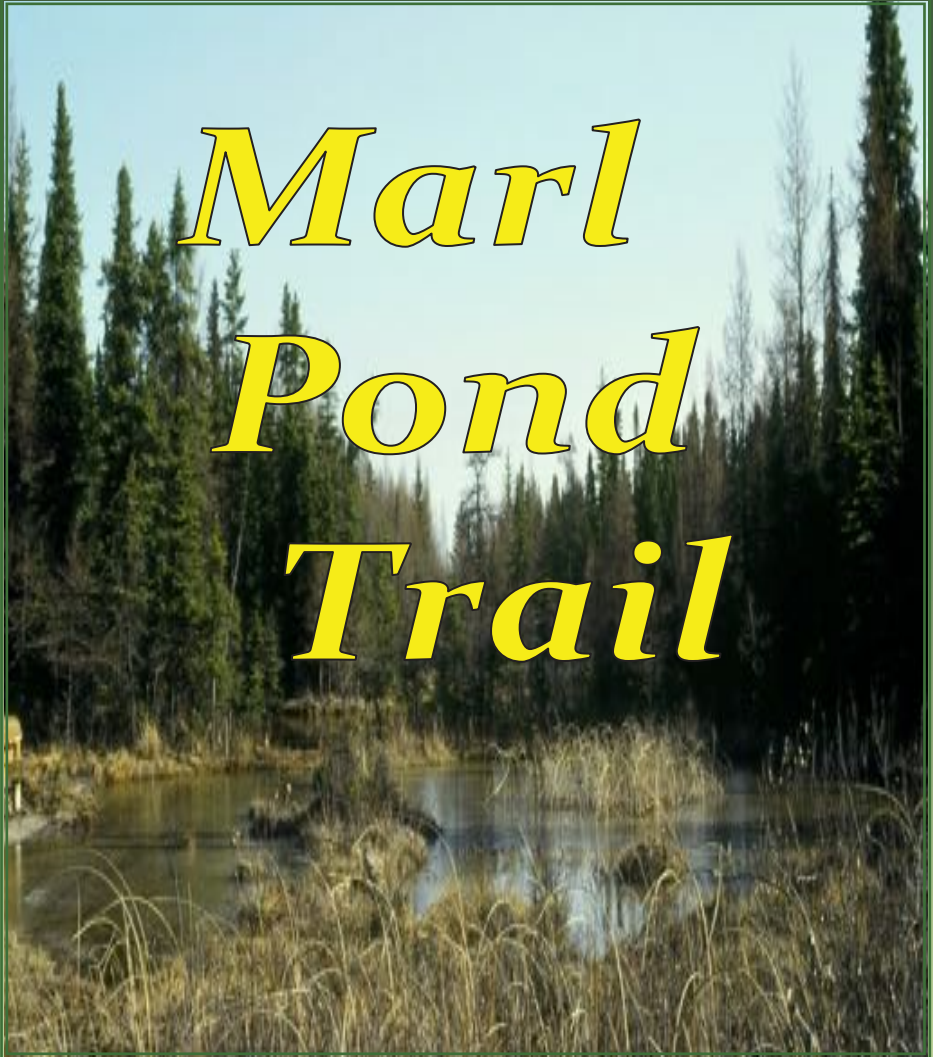


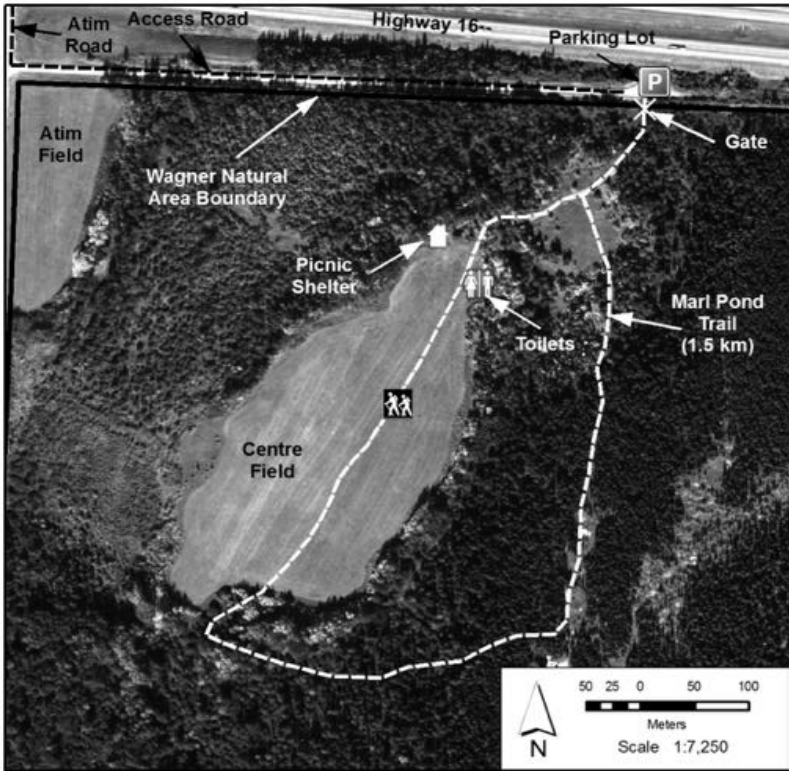
WAGNER NATURAL AREA



A GUIDE TO SOME OF ITS NATURAL FEATURES

WEBSITE: www.wagnerfen.ca

MARL POND TRAIL



Keep track of what you see along the trail, using the checklist on pages 16 and 17

The Marl Pond Trail (a 1.5 km looped trail) provides an overview of some of Wagner's varied habitats, including its fens.

**Find additional information on the Wagner website:
<http://www.wagnerfen.ca>**

Why is an Alberta Provincial Natural Area here?

A feature of Wagner Natural Area is its fens. Fens are a special type of wetland in which peat (undecomposed plant remains) has formed. The fens may be open, with islands of low vegetation lying within shallow, whitish pools known as marl ponds, or they may be forested with coniferous trees (spruce and tamarack). Both types of fens exist in this area. In Wagner groundwater, carried in underground layers of sand and gravel called aquifers, discharges at the surface as springs. The spring water flows overland down a gentle slope to the north.

Groundwater is affected by surrounding land and water uses. Roads, urban or industrial development all alter the ground surface over which precipitation infiltrates the soil to replenish the aquifer. Wells or pumping can directly reduce the amount of water in the aquifer.

Because water is the lifeblood of Wagner's fens, to preserve the Natural Area we must not only protect its land base, but also its water supply.

History of Wagner Natural Area

Once owned by local farmer William Wagner and popularly known as Wagner Bog, the original half section of land was purchased by the Alberta government and other interested parties in 1971 to protect its outstanding natural features. It officially became Wagner Natural Area in 1975. Subsequent land purchases by the Alberta government and the Nature Conservancy of Canada have extended the protected area to 251 hectares (620 acres) covering a range of vegetation communities. Since 1983 it has been managed by a volunteer steward group, the Wagner Natural Area Society, which has a recreational lease on the land. The Society's objectives are to preserve the Natural Area's ecological integrity, promote its appreciation by the public, and maintain it as a resource for nature education and research.

Please remember:

- 1. Only pedestrian use is permitted in the Natural Area.**
- 2. Keep to the trail; trampling off the trail will destroy the surrounding vegetation.**
- 3. Do not damage, collect or remove any specimens from the Natural Area.**
- 4. Do not leave litter; take it home with you.**
- 5. Keep dogs on a leash and please pick up after your dogs.**
- 6. Lighting fires, cutting trees and camping are forbidden in the Natural Area.**

1 Centre Field

Enter the Wagner Natural Area through the gate and follow the trail past the bulletin board to the large open field, passing by the picnic shelter on your right and the toilets on your left. The Natural Area has several high points, or upland areas, where the trees were cleared several decades ago for farming. Now willows and poplars are gradually reclaiming this field along the edges. Eventually it will return to forest, by the process of succession.

In early spring or fall look for low mounds of fresh soil in the grass. These are made by northern pocket gophers, rodents which live in underground tunnels and chambers. They eat herbaceous plants, stuffing them with their forepaws into their fur-lined cheek pouches or “pockets” – hence their name. They play an important part in grassland ecology by keeping the soil open and incorporating humus at lower levels in the soil.

The trail crosses the field heading south. The vegetation here is chiefly smooth brome grass, Kentucky bluegrass, and alfalfa, all non-native species originally sown for hay.

In spring and summer, watch for butterflies, moths and dragonflies as you cross this field. The silvery-blue butterfly is particularly common during June and early July.



Poplar Grove

The deciduous trees in this area are a mixture of balsam and aspen poplars. Both of these tree species produce upright shoots from their roots known as suckers. They can colonize open ground quickly by means of these suckers. The smaller trees are sucker shoots and may still be connected underground to the taller trees, their genetically identical parents.



Aspen, Red-osier Dogwood and Nettles

Look to your left (north) to see a small forest of tall aspen trees. Such aspen groves occur on the uplands in the Natural Area. Willows, too, proliferate in more open, but moist, areas.

The red-stemmed shrubs along the trail are red-osier dogwood, a favourite food of white-tailed deer and moose in this part of the world. Many twigs have had their tips bitten off by these ungulates, leaving a slanting or jagged cut, and causing the shrubs to branch repeatedly.

Common, or stinging, nettle plants are abundant here. Avoid brushing your bare skin against the leaves. The toothed edges on the leaves bear stinging hairs that break on contact, releasing histamines that cause an irritation that can last for several hours. Common nettle occurs in rich, moist, disturbed, often shady areas.

4

Willow Carr (Shrubland) with Lichens



You can tell the ground is wetter here than in the field, because the vegetation has changed. Moisture-loving plants, including willows, gooseberries and currants, wild raspberry, bracted honeysuckle, wild mint, hemp-nettle and tall sedges grow here. Do you see a very old, leaning willow covered with the pale green plaques of lichens? Although most of these willows are in a decline, some can still produce new life from shoots growing out of old trunks. Plant communities change over time. This area may become drier and more open, depending on the availability of water.

5

Alaskan Birch

Notice the dead Alaskan birch tree in front of you, with only part of its trunk remaining. It is known as a “snag”. Birches are pioneering trees, spreading by winged seeds and colonizing moist open ground, such as often occurs at the edge of peatlands. As a pioneer, like aspen, it is relatively short-lived (about 100 years). However, in this mature location, young trees are growing up to replace the old, dying or dead ones.

6 Hummocks and Hollows

The trail now passes through a forest community of coniferous trees (white spruce, tamarack) and Alaskan birch. Note the uneven ground surface: it is a mixture of hummocks and hollows. Such hummocky ground is likely the result of the alternate freezing and thawing of the waterlogged soil here. The hummocks around the tree roots provide good underground homes and seed caches for red squirrels. In May and June, the wet hollows are golden with marsh marigolds. These hollows make excellent nurseries for mosquitoes! In winter, they retain snow and may provide shelter for snowshoe hares.

7 Annual Growth Rings

The age of a tree can be determined by counting the number of rings seen in a cross-section of the tree trunk taken at stump height – about 30 cm off the ground. The distance between each ring equals the increase in trunk girth made in one growing season. Wide rings indicate seasons with good growing conditions; narrow ones, poor growing seasons. Can you make a rough estimate of how old this tree in front of you was when it was felled?



8

Windfallen White Spruce

Uprooted trees, by creating openings in forests, can initiate a change in plant composition. White spruce has a shallow root system and so is very susceptible to uprooting by wind, especially when it has grown tall. Shallow roots are an advantage in wet or waterlogged soils, where oxygen is present only in the upper layers. Standing dead trees (snags) and fallen trees (logs) continue to provide food and shelter for insects and various forms of wildlife. Ruffed grouse use logs for their drumming courtship behaviour. When fallen trees decay, usually with the aid of decomposing fungi, nutrients are recycled to the soil. With more light, shade-intolerant plants are then able to invade, increasing the diversity of the area.

*See Posts 10 and 20 for differences between white spruce and black spruce present in the Natural Area.

White spruce



Black spruce



9

Wild Sarsaparilla

Wild sarsaparilla is a common understory herb of woodlands in the Edmonton area and indeed throughout the boreal forest region. When its large, divided leaves first begin to unfold, they are wrinkled and purplish-red. As the plant matures, the leaves expand and become smooth and green. In the fall they turn golden yellow. Why might large, thin leaves be an advantage in a forest habitat?

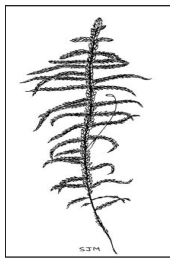


Black Spruce, Tamarack, Labrador Tea and Feathermoss Forest

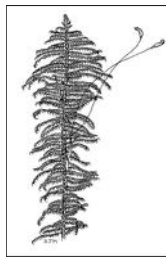
In this relatively dense and uniform forest, white spruce is outnumbered by black spruce trees, which are characteristic of muskegs (treed bogs). Tamarack trees are also present. Few plants can grow in the low light and acidic conditions. Labrador tea and mosses are the exceptions. Mosses make up much of the ground cover in northern forests. Three common mosses, known as feathermosses (stair-step moss, big red stem and knight's plume) form an extensive ground cover in these black spruce forests. Here they contribute to peat formation, but they can also be abundant in drier coniferous woods. During drought, mosses dry and become dormant but, after absorbing water directly from precipitation, they swell and resume photosynthesis and growth. Mosses play an important role in the ecology of woodlands.



Stair-Step



Big Red Stem



Knight's Plume

*These moss illustrations courtesy of S.J. Meades, Great Lakes Forestry Centre Herbarium

Hare "Runways", Labrador Tea and Twinflower

To your right, notice several well-defined narrow pathways or "runways" through the trees, most likely made by snowshoe hares. Such runways connect their shelter and feeding areas, and provide a fast escape route from predators if necessary. Hares usually have several runways in their territories; they clip the vegetation off in summer, and tamp down the snow in winter, to keep them open.

Prominent among the ground vegetation here is shrubby Labrador tea and the small, trailing twinflower, so called because of its dual pink, bell-like flowers.



Post 2—Poplar Grove in Winter



Post 3—Nettles



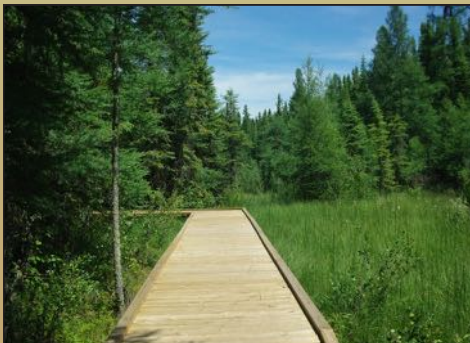
Post 6—Marsh Marigolds



Post 8—Wind-Fallen Spruce



Post 14—Fringed Gentian



Post 16—The Boardwalk



Post 19—Red Squirrel



Post 20—White Spruce Cones



Post 4—Willows



Post 5—Alaskan Birch



Post 11—Labrador Tea



Post 13—Marl Pond



Post 17—Tamarack Fall Foliage



Post 18—Twinflower & Bunchberry



Post 22—Yellow Lady's Slippers



Post 23—Bog Fritillary

12

Water Sedge



Look for dense tufts or hummocks of water sedge, a grass-like plant common everywhere in wet places – on lake margins, in ditches and sloughs, and in the fens and watercourses of the Natural Area. The slender, grass-like leaves have a characteristic bluish-white appearance, Especially in the spring.

13

Fens and Marl Ponds

Here we encounter the most distinctive ecological feature of Wagner Natural Area, the open fens and marl ponds. They occupy a broad channel in which water drains slowly northward. Notice the whitish or yellowish paste at the bottom of this shallow pond. This is marl - a mixture of calcium carbonate and aquatic plant and animal remains.

How does marl form? Calcium ions are present in the sands and gravels of the underground aquifers and they enter into solution with bicarbonate ions present in the water of the aquifer. Here a complex equilibrium between carbonate ions, bicarbonate ions, carbonic acid and carbon dioxide is established. When the water reaches the surface in springs, carbon dioxide is lost to the atmosphere. This “degassing process” increases the concentration of carbonate ions and as a result, insoluble calcium is formed and marl is deposited. Some bicarbonate ions and carbonic acid remain in solution; this is responsible for the buffering effect which maintains near neutral conditions (pH around 7) in the water of the fen.

It is this neutrality, as well as various mineral ions that occur in the groundwater and provide plant nutrients, that allows a greater diversity of plant life to flourish in fens than in the acidic conditions of bogs.

This pond is framed by a forest of tamarack and black spruce, growing where the ground is higher. These types of communities are known as treed fens.

14

Fen Flora

The fens are home to a great variety of plants that tolerate a high water table and neutral or alkaline conditions. In early spring, tufted bulrush, a major component of the fen ridges, is yellow with pollen. Also flowering in spring are arrow-leaved coltsfoot, bog rosemary and bog violet, followed by saline shooting-star. Seaside arrow-grass is abundant here and gives off a distinctive odour when trampled or crushed. Summer flowers include purple elephant's-head, rush aster, Kalm's lobelia, fringed gentian, northern grass-of-Parnassus, bog muhly grass and many others.

Observe a particular kind of curly brown moss growing at the edges of the marl ponds along the trail here. The shoots of this moss curl in a way reminiscent of a scorpion's tail and give the plant its scientific name of *Scorpidium scorpioides*. Other species of brown mosses can be found in the water and on the fen ridges.

In the waterlogged grounds of fens, dead vegetation accumulates very slowly. If the dead plant material accumulates faster than it decays, it forms peat. Peat core samples from the Natural Area indicate that it has been a peatland for about 4700 years!



15

Fen Fauna

Wood frogs and western toads breed in the marl ponds. After their eggs hatch into tadpoles in the early spring, it is a race to quickly metamorphose (transform) into adults before the water dries up in the summer. Dragonflies frequent these ponds in summer, hawking for mosquitoes. The marl ponds provide homes for a variety of aquatic invertebrates such as snails, water beetles, water boatman, caddisfly larvae, dragonfly larvae, water striders, and back swimmers.

Ahead of you is a boardwalk that spans some of the wettest parts of the fens. The original boardwalk was installed in the mid 1980s when the trail was opened. The present boardwalk was installed in 2010; its low height allows visitors a better view of the fens.

In the marl ponds themselves a few shorebirds may sometimes be seen, such as the solitary sandpiper, lesser yellowlegs and common snipe. The boardwalk is a good place to listen and watch for birds that frequent the surrounding forest. In spring, you will probably hear the white-throated sparrow's "I-love-Canada-Canada-Canada" call. Listen, too, for the persistently repeated song, ending on a rising inflection, of the red-eyed vireo. The ruby-crowned kinglet is a tiny, active bird that frequents tree branches. Its song is a characteristic "tea-tea-tea-tew-tew-tew look-at-me, look-at-me, look-at-me", sung on a rising and accelerating note.

Black-capped chickadees are frequent in the Natural Area, and often come to investigate visitors on the trail. In fall and winter chickadees travel in loose flocks to their favourite foraging sites.



17 Butterworts and Tamaracks

Along the trail close to the fens look for rosettes of yellowish-green leaves hugging the wet ground. In late June and early July a violet-like flower on a single stalk arises from the centre of each rosette. These are common butterworts, one of the Natural Area's several insectivorous (aka, carnivorous) plants. Insects get stuck on the greasy basal leaves and die; their body parts are digested by the plant and eventually absorbed into the leaf tissue. This is a good spot to admire the tamarack trees along the trail and across the marl ponds. Tamaracks are deciduous conifers whose needles turn golden in the fall, standing out in striking contrast to the dark green of the evergreen spruces. Tamaracks lose their leaves (needles) all at once at the onset of winter. Some people mistake the leafless winter tamaracks for dead trees, but fresh green leaves will appear in the spring. Years of reduced water flow, due to drought, has gradually filled in the marl pond here with vegetation such as great bulrush, water sedge, seaside arrow-grass and cotton-grass.

18 Forest Ground Cover

Several of the low herbaceous species forming a ground cover here are characteristic of coniferous forests in our area, or of mixed woods (conifers plus deciduous trees). Bunchberry, twinflower, bishop's-cap and woodland strawberry can thrive where enough light penetrates between the trees.

19 Red Squirrels

The red squirrel is common in mixed woods or coniferous forests, where it often reveals its presence with its harsh, ratchet-like alarm call. It is active all year except on extremely cold days. From midsummer onwards, it cuts off green cones from coniferous trees and drops them to the ground. It then caches them in middens, underground, or in piles beside logs. Look for heaps of discarded brown scales.

Black Spruce, White Spruce, and Lichens

Black spruce and white spruce trees mingle in the forest here. Black spruce tend to retain their cones on their top branches, so they are more difficult to find than the cones of white spruce, which are shed readily. Look for fallen boughs to see the stubby barrel-shaped cones of the black spruce. White spruce cones are more slender and cylindrical. Black spruce can tolerate wetter soils than white spruce, which become more abundant towards the upland areas.

Notice the abundance and diversity of lichens growing on the spruce trees here. Some are of the kind commonly referred to as old man's beard, whose clusters of green threads hanging from the branches represent a growth form of lichens known as fruticose, meaning "shrubby".

Lichens are formed by a relationship between certain species of fungi and algae. The fungus and alga live together, both benefiting from the association.



Forest Progression into the Field

Although river alders are usually found by running water, you will see on your left, as you move into the more open area, a group of these small trees. Uncommon in the Natural Area, river alders also occur along Morgan Creek, at the eastern side of the Natural Area.

The trail emerges into an open field, now being filled in by trees and shrubs. This previously-cultivated field has not been mown since the mid 1970s, and is slowly reverting to its natural forested state. Spruces, willows and birches produce copious numbers of light seeds which are effectively dispersed to colonize these open areas. After a succession of changes in vegetation, a stable or climax plant community may be established which persists for a long time, unless disturbed by fire, other natural hazards, or by man.

Yellow Lady's-slippers

In early to mid-June, yellow lady's-slipper orchids gleam brightly amid the grass and shrubs. Of the various species of wild orchids found in the Natural Area, this one was chosen as the emblem of Wagner Natural Area because of its beauty and relative abundance. The characteristic pouch or "slipper" is formed by the lowest petal of the flower and serves to entrap bumblebees. These insects enter it in a fruitless search for nectar, pollinating the flower as they exit. Orchids produce numerous tiny seeds that lack food reserves. Only by setting up a relationship with fungi in the moist soil can they obtain nourishment, develop and thrive. For even the common orchids, establishment and growth is precarious and slow.

Under NO circumstances should orchids be removed from the Natural Area. Care should be taken when photographing them not to trample vegetation or compact the soil.

Note the bushy shrubs with paired oval leaves, close to the trail guide box. These are Canada buffaloberry, which produces tiny yellow flowers early in May before the leaves open. Male and female flowers are on separate plants. The female plants will bear translucent red berries in late June to July.

Meadow Succession

The more north-western, drier, upland part of this old field is being filled in by native common wild rose and buckbrush shrubs. These flourish along with Canada goldenrod, a colonizer of abandoned fields. Weedy and alien invasive species such as Canada thistle, perennial sow-thistle, and smooth brome grass will persist here, unless they are deliberately removed.

White spruce saplings were originally planted here in 2005, by the Junior Forest Wardens of Spruce Grove. The Wagner Society regularly monitors them for survival and growth. In time, this field will become a forest.

Marl Pond Trail Check List: Year _____ Date _____

Herbaceous Plants:

- | | | |
|---|--|--|
| <input type="checkbox"/> Alfalfa | <input type="checkbox"/> Bishop's-cap | <input type="checkbox"/> Bog Muhly |
| <input type="checkbox"/> Bog Rosemary | <input type="checkbox"/> Bog Violet | <input type="checkbox"/> Bracted Honeysuckle |
| <input type="checkbox"/> Bulrush | <input type="checkbox"/> Bunchberry/Dogwood | <input type="checkbox"/> Canada Thistle |
| <input type="checkbox"/> Coltsfoot | <input type="checkbox"/> Common Butterwort | <input type="checkbox"/> Common Nettle |
| <input type="checkbox"/> Cottongrass | <input type="checkbox"/> Elephant's-head | <input type="checkbox"/> Fringed Gentian |
| <input type="checkbox"/> Goldenrod | <input type="checkbox"/> Grass-of-Pernassus | <input type="checkbox"/> Hemp-nettle |
| <input type="checkbox"/> Kalm's Lobelia | <input type="checkbox"/> Marsh Marigold | <input type="checkbox"/> Perennial Sow-thistle |
| <input type="checkbox"/> Round-leaved Orchid | <input type="checkbox"/> Round-leaved Sundew | <input type="checkbox"/> Rush Aster |
| <input type="checkbox"/> Saline Shooting-star | <input type="checkbox"/> Seaside Arrow-grass | <input type="checkbox"/> Twinflower |
| <input type="checkbox"/> Water Sedge | <input type="checkbox"/> Woodland Strawberry | <input type="checkbox"/> Tufted Bulrush |
| <input type="checkbox"/> Wild Mint | <input type="checkbox"/> Wild Sarsaparilla | <input type="checkbox"/> Yellow lady's-slipper |

Trees:

- | | | |
|--|-----------------------------------|--|
| <input type="checkbox"/> Alaskan Birch | <input type="checkbox"/> Aspen | <input type="checkbox"/> Balsam Poplar |
| <input type="checkbox"/> Black Spruce | <input type="checkbox"/> Tamarack | <input type="checkbox"/> White Spruce |

Shrubs:

- | | | |
|--------------------------------------|--|--|
| <input type="checkbox"/> Buckbrush | <input type="checkbox"/> Canada Buffaloberry | <input type="checkbox"/> Currant |
| <input type="checkbox"/> Gooseberry | <input type="checkbox"/> Labrador Tea | <input type="checkbox"/> Red-osier Dogwood |
| <input type="checkbox"/> River Alder | <input type="checkbox"/> Wild Raspberry | <input type="checkbox"/> Wild Rose |
| <input type="checkbox"/> Willows | | |

Mosses:

- | | | |
|---------------------------------------|--|---|
| <input type="checkbox"/> Big Red Stem | <input type="checkbox"/> Brown mosses | <input type="checkbox"/> Knight's-plume |
| <input type="checkbox"/> Peat Moss | <input type="checkbox"/> Stair-step moss | |

Others:

- | | | |
|--------------------------------|-------------------------------------|----------------------------------|
| <input type="checkbox"/> Algae | <input type="checkbox"/> Horsetails | <input type="checkbox"/> Lichens |
|--------------------------------|-------------------------------------|----------------------------------|

**Report any interesting finds, with a photo and the date found to:
info@wagnerfen.ca**

Mammals:

- Northern Pocket Gopher Red Squirrel Snowshoe Hare

Birds:

- Black-capped Chickadee Boreal Chickadee Common Snipe
 Lesser Yellowlegs Red-eyed Vireo Ruby-crowned Kinglet
 Ruffed Grouse Solitary Sandpiper White-throated Sparrow

Amphibians:

- Boreal Chorus Frog Western Toad Wood Frog

Invertebrates:

- Ants Backswimmers Caddisflies
 Dragonflies Mosquitoes Snails
 Spiders Water beetles Water Boatmen
 Water Spiders Water Striders

Butterflies and Moths:

- Fritillaries Gossamer-wings Sulphurs
 Cabbage Whites Police Car Moth Tiger Moths
 Swallowtails Silvery Blue Butterfly Caterpillars

Further Reading:

Plants of the Western Forest, Alberta, Saskatchewan, and Manitoba, Boreal and Aspen Parkland. 1995. Johnson, J.D.; Kershaw, L.J.; MacKinnon, A.; Pojar, J. Lone Pine Publishing, Edmonton, Alberta

Coyotes Still Sing in My Valley: Conserving Biodiversity in a Northern City. 2006. Ed. Ross W. Wein. "The Wagner Natural Area", P. Cotterill, 180-190.

Preserving our Natural Environment. Celebrating the Centennial of the Edmonton Nature Club. 2009. Ed. Brian Hitchon. "Wagner Natural Area and the Wagner Natural Area Society", A. Hendry, 87-95.

Wagner Natural Area Society thanks all who gave support for the Marl Pond Trail:

Alberta Conservation Association

Alberta Lotteries Fund

Alberta Tourism, Parks and Recreation

Nature Alberta

Parkland County

Recreation, Parks and Wildlife Foundation





Design, photos and text by Wagner Natural Area Society Members

If you do not wish to keep your trail guide, please return it to one of the boxes provided. But DO COME AGAIN! Wagner Natural Area is a place for all seasons!

**Donations and enquiries regarding membership can be sent to:
The Treasurer, Wagner Natural Area Society
26519 Hwy 16, Spruce Grove, AB T7X 3L4**

**Volunteer with the Wagner Natural Area Society by contacting:
info@wagnerfen.ca**

**For on-site questions or to report a non-emergency incident, please contact
the Parks Division, Government of Alberta, at 780-960-8170**