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Harvest Species

NAOS

Betula papyrifera
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Amelanchier alnifolia
Arctostaphylos uva-ursi
Betula pumila
Cornus sericea
Dasiphora fruticosa
Empetrum nigrum
Prunus pensylvanica
Prunus virginiana
Ribes species
Shepherdia canadensis
Vaccinium myrtilloides
Vaccinium vitis-idaea
Viburnum edule
10 forb species

SAOS

Salix exigua cuttings
Populus balsamifera cuttings

COLK

No harvest in 2020

Species of Interest

Paper birch (*Betula papyrifera*) is a common tree species found growing in the boreal region of Alberta on a variety of soils. It is prevalent on rolling up-land sites especially on well-drained soils but can be found along swamp margins and in bogs. It is a shade-intolerant, early pioneer and is one of the first species to colonize areas following fire or other disturbance. When growing in open areas it is often multi-stemmed. Paper birch produces large amounts of seed most years. Seeds are small and papery-winged allowing them to spread extensively in the wind. The name paper birch alludes to the tree's thin white bark that peels away in papery layers from mature trunks. Other common names for this species include canoe birch (in reference to traditional use) and white birch. The bark is an important winter browse for moose and seeds provide food for many passerine birds. The sap is favoured by yellow bellied sapsuckers and often, one can see a series of holes drilled by this species into the trunks.



Paper Birch

Photo Credit: Treetime.ca

A similar species, *B. neoalaskana* (Alaska birch or resinous birch) is only found in northern Alberta and the Territories. The main identifying feature between these species is found in the leaves. *B. papyrifera* has hairs along veins whereas *B. alaskana* does not. Otherwise, they are of similar size and shape, have the same peeling bark and grow in similar environments.

2020 Harvest Partners

NAOS: Canadian Natural Resources Ltd., Imperial Oil Ltd.

SAOS: Conocophillips Canada

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Seed Dispersal

Seed dispersal is the transport of seeds away from a parent plant, and because plants are stationary, it is crucial for continued survival. It allows plants to spread and colonize new areas and is an important factor in revegetating disturbances. Although some plants merely drop their seeds (gravity dispersal), others have evolved to take advantage of both biotic and abiotic mechanisms to more widely distribute their seed, thus ensuring that seedlings do not compete with the parent plant for space, light, water and nutrients. Abiotic seed dispersal generally involves either wind or water whereas biotic dispersal is accomplished by animal vectors or by autogenic mechanisms such as ballistics.

Wind dispersed seeds have developed structures such as wings or hairs (pappus) to take advantage, in some cases, of even the slightest breeze. There are two types of winged seeds, those that are lightweight and have papery wings (e.g. paper birch and green alder) such that seeds can travel great distances on the wind and heavier seeds with a single wing that allows seeds to slowly descend or flutter to the ground (e.g. white spruce and maples) allowing seeds to travel at least a short distance from the parent. Seeds with pappus or other hair-like structures are often produced by herbaceous perennials or annuals and are characteristic of many weedy or early pioneer species (e.g. dandelions). However, important in this group are early seral boreal tree and shrub species such as aspen, poplar and willows. Light-seeded species produce prodigious amounts of seeds to ensure that at least some find suitable sites on which to germinate



Paper birch seeds—each with two papery wings.

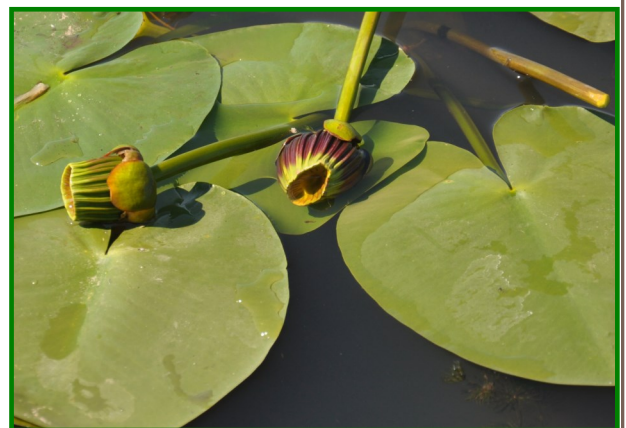
and thrive. Heavier seeds with a single wing have a greater chance of landing on a suitable sites as they do not travel as far from the parent plant. A very specific type of wind dispersal occurs with annuals or biennials when the entire plant or a portion of the plant dries up, breaks off and tumbles across the landscape dispersing seed as it travels

(e.g. Russian thistle or tickle grass). This phenomenon is generally limited to grasslands and deserts but can be a problem with weedy species on large open disturbed sites.

Seeds dispersed by water can travel long distances especially in river systems. Although most water-dispersed species are tropical, in Alberta, yellow-pond lily produces seeds in an inflated capsule that will float for a period of time before sinking to the bottom of a pond or lake, where, if conditions are suitable, seeds can germinate. Ratroot seeds are also disseminated to some extent by fruit breaking off and floating to new locations.



Aspen seeds with attached hairs emerging from ripe capsules.



Yellow pond lily seed pods will float for a period of time then sink to the bottom where seeds can germinate and take root.

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Seed dissemination by animal vectors is accomplished by both external and internal means. Seed or fruits of some plants have evolved structures that allow them to attach to animals whereas other species have developed fleshy fruit that are consumed by foraging wildlife. Twinflower (*Linnaea borealis*), produces small fruit with tiny bristles, and beggars ticks (*Biden cernua*) an annual species native to boreal riparian zones, produces seed with barbed hooks. Both are spread by attaching to animal fur or bird feathers. Many of the shrub species that are important for revegetation in boreal Alberta produce seeds that are surrounded by attractive, nutritious fleshy fruits (e.g. Saskatoon, pin cherry, buffaloberry). These are consumed widely by mammals (e.g. bears, ungulates, bats) and birds. Caching of seeds and fruit by squirrels is another means of dispersal. It is notable that plants have evolved to produce fruit in the same season that mammals and birds are feeding heavily or storing food for winter.



Saskatoon and Canada buffaloberry fruit — nutritious and appealing to wildlife
Photo Credit (Saskatoon) Meggar, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=604930>

Finally, some plants have developed ballistic means of spreading their seeds. Energy stored in drying fruit tissues is released and transferred to seeds to increase their dispersal distance. The mechanism is often triggered by something touching the seed pod or by movement such as wind. Touch-me-not (*Impatiens capensis*) found in riparian areas, and the early pioneer crane's bill (*Geranium bicknellii*) both expel their seeds in this manner. See a video of touch-me-not seed release at the following site:

<https://www.youtube.com/watch?v=48YAHg-kY10>

Related Reading

Roberts, D, S Ciuti, QE Barber, C Willier & SE Nielsen. 2018. Accelerated seed dispersal along linear disturbances in the Canadian oil sands region. *Sci Rep* 8, 4828 (2018).

Publications of Interest

Robb, L. 2019. Seed Matters 1: Recommendations for aspen seed collection and handling. [Government of Alberta](#)

Robb, L. 2020. Seed matters 2 : Extracting and handling five-needle pine seed in Alberta. [Government of Alberta](#)

Mackenzie, D.D. and M.A. Naeth. 2019. Native seed, soil and atmosphere respond to boreal forest topsoil (LFH) storage. [PLoS One 14\(9\)](#).

Ali, M.H., J-M. Sobze, T.H. Pham, M. Nadeem, C. Liu, L. Galagedara, M. Cheema and R. Thomas. 2020. Carbon nanoparticles fFunctionalized with carboxylic acid improved the germination and seedling vigor in upland boreal forest species. [Nanomaterials 10\(1\)](#)

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