEWSLETTER

Volume 18 Number 1 June 2004

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



Left: Beth Jenkins, Frank Cantafio and April Cantafio at the memorial bench on the Cabin trail. Above: the two plaques. Photos: Derek Johnson.

On May 15<sup>th</sup>, 2004, several Wagner Society members finished their annual spring clean-up of the site early and met up with Frank and April Cantafio at the main gate of the Natural Area for a pilgrimage to the memorial bench at the old cabin site on the Cabin Trail. Here a plaque commemorating Janice Cantafio, former executive director of the Society who died in July 1996, was placed alongside that of Barry Jenkins, former Wagner president, who died December 1994. Also attending the ceremony and recounting memories of Janice was Phyllis Kobasiuk, Parkland County Councillor and long-time friend of Janice's.

## Wagner Society Welcomes New Members!

Over the past year the Society has been pleased to welcome into the fold the following new **voting members**: Alan Hingston (who has already spent many hours auditing our books), well-known naturalist Jim Lange, and long-time Wagner member Patricia Horton Webb. New 'regular' **members** include: Doug Bovee, Ted and Sharon Enns, Ann and Charles Grant, Daphne Marr, and Northgate Seniors Garden Club.

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**A Big Thank-You** to all of you who have made donations on behalf of Wagner, either for ongoing operating costs or for the new land acquisition. (See the "Grapevine" – page 3).

## President's Report for the Annual General Meeting, 2004

by *Alice Hendry*

Being managers of Wagner Natural Area (WNA) is as complicated as juggling several balls of different colours, or keeping a complex piece of machinery running, or weaving a tapestry of many-coloured threads.

The Wagner management tapestry is now almost 21 years old. Our tapestry is made out of many individual threads. The most important threads in the Wagner tapestry are the blue threads of water. Without this water, ground and surface, the fens in the natural area, and their associated flora and fauna, would cease to exist. From March of 2003 to March of 2004, the Society dealt with water issues over and over again. We continued to monitor the data from the wells constructed during the Omni McCann study (commissioned by Alberta Environment). Under the direction of Dr. Ben Rostron of the University of Alberta, we did electro-resistance tomography studies. We accomplished another season of monitor-well drilling through the NAIT field school. We reviewed our neighbour to the north NOVO Development's plans for a stormwater retainment pond and successfully filed a Statement of Concern (SOC) with respect to their plans. We reviewed NOVO's plans for irrigation ponds. We met with the provincial Environment department and Parkland County staff about plans to divert water into Morgan Creek and successfully filed an SOC about those plans too. Our Annual Members' Night focused on Wagner's water sources and issues with a lecture by Dr. Rostron. We attended meetings of the Parkland Liaison Committee and worked with oil companies to protect WNA's groundwater sources from oil and gas industry exploration. We attended an open house about the Big Lake Sturgeon River Drainage Basin. Blue threads run through the tapestry vertically, horizontally, and around the border. When we are asked what the major management concern is for WNA, we can safely say WATER! WATER! WATER!

Other important thread colours (white and black) connect with Parkland County and with the provincial government Departments of Community Development (Parks and Parkland Services), Agriculture and Environment. We dealt with the last on water issues, and with the County on water issues and land purchase procedures. We dealt with Community Development over insurance, our lease renewal and other concerns. Again, the weaving of these threads required many hours of our time, but the tapestry would be incomplete without them.

We worked hard to communicate with our Society members, through our twice-yearly newsletters, through our Annual Members' Night and our guided walks. We count on our members for support. We network with other environmental organizations and we attend conferences. Call these threads a warm orange. One warm orange thread stands for the Green Shield Award we received at the Volunteer Conference and another represents our celebratory dinner for Pat and Dick Clayton in recognition of their Emerald Award.

The administration threads, sometimes an angry red and sometimes a subdued red, include meetings – board meetings, committee meetings, and meetings with government and County officials. Additional red threads are for meeting minutes (six sets), reports, grant applications, insurance issues, phone calls, donor recognition plaques, and letters. This year we sent 31 letters and we received 22, and that does not count receipts and thank-you letters sent to our donors. We attended hearings and open houses and conferences. We maintained the Web site. Another administration thread includes the chores associated with the treasurer's job – banking, receipts, forms, book balancing. These administrative chores are tasks that must be completed, but that none of us particularly enjoy. Unfortunately we were not successful in obtaining a summer student. That meant that society members had to take over the summer maintenance jobs. In addition, we participated in the usual spring and fall clean-ups. Our board members contributed over 2,000 hours of volunteer time for WNA this year. That's a lot of red thread!

Then there are the threads for Wagner's wonderful flora and fauna. These are yellow for the beautiful flowers, green for the trees and other vegetation, brown for the mammals, lime green for the reptiles, fish and amphibians, rose for the birds, and grey for the insects. These are important threads because they are the *raison d'être* for all that we do. These threads renew our dedication and reward us through their continued existence. We wove with these threads when we participated in the May frog-and-toad walk, the May flower count, and the June orchid walk, and any other time we were in the natural area.

Another colour of thread that continues to run through the tapestry is the violet thread for land acquisition. These threads run around the outside of the tapestry and form a buffer to protect the natural area. Many hours were spent on violet threads this year. We designed, printed and mailed a brochure, applied for grants, met with officials, wrote and sent letters, arranged with the Federation of Alberta Naturalists to handle the finances, and held many meetings, beginning with the September meeting when the Kichtons were our guests. Our challenge over the next year will be to complete the task of adding this thread, this 80 acres of property currently belonging to the Kichtons, to the tapestry.

This coming year, we will continue to weave these many colours into the WNA tapestry. We can't drop any of the threads. We can't break any of the threads. We can't ignore any of the colours. However, it is my hope that, during the coming year, we will be able to spend more time just enjoying the site. Just being in Wagner can renew our sense of purpose and dedication. This next year, I hope we can all take more Wagner walks, enjoy a few moments of quiet contemplation in and of Wagner, and do some exploration of the new properties – after all, the Wagner tapestry is a masterpiece.



## The Wagner Grapevine



### ***“Project Land”***

As many of you already know as recipients of a begging brochure, Wagner Society has embarked upon an initiative, dubbed “Project Land” to further expand its land base. It is hoping to purchase 80 acres of forested land on its southwest flank and is in the midst of a fund-raising campaign. The expansion would increase the integrity of the natural area — when you’re an island of wildness in a sea of development your chances of survival are better if you are a big island! — and offer better protection to the areas of prime sensitivity, the peatlands and adjacent wet habitat. In 2001, the Society was fortunate to have the government of Alberta purchase an additional 160 acres of land to add to the southcentral part of the property.

Currently, our land kitty stands at about \$12,000, only a fraction of what we need for the parcel. We have seven grant applications outstanding (thanks mainly to the hard work of **Pat Clayton**, **Alice Hendry** and **Irl Miller**), have already had several rejections from potential granting sources, and still have a number of other organizations and persons to whom we plan to appeal.

We would like to thank everyone who has given generously to the land fund so far — as well as those who donated — and many do so year after year as they renew their memberships — to the ongoing operating costs of the area and the Society’s activities. Cheques for donations specifically to purchase land should be made out to our fiscal agent for the project, the **Federation of Alberta Naturalists, 11759 Groat Road, Edmonton, T5M 3K6**, and clearly marked “Wagner land acquisition.” Online donations may be made at <http://fanweb.ca/donate.htm>. Income tax receipts are issued for donations over \$30. Donors of over \$100 will receive a free “Orchids of Wagner Natural Area” poster and will have their names posted on the donor bulletin board in the main field (unless they indicate otherwise). If you have any good ideas for fund-raising, please let us know of them. Or if you know of someone who might be interested in making a donation, give us their particulars with their permission, so that we can give them the relevant information. Our webmaster **Mike Jenkins** is currently working on getting the brochure onto our website: <http://www.fanweb.ca>

Information on the land project may also be obtained by contacting Alice Hendry at (780) 962-4836 or FAN Executive Director Glen Semenchuk at (780) 427-8124.

### ***Wagner Society Being Sued***

Edmonton West R.V. Park & Campground Inc. and Novo Development Corp. are suing Wagner Society and several of its individual members for \$10 million, in a statement

of claim filed April 14, 2004. The plaintiffs allege that Society members have made “false or misleading” statements about their property which has harmed their ability to do business. In fact, any statements the Society has made have been in the context of provincial and municipal regulations regarding land development, and have been through official channels. The Society and persons involved are taking legal steps to defend themselves.

### ***NAIT Well-Drilling Field School***

Another field school, involving NAIT teachers and students and Dr. **Ben Rostron**, hydrogeologist at the University of Alberta, took place on April 12<sup>th</sup>. A number of wells were drilled in the “Villeneuve field.” The benefits of the exercise are that NAIT technologists get practical, hands-on field experience and Wagner Society gets further information on its groundwater!

### ***Testing for West Nile Virus (WNV)***

Director **Mike Jenkins**, who is also an entomologist with the City of Edmonton’s pest control branch, informs us that Wagner will likely be a venue for sampling for the larvae and adults of the mosquito species that carries WNV again this summer. Depending on the results of this testing, the Society might have to wrestle with the problem of the natural area being sprayed.

### ***Bouquets***

A big bouquet to **Dick Clayton** for looking after commemorative plaques, including the plaque for Janice Cantafio recently affixed to the Jenkins’ memorial bench on the Cabin Trail, the bird boxes, and many other items of hardware and maintenance at Wagner. The ongoing care and attention which both Dick and Pat Clayton lavish on Wagner is much appreciated.

A bouquet also to **Cliff Adams** for his work on two presentations on Wagner which he is placing on CD. One presentation will be promotional, geared for fund-raising, and the other will be educational, directed at school children. Cliff is a school teacher with a passion for science, especially biology.

Last but not least, bouquets to our newsletter contributors **David Locky** and **Markus Thormann** for the scholarly, carefully crafted articles on wetlands that have featured in our Wagner newsletter for the last several issues.

*See overleaf for more Grapevine news...*



## Wagner Grapevine (continued)



Although the Wagner Natural Area Society is the official steward of Wagner Natural Area and manages it under a provincial lease, the land itself belongs to the Crown and the Provincial Government is responsible for the land base. If you see anything that you feel should be reported, please contact Land Manager **Wayne Holland** at (780) 464-7955 or the Conservation Officer in charge, **Rob Spelliscy**, at (780) 963-6131 ext. 224, during working hours. For urgent after-hours problems, please contact the local RCMP.

### Field Trips

Please join us for our annual **Orchid Walk in Wagner, this year taking place on June 19<sup>th</sup>**. We'll assemble at the main gate at 10 a.m. or later for guided tours that guarantee to show off some of Wagner's showiest orchids, along with a lot of other flowering plants as well. Tours will run until 4 p.m. as long as there are visitors. Admission is free. Come suitably dressed for the weather and ground conditions and armed with insect repellent.

### Butterfly Count in Wagner

Check the website for details of this count.

### Calling all Volunteer Stewards...

This year the provincial government's Parks and Protected Areas branch of Community Development will be breaking with tradition and holding its annual **Volunteer Stewards' Conference** in the fall instead of the early spring. It will take place **September 24-26<sup>th</sup> at the Rocky Mountain Y.M.C.A.** in Bow Valley (near Canmore). Topics to be covered at the conference include something for everyone: use of GPS units, trail care, monitoring, safety, urban wildlife corridors, pictographs and more. There will be field trips to watch migrating golden eagles and to the Grotto Canyon. The well-known naturalist/entertainer **John Acorn** will be the banquet speaker. Brochures will be available soon with the details, or call 1-866-427-3582.



Alberta Transportation showed creativity, and a belief in the permanence of Wagner Natural Area, when they commissioned this relief to be moulded into the overpass bridge where S.H. 44 (the Villeneuve Road) crosses Highway 16. It depicts Wagner's iconic yellow lady's-slipper orchids.

*Photo by Derek Johnson*

## Wagner Natural Area Society

26519 Highway 16, Spruce Grove, AB T7X 3L4 Visit our website at <http://www.wagner.fanweb.ca>

Executive 2004:	President	Alice Hendry (962-4836)	Directors:	Pat Clayton (456-9046)
	Past President	Irl Miller (455-3866)		Leota Cummins (447-4256)
	Vice-President	Ben Rostron (434-3839)		Beth Jenkins (458-1794)
	Treasurer	Tom Sherwood (435-6065)		Derek Johnson (436-8231)
	Secretary/Ed/Membership	Patsy Cotterill (481-1525)		Edgar Jones (436-5327)
		Mike Jenkins (Webmaster) (481-8695)		Jasper Keizer (Fire Warden) (962-2745)

## **Wetland Series (Part 5)**

### **Peatlands and Creatures Great and Small: Part II – Invertebrates and Microfauna**

by *David A. Locky*

#### ***Introduction***

This article is the last of a two-part series on peatland creatures. Here, I focus on peatlands and invertebrates and some microfauna, and then outline wetlands from the perspective of conservation and creatures of all sizes. A table with peatland creatures, great and small, is included below.

Invertebrates are essential food sources for animals in higher trophic levels and some plants at lower trophic levels. They are a common component of most wetland types and appear to be less affected by the acidity of water than other animals. Water availability appears to be the critical aspect, with ephemeral and permanent pools providing key habitat; temporary extreme conditions such as drought or too much water can play havoc on specific lifecycle stages (Neckles *et al.* 1990).

Invertebrates are closely tied to their environment and their fossilized parts are important aspects of understanding plant succession (Roper 1996, Whitehouse 2004) and the potential impacts of global warming (Mitchell *et al.* 1999), especially in peatlands.

#### ***Macro invertebrates***

Some insects have developed symbiotic relationships with peatland plants. Perhaps the best known is that between pitcher plants and flies. The larval stages of these flies develop within the cupped leaves of the plants, catching insects that become trapped. It is surmised that the larvae assist the plants by breaking down food matter for them (Hardwick and Giverson 1996). Another less known relationship is that between orchids (commonly found in peatlands) and mosquitoes, bees, fungus gnats, and moths (Kevan *et al.* 1993). Orchids are neither numerous nor diverse in the boreal region, but have the most specialized pollination mechanisms of the angiosperms; they require insects for successful pollination because they rarely self-pollinate. Mosquitoes, in particular, are important pollination vectors in peatlands (Gorham 1976) and can be found with orchid pollinia affixed to various body parts.

Although not well known, ants are commonly found living within the hummocks of peatlands. Imagine pulling a clump of moss from the top of a hummock and finding your hand covered in ants! Restricted generally to the warmer, drier hummocks of senescing *Sphagnum*, ants may actually contribute to the regression of dying hummocks with their tunnelling (Luken and Billings 1986). It has also been found that ant-inhabited hummocks have elevated levels of nutrients and minerals that, in conjunction with the aerating effects of their tunnels, are conducive to vascular plant growth. Rhizomatous graminoids are commonly found on active mounds, but abandoned mounds are often covered with shrubs and other vascular plants that take advantage of drier, warmer conditions. The interesting twist is that the ants tend aphids on these shrubs, and these aphids provide

much of the nutrition ants require, potentially creating a positive feedback relationship (Lesica and Kanno 1998).

We often do not think much about snails but there are currently at least 42 species of land snails in the fens of Iowa, Wisconsin, Minnesota, and New York (Nekola as reported in Bedford and Godwin 2003). The tiny land snail, *Vertigo morsei*, is better known as a Pleistocene fossil, but is actually one of the rarest species in eastern North America, and is restricted to fens.

In the early 1990s, a survey of Hymenopterans (narrow-waisted insects like wasps and ants) revealed an astonishing diversity of species at the Wagner Natural Area (Finnamore 1994). Almost 2,200 species of insects were collected, more than any other study of peatlands. Based on this study and data from a study of beetles, it was estimated that almost 6000 species inhabited this small area, including Hymenopterans (22.6%), beetles (5.6%), Diptera (two-winged insects, 29.3%), butterflies and moths, 31.3%, and others (spiders, etc., 11.2%). This translates into approximately 30% of the 20,000 estimated insects and spiders in Alberta. This high species richness of insects has been attributed to the diverse physiognomy, or architecture, of the vegetation in the area (Finnamore 1994). This diverse vegetation physiognomy has also been indirectly related to the high number of vascular and non-vascular plants (471 species) found at the Wagner Natural Area (Hrapko 1988, Wagner Natural Area Society 2000), which thus reflects the large number of habitats, including boreal forest, mixed wood, second growth shrub, forest edge, and fields (Thornin 1982).

While many of the insects at Wagner Natural Area have yet to be named, the great diversity of insects there is probably a conservative estimate. Studies of other peatland insects will probably have larger species lists (Finnamore 1994). For example, 55 species in of chironomids found in a NW Ontario peatland are probably found across the boreal region of North America (Rosenburg *et al.* 2001).

#### ***Microfauna***

While not widely known, a great diversity of micro-faunal creatures called rhizopods, or testate amoebae, live in *Sphagnum*-dominated peatlands. These protozoans are not true animals but amoebae that are protected within a helmet-like shell of silica, calcium, or protein. Their pseudopodia emerge from an opening (Ogden and Hedley 1980). From a paleo-ecologic perspective, these organisms are important indicators of environmental change. They are very specific in their habitat requirements, which are related to peat pH and depth to water table (Mitchell *et al.* 1999), are quick to react to environmental changes, and their shells are well preserved in peat. This makes them excellent bioindicators in peatlands (Warner 1987). Rhizopods are associated more

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with mosses than vascular plants (Mitchell *et al.* 2000) and are often abundant and diverse in *Sphagnum* mosses (Warner 1987) and the poorly decomposed layers below (Gilbert *et al.* 1998). They also have a key position in the microbial trophic network of a peatland. Researchers investigating the microbial loop of a French peatland found that rhizopods made up 48% of the total microbial biomass, followed by 15% heterotrophic bacteria, 14% cyanobacteria, and 13% diatoms. Experimental nutrient inputs negatively influenced rhizopod populations, suggesting that these taxa are well-adapted to peatlands with low pH and low available nutrients (Gilbert *et al.* 1998).

### Wetlands, animals, and conservation

In 1985, there were approximately 30 animals designated as species at risk in Canada that lived in or were reliant on wetlands (NWWG 1988). These included wood bison, piping plover, whooping crane, Henslow's sparrow, white pelican, Caspian tern, king rail, prothonotary warbler, Ross' gull, and the trumpeter swan (COSEWIC 2003). Approximately one third of the species at risk listed by the Committee on the Status of Endangered Wildlife in Canada live in or adjacent to wetlands. This makes wetlands crucial habitats for many endangered species (Atlas of Canada 2003). Fens in the US are often frequented by uncommon, rare, threatened, endangered, or federally listed animals. Threatened species include bog turtles, copper-bellied water snake, grizzly bear, and Preble's jumping mouse. Endangered species include Fender's blue butterfly, Mitchell's satyr, Saint Francis' satyr, Hine's emerald dragonfly, gray wolf, red wolf, cougar, lynx, and Indiana bat. The eastern massasauga rattlesnake frequents eastern US fens and is currently a candidate for federal listing (US Fish and Wildlife Service 2002). In Iowa fens there are nine state-rare butterflies and skippers (Nekola 1994), and in small mountain fens of North Carolina there are six species of rare, threatened, or endangered animals (Murdock 1994).

Although most of our comprehensive studies on peatland fauna have been restricted to eastern North America, research conducted at Wagner Natural Area has contributed greatly to our knowledge of the fauna in western peatlands. Approximately 201 species of vertebrates have been known to use Wagner Natural Area (extrapolated from Wagner Natural Area 2001). Add to this the estimated 6,000 species of invertebrates (Finnamore 1994) and the diversity on an area only 215 ha in size is striking. The ecological value of such an area with a significant peatland component, especially in the midst of urban sprawl, is difficult to calculate. However, it is very important to consider and preserve a variety of peatlands, like those found at Wagner Natural Area; who knows what animal species, charismatic or not, are yet to be found?

### References

Atlas of Canada. 2003. URL: [http://atlas.gc.ca/site/english/learning\\_resources/wetlands/wetlands\\_ecosys.html](http://atlas.gc.ca/site/english/learning_resources/wetlands/wetlands_ecosys.html)

Bedford, B.L. and K.S. Godwin. 2003. Fens of the United States: Distribution, characteristics, and scientific connection versus legal isolation. *Wetlands* 23: 608-629. COSEWIC. 2003.

Finnamore, A.T. 1994. Hymenoptera of the Wagner Natural Area, a boreal spring fen in central Alberta. *Memoirs of the Entomological Society of Canada* 169: 181-220.

Gilbert, D., C. Amlard, G. Bourdier, and A.-J. Francez. 1998. The microbial loop at the surface of a peatland: structure, functioning and impact of nutrients input. *Microbial Ecology* 35: 83-93.

Gorham, J.R. 1976. Orchid pollination by *Aedes* mosquitoes in Alaska. *American Midland Naturalist* 95: 208-210.

Hardwick, M.E. and D.J. Giverson. 1996. Aquatic insect populations in transplanted and natural populations of the purple pitcher plant, *Sarracenia purpurea*, on Prince Edward Island, Canada. *Canadian Journal of Zoology* 74: 1956-1963.

Hrapko, J.O. 1988. Wagner Natural Area Plant Checklist. Provincial Museum of Alberta, Edmonton, AB, Canada. *Natural History Information* 88: 15 pp.

Kevan, P.G., E.A. Tikhmenev, and M. Usui. 1993. Insects and plants in the pollination ecology of the boreal zone. *Ecological Research* 8: 247-267.

Lesica, P. and P.B. Kanno. 1998. Ants create hummocks and alter structure and vegetation of a Montana fen. *American Midland Naturalist* 139: 58-68.

Luken, J.O. and W.D. Billings. 1986. Hummock-dwelling ants and the cycling of minerotrophy in an Alaskan peatland. *The Canadian Field-Naturalist* 100: 69-73.

Mitchell, E.A.D., A.J. Buttler, B.G. Warner, and J.M. Gobat. 1999. Ecology of testate amoebae (Protozoa: Rhizopoda) in *Sphagnum* peatlands in the Jura mountains, Switzerland and France. *Ecoscience* 6: 565-576.

Mitchell, E.A.D., A.J. Buttler, P. Grosvernier, H. Rydin, C. Albinsson, A.L. Greenup, M.M.P.D. Heijmans, M.R. Hoosbeek, and T. Saarinen. 2000. Relationships among testate amoebae (Protozoa), vegetation and water chemistry in five *Sphagnum*-dominated peatlands in Europe. *New Phytologist* 145: 95-106.

Murdock, N.A. 1994. Rare and endangered plants and animals of southern Appalachian wetlands. *Water, Air, and Soil Pollution* 77: 385-405.

NWWG (National Wetlands Working Group). 1988. *Wetlands of Canada*. Ecological Land Classification Series, No. 24. Sustainable Development Branch, Environment Canada, Ottawa, ON, and PolyScience Publications, Inc., Montreal, PQ, Canada.

Neckles, H.A., H.R. Murkin, and J.A. Cooper. 1990. Influences of seasonal flooding on macroinvertebrate abundance in wetland habitat. *Freshwater Biology* 23: 311-322.

Nekola, J.C. 1994. The environment and vascular flora of northeastern Iowa fen communities. *Rhodora* 96: 121-169.

Ogden, C. G., and R. H. Hedley. 1980. *An Atlas of Freshwater Testate Amoebae*: British Museum of Natural History and Oxford University Press, London and Oxford, UK.

Roper, T. 1996. Fossil insect evidence for the development of raised mire at Thorne Moors, near Doncaster. *Biodiversity and Conservation* 5: 503-521.

Rosenburg, D.M., A.P. Wiens, B. Bilyj, and L. Armstrong. 2001. Peatland Chironomidae (Diptera): effects of flooding on emergence from lake 979, Experimental Lakes Area, Ontario. *Journal of the North American Benthological Association* 20: 448-467.

Semenchuk, G. (ed.). 1992. *Atlas of the Breeding Birds in Alberta*. Federation of Alberta Naturalists, Edmonton, AB, Canada.

Thornin, T. 1982. Butterflies of the Wagner Bog. *In* The Edmonton Naturalist, Special Issue: The Wagner Bog 10: 42-45.

US Fish and Wildlife Service. 2002. Environmental Conservation Online Service (ECOX).

Wagner Natural Area Society. 2000. Wagner Natural Area Plant Checklist. Wagner Natural Area Society, Edmonton, AB, Canada. 17 pp.

Wagner Natural Area Society, 2001. Fish, Amphibians, Reptiles and Mammals of the Wagner Natural Area. URL: <http://wagner.fanweb.ca/vert.htm>

Warner, B.G. 1987. Abundance and diversity of testate amoebae (Rhizopoda, Testacea) in *Sphagnum* peatlands in south-western Ontario, Canada. *Archiv für Protistenkunde* 133: 173-189.

Whitehouse, N.J. 2004. Mire ontogeny, environmental and climatic change inferred from fossil beetle successions from Hatfield Moors, eastern England. *Holocene* 14: 79-93.

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**Table 1. Selected animals and micro-fauna that inhabit or use peatlands for all or part of their life cycles.**

Compiled from the references cited in the text, plus additional species from Semechuk (1992) and Banfield (1977).

**MAMMALS**

Shrews – Soricidae: Masked Shrew (*Sorex cinereus cinereus*); Short-tailed Shrew (*Blarina brevicauda*); Wood Shrew (*Sorex palustris*); Arctic Shrew (*Sorex arcticus*); Pygmy Shrew (*Sorex hoyi*).

Moles – Talpidae: Star-nosed Mole (*Condylura cristata*).

Bats – Chiroptera: Little Brown Bat (*Myotis lucifugus*); Silver-haired Bat (*Lasionycteris noctivagans*); Big Brown Bat (*Eptesicus fuscus*); Hoary Bat (*Lasiurus cinereus*).

Rabbits & Hares – Lagomorpha: Snowshoe Hare (*Lepus americanus*).

Rodents – Rodentia: Squirrel – Sciuridae: Least Chipmunk (*Tamias minimus*); Red Squirrel (*Tamiasciurus hudsonicus*); Northern Flying Squirrel (*Glaucomys sabrinus*). Beaver – Castoridae: Beaver (*Castor canadensis*). New World Mice – Cricetidae: Deer Mouse (*Peromyscus maniculatus*); Southern Red-backed Vole (*Clethrionomys gapperi*); Meadow Vole (*Microtus pennsylvanicus*); Heather Vole (*Penacomys intermedius*); Muskrat (*Ondatra zibethicus*); Jumping Mice – Zapodidae: Meadow Jumping Mouse (*Zapus hudsonius*); Lemmings – Muridae: Southern Bog Lemming (*Synaptomys cooperi*); Northern Bog Lemming (*Synaptomys borealis*); Porcupines – Erethizontidae: Porcupine – (*Erethizon dorsatum*).

Carnivores – Carnivora: Dog – Canidae: Coyote (*Canis latrans*); Gray Wolf (*Canis lupus*); Red Fox (*Vulpes vulpes*). Bear – Ursidae: Black Bear (*Ursus americanus*). Raccoon – Procyonidae: Raccoon (*Procyon lotor*). Weasel – Mustelidae: American marten (*Martes americana*); Ermine (*Mustela erminea*); Least Weasel (*Mustela nivalis*); Long-tailed Weasel (*Mustela frenata*); Mink (*Mustela vison*). Cat – Felidae: Canada Lynx (*Lynx canadensis*); Ungulates – Artiodactyla: Deer – Cervidae: Wapiti (*Cervus elaphus*); Woodland Caribou (*Rangifer tarandus*); Mule Deer (*Odocoileus hemionus*); White-tailed Deer (*Odocoileus virginianus*); Moose (*Alces alces*). Cow – Bovidae: Bison (*Bison bison*).

BIRDS. Herons & Allies – Ciconiiformes: American Bittern (*Botaurus lentiginosus*). Waterfowl – Anseriformes: Ring-necked Duck (*Aythya collaris*); Plus, others that associated with peatlands to varying degrees. Hawks, Falcons & Allies – Falconiformes: Northern Harrier (*Circus cyaneus*); Red-tailed Hawk (*Buteo jamaicensis*). Pheasants, Grouse & Allies – Galliformes: Spruce Grouse (*Falcapennis canadensis*); Sharp-tailed Grouse (*Tympanuchus phasianellus*); Ruffed Grouse (*Bonasa umbellus*). Shorebirds, Gulls, Terns & Allies – Charadriiformes: Greater Yellowlegs (*Tringa melanoleuca*); Solitary Sandpiper (*Tringa solitaria*); Upland Sandpiper (*Bartramia longicauda*); Short-billed Dowitcher (*Limnodromus griseus*); Common Snipe (*Gallinago gallinago*); Ring-billed Gull (*Larus delawarensis*); Greater Black-backed Gull (*Larus marinus*); Red-necked Phalarope (*Phalaropus lobatus*). Owls – Strigiformes: Great Gray Owl (*Strix nebulosa*); Northern Saw-whet Owl (*Aegolius acadicus*). Nighthawks – Caprimulgiformes: Common Nighthawk (*Chordeiles minor*). Woodpeckers – Piciformes: Three-toed Woodpecker (*Picoides tridactylus*); Black-backed Woodpecker (*Picoides arcticus*); Northern (yellow-shafted) Flicker (*Colaptes auratus*).

Perching Birds - Passeriformes: Flycatchers: Olive-sided Flycatcher (*Contopus cooperi*); Alder Flycatcher (*Empidonax alnorum*); Least Flycatcher (*Empidonax minimus*); Yellow-sided Flycatcher (*Empidonax flaviventris*); Eastern Kingbird (*Tyrannus tyrannus*). Larks, Swallows: Tree Swallow (*Tachycineta bicolor*). Jays, Crows & Allies: Gray Jay (*Perisoreus canadensis*); Common Raven (*Corvus corax*). Chickadees to Wrens: Black-capped Chickadee (*Poecile atricapillus*); Boreal Chickadee (*Poecile hudsonicus*); Red-breasted Nuthatch (*Sitta canadensis*); Sedge Wren (*Cistothorus platensis*). Kinglets, Thrushes, and Shrike: Golden-crowned Kinglet (*Regulus satrapa*); Ruby-crowned Kinglet (*Regulus calendula*); Swainson's Thrush (*Catharus ustulatus*); Hermit Thrush (*Catharus guttatus*); American Robin (*Turdus migratorius*); Northern Shrike (*Lanius excubitor*). Vireos and Warblers: Blue-headed Vireo (*Vireo solitarius*); Red-eyed Vireo (*Vireo olivaceus*); Yellow Warbler (*Dendroica petechia*); Magnolia Warbler (*Dendroica magnolia*); Black-throated Green Warbler (*Dendroica virens*); Cape May Warbler (*Dendroica tigrina*); Yellow-rumped (Myrtle) Warbler (*Dendroica coronata*); Black-throated Green Warbler (*Dendroica virens*); Palm Warbler (*Dendroica palmarum*); Bay-breasted Warbler (*Dendroica castanea*); Northern Parula Warbler (*Parula americana*); Black-and-white Warbler (*Mniotilta varia*); Nashville Warbler (*Vermivora ruficapilla*); Northern Waterthrush (*Seiurus noveboracensis*); Connecticut Warbler (*Oporornis agilis*); Common Yellowthroat (*Geothlypis trichas*). Cardinals: Northern Cardinal (*Cardinalis cardinalis*). Sparrows & Allies: Chipping Sparrow (*Spizella passerina*); Savannah Sparrow (*Passerculus sandwichensis*); Le Conte's Sparrow (*Ammodramus leconteii*); Song Sparrow (*Melospiza melodia*); Lincoln's Sparrow (*Melospiza lincolni*); Swamp Sparrow (*Melospiza georgiana*); White-throated Sparrow (*Zonotrichia albicollis*); White-crowned Sparrow (*Zonotrichia leucophrys*); Dark-eyed (Slate-colored) Junco (*Junco hyemalis*). Blackbirds & Allies: Red-winged Blackbird (*Agelaius phoeniceus*); Rusty Blackbird (*Euphagus carolinus*).

Finches & Allies: White-winged Crossbill (*Loxia leucoptera*); Evening Grosbeak (*Coccothraustes vespertinus*).

AMPHIBIANS. Mole Salamanders – Ambystomidae: Tiger Salamander (*Ambystoma tigrinum*); Blue-spotted Salamander (*Ambystoma laterale*); Four-toed Salamander (*Hemidactylium scutatum*); Mole Salamander (*Ambystoma talpoideum*). Toads – Bufidae: American Toad (*Bufo americana*); Western (Boreal) Toad (*Bufo boreas boreas*). Tree Frogs – Hylidae: Boreal Chorus Frog (*Pseudacris maculata*); Frogs – Ranidae: Mink Frog (*Rana septentrionalis*); Northern Leopard Frog (*Rana pipiens*); Green Frog (*Rana clamitans*); Wood Frog (*Rana sylvatica*).

REPTILES. Snakes – Colubridae: Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*); Eastern Garter Snake (*Thamnophis sirtalis sirtalis*); Turtles – : Bog Turtle (*Clemmys muhlenbergii*); Spotted Turtle (*Clemmys guttata*).

FISHES. Minnows – Cyprinidae: Fathead Minnow (*Pimephales promelas*). Pikes – Esocidae: Northern Pike (*Esox lucius*). Sticklebacks – Gasterostiidae: Brook Stickleback (*Culaea inconstans*); Plus many others!

INVERTEBRATES. Insecta (insects) and Arachnida (Spiders): Assorted and many!

PROTOZOANS. Rhizopoda: Rhizopods (testate amoebae).

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## Wildflowers of Wagner No. 22

***Carex aquatilis* Wahl.**  
Cyperaceae

**Water Sedge**  
Sedge Family

Water sedge is both a common and abundant sedge, and as such is an important component of wetland ecosystems. It is circumpolar in range and in North America occurs throughout Canada and much of the United States, where it is found in fens and marshes, along the shores of lakes and ponds, and in roadside ditches. (It occurs in all these types of habitats in Wagner Natural Area.) It is densely tufted, its large tussocks being most clearly seen when there has been a drawdown of the water level. However, it also produces long, cord-like horizontal stems or rhizomes, at or under the ground surface, which enable it to colonize large patches of wet ground. It appears to be indifferent to elevation, growing from lowland sites to quite high elevations in the mountains. Water Sedge is particularly easy to distinguish in May and early June when the bluish-white (glaucous) colour of its new leaves renders it conspicuous amid the straw colour of last year's leaves or the greenery of other sedges. The leaves are from 2–5 mm wide and rough to the touch. Erect flower-bearing stems, which are characteristically reddish at the base and sharply angled above, later arise within the cluster of leaves, growing 20 to 80 cm high.

Water Sedge belongs to the large group of sedges (subgenus *Carex*) that has very distinct male and female flower clusters, with the males situated above the females on the plant (no doubt to allow for better dissemination of pollen by the wind). The flowers are tiny and numerous, grouped into long, narrow cylindrical spikes, which can vary from 1 to 4 cm in length. The male spikes, of which there can be one or two, appear dark from the black scales that subtend the stamens (three per flower); the plant can thus look strikingly handsome at the time of pollen shedding. The female spikes, which may vary from two to six, with the uppermost one sometimes having male flowers at the top, become progressively greener as the densely packed fruits mature. Each fruit is a flattened, flask- or lens-shaped structure called a perigynium, sitting in the angle of a dark, green-veined scale. Surmounted by two tiny stigmas atop a tiny beak, each perigynium reaches 2-3 mm long and encloses a single seed known as an achene. These fruits float and their movement in water likely aids their dissemination.

Several varieties of Water Sedge have been recognized, as may be expected with a wide-ranging species, but all appear to intergrade. *C. aquatilis* is grouped in the section of sedges called Acutae, along with several species that are rare to Alberta. Water Sedge may be reliably distinguished from any of these rarities (mostly found in the southwest and northeast corners of the province) by having the leaf subtending the flowering spikes as long as or longer than the uppermost spike, smooth perigynia (i.e., without nerves) and scales and perigynia that are pressed closely against the axis of the spike rather than projecting.



Illustration is a scan of a herbarium specimen of *Carex aquatilis* by Patsy Cotterill.  
Approx. 0.5 x life size.