

5.2 INVASIVE PLANTS

BACKGROUND

Invasive plants can pose a threat to forest ecosystems and forest productivity. Foresters, landowners, and loggers can play important roles in slowing the spread of invasive species.

Invasive plants are non-native species that invade natural communities and develop self-sustaining populations. The start of many infestations is often tied to a disturbance, and once established, the invasive species spread into undisturbed landscapes. They out-compete native species, disrupting ecological processes, and cause a loss of economic value or output. The economic impacts, sometimes hard to discern directly, often result from the environmental impacts.

The N.H. Invasive Species Law (RSA 430:52 and N.H. Administrative Rules AGR 3800) defines an invasive species as “an alien species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.” These species come in a variety of forms, including trees, vines, shrubs, grasses, terrestrial herbaceous and aquatic.

As a group, invasive plants are generalists. Although there is at least one invasive plant for every habitat, many terrestrial invasives tolerate a wide variety of environmental conditions, allowing them to thrive at diverse sites. Glossy buckthorn successfully invades sunny and shady sites alike and tolerates both wet and dry conditions. Oriental bittersweet, a strangling woody vine, may languish in the shade of a forest until a canopy gap opens or its leading branch reaches the canopy. It grows rapidly across the forest canopy, strangling trees and weighing them down.

Some impacts on forests include:

- Reducing the abundance, density, and diversity of tree seedlings.
- Displacing natural plant and animal communities or altering species composition.
- Competing with native species for space, nutrients, and water.
- Altering soils, which in turn may affect their ability to retain or shed water; may increase soil erosion.
- Increasing fire hazard.
- Acting as hosts for other damaging organisms.
- Decreasing the quality of forest habitats for native wildlife.

**Table 3800.1
New Hampshire Prohibited Invasive Species List
from N.H. Administrative Rules AGR 3800**

Scientific Name	Common Name
<i>Acer platanoides</i>	Norway maple
<i>Ailanthus altissima</i>	tree of heaven
<i>Alliaria petiolata</i>	garlic mustard
<i>Berberis thunbergii</i>	Japanese barberry
<i>Berberis vulgaris</i>	European barberry
<i>Celastrus orbiculatus</i>	Oriental bittersweet
<i>Centaurea biebersteinii</i>	spotted knapweed
<i>Cynanchum nigrum</i>	black swallow-wort
<i>Cynanchum rossicum</i>	pale swallow-wort
<i>Elaeagnus umbellata</i>	autumn olive
<i>Euonymus alatus</i>	burning bush
<i>Heracleum mantegazzianum</i>	giant hogweed
<i>Hesperis matronalis</i>	dame's rocket
<i>Iris pseudacorus</i>	water-flag
<i>Lepidium latifolium</i>	perennial pepperweed
<i>Ligustrum obtusifolium</i>	blunt-leaved privet
<i>Lonicera bella</i>	showy bush honeysuckle
<i>Lonicera japonica</i>	Japanese honeysuckle
<i>Lonicera morrowii</i>	Morrow's honeysuckle
<i>Lonicera tatarica</i>	Tatarian honeysuckle
<i>Microstegium vimineum</i>	Japanese stilt grass
<i>Polygonum cuspidatum</i>	Japanese knotweed
<i>Polygonum perfoliatum</i>	mile-a-minute vine
<i>Reynoutria × bohemica</i>	bohemia knotweed
<i>Rhamnus cathartica</i>	common buckthorn
<i>Rhamnus frangula</i>	glossy buckthorn
<i>Rosa multiflora</i>	multiflora rose

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OBJECTIVE

Prevent the dispersal and establishment of invasive plants and mitigate their impacts on the forests.

CONSIDERATIONS

- Invasive plants are dispersed in many ways including by wildlife, horticulture, personal and recreational vehicles (e.g., all-terrain vehicles, bicycles), mowers and the activities of state and local road crews. Forestry (with its associated practices and equipment—skidders, trucks, mowers, etc.) is just one way invasive plants can be introduced and existing infestations exacerbated.
- State law prevents the sale, distribution, or transport of invasive species. RSA 430:51-57 states, “No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1, New Hampshire prohibited invasive species list.” For example, the movement of viable seeds or fruits in the treads of heavy equipment or the transport and use of fill with invasives violates state law.
- Invasive plants thrive on disturbance, often requiring the combination of seed sources or vegetative propagule (plant pieces that root and sprout) and disturbance. Once established they can spread beyond the introduction site even in the absence of continued disturbance.
- Healthy forest ecosystems are less susceptible to infestation by invasive plants. Though careful silvicultural planning and practices can reduce or prevent invasive plant infestations, forestry practices can also create conditions suitable for invasive plants. These conditions occur when site disturbance exposes soil creating a seedbed, or tree removal releases invasives already present.
- Early detection (pre-operation survey) and rapid response (development and implementation of a control plan) can prevent further spread of invasive plants.
- Prevention and control can be costly. Costs can be silvicultural, as in the case of modifying prescriptions or the failure of planned regeneration, or direct payments to control invasives or clean equipment. The costs associated with invasive plant prevention and control should be evaluated against silvicultural objectives, and be commensurate with the threat posed.
- Cleaning equipment will help prevent the spread of invasive plants into areas not already infested. Clean equipment is visibly free of mud, seeds, berries, and other plant material. Cleaning equipment using pressure washing equipment and catchment basins to collect wash water as well as hydraulic fluids, oil, and fuel, though desirable, may not be practical and economically feasible.
- It's difficult to know that sand, gravel, mulch and fill materials are invasives-free. Hay can contain seeds of invasives. Though straw is generally considered invasives-free, it's significantly more expensive than hay and not always weed-free.
- Deer overpopulation and browsing pressure, combined with invasive plant infestations, can make it difficult to regenerate native plants and can hinder the growth of seedlings and saplings. Deer tend to selectively browse on native species, thereby giving invasive plants the advantage.
- Fire benefits many invasive plants and may result in their dominance in the regeneration layer.

RECOMMENDED PRACTICES

Develop a strategy for managing invasive plants based on owner objectives and the species and amount of invasives present. Methods exist for managing invasives prior to, during, or following a forestry project. Except as required by law, all these practices are voluntary.

Planning

- ✓ Conduct a pre-operation survey to determine whether invasive plants are present. This can be integrated into regular stand inventory and monitoring.

- ✓ Map infestations and use the mapped locations in planning harvest areas and skid trails, truck roads, and landing locations. Avoid placing transportation infrastructure and landings in infested areas.
- ✓ Reuse landings and roads at invasive-free sites, to limit new disturbance.
- ✓ Use invasives-free sand, gravel, mulch, and silt barriers.

Equipment Cleaning

- ✓ If operating at a site with invasive plants, inspect equipment to ensure that seeds, berries, roots or branches aren't transported to an uninfested location. Clean equipment using a broom, compressed air or pressure-washing before moving to a new location.
- ✓ Dispose of invasive debris in a manner that avoids further spread. Burning collected debris in a pile is the best disposal method. Seek necessary permits and otherwise comply with RSA 227-L.

Control

- ✓ Determine whether control is practical and ecologically feasible. Control may not be warranted for species that cause minimal interference with management objectives. Control may be impractical and costly for invasives present in large numbers, in which case avoiding them may be the best option.
- ✓ Determine if control should take place before, during, or after the project. Control small to moderate infestations of species known to cause severe economic or ecological damage before or immediately after starting the project.
- ✓ Three to five years of active control and monitoring are typically required to ensure effective control and depletion of seed reserves in the soil seed bank.
- ✓ Mechanical control can take many forms including hand pulling, digging, mowing, blading, and tilling. Due to its labor intensive nature and the large amount of soil disturbance it causes, manual control is best applied only to small numbers of plants in limited infestations.
- ✓ Biological control currently has limited application. The only widely available biological control is for purple loosestrife, an invasive that infests many roadsides, wetlands and landings.
- ✓ Chemical control is the most cost-effective method. A variety of techniques and chemicals are available. The technique and herbicide used depend on the size of the infestation and species, as well as the timing of the application. Common techniques include foliar or mist application with a backpack sprayer, basal bark treatments, frill treatments, and cut-stem or injection treatments. Refer to the *Invasive Plant Management Guide* by the Connecticut Invasive Plant Working Group for information on invasive species management, chemical selection and concentrations, and control strategies. Contact the N.H. Division of Pesticide Control for the necessary license and permit requirements.
- ✓ Chemical control typically requires follow-up monitoring and treatment. Without effective follow-up, initial treatments may only make the problem worse.

Operation

- ✓ Avoid or minimize the movement of equipment and machinery from infested into invasive-free areas, unless you clean the equipment before moving it. Operate in invasive-free areas first. Operate from areas of lesser to greater infestation.
- ✓ Locate skid trails, truck roads and landings in invasive-free areas.
- ✓ If soil disturbance is needed to achieve a silvicultural objective in an infested stand, limit the disturbance to the target area.

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Close-Out and After

- ✓ To rehabilitate skid trails, truck roads and landings use a seed mix containing winter rye and both short- and long-lived native species. The traditional “conservation mix” often contains several undesirable, weedy species.
- ✓ Minimize the time between close of operations and rehabilitation to reduce the chance of invasive establishment.
- ✓ Monitor project area, especially transportation infrastructure and landings, for invasive plants for three to five years. If invasive plants are discovered, begin control efforts immediately.
- ✓ Closely monitor sites where seed, mulch, or fill materials were used. Focus follow-up monitoring efforts on high-traffic areas or where invasive control was conducted. These are some of the most likely locations of new infestations.
- ✓ Don't plant species suspected of being invasive during rehabilitation work. Problem plants not listed as invasive in New Hampshire have caused damage in other areas. Refer to the *Invasive Plant Atlas of New England*.

CROSS REFERENCES

2.3 Regeneration Methods; 3.1 Timber Harvesting Systems; 7.1 Natural Communities and Protected Plants.

ADDITIONAL INFORMATION

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