

PETITION TO PLACE RUSSIAN OLIVE (*ELAEAGNUS ANGUSTIFOLIA*)
ON THE MONTANA STATEWIDE NOXIOUS WEED LIST AS A
CATEGORY 4 - WATCH LIST SPECIES

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Introduction: Russian olive is a commonly planted, Eurasian tree that was originally introduced as an ornamental plant in North America. Although considered a desirable component of windbreaks in the semi-arid environments of Montana, it has spread from intentional plantings and invaded many riparian areas in the state. It has also shown potential to dominate riparian and lowland sites, causing serious ecological changes to these important habitats. Potential losses include wildlife, agriculture, and recreation.

Because of its invasive nature, control programs to remove Russian olive are becoming more common. As an example, the plant is currently targeted for control by conservation and weed districts along portions of the Marias and Yellowstone Rivers in Montana (Attachment A), and it is on the county noxious weed list in Treasure County.

History: Russian olive is native to southern Europe, and central and western Asia (Little 1961), and was introduced into North America during colonial times, probably for ornamental purposes (Elias 1980). Since ca. 1900 it has been planted for windbreak and wildlife enhancement purposes, and has become extensively naturalized throughout the western United States, especially in riparian areas (Christiansen 1963, Little 1961, Olson and Knopf 1986a, b, Katz and Shafroth 2003). Russian olive has been planted for windbreaks in Montana since at least 1953 (Montana Department of Natural Resources and Conservation nursery data), and the first collection of a naturalized plant was taken in Lake County in 1966 (Invaders Database). Naturalized trees now

occur along most major rivers in the Great Plains portion of the state (Olson and Knopf 1986a). Until just recently planting of Russian olive has been subsidized by state and federal agencies in Montana; an average of 40,000 Russian olive nursery stock have been distributed by state and federal agencies each year (Montana Department of Natural Resources and Conservation (DNRC) nursery data). In 2008 the DNRC nursery destroyed their stock of Russian olive, but it is still available from private nurseries. Russian olive is listed as noxious by the states of Colorado, New Mexico and Wyoming, as well as several counties in Utah.

Biology: Russian olive is a small tree; naturalized plants may reach 10 m tall in Montana. Roots systems have deep vertical as well as shallow and nearly horizontal components. Russian olive branches at ground level in moist, unshaded sites; however, it branches well above ground level in drier, shaded habitats (Lesica and Miles 2001). Twigs have spines, and branches elongate each year by growth from a lateral bud near the terminus of the previous year's growth. Russian olive is capable of sprouting from the base when damaged. Mature trees bear nectar-producing flowers (Hayes 1976) that mature into numerous clusters of small, edible, berry-like fruits in late summer. These fruits float for at least 24-48 hours once they are fully mature (Lesica, unpublished data), and can be dispersed by water. Seeds are also dispersed by fruit-eating birds and mammals (Olson, 1974, Kindschey 1998, Lesica and Miles 2004). Seeds germinate under a wide variety of moisture conditions at different times of the growing season (Shafroth et al. 1995). Russian olive fixes nitrogen in its roots through a symbiotic relationship with the bacteria *Frankia* spp. (Huss-Danell 1997).

Russian olive is shade tolerant (Campbell and Dick-Peddie 1964), capable of reproducing beneath a cottonwood canopy or in other shaded sites. Consequently older stands of Russian olive

often have plants of many ages (Lesica and Miles 2001). The large seeds allow establishment in shaded as well as open lower terraces and other moist sites, such as banks of overflow channels (Shafroth et al. 1995). Russian olive has a low recruitment rate in eastern Montana and requires ca. ten years to reach reproductive maturity, so invasion often proceeds slowly compared to many aggressive herbaceous or shrubby weeds (Lesica and Miles 2001).

Russian olive is rarely eaten or used by beavers (Lesica and Miles 1999a, 2001; Pearce and Smith 2001), thus providing a competitive advantage over cottonwood and willow. Twigs of Russian olive are lightly to moderately browsed by livestock and/or native ungulates (Lesica and Miles 1998, 1999b), but these low levels of browsing do not usually result in mortality (Katz and Shafroth 2003). Russian olive is susceptible to several fungal canker diseases and contributes to the decline of windbreaks and nursery stock (Riffle and Peterson 1986). The prevalence of these diseases in naturalized trees is not known.

Habitat: Russian olive has escaped cultivation and established "naturalized" stands throughout the western U.S. from North Dakota to Washington south to Texas and California (Olson and Knopf 1986a) as well as in several midwestern states and three Canadian provinces (Olson and Knopf 1986b). The Success of Russian olive may be due to its ability to tolerate a broad range of physical conditions. It occurs on soils with low to moderate soluble salt concentrations (Carman and Brotherson 1982) and is moderately drought tolerant (reviewed in Katz and Shafroth 2003). Russian olive has become naturalized mainly in riparian areas (Christiansen 1963, Olson and Knopf 1986a, b). In Montana Russian olive is found on high river terraces as well as moister, low terraces (Lesica and Miles 2001). It commonly invades the banks of irrigation ditches and subirrigated pastures in south-central Montana (Lesica and Miles observations).

Impacts: The amount of land infested with Russian olive in Montana is not known. There are herbarium collections representing 12 counties (Invaders Database), but this is surely an underestimate. Infestations occur along the Marias River (Lesica and Miles 1999), Milk River (Lesica observation), Missouri (Duncan observation), Musselshell (Marias River Watershed, 2008), Yellowstone River (Lesica and Miles 2001), Clarks Fork of the Yellowstone and Powder Rivers (Lesica and Miles observation), and Bighorn River (Lesica and Miles submitted).

Russian olive will continue to increase along Montana rivers and streams, at least partly due to relative immunity from beaver use, its tree-size stature, and shade tolerance (Lesica and Miles 2001). On many streams and entrenched rivers, cottonwood recruitment occurs primarily in alluvium deposited on existing vegetation by overbank flows. Here Russian olive could eventually preclude establishment of cottonwood's shade-intolerant seedlings (Lesica and Miles 2001, Read 1958, Shafroth et al. 1995) and eventually replace it. Moist, little shaded channels and ditches where flooding rarely occurs also provide habitat conducive to invasion (Lesica and Miles 2001).

In the riparian systems of eastern Montana, Russian olive can fill the niche of late successional canopy dominant. Russian olive is shade tolerant (Campbell and Dick-Peddie 1964), capable of reproducing beneath a cottonwood canopy or other shaded sites. As cottonwoods decline with age and eventually disappear, Russian olive can continue to reproduce and become the canopy dominant (Lesica and Miles 1999). Green ash is also capable of reproducing in the shade of cottonwood and is the native late successional dominant along major rivers in much of the Northern Great Plains and parts of eastern Montana. Russian olive is ecologically similar to green ash and could replace it where both occur because it grows three times faster in girth than green ash (Lesica and Miles 2001).

Russian olive can enhance habitat for some wildlife species (Borell 1962, Freehling 1982). Grouse and pheasants as well as some non-game birds eat the fruits. On the other hand, Russian olive may also replace native floodplain forest vegetation and cause the loss of habitat for species such as cavity nesting, insectivorous, and wetland obligate birds (Knopf and Olson 1984, Olson and Knopf 1986a, Brown 1990, Naugle et al. 1999). Wildlife species richness, abundance and density have been shown to be greater in willow than in Russian-olive habitats, and all bird foraging guilds avoided Russian-olive in the breeding season along the Snake River in Idaho (Brown 1990). Brown (1990) attributed lower bird use to low insect abundance in Russian olive. Russian olive also provides habitat for predators such as hawks, magpies, skunks and racoons which prey on the nests of ducks and grouse (Gazda et al. 2002; Steve Martin, U.S. Fish and Wildlife Service, personal communication).

Russian olive has adverse effects on agriculture in Montana. It can block the flow of irrigation ditches (Lesica observations in Yellowstone County). Dense infestations of Russian olive make it difficult to move cattle in bottomland pastures. Dense stands of Russian olive can also completely shade out understory plants, decreasing the value of these lands for livestock forage. Russian olive can also spread into low lying pastures, reducing forage production and utilization by livestock.

The value of Russian olive to recreationists is equivocal. Russian olive may increase hunting opportunities for upland game birds such as grouse and pheasants. However, heavy infestations of Russian olive will make big game hunting in bottomlands more difficult and less enjoyable. The value of riparian forests for hiking and camping will also decline with Russian olive infestation.

Russian olive is becoming a management concern along Montana's river systems, particularly in eastern Montana. This led the Montana Natural Resources Conservation Service's to take

Russian olive off their Field Office Technical Guide Species List in 2007. Local Conservation Districts, federal agencies, and others are spending time and money to control this species. As examples:

- From 2005 through 2007, the Bureau of Land Management expended about \$500,000 for control of Russian olive in riparian areas (Jennifer Cramer, personal comm.).
- A Russian olive control/demonstration project along the Marias River has received \$21,000 in state funding (Warren Kellogg, personal comm.).
- Treasure County removed 100 acres with hand labor at a cost of \$1,000/acre (Marias River Watershed Meeting Minutes, January 8, 2008).
- On June 21, 2007, the Yellowstone River Conservation District Council adopted a recommendation for Russian olive management in the Yellowstone River Valley that states, "Russian olive should not be planted in the Yellowstone River valley, and where it currently exists, Russian olive should be controlled or eradicated." Several removal demonstration projects have been initiated since this recommendation was approved.

Management: Several publications provide methods for controlling Russian olive (Parker and Williamson 1996, Colorado Natural Areas Program 2000, Stannard et al. 2002). Russian olive can be controlled with a combination of cutting followed by immediate application of triclopyr herbicide. Dozing is another method that has been proposed for some situations. Managers at the Sterling Wildlife Management Area in southeast Idaho found that mechanically removing the whole trees with a backhoe or forklift was the only effective method to kill Russian olive (Joe Ball, U.S. Fish and Wildlife Service, personal communication).

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