Oil Sands Vegetation Cooperative

In This Issue:

2016 Harvest

NAOS

45 L Saskatoon
11 L buffaloberry
1 L beaked hazelnut
86 L dogwood
0.14 L currant/gooseberry
10 L dwarf blueberry
22.5 L chokecherry
32 L bearberry
21.3 L bog cranberry
51 L green alder
0.1 L river alder
19.5 L paper birch
30 L shrubby cinquefoil
5.75 L Labrador tea
31 L lowbush cranberry
10.25 L prickly rose
Total: 376.5 L

SAOS

80 L green alder
12 L bog birch
82 L paper birch
5 L Labrador tea
15 L dwarf blueberry
7.5 L bog cranberry
Total: 201.5 L

COLK

40 L aspen
39.25 L buffaloberry
5 kg jack pine (purchased)
Total: 79.25 L

HORSE RIVER WILDFIRE

Wildfire (Photo — Wikimedia commons)

In the spring of 2016, a devastating wildfire raged through the City of Fort McMurray and surrounding areas. By the time the Horse River Fire was determined to be under control on July 5th, approximately 590,000 ha of land had been burned. Beyond the damage to infrastructure and the significant impact to the people of the Regional Municipality of Wood Buffalo, many of the OSVC's historical collection areas in CM2.2 and CM2.1 were decimated. Effects of the fire were felt most keenly by the North Athabasca Oil Sands (NAOS) members, who were unable to harvest aspen and buffaloberry which had dispersed prior to regaining access to collection areas. Most of the harvest from CM 2.2 was hampered, but collection sites were found in CM 2.1 for many of the remaining shrub species. A disaster like this, both the Horse River Fire of 2016 and the Richardson Fire of 2011 (that burned ~700,000 ha), reinforces the need to bank seeds for use when harvest isn't possible.

Fresh growth in a newly burned area near Willow Lake (Anzac) in August 2016. (Photo—WRC)

Although the recent fire has left a terrible scar, the forest will recover. Several herbaceous species will emerge quickly and cover large areas providing microsites for establishment of later seral species. Shrubs and trees including aspen, green alder, red osier dogwood, red raspberry, pin cherry and beaked hazelnut will resprout from root crowns in areas where the fire was not as severe, perhaps providing cuttings materials to establish stooling beds. Species such as blueberry will produce prodigious amounts of fruit in response; an opportunity for banking seeds in the next few years.

OSVC 2016 Harvest Partners

NAOS: Canadian Natural, Imperial, Shell, Suncor and Syncrude

SAOS: ConocoPhillips, Statoil and Suncor

COLK: Canadian Natural, Imperial and Suncor

SPECIES OF INTEREST

Bearberry flowers in late spring. (Photo —WRC)

Arctostaphylos uva-ursi (bearberry) is a common species in the northern forests of Alberta and is particularly well adapted to the frequent wildfires that drive boreal forest dynamics. It is of great cultural value to many First Nations who have historically used the fruit as a winter foodstuff (Marles *et al*. 2000). Bearberry is a prostrate, evergreen suffrutescent shrub with a thin, exfoliating bark and long trailing branches. The small pinkish flowers are borne in terminal racemes early in the season (May through June) and result in brilliant red, berry-like drupes. Each fruit contains 6-10 nutlets that are united in a large single 'stone'. Roots of this plant can penetrate deeply (up to 2 m), especially on drier, coarse textured soils (Nimlos *et al.* 1968). Although aboveground portions of the plants can be destroyed by intense fires, they can resprout from nodal buds on underground stems. The new branches grow and spread very quickly to provide early cover on exposed sites. Stems will produce feeder roots at nodes to capture nutrients released by fire. Smreciu & Gould (2009) evaluated this species for use in reclamation and found that it was extremely easy to produce container stock from stem cuttings taken in May from areas which had been recently burned. Growth and establishment on reclaimed areas was excellent with 88-100% survival on open sites. Nursery production of seedlings can be achieved from seeds that have been acid scarified and stratified (Smreciu & Gould 2009).

Bearberry fruit is a brilliant red, drupe containing a 'stone' of fused nutlet seeds. (Photo—Wikimedia)

Marles, R.J., C. Clavelle, L. Monteleone, N. Tays and D. Burns. 2000. Aboriginal plant use in Canada's northwest boreal forest. UBC Press. Page 175.

Nimlos, T.J., W.P. Van Meter and L.A. Daniels. 1968. Rooting patterns of forest understory species as determined by radioiodine absorption. Ecology 49(6):1145-1151.

Smreciu, A. and K. Gould. 2009. Priority shrub species; propagation and establishment. Final Report. Prepared for CEMA. 20 pp. + appendices.

The OSVC has submitted an abstract to present a paper at the 'Biodiversity Without Boundaries' conference in Ottawa April 9-13, 2017. For more information:
http://www.natureserve.org/news-events/events/biodiversity-without-boundaries-2017

New Harvest Contractor

The NAOS contracted Paragon Soil & Environmental Consulting Inc. to complete their 2016 harvest. Boreal Horticultural Services continued to supply harvest services to the SAOS and COLK divisions.

FIRE EFFECTS ON BOREAL SPECIES

Wildfires are a natural disturbance common to the boreal forests of northeastern Alberta. Typically fires in this area have a fire return interval of 75 to 100 years, with fire intensity being affected by a variety of factors including climate, vegetation and stand age. Forest fires produce a heterogenous landscape throughout the boreal region.

It is well documented that periodic wildfires release seed from serotinous cones, such as those of jack pine. Less obvious are species that respond to other physical and/or chemical cues resulting from burning (VanStaden *et al.* 2000). Increased light levels resulting from elimination or extreme thinning of the canopy, can stimulate germination and emergence of some herbaceous species such as fireweed, wild strawberry and Bicknell's geranium. Mallik and Gimingham (1985), in a study in the UK, simulated the dry heat of a heath fire on seven heath species (including bog cranberry or *Vaccinium vitis-idaea*) by putting seed in an oven at 50-200 °C for 30 seconds to 3 minutes. Most species in the study benefited from exposure to brief blasts of heat although some still required a cold stratification. Sampson, as early as 1944 reports that chokecherry seed germination is stimulated by heat from fires.

Fireweed —a common sight following fire in the boreal forest . (Photo— Wikimedia)

Wild strawberries are abundant in open areas following wildfires. (Photo—WRC)

Chemical cues include release of nutrients, gas exchange and smoke. This latter is so effective that the use of smoke and smoke-water are not uncommon in reclamation or horticulture to encourage germination. Smoke can interact with growth hormones (gibberllins, cytokinins, abscisic acid and ethylene) (VanStaden *et al.* 2000).

Aside from germination, root and stem fragments often sprout following fire. In fact, sprouting and resulting regrowth can make ideal cuttings for vegetative propagation. This is particularly true in prostrate shrubs like bearberry which can produce new shoot growth of over a metre in length!

Mallik, A.U. and C.H. Gimingham. 1985. Ecological effects of heather burning II. Effects on seed germination and vegetative regeneration. Journal of Ecology 73: 633-644.

Sampson, Arthur W. 1944. Plant succession on burned chaparral lands in northern California. Bull. 65. Berkeley, CA: University of California, College of Agriculture, Agricultural Experiment Station. 144 p.

Van Staden, J., N.A.C. Brown, A.K. Jager and T.A. Johnson. 2000. Smoke as a germination cue. Plant Species Biology 15: 167-178.