



Acadia National Park
IPMT
Invasive Plant
Management Team



INVASIVE PLANT CONTROL METHODS AND HOW TO SELECT THEM

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NPS photo



OUTLINE

- Mechanical and Manual Methods
- Herbicide
- Flame Weeding and Biological Control
- Things to Consider for Treatment Recommendations
- Conundrums and Questions



MECHANICAL AND MANUAL REMOVAL

Forestry Mulching Brush Cutting



[Complete guide to Forestry Mulching](#)

MECHANICAL AND MANUAL REMOVAL

Weed wrench Digging



MECHANICAL AND MANUAL REMOVAL

Cutting



MECHANICAL AND MANUAL REMOVAL

Hand Pulling



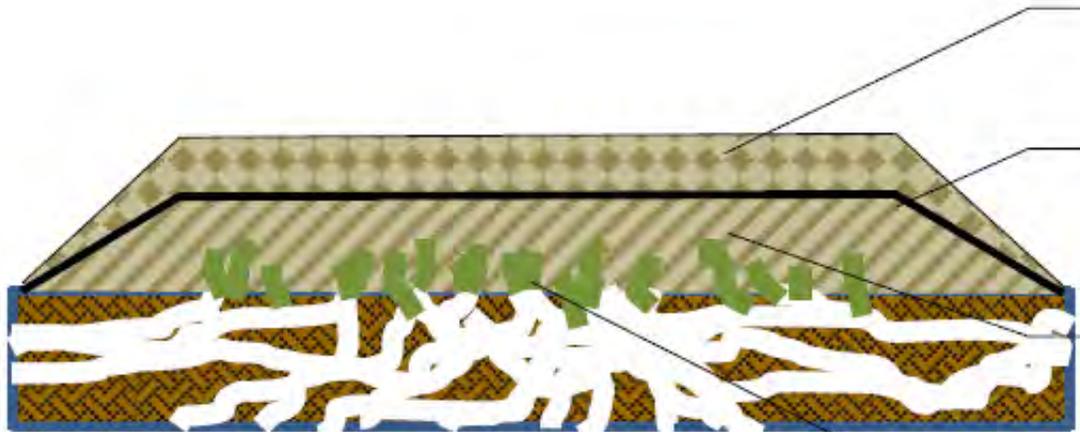
MECHANICAL REMOVAL WITH COVERING BUCKTHORN BAGGIES



[Buckthorn Baggie :: Control, Remove, and Kill Buckthorn Without Poison](http://www.buckthornbaggies.com)

www.buckthornbaggies.com

MECHANICAL REMOVAL WITH COVERING WEED BLOCK FABRIC - MULCHING



3-4" Bark mulch or wood chips

7-mil Black plastic or non-woven geotextile material

3-4" Bark mulch or wood chips to act as a cushion layer

Cut Japanese knotweed stems



[Preventing the Spread of Japanese Knotweed: Best Management Practices.](#) 2018. Doug Cygan, NH Dept. Ag., Markets, and Food.

MECHANICAL REMOVAL WITH CHEMICAL FOLLOW-UP NEXT YEAR



NPS photo

HERBICIDE

- Foliar
- Basal Bark
- Cut/Stem
- Hack/Frill
- Injection



NPS photo

HERBICIDE

- Foliar



HERBICIDE

- Foliar



HERBICIDE

- Basal Bark



Nancy Loewenstein-
Alabama Coop Ext

HERBICIDE

- Cut/Stem



HERBICIDE

- Cut/Stem with Dabber



HERBICIDE

- Vine 'Window'



HERBICIDE

- Hack/Frill



David Jackson photo



UGA2307261

HERBICIDE

- Stem Injection



- Stem Injection Systems (UK)

- “As stem injection is specific to the target species, the treatment can be completed in all weather conditions and near water with the relevant applicator licenses”

FLAME WEEDING WITH PROPANE TORCH

- *Fire = Serious risk potential*
careful attention to weather conditions required
- Consult local fire authorities before using
- Most effective for herbaceous annuals; less effective on perennial, woody veg w/deep roots
- Repeated applications needed

["A New Weapon in the War on Weeds: Flamethrowers,"](#) by Alison Gillespie
smithsonianmag.com
March 16, 2016



BIOLOGICAL CONTROLS

- “Classical” - insects



Several different beetles to control purple loosestrife

- In research:
 - Knotweeds
 - Phragmites
 - Swallowworts
 - (Water chestnut)
 - (Hemlock woolly adelgid)

See [Cornell's NYISRI website](#) for more details

BIOLOGICAL CONTROLS

- Animals: goats, sheep
- *Need careful planning and professional help*
- Goats remove above-ground tissue only
- Part of a long-term plan
- Fairly indiscriminate eaters, mostly woody veg
- Issues with poop in some habitats
- Plant species present and size of seeds



Goats from Allegheny GoatScape herd.

Management Library

- ▶ Maine Natural Areas Program – *Maine Invasive Plants Field Guide*
- ▶ Penn State Cooperative Extension factsheet series
 - ▶ <https://extension.psu.edu/announcing-new-invasive-plant-fact-sheets-series>
- ▶ Cal-IPC: BMPs for Non-Chemical Weed Control
 - ▶ <https://www.cal-ipc.org/resources/library/publications/non-chem/>
- ▶ Casco Bay Invasive Species Network – *Winning the War on Weeds*
 - ▶ <https://cbisn.wordpress.com/>

There are no “silver bullets” – monitor, repeat, use combinations of methods. Invasive plant control is a long-term commitment in many cases.



Factors to consider when recommending treatment methods



Landowner preferences



- ▶ Talk to the landowner!

Integrated Pest Management – 11 Step Process boiled down to 6-ish

- Identify the pest and biology
- Research best control tactics (efficient, realistic, timely, etc.)
- Choose the least aggressive method needed to do the job (lowest risk and most effective)
- Emphasize prevention, avoidance of spread, monitoring
- Eradication is not the only good goal; suppression can be a good goal
- Use pesticides when necessary, not as the first and easy choice





Timeline and resources available



- ▶ Is a harvest planned for next year?
- ▶ Do the landowners have equipment and are they willing and able to work on the property themselves
 - ▶ esp. important for follow-up monitoring and follow-up treatments

Herbicide-specific considerations

- ▶ [Pesticide Notification Registry](#) – neighbors?
Town by Town
- ▶ **Town pesticide ordinance?**
Town by Town; [list maintained by BPC](#)
- ▶ **Organic certified farm area?**
Must consult with certifier to determine acceptable use in non-farm areas; note sugaring can be organic too.



Property open to the public / recreational uses

- ▶ Commercial Applicator License
- ▶ Posting signs along trails
- ▶ Messaging the point of the work



National Park Service
U.S. Department of the Interior
Acadia National Park



CAUTION

Pesticide Application

Please Remain on the Trail

Date/Time Applied:

(Remove Sign after 48 Hours)

Date/Time for Re-entry:
-When Dry-

Herbicide Used for Invasive Exotic Plant Management:

Product Used On This Site:

- Rodeo (active ingredient Glyphosate)
- Garlon 3 or 4 (active ingredient Triclopyr amine or ester)
- Milestone (active ingredient aminopyralid)



For questions and general information on pesticide use and exotic plant management: Jesse Wheeler: 207-288-8722

Sensitive areas (Shoreland Zone, wetlands)

- ▶ Additional rules and precautions
 - ▶ 250 feet of the upland edge of ocean, coastal & freshwater wetlands, and great ponds
 - ▶ 75 feet of streams
 - ▶ Resource Protection Zone may be more restrictive
 - ▶ May be worth checking with the local Code Enforcement Officer for permits
- ▶ Maine DEP Shoreland Zoning by Town
 - ▶ [Shoreland Zoning, Bur. of Land & Water Quality, Maine Department of Environmental Protection](#)



Sensitive areas (Shoreland Zone, wetlands)

Example from Bucksport's Supplemental Shoreland Vegetation Standards

Exemption #6: The removal of non-native invasive vegetation species, provided the following minimum requirements are met:

- ▶ Removal of vegetation within 25 feet from the shoreline occurs via hand tools; and
- ▶ If applicable clearing and vegetation removal standards are exceeded due to the removal of non-native invasive species vegetation, the area shall be revegetated with native species to achieve compliance.

It could happen to you...

In 2016, Kennebunk imposed only a \$500 penalty on a land trust for cutting invasive bushes in the Shoreland Zone. The consent agreement also included \$10,554 for remediation and additional money for legal and surveyor fees. (Andrew Hill Legal, andrewchill.com)

Conundrums

- ▶ Labor source for non-herbicide work/manual/mechanical
- ▶ MNAP non-herbicide (or herbicide+) list of providers
 - ▶ https://www.maine.gov/dacf/mnap/features/invasive_plants/nonherbicide.html
 - ▶ Local landscaping companies



Figure 2. Weed wrench for pulling invasive plants out of the ground. Image by Steven Manning, Nashville, Tennessee.

Photo from [link here](#)

Conundrums

- ▶ Knotweed stands in wetland



Conundrums

- ▶ New England Cottontail habitat (southern Maine)

