

Techniques and Options for Removing Russian Olive

Invasive species removal is a complex issue we can tackle with many tools. Depending on resources and desired outcomes, land managers may choose different methods. It is important to understand the pros and cons of each tool and choose a method (or multiple methods) that will work for your needs.

Technique	Description
Mowing (no herbicide)	Mowing with a common mower can be effective for stems up to 0.5" in diameter with no soil or other disturbance; it can also be done with a timber mastication head on trees up to 12" diameter. Mowing is a great means to keep saplings and resprouts down in large flat areas with grasses and forbs in the understory (under cottonwoods for instance). A larger brush mower may be needed for uneven terrain or very large properties.
Cutting (no herbicide)	Cutting and removing biomass without treating stumps with herbicide. This will result in resprouting at each stump that needs to be maintained with mowing or recutting at least once a year (easier if it is twice or more). This can be effective on the edges of cultivated land or other easy to access areas where chemical use is of concern.
Goat grazing	Goats can be trained to eat Russian olive, mimicking mowing. Works best on saplings. Goats may strip the bark off of larger trees. If the goats have eaten weedy feed prior to entering an area they may introduce other weed seed; in addition, their feces can change the nitrogen available which can change the soil chemistry enough that some native plants will not grow there. Good in cultivated areas.
Girdling	Severing the bark around the circumference of the tree; roots are left intact. The tree will resprout below the girdle creating ladder fuels into the dead tree above the girdle. Retreatment needs to occur one to two times annually to keep fire fuels reduced. Good for a smaller number of trees and where chemical use is a concern.
Burning	Fire will remove biomass; leaves roots intact. Burn piles will have a minimal effect on soils, but large fires in riparian areas can deplete seeds and create barren areas where the resprouts from the roots can grow rapidly with little competition. Can be useful for large areas that can be managed with fire and follow-up treatments. Burn permits may be required.
Dozing	Removes biomass & some root crowns; biomass needs to be hauled or burned. This technique has been used often in the Moab area and has resulted in denser stands of olives due in part to the regrowth of multiple trunked trees with more low to the ground biomass.
Tillage	Tillage with tractor pulled discs or rototiller; best done with saplings and results in disturbed soil which can promote annual weeds. May need consecutive years of tillage to eradicate olives. Most effective in areas that will be planted with annual crops.
Hand Digging/Pulling	Saplings and smaller trees can be pulled; larger trees can be dug out. This is a very effective means to keep a property clear of new trees where larger denser stands of olive have already been removed. As the seeds on the property continue to germinate the need for pulling and digging diminishes. Trees 2" diameter and smaller can be pulled with the right soil conditions with a weed wrench.
Bio-control	Verticillium wilt and Phomopsis canker have shown some effectiveness but is not common. This is not a strategy that is well developed at this time or available to homeowners.
Frill cut Herbicide Treatment	Cut open the tree bark at various spots on trunk and inject with herbicide; biomass & roots remain. The standing dead tree can be good wildlife habitat, though it will ultimately fall over. This is very effective along rivers and streams where olives are far apart and roosting sites are needed. These perches can provide locations for seeds to be dropped so the area near these trees should be monitored and saplings pulled while young. Can also be useful on large trees where removal may be time consuming and unnecessary.
Basal Bark Herbicide Treatments	The lowest 12"-18" of bark of a tree is sprayed; works best on young trees with smooth bark. This is an effective and fast retreatment method in large areas where cut stump or mowing treatments were used.
Foliar Treatments	Apply herbicide to all leaves and branches of a tree; biomass and roots remain. A fast treatment for resprouts or saplings, although there can be overspray from chemical applications and application rates can be quite high.
Cut Stump Herbicide Treatments	Remove all biomass to chip or burn piles, Cut the base of the trees and quickly apply herbicide to the cut surface; can be done in conjunction with mowing when handling larger trees. A common method of treatment for land managers in various situations. See "How to Effectively Kill Tamarisk and Russian Olive" document.



BLM uses burning to reduce biomass in Westwater



Using a weed wrench to pull Russian olive in the Matheson.

Definitions

BIOMASS: above ground portions of the tree including trunk, branches and leaves.

MASTICATION: mulching material in place with a tractor or other equipment mounted attachment. A Fecon head or Timber Ax are common attachment heads.

Invasive species removal is a complex issue that requires many different tools to tackle. Depending on resources available and desired outcomes, property owners may choose different methods. It is important to weigh the pros and cons of each tool and use a method, or combination of methods, that work well for the site needs to project goals. This table compares methods to each other.



Clearing tamarisk with a Timber Axe mastication head



Herbicide applied to a cut stump tamarisk in willows

Sources

¹https://weeds.nmsu.edu/pdfs/Mgmt_of_Exotic_Trees.pdf

²https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=2055&context=extension_curall

³https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd563043.pdf

Technique	Effective Tree Size (Diameter)	Resources Needed	Labor Needed	Amount of Chemical Used	Biomass Removed	Disturbed Soils	Retreatment Required: All treated areas should be monitored and retreatment should be expected for at least 3 – 5 years depending on management goals.
Mowing	≤12"	Low to High depends on size	Low	None	Yes	No	Continuous follow-up treatment required if a seed source is nearby.
Cutting (no herbicide)	All	Low	High	None	Yes	No	Tree will resprout immediately; anecdotal evidence suggests a tree can be killed after 7 years of recutting.
Goat grazing	≤2"	Unknown	Unknown	None	Yes	maybe	Annual retreatment needed.
Girdling	All	Low	Med to high	None	No	No	Tree will resprout from below girdle and need annual cutting to prevent tree from becoming multi-trunked.
Burning	All	Low to Medium	High	None (unless retardant is used)	Yes	No but seeds and soil are impacted	Roots will resprout from the base within months; cutting, mowing or grazing resprouts needed annually to prevent regrowth.
Dozing	All	High	Low to Med	None	Burn or Chip	Very High	Will resprout from root fragments within months; cutting, mowing or grazing resprouts needed annually to prevent regrowth.
Tillage	≤4"	Medium	Low to Med	None	Burn or Chip	Medium (Shallow Impact)	Will resprout from root within months; cutting, mowing or grazing resprouts needed annually to prevent regrowth. Also, other weeds may become an issue.
Hand Digging/Pulling	≤3.5"	Low	Med to High	None	Burn or Chip	Low (Localized Impact)	Olives can resprout from exposed roots. Mowing is a possible retreatment method.
Bio-control	All	Unknown	Unknown	None	Left in Place	No	Unknown; likely trees won't die.
Frill Cut Herbicide	≥6"	Medium	Medium	Low	Left in Place	No	Monitor annually for 5 years; usually effective to kill. Saplings may grow under tree from seeds.
Basal Bark Herbicide Treatments	≤4"	Medium	Low to Med	Low to Medium	Left in Place	No	Monitor annually for 5 years; usually effective to kill. Saplings may grow from seeds.
Foliar Treatments	≤6"	Medium	Low to Med	High	Left in Place	No	Monitor annually for 5 years. Saplings may grow from seeds.
Cut Stump Treatments	All	Medium to high	Medium to High	Low	Burn or Chip	No	Monitor annually for resprouts and saplings from seed.

Invasive woody species control is not an inexpensive task. Expect costs to range from \$300 to \$5000 per acre depending on the chosen method. The more labor intensive the method the more expensive removal may be.

NOTES:

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From top of the Document via Kara:

If a property owner has decided to remove or control Russian olive there are many different strategies to consider using to remove the trees depending on the size of the trees, the number of trees, the size of the property, and whether there are trees nearby that present a constant re introduction opportunity. The following table outlines these options with some specific information about how to implement these strategies in different settings.

Low-volume Basal Bark Herbicide Application: Small saltcedar, Russian olive, and Siberian elm saplings and regrowth (stems less than 2 to 3 inches in diameter at ground level and less than 8 feet tall) can be controlled by a basal application of triclopyr (ester formulation) mixed with vegetable oil or another proven carrier. This technique involves Effectiveness, cost, restoration potential and the risk of causing adverse environmental impacts are important considerations when determining which sections of a river system to treat.

Cut-stump Herbicide Application:For large trees with thick bark, a low-volume, Figure 6. Selective control of Russian olive and saltcedar saplings following basal bark application cut stump method involves a combination of cutting and herbicidal treatment to achieve “root kill.” This involves cutting the trunk just above the ground and immediately applying an amine formulation or ester formulation mixed with vegetable oil of triclopyr (Parker and Williamson 2003) or imazapyr to the cut surface (Duncan 2003). Cutting large trees with chain saws can be dangerous, but this approach is a cost effective, selective treatment for light infestations. Per acre costs depend on tree density, and the majority of the cost is for tree cutting and removal or chipping of the woody debris.¹

Control Treatment	Cost per Acre	Percent Control
Individual Plant Treatments		
Manual Removal (Immature Plants)	0-\$5,000	95-100
Mechanical Grubbing	\$40-\$300	97-99
Low-volume Herbicide Application ¹	\$30-\$60	80-95
Cut-stump Herbicide Application ²	\$1,600-\$2,500 ⁶	60-80
Ground-based Foliar Herbicide	\$40-\$300	97-99
Large-scale Control		
Mechanical	\$700	97-99
Airplane Herbicide-Burn	\$300	93
Helicopter Herbicide-Burn ⁴	\$240	89
Airplane Herbicide-Shred ^{3,5}	\$400	97-99
Helicopter Herbicide-Shred ⁴	\$510	97-99
Airplane Herbicide-Burn-Mechanical	\$380	97-99
Helicopter Herbicide-Burn-Mechanical ⁴	\$490	97-99

¹ Doug Parker, 2003, personal communication

² Duncan 2003

³ McDaniel and Taylor 2003a

⁴ McDaniel and Taylor 2003b

⁵ Includes 2 years of followup, ground-based foliar herbicide treatment

⁶ The majority of the cost will be for tree cutting and removal or chipping, and the herbicide cost can vary from \$20-\$60 per acre. National Park Service costs range from \$400-\$1,000 per acre with 80 to 85 percent efficacy (Gerald McCrea, IPM Coordinator, National Park Service, 2005, personal communication).