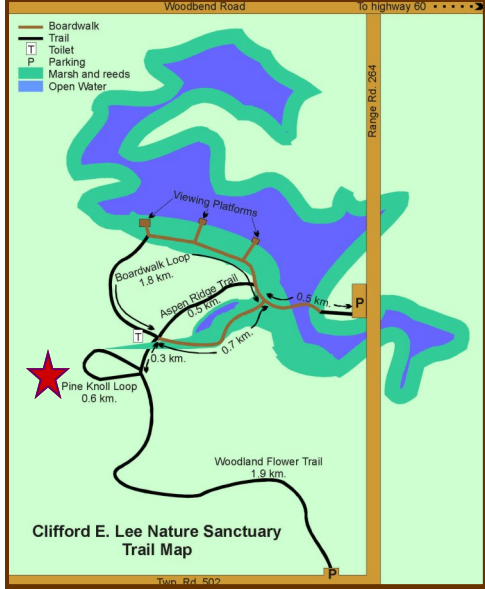
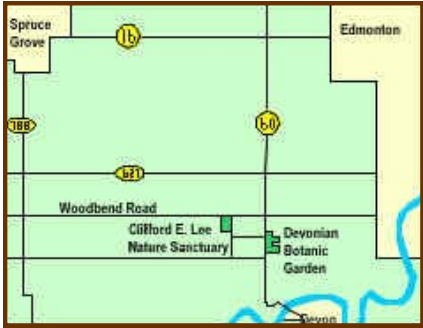


# Trail Map



## Directions

33km SW of Edmonton city centre. Take highway 16 W to highway 60, go S for 13.2 km to Woodbend Rd. and turn W for 1.6km then S for 1.4 km.



The Sanctuary is open to the public year round free of charge. Donations are encouraged on site or they can be sent to:

51306 Range Road 264  
Spruce Grove, Alberta  
T7Y 1E7



Clifford E. Lee Nature Sanctuary



# Clifford E. Lee Nature Sanctuary



# Pine Knoll Trail

Explore this ecological must see!

## Pine Tree Facts

Pine trees have **serotinous cones**, meaning they require intense heat, like kind you'd get from a fire, to open and release their seeds. Extreme heat is essential to



opening the scales on the cones as they are sealed with **resin**, a natural glue. Once the scales are open, the cone can fall to the ground spilling the seeds on the forest floor. Sometimes wind gives flight to the winged seeds, scattering them amongst the forest. As the seeds land on the freshly exposed mineral rich soil, they germinate

### Interesting Fact

Jack Pines have an advantage over other trees in colonizing burnt-over sites because their saplings, young trees, can produce a cone crop as young as 3 years of age.

quickly. The seedlings also grow rapidly, nourished by nutrients that are released into the soil after a fire. When observing the pine trees, you may notice slight variations between them. Height and trunk diameter are determined by the age of the tree and thickness of the surrounding stand of pine trees. A Jack Pine can grow up to 20 meters high with a 30 cm diameter at the age of



150 years. In rare situations the diameter of a Jack Pine can reach 60 cm. Jack Pine needles range in length from 2 to 5 cm. Usually the needles are straight, but sometimes they can be slightly twisted. Due to their stiffness and their sharp-pointed spread-apart ends, the yellowish-green Jack Pine needles

are not touch-friendly. The cones tend to vary in shape from egg shaped to conical, with straight or slightly curved sides. The average length of the cones is between 3 to 8 cm. Smooth or prickly scales cover the cones, which are found in clusters of 2 or 3. Young yellowish-green **Jack Pine** twigs mature into dark grayish-brown to grey branches. On old tree trunks the bark turns dark brown and flaky, and is furrowed into plates.

The sanctuary is located on the boundary between the ranges of the Jack Pine and the **Lodgepole Pine** (below). Consequently, some of the pine trees in this area may be a Lodgepole Pine or a **hybrid** with the Jack Pine. Hybrids are produced when pollen of one species fertilizes the eggs of another species. Hybridizing is quite a natural occurrence, because these two pines are so similar. There are still a few distinct differences. Both trees have two needles per cluster, but the Lodgepole Pine needles have a definite spiral twist.



Also, while both trees have curved cones, the Jack Pine cones point forward and away from the stem while Lodgepole Pine cones point towards the stem.

### Historic Tidbit

The First Nation's people of this area used Lodgepole Pine for their teepee poles, hence the name.

### Sources:

McGillivray W.B. Semenchuk G.P. 1998. The Federation of Alberta Naturalists: Field Guide to Alberta Birds. Federation of Alberta Naturalists.  
Farrar J.L. 1995. Trees in Canada. Fitzhenry & Whiteside Ltd and the Canadian Forest Services.

Design by: Sacha Mulholland 2007



# The Pine Knoll Trail

## At the Entrance

As you begin to walk along the path leading to the Pine Knoll Loop trail, notice that there are **Willow** shrubs on your left and **Trembling Aspen** trees on your right. The trail marks a point of change where one kind of plant community is being replaced by another, which is known as **forest succession**.



Succession is a natural pattern of change that occurs over time as plants compete for limited resources. Early successional stages usually consist of faster-growing, shorter-lived trees like Aspen. Later stages are made up of slower growing trees that live longer lifespans, such as the **Jack Pine**. Most often in moist aerated soil environments, Willows (above left) are replaced by Trembling Aspens.

## Listen & Look for...



**Yellow-rumped Warbler**  
**Sound:** Loose musical trill that sometimes changes pitch

**Yellow Warbler**  
**Sound:** a clearly whistled “see-see, ti- ti-see” with emphasis on the last 3 syllables



## As You Continue



The path now climbs to a clearing which is home to plants like the **Wild Raspberry** (left) as well as the **Wild Strawberry** (above right). The most interesting resident living in the clearing is the Trembling Aspen, a tree which is known for its ability to multiply. A single Trembling Aspen is usually responsible for cloning an



entire tree stand, consisting of thousands of trees. Therefore when you see a stand of Trembling Aspens, you’re truly seeing a “one of a kind” tree!

## Quick ID

Small round leaves that tremble in the wind; reddish-brown buds; whitish bark.

## Listen & Look for...



**White Crowned Sparrow**  
**Sound:** One clear whistle mixed with a trill. Their call note is a sharp “chink.”

## Funny Piles of Dirt

You may have noticed small mounds of dirt scattered randomly alongside the trail. They are the work of the **Northern Pocket Gopher**. These little critters are usually the colour of the local soil and very rarely venture above ground. If they do leave their several hundred foot tunnel system, it’s usually to go no more than 2.5 metres



from the entrance.

## Leaving the Clearing

As you continue through the Trembling Aspens, the trail divides. Follow the path to the right where the first pine trees soon come into view. These pines, known as Jack Pines, like to grow in sandy acidic soils that are well drained and fairly dry. Being one of the first species to grow on bare mineral soil makes the Jack pine a **pioneer species**. Pioneer species are usually shade intolerant, meaning they will not grow in the shady **understory** found in a mature stand of trees. When



there is a disturbance like a fire or disease, breaks in the stand are created, allowing the sun to reach the forest floor. This makes an

opening for the Jack Pine. Without a disturbance, the final phase of succession, The **climax forest**, will occur with the Jack Pine being succeeded by the **White Spruce**, a more shade tolerant tree. The last disturbance that occurred in this area was a fire in 1961.

## The Pine Canopy

Further along the path you’ll come upon an area where the Jack Pines are quite thick at the top, or the **canopy**. Consequently, little sunlight reaches the forest floor, minimizing the amount of understory growth. Over time dry dead pine needles form a thick blanket on the ground. This makes pine forests prone to ground fires.

## Forest Neighbours to the Jack Pine

Now that you

have rounded the corner, you will observe the **Paper Birch** (right), **Beaked Hazelnut** and the Trembling Aspen that also live in the Jack Pine community. Local residents of the community, like the **Red Squirrel**, feed on pine cones and hazelnuts as they ripen. **Chickadees** are also seen through this area and allow you to come close due to their



curious nature and fondness for company.



Beaked Hazelnut



## Historic Tidbit

This and other areas in the sanctuary were once sand dunes that were formed on the west shore of Glacial Lake Edmonton. Lake Edmonton covered most of the city during post glacial times, thus creating the perfect habitat for the Jack Pine.

## Listen & Look for...



**Black-Capped Chickadee**  
**Sound:** a clear “chick-a-dee-dee-dee” or a clearly whistled “per-ter” in the spring



Red Squirrel



**Photo Credit:**  
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<http://www.forestryimages.org>