

# **An Overview of Ecological Services Provided by the Itaska Audubon Natural Area**

by  
Richard Quinlan and Ron Hammerstedt

## *About the Authors:*

**Richard Quinlan** is a retired, award winning professional wildlife biologist and educator with over 40 years of experience in wildlife biology and management. He was formerly an Area Wildlife Biologist, Species at Risk Biologist, and Provincial Program Head for Non-game Wildlife with Alberta Fish and Wildlife Division. Richard has also worked for the Canadian Wildlife Service and in private consulting on environmental impact assessment related projects. He most recently taught Wildlife Biology and Wildlife Habitat Management courses at Lethbridge College. Richard primarily contributed the Wildlife Habitat discussion to this document.

**Ron Hammerstedt** is a retired, award winning professional forester and educator with 40 years of experience in forestry and integrated resource management. He was formerly the Chief Forester and V.P. of Woodlands Operations for a large forest products company with divisions in both Alberta and British Columbia. This was followed by Managing Partner in an engineering and environmental consultancy with national and international clientele. He most recently taught Environmental Ethics, Environmental Impact Assessment and Integrated Resource Management at Lethbridge College. Ron primarily contributed the Descriptive, Forestry, and Ecological Services discussions to this document.

This paper is an overview discussion about the ecological services provided to both the Itaska Beach Summer Village and Pigeon Lake by the Itaska Audubon Natural Area. It is common to hear that natural areas that are not being logged, mined or otherwise exploited for natural resources, are really only possessed of aesthetic value. That is to say, they look "pretty" and are "nice" to have, but really have no measureable value to people. This could not be further from the truth. We will demonstrate with this brief discussion, that such areas actually provide essential, valuable, and measureable service to people and wildlife specifically, as well as to the surrounding environment in general.

## **A Brief Description of the Itaska Audubon Area:**

The area is comprised of 50 acres (20.2 hectares) of primarily forested wetland that lies along the north-eastern extent of the Itaska Beach Summer Village. The area falls within the furthest southern outlier of Alberta's Boreal forest and is known as the Boreal Dry Mixedwood Natural Subregion (southern climatic variant). Even though the Audubon area falls within this Subregion, it is heavily influenced by the adjacent Central Parkland Subregion. This close association with the parkland sets up what might be referred to as an atypical boreal ecology.

The Audubon area, even though quite small, is representative of a fairly broad range of sites. The area ranges from imperfectly to poorly drained Luvisolic (grey wooded) and Gleysolic (saturated) soils to fens with deep, organic soils. The imperfectly to poorly drained areas are characterized primarily by balsam poplar, trembling aspen, and white spruce overstories with red-osier dogwood, forbs and feathermoss understories. The fens are characterized primarily by a

black spruce overstory and an understory of dwarf willow, bog birch, Labrador tea, a few forbs, plus feather and peat mosses. Fens are more nutrient rich and less acidic than bogs. The result is that they are more amenable to tree growth. This is a matter of some importance later in our discussion. As an interesting sidebar, the fens in the Audubon area are also host to the carnivorous round-leaf sundew (*Drosera rotundifolia*). This could well be one of the most southerly occurrences of Sundew in Alberta. In addition, it has been noted that there are as many as six unique species of butterfly in the area.

The area is really quite unique in its ecology, which is found only within this relatively small niche in the province. To complicate matters, the adjacent parkland is heavily cultivated, and the transition between the two subregions is thus rather abrupt. In a less disturbed setting, the transition between the two would have been much more gradual. All of this means that what used to be (pre-cultivation) a wide protective buffer for the Itaska Summer Village and Pigeon Lake, has been greatly reduced. The relatively small Audubon area is now the primary buffer for the community and the lake from a number of potentially detrimental external forces. This small, protected area has to work hard to counteract these forces and in fact, it does just that.

### **The Audubon Area as Hydrology Regulator:**

There is a great tendency to underestimate the power of trees. A single tree will profoundly change the space that it occupies. However, a forest is something else entirely. Given an unlimited water supply, a forest can transpire an immense amount of water. For example, a single mature oak tree can transpire as much as 100 gallons of water per day during the height of the growing season, while a single giant sequoia can use as much as 500 gallons per day. The smaller and slower growing trees of Alberta might typically transpire in the range of 50 gallons per day, per tree.

A modestly stocked Alberta forest (such as the Audubon area) might be in the range of 400 trees per acre. If we use the conservative 50 gallons per day per tree on a 50-acre area, we arrive at an estimated **1,000,000 gallons of water per day** that is being transpired by the Audubon forest. This is greater than one and a half times the amount of water in a regulation Olympic swimming pool... per day. Imagine the contents of over one and a half Olympic swimming pools being dumped on the Itaska Beach Summer Village on a daily basis, all summer long. These figures might be shocking to anyone not familiar with tree physiology, but they are very real. I have seen and heard many tales of woe regarding flooded clearcuts that cannot be regenerated. Clearcutting of forests in high water table areas often leads to actual surface water flooding of the entire site due to the removal of the thousands of water pumps that trees represent. The Audubon forest is a very effective water pump and removal system that runs for 24 hours a day, seven days a week. It effectively controls the water table surrounding Itaska Beach so that it does not rise above ground level and render the area unusable. If the Audubon forest was removed, you would require a costly drainage system, to operate for 24 hours per day, all summer. The system would have to have the capacity to move 1,000,000 gallons per day... **but to where?** The forest pumps the water into the atmosphere and it is safely dissipated to become clean, filtered rainfall somewhere else. However, you cannot allow the unfiltered agricultural water into the lake (re: algal bloom issues) from a simple drainage system, and so in reality, there is no place to pump the water without first filtering it. The complications that would be created by removing the

natural water control system of the Audubon forest would become decidedly unwieldy. This introduces the next topic of clean water.

### **The Audubon Area as a Water Filter:**

Forests and wetlands are also very efficient water filtration systems. The approximately 1,000,000 gallons per day of ground water being transpired by the trees is filtered as the trees take up the nitrates and phosphates to build biomass, and store other impurities in the stems. It is then ultimately manifested as clean rain, somewhere down wind of Pigeon Lake. The ground water that is not utilized by trees is shunted through the understory vegetation and organic soil filter of the fens and other areas of the Audubon forest.

The filtering capacity of natural wetlands is well known and understood. As a result, both natural wetlands and engineered wetlands are commonly used for wastewater treatment in small towns and rural communities with great success. They are as efficient as chemical and mechanical systems. Such systems are near-zero energy input, free of chemicals and odors, and can provide waterfowl and other wildlife habitat. All of this simply emphasizes the point that the Audubon area is of great importance to the control of cyanobacterial blooms (and other impurities) in Pigeon Lake. The hard work that the community is doing to control external nutrient sources around the lake is only enhanced by the existence of the Audubon area. It is reasonable to suggest that if the original ecosystem represented by the Audubon area was still intact around the entire lake, then the external nutrient issue would be a minor problem at worst. The Itaska Beach Summer Village is quite blessed to have this small, but hard working ecosystem working for it.

### **The Audubon Area and Forest Fire:**

The recent increase in forest fire activity in Alberta and British Columbia is obviously of concern to many. Communities that are bordered closely by forests have been urged to consider various methods to reduce forest fire risk, usually via "Firesmart" programs. There are a couple of important features of the Itaska Beach Summer Village and the Audubon area that work in favour of the community regarding fire control.

One of the highly recommended (Firesmart) means of protecting properties is via landscaping around community houses and other structures with open areas of well-watered and groomed lawns. These are already in relative abundance in the community for control of external nutrient drainage and should be further promoted for fire protection.

A very useful structural feature of the community is the access road that runs the length of the community and acts as a very effective fire break. This is also a feature that is recommended in Firesmart programs. Fire breaks are, in fact, one of the first items to be established in any forest or prairie fire scenario.

The Audubon area is forested primarily with two poplar species: balsam poplar and trembling aspen. These are quite fire resistant species and are in fact, recommended by Firesmart BC to replace more fire oriented species around communities. The only significantly fire-oriented species in the area is a small stand of mature black spruce. However, it is largely surrounded by the less fire prone poplars and so is reasonably safe. In addition, the Audubon area is primarily a wetland and otherwise imperfectly drained area and so offers further protection against burning.

Although no guarantees can ever be made regarding fires, the Audubon area is a relatively fire resistant forest and the community is well placed to protect itself due to its current road structure and landscaping goals.

### **The Audubon Area as Wildlife Habitat:**

Trees, shrubs and other vegetation are intrinsically important in their own right, and for the ecological services already mentioned, plus have added importance to wildlife.

Without habitat, there is no wildlife, a fact recognised by most people who spend time in nature. Wildlife biologists organise their population surveys by habitat, birders arrange their trips by habitat, and hunters know how important it is to recognise the habitat of their target species. Habitat is where wildlife live. It's where they eat, drink and sleep. It's where they breed, nurture their young, and raise them until they become independent adults. Habitat includes physical structures, like rocks and soil of certain characteristics. Habitat includes water, both free-standing and that held within soil and vegetation. And habitat includes vegetation, important as food and shelter for wildlife species.

Some wildlife habitat management can be relatively simple. In the days of 'single species management', large areas of habitat were actively managed to benefit high-priority species, primarily those that were hunted or trapped. Ponds were built to attract ducks and forests were cleared to stimulate tender woody vegetation for moose to eat. More recently, as scientific knowledge advanced and societal values changed, our field of view has expanded to include other non-harvested wildlife species. We now recognise the importance of whole ecosystems and have multi-species objectives. We know it's important to have viable populations of all native species, and to retain their ability to interact with other species and their habitats. This allows for a healthy functioning ecosystem.

So, why are we talking about wildlife habitat? And what does it have to do with the Itaska Audubon property? As a professional wildlife biologist with over 40 years of experience, and as a person with roots in Itaska Beach, I'd like to share my experience and advice. Itaska Audubon is a rare little gem of wildlife habitat with great diversity. I hope I can help you realize the benefits the Itaska Audubon provides and advise you on how to look after it well.

The 50-acre Itaska Audubon provides an interesting and unique environment, and habitat for many species of wildlife. In a walk through the area in August, 2021, I saw and heard several species of wildlife and recognised habitat structural features of importance to wildlife, as listed below.

- Large white spruce trees of importance to seed-eating birds (such as crossbills), red squirrels, and nesting cover for songbirds and birds of prey.
- Large downed trees in early stages of decomposition available for use as ruffed grouse drumming logs and providing cover for small mammals such as voles, hares, and marten.
- Other downed trees in advanced stages of decomposition providing a substrate for fungal growth and inhabitation by insects, other invertebrates, and small mammals.
- Dead standing trees, known as snags, providing open perches for birds of prey like hawks and owls, and for insectivorous birds such as flycatchers.

- Snags with open cavities created by primary cavity-nesting birds (woodpeckers), that are also being used by secondary cavity-nesting wildlife including owls, songbirds, and bats.
- Clusters of black spruce trees in areas of Sphagnum (peat), feathermosses and sedges, providing bog-like characteristics for heath plants such as Labrador tea, willows and carnivorous plants, such as sundew; all combining to create habitat for frogs, toads, salamanders, voles, other small mammals, and even moose.
- A variety of deciduous forest areas, with balsam poplar, trembling aspen and white birch, varying in age and tree size, along with a diverse shrub understory; all providing suitable habitat for warblers, chickadees, nuthatches, flycatchers, thrushes, jays, accipiters (forest-dwelling hawks) and owls.
- Thick forest-floor vegetation important to small mammals, amphibians, and ground-nesting birds.
- Mammal dens amongst upturned roots, below large trees, and inside large woody debris on the forest floor.
- Edge habitats with heavy shrub and understory plant development that is important to edge-dwelling wildlife such as white-tailed deer, varying hare, yellow warbler, crows, magpies, and blue jays.

The Itaska Audubon has a diverse wildlife community and the wildlife are there because of the complex habitat structure provided by vegetation of multi-species and multiple ages. Much of the uniqueness is a result of vegetation becoming very old, to the point that it is dead or dying. This provides for completion of the successional process to and through climax forest stages and creates habitat structure and decomposition that's mostly lacking today in altered and managed areas of habitat. It is, in effect, a close replication of old-growth forest such as could have been found in some parts of Alberta's Parkland and Boreal Mixedwood natural regions in pre-settlement times.

In short, the Itaska Audubon is great wildlife habitat! So... what should you do?

It's a matter of how much risk you want to take. If you plan a high level of intervention or use, as done for resource extraction or high levels of recreational use, then you'll negatively impact some wildlife and their habitats. That's why environmental impact assessments are done – to document what's there, predict what the impacts will be, and lessen those impacts by recommending and carrying out special measures. If, on the other hand, you decide upon little intervention, no resource extraction, and only low-intensity use, then the risks are less and possibly negligible. Under such a low-risk scenario it can be assumed that wildlife species composition and population levels will only be minimally impacted by some adjacent activities. Impact assessments aren't needed under low-risk scenarios. Periodic surveys may be done to detect trends in wildlife and habitat. This soft-stepping approach is suitable for Itaska Audubon, provided human use remains low and new developments, extractions and interventions are avoided. The Itaska Audubon is a real wildlife habitat gem – right in your back yard. By using minimal intervention and making well-informed decisions, you can continue to conserve it well.

**Conclusion:**

We recommend a light touch in the Itaska Audubon Natural Area for all of the above reasons. The ecological services and wildlife habitat provided by the Audubon area are very significant and would be difficult, if not impossible to substitute by any other means. One of the greatest attributes of natural systems is that they provide all of their services with virtually no cost and no maintenance. Nowhere else would you receive all of the above benefits virtually for free.