Non-Chemical Control of Russian olive Trees   February 2023

Native to Europe and Asia, Russian olive (*Elaeagnus angustifolia*) was introduced to Canada as an ornamental and a shelterbelt tree. Although aesthetically pleasing with its silver green leaves, medium height, and fragrant blossoms, the Russian olive tree has significant negative impacts on southeastern Alberta's grassland ecosystem. Russian olive trees have become ubiquitous in Medicine Hat and surrounding areas. Dense stands and individual trees are readily found in riparian areas (stream banks and edges of ponds), wetlands, and roadside drainage ditches. They are also found in golf courses, coulees, natural areas, gardens, and around stormwater management ponds. The Russian olive produces numerous fruits (olives), containing a seed each, that are easily dispersed by birds and other wildlife. This tree can extract (fix) nitrogen from the air, and with other essential nutrients (phosphorus and potassium) available from the soil, it grows luxuriantly. It can also tolerate some degree of soil salinity or alkalinity. In southeastern Alberta's semi-arid climate, there are few diseases or pests to hinder its growth. These characteristics make it a highly invasive species that once established, is very difficult to eradicate.

Russian olive trees have shaded and outcompeted many species of native shrubs around Connaught Pond, Medicine Hat

A Russian olive tree growing in the middle of an open grassland outcompetes native silver sagebrush shrubs, forbs, grasses, and wildflowers. It robs native vegetation of soil moisture, sunlight, and nutrients, affecting pollinators (bees, butterflies, moths), birds, and other wildlife that depend on these native plants for food and habitat. Although Russian olive trees are used by generalist bird species, some specialist bird species prefer open grassland or tall riparian trees such as

Numerous fruits of Russian olive trees

cottonwoods. Beavers also prefer native trees (cottonwoods, MB maples), willow trees, and shrubs (chokecherry). Thorny Russian olive thickets provide little opportunity for deer to rub. Russian olive growing around waterbodies deposit leaves and fruits that negatively impact water quality and aquatic organisms.

A Russian olive tree growing inside a native golden currant shrub

To control Russian olive in Medicine Hat and area, SEAWA has developed cultural methods (non-chemical), derived from its field experiments conducted during 2019-2021. The use of chemicals must be avoided in riparian areas due to the risk of contaminating water bodies. In addition, cultural methods are easily done by volunteers.

Cultural control methods and their suitability for various types of volunteers are listed on the next page.

Tools: sturdy shovel or spade, a pair of loppers, pickaxe, hatchet, battery operated chainsaw (optional), branch saw.

Seedlings (about 5mm diameter, less than a meter in height). Using a shovel, dig around the seedling to at least 15cm deep and uproot it. Extract as many roots as possible. Put back the soil, level and stomp it with your feet. Leave the seedlings on the ground to decompose. This activity is suitable for school kids who are comfortable with hand tools.

Saplings (bigger than a seedling, smaller than a young tree, 40mm or less diameter). Trim the branches and the top as needed. Using a shovel, dig around the sapling about 30cm deep, uncover the roots around it (30cm radius or more) using a shovel or a pickaxe. Try to extract long roots as far as you can. Use a pair of loppers to cut off roots and separate the sapling. Put back the soil, scrape more soil from around the hole, cover completely, and stomp it with your feet. Ensure that cut ends of remaining roots are properly covered with soil, so they don't get sunlight. Otherwise, they will grow back. Sprouts can also be covered with a heavy-duty black plastic garbage bag to keep them in the dark. If the area is not within the sight of people who expect a "clean" park appearance, you can leave the cut saplings on site. Their nutrients/organic matter should return to the soil. This is a suitable activity for adult volunteers.

Uprooted Russian olive sapling

Young trees (40-100mm diameter). Trim branches and cut the trunk using a chainsaw or a branch saw. The stump should be at about 30 cm height to facilitate wrapping with a heavy-duty black plastic garbage bag, tied with twine (wound several times) at the base of the stump (darkness enforcement). Use a hatchet to make dents at the base of the stump to secure the twine. Spread the bottom edge of the garbage bag such that it covers the wider base of the stump. You can lay cut branches/stones around to help keep the bag in place. Keep the bags on for at least 2 seasons. If the garbage bags have holes or are ripped, the Russian olive will regrow through those holes. Check after one season if another layer of garbage is to be added to cover holes.

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Mature trees. You will need a professional tree cutter. If the stump size is too big to be covered by a heavy-duty black garbage bag, then cut the stump level with the ground surface. Cover the stump and any protruding or shallow roots with three layers of weed control landscaping fabric (darkness enforcement). Secure with sturdy pins at the sides, add stones and other materials to weigh it down. Cover for at least three seasons. Cut trees should be disposed of according to local bylaws.

For safety reasons, invite volunteers to do stump covering after the tree cutting operation is done.

Photo credit: Ben White

Covering a tree stump with a heavy-duty black plastic garbage bag

Remove Russian olive trees before their fruiting period. Plant native trees or shrubs as replacement of removed Russian olive trees.

Russian olive infestation causes a decline in biodiversity and reduces ecosystem resilience through its natural cycles of drought, floods, fire, and pests and diseases. Removal of invasive species helps restore and conserve ecosystems —terrestrial, aquatic, or riparian – and helps mitigate the risks of a changing climate.

The methods that SEAWA has developed for controlling Russian olive are simple and straightforward, allowing anyone, with a bit of effort, to take direct action to protect the environment.

Volunteers removing Russian olive saplings that have invaded the cottonwood riparian forest by the South Saskatchewan River at Medicine Hat.