

Buckthorn, Barberry, and Honeysuckle
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Almost all of the photos in this presentation are from the Ottawa NF.

Exotic buckthorn, exotic honeysuckle, and Japanese barberry:

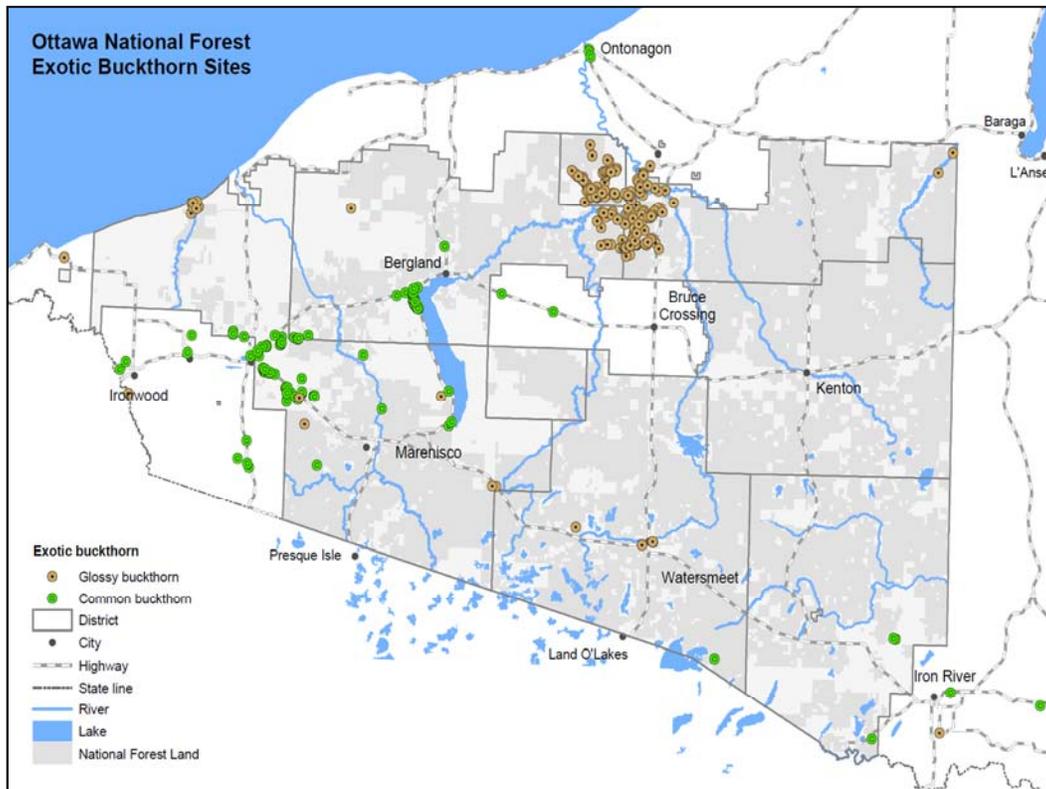
- Not native to North America.
- Invade natural areas.
- Cause harm in natural areas.



Upper Peninsula Buckthorns



Alder-leaved buckthorn (*Rhamnus alnifolia*), native. Common buckthorn (*Rhamnus cathartica*), exotic. Glossy buckthorn (*Rhamnus frangula*, *Frangula alnus*), exotic.



We have 119 mapped sites of common buckthorn (497 acres) and 251 sites of glossy buckthorn (2928 acres).



Glossy buckthorn (*Rhamnus frangula*). Glossy, entire, leaves. Fruits start out green, then turn red, then turn black. Very distinctive in July and August.



Large glossy buckthorn bushes at Black River Harbor campground.



Glossy buckthorn in Iron County, MI.



Glossy buckthorn at Black River Harbor Campground by Lake Superior. Glossy buckthorn stays green, photosynthesizing, longer into the fall than our native plants. One of its competitive advantages. Photo taken in early October.

Glossy buckthorn



- Tall shrubs
- Entire, glossy leaves
- Fruits green to red to black
- No thorns

Glossy buckthorn video
Ottawa National Forest
After aspen clearcut harvest



<http://www.youtube.com/watch?v=rWmJRfeS-ks>

Glossy buckthorn control:

- Cut stump herbicide. Strong glyphosate or triclopyr herbicide.
- Basal bark triclopyr. 15.4% triclopyr.
- Foliar spray triclopyr. 2% triclopyr.
- Hand-pull
- Expect many seedlings





Glossy
buckthorn
before



Glossy buckthorn, one year after cut-stump herbicide application.



Resprouts with malformed leaves. These plants may recover.



Basal bark herbicide application on glossy buckthorn. The herbicide (Element 4) in oil will soak through the stems, killing the whole bush. Apply to bottom 8 inches of the stem.



4-Control treating glossy buckthorn with basal bark herbicide.



Unfortunately, after you kill the large glossy buckthorn, seeds in the soil are released, so you need to go back and hand-pull or foliar spray the seedlings (2% triclopyr, Element 3A). We have had to back off treating glossy buckthorn on the Ottawa. We are concentrating on Black River Harbor and outlier plants around the large Victoria infestation.



Norrie Park. RRIP-IT-UP Demonstration Site.



Norrie Park. RRIP-IT-UP Demonstration Site.



Norrie Park. RRIP-IT-UP Demonstration Site. Before.



Norrie Park. RRIP-IT-UP Demonstration Site. After.



Common buckthorn. *Rhamnus cathartica*.

Common buckthorn

- Shrub with peeling bark
- Dark green, toothed, opposite leaves
- Green to black fruits
- Thorn-tipped twigs



Common buckthorn (*Rhamnus cathartica*). So far we have mostly treated with cut-stump herbicide (41% glyphosate, Razor Pro).

Buckthorn research

- Oliver Pergams & James Norton (2006) report that girdling or cutting along with proper herbicide of a single stem of multiple-stemmed buckthorn usually results in the death of the entire shrub.
- James Reinartz (1997) reports success with cut-stump 10% glyphosate of glossy buckthorn down to 14° F.
- The Nature Conservancy (2001) uses propane weed torches to treat buckthorn seedlings.



Pergams & Norton had good results with RoundUp Pro (41% glyphosate), Stalker (imazapyr), and Tordon (picloram & 2,4-D).

Tall Stump Treatment Method

John Lampe, private Minnesota landowner.

1. Cut at waist to shoulder height.
2. Can leave for up to eight months.
3. Use frill method at base and apply herbicide.



Cut off all branches with leaves or buds. Haul away for burning or chipping. Advantages: two distinct phases, fewer tools to carry, time between treatments, can cut easily in winter, easy to spot stumps, more bark available for treatment, easy to re-treat if you get resprouts. John Lampe recommends 20% to 30% glyphosate.

Buckthorn biocontrol?

- Ongoing research by Minnesota DNR, Univ. of Minnesota, and CABI, Switzerland.
- They have field-tested insects in Switzerland but so far have not identified any insects specific to *Rhamnus cathartica* or *Frangula alnus*.
- “For *F. alnus*, it will undoubtedly be very difficult to find potential biological control agents in Europe that are genus or species specific.”



André Gassman



Ongoing research by Minnesota DNR (Laura Van Riper, Luke Skinner), University of Minnesota (David Ragsdale), and CABI, Switzerland (Andre Gassman)

Left: *Philereme vetulata* is a defoliator moth.

Middle: *Trichoermes walkeri* is a leaf-margin curl galler.

Right: *Wachtliella krumbholzi* is a seed-feeding midge.

“For *F. alnus*, it will undoubtedly be very difficult to find potential biological control agents in Europe that are genus or species specific.”

Exotic honeysuckle



White or pink flowers. We have three species: *Lonicera X bella* (Bell's honeysuckle), *Lonicera tatarica* (Tartarian honeysuckle), and *Lonicera morrowii* (Morrow's honeysuckle). They integrate, hybridize, and are difficult to tell apart. Mostly infestations are *Lonicera X bella*.



Multi-stemmed bushes. White and pink flowers.



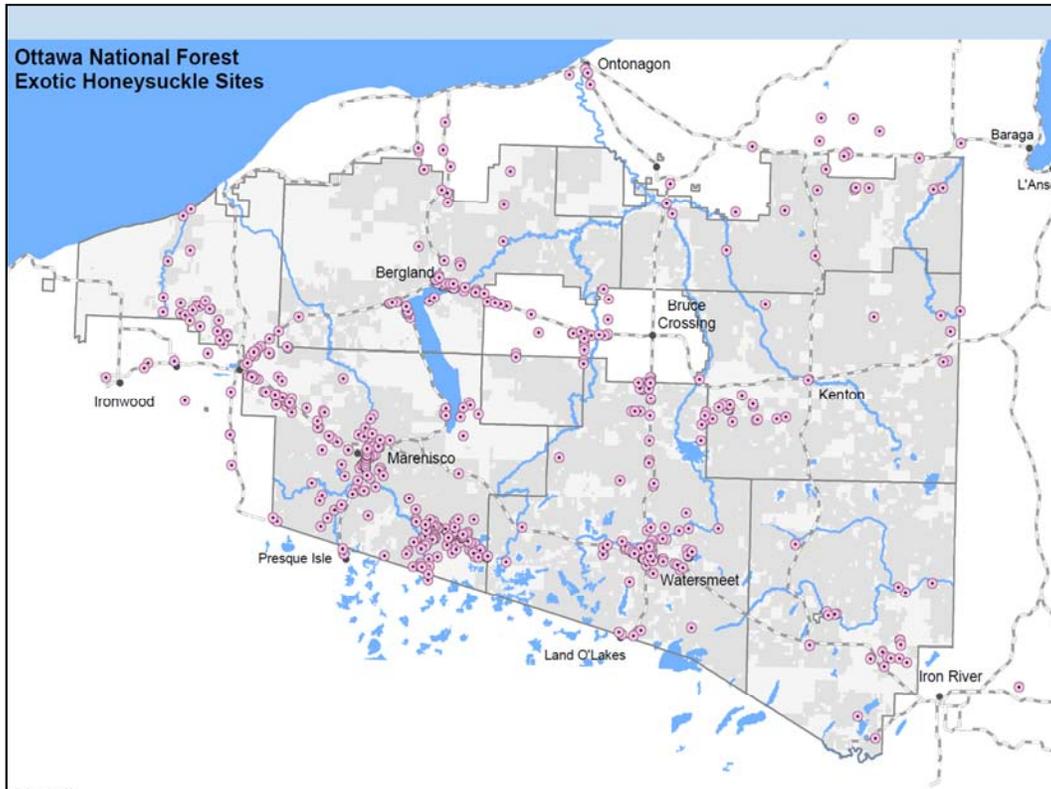


Many berries.

Honeysuckle



- Opposite leaves
- Large multi-stemmed bushes
- White or pink two-lipped flowers (4 +1)
- Red or orange fruits in pairs
- Branches are brown and hollow in the middle



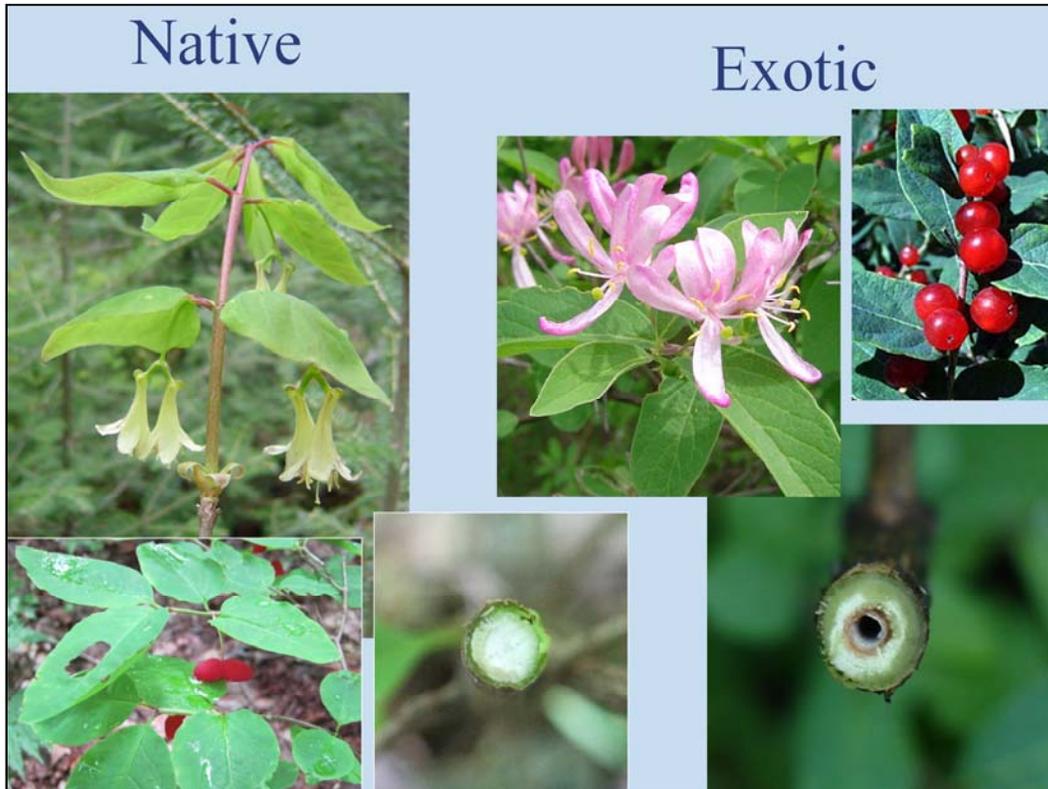
We have 598 known sites of honeysuckle, 1335 acres total.



Honeysuckle infestation along County Road 527, near Tenderfoot Creek.
Honeysuckle is particularly invasive along riverbanks, lake shores, and roadsides.



Tenderfoot Creek, Gogebic County, MI.



On the Ottawa NF we have five native species of honeysuckle. Vines are *Lonicera dioica* and *L. hirsuta*. Shrubs are *L. canadensis* (by the far most common), *L. oblongifolia*, and *L. villosa*. Exotic honeysuckles have brown and hollow pith and bilabiate flowers. Native honeysuckle have white and solid pith, and flowers not bilabiate.

Key to exotic bush honeysuckles

- 1. Leaves and young stems completely glabrous or with very few hairs. Corolla pink to white, not fading yellow.....*Lonicera tatarica*
- 1. Leaves and at least young stems pubescent. Corolla fading yellow....2
- 2. Bracteoles more than half as long as the ovary at anthesis. Corolla white in bloom..... *Lonicera morrowii*
- 2. Bracteoles half or less as long as the ovary at anthesis. Corolla pink or white in bloom..... *Lonicera x bella*.





Cut-stump herbicide.



Cut-stump honeysuckle.



Fish crew cutting honeysuckle and applying herbicide near Tenderfoot Creek in 2008. The bushes were along the river, on land. We cut the stems and apply undiluted Aqua Neat (53.8% glyphosate).



Once we tried scorching honeysuckle stumps with a weed torch. It didn't prevent resprouting.

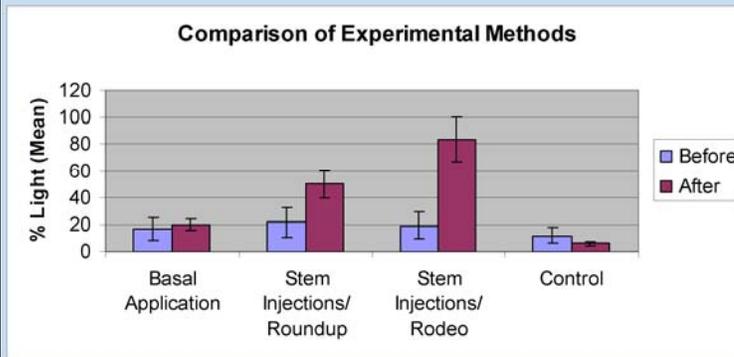
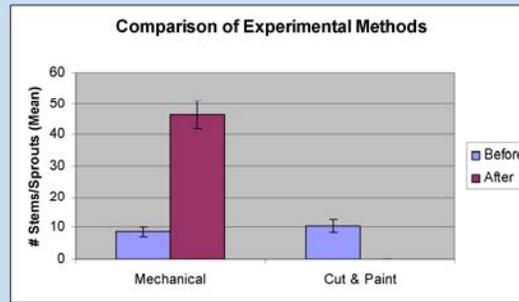
Exotic honeysuckle control:

- Cut stump herbicide. Strong glyphosate herbicide.
- Foliar spray 2% glyphosate.
- Hand-pull seedlings.



Honeysuckle research

- Jeffrey Ross UNDERC Notre Dame study
- Roundup Poison Ivy & Tough Brush Killer Plus = 18% glyphosate + 2% triclopyr
- Rodeo = 53.8% glyphosate



Control methods and management considerations of Bell's Honeysuckle (*Lonicera x bella*). Bios 569: Practicum in Field Biology. Jeffrey Ross. Advisor: Dr. Gary Belovsky & Dr. James English. July 19, 2005

The percentage of light coming through the bush canopy pre- and post-treatment was determined using a densitometer.

JAPANESE BARBERRY



Japanese barberry (*Berberis thunbergii*)

--Low spiny shrub, small smooth spoon-shaped leaves

--Small yellow flowers, red fruits

--Inner Yellow Bark

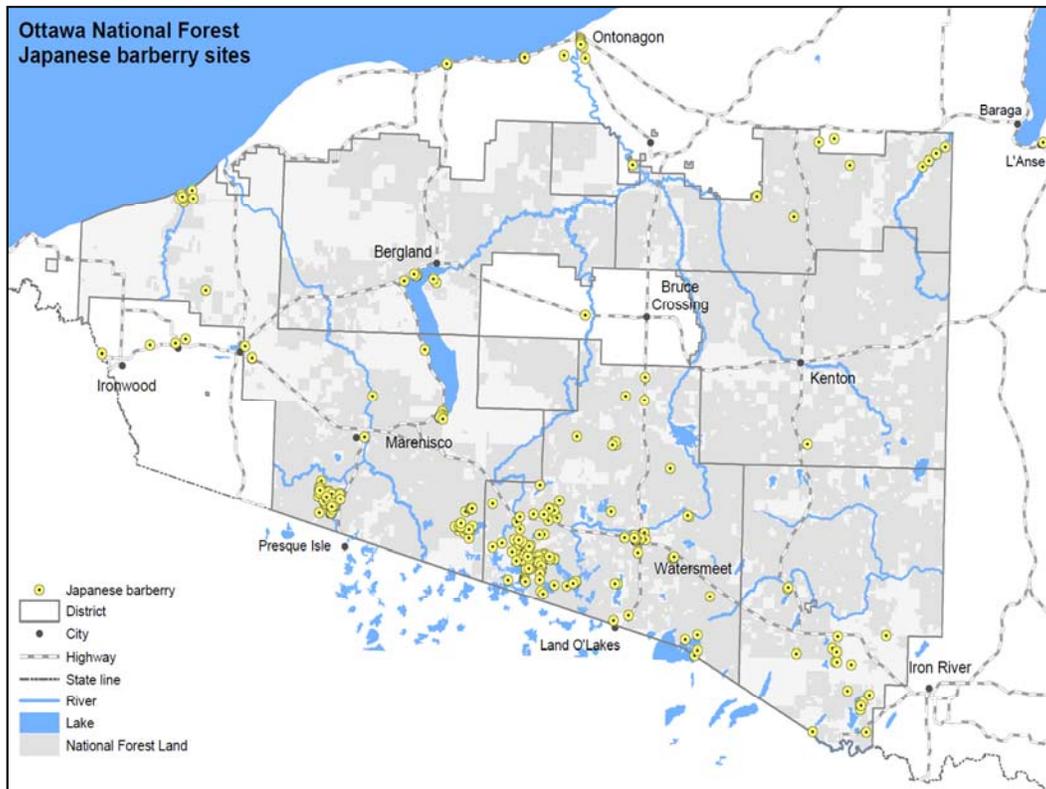
--Sold by nurseries. People like barberry because deer don't eat it, due to the spines.

--can become so dense in woodlands that it shades out other understory species





Egg-shaped fruits turn red in the fall.



We have 305 known sites of Japanese barberry, 1251 acres total.



Forest near Long Lake. Gogebic County, Michigan.

Japanese barberry



- Small spiny shrub
- Small spoon-shaped leaves
- Small egg-shaped green to red fruits



Japanese barberry in red pine.



Japanese barberry in red pine.



2009 invasive plant crew with PPE for barberry spraying



2007, pre-treatment. We spray barberry with 2% triclopyr (Element 3A).



2008, one year after spraying. Native seedlings soon established where the barberry died.



Many dead barberry. Few resprouts.

Japanese barberry control

- Foliar spray 2% triclopyr.
- Cut-stem herbicide. Strong glyphosate or triclopyr.
- Hand-pull seedlings.
- Dig up.





Lehrer et al. 2006. Seedling Populations Produced by Colored-leaf Genotypes of Japanese Barberry (*Berberis thunbergii* DC.)

Contain Seedlings with Green Leaf Phenotype. *J. Environ. Hort.* 24(3):133–136.

Cultivated vs. wild barberry

- Mark Brand (Univ. of Connecticut, 2006) grew seed from J. barberry cultivars. Green cultivars produced 100% green-leaved plants. Yellow-leaved barberry produced at least 20% green offspring. Red-leaved barberry produced 18.5% to 71% green seedlings.
- Smith & Clasen (University of Minnesota) are testing strategies to produce sterile cultivars of valuable but invasive landscape plants, including Japanese barberry.



Lehrer, Jonathan M., Mark H. Brand, and Jessica D. Lubell. 2006. Seedling Populations Produced by Colored-leaf Genotypes of Japanese Barberry (*Berberis thunbergii* DC.) Contain Seedlings with Green Leaf Phenotype. *J. Environ. Hort.* 24(3):133–136. <http://www.psla.uconn.edu/documents/JEH24-3-133-136.pdf>

Clasen, Benjamin M. and Alan G. Smith. 2010. Development of non-invasive plant alternatives for use in the landscape. Minnesota-Wisconsin Invasive Species Conference 2010. Conference Abstracts. http://mipn.org/MNWIISC_2010_Conference_WednesdayAM.html

Barberry research

- Williams and Ward (2010) found that Japanese barberry infestations favor deer ticks.
- Deer tick abundance in barberry-infested areas is 67 percent higher than those where native plants are predominant.
- Also, for some reason, the percentage of ticks that carry the Lyme bacteria is higher - 126 infected ticks per acre versus 10 per acre in barberry-free areas.
- After barberry removal, tick populations drop as much as 80 percent.



Japanese barberry thickets create a moist, cool, microclimate near the ground that favors ticks. Deer tick abundance in barberry-infested areas is 67 percent higher than those where native plants are predominant. Also, for some reason, the percentage of ticks that carry the Lyme bacteria is higher - 126 infected ticks per acre versus 10 per acre in barberry-free areas. After barberry removal, tick populations drop as much as 80 percent.



2009 prices: Hi-Light Blue \$45, AquaNeat \$112.50, Razor Pro \$87.50, Transline \$360, Element 3A \$175, Element 4 \$212.50, Veteran 720 \$75, Activator 90 \$15, SP2 Backpack sprayer \$159.50.



Mixing herbicide.

HERBICIDE APPLICATION IN PROGRESS

Ottawa National Forest
Location: Mink Lake area
We are treating non-native invasive Japanese barberry bushes near Forest
Road 8100 with Element 3A herbicide (triclopyr).
For more information contact Ian Shackleford at 906-932-1330 ext. 331.



Herbicide mixing

Herbicide	Active ingredient	Target	Ounces per gallon	Active ingredient concentration	Product concentration
Garlon 3A, Element 3A	44.4% Triclopyr	Foliar spray Japanese barberry and glossy buckthorn	6	1.99%	4.5%
Rodeo, Aqua Neat	53.8% Glyphosate	Exotic honeysuckle foliar spray	5	2.02%	3.8%
Rodeo, Aqua Neat	53.8% Glyphosate	Cut stump honeysuckle, buckthorn, and Japanese barberry	UNDILUTED	53.80%	100.0%
Roundup Pro, Razor Pro, Makaze	41% Glyphosate	Exotic honeysuckle foliar spray	6	1.84%	4.5%
Garlon 4, Element 4	61.6% Triclopyr	Glossy buckthorn, basal bark	3.75 gallons Element 4 + 11.25 gallons bark oil	15.40%	25.0%

References

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For more information about invasive
plants on the Ottawa National Forest,
please visit:
<http://fs.usda.gov/goto/ottawa/invasive>

Garlic mustard in Hurley, Wisconsin.

At our website you will find many of these photos and more information, as well as links to other helpful websites.

In closing, emphasize asking people to keep an eye out for these invasive plants, and report other infestations to us.