

COVE FOREST MANAGEMENT

Identification and Mitigation of Invasive Species in Mesophytic Coves

WHAT ARE COVE FORESTS?

Mesophytic cove forests are highly diverse hardwood forests in the Appalachian region that occur on sheltered, low- to mid-elevation valleys and ravines. Cove forests have high species richness and diversity, fertile soils, and complex forest structure. These forests are dominated by a high diversity of mesophytic hardwood tree species such as tulip poplar, red oak, sugar maple, basswood, and eastern hemlock.

For more information on cove forests, visit www.foreststewardsguild.org/mesophytic-cove-sites/





THE THREAT OF INVASIVE SPECIES

Invasive species are non-native plants and animals that expand their population rapidly in a new place disrupting ecosystem processes and damaging forests. Among other things, non-native invasive species can alter soils, interrupt native pollinators, and displace native vegetation that are important food sources for wildlife. Most non-native species are shade intolerant and fast-growing and thrive in recently disturbed sites. However, recent studies found several invasive plant species that have invaded sites within older forests or have the capability of invading shaded forest interiors such as Japanese stilt grass and oriental bittersweet. Mesophytic cove forests are threatened by the influx in invasive plants, pests, and pathogens. Non-native invasive plants can be particularly prolific when found in rich Appalachian cove sites as they utilize the abundant soil nutrients and available water without competition from other species or natural predators. This advantage threatens the valuable biodiversity of even the most healthy and mature mesophytic cove sites.

For more information about invasive plants in coves, check out these resources:

- "Herbaceous species composition and richness of mesophytic cove forests in the southern Appalachians: synthesis and knowledge gaps" by Elliott et al (2014).
- "A field guide for the identification of invasive plants in southern forests" by Miller et al (2010).
- "Managing invasive species in coves" <u>webinar</u> by the Forest Stewards Guild (2020).



COMMON INVASIVE PLANTS FOUND IN COVE FORESTS

Garlic Mustard (*Alliaria petiolate*) is an herbaceous biennial plant that can be identified by its heartshaped toothy leaves and small white flowers. Garlic mustard spreads by seed and can propagate via any live plant material. It is often found growing along roadways, logging trails, and other pathways into a forest interior. When treating this species, it is important to pull up plants by the roots or treat with herbicide. A land manager can treat for this plant before it seeds early in the growing season.

Japanese Stiltgrass (*Microstegium vimineum*) is an annual grass that can grow up to 3.5 feet tall. It has a high rate of spread, can propagate vegetatively and through seed, and can inhibit regeneration of native plants by smothering seed beds in a thick monoculture mat. For the most effective results, treatments should occur when the plant has matured but before it has gone to seed. This will discourage ample regrowth and prohibit the production of seeds. Effective treatments included properly timed mowing, in mid to late August.

Asiatic Bittersweet (*Celastrus orbiculatus*) is a deciduous woody vine that can be identified by its round leaves and red fruits with yellow casings. This plant spreads by seed and prolific vine growth, often girdling trees it grows on. It is important to treat with herbicide after cutting as cutting the stems stimulates the vine to resprout ten-fold. Cutting stems close to the ground and immediately applying herbicide to the stem will often have the best results and can happen in the dormant season.

MANAGEMENT SUGGESTIONS

Reducing impacts of invasive plants is possible through thorough planning of pre- and post-harvest treatments. Three key steps to reduce the threat of invasive plants in coves is to: 1) know what is already in the forest and prioritize the areas of highest risk, 2) plan treatments for pre- and post-timber harvest, and 3) budget for long-term treatments.

During the planning process and when taking inventory, notice and document the location or presence of existing populations of high-risk invasive plants such as Japanese stiltgrass, garlic mustard, kudzu, or Asiatic bittersweet, particularly in areas that are under consideration for timber operations.

If any high-risk species are within operating areas, preharvest actions can reduce the risk of spread, particularly when properly timed.

- Pre-treat landing locations, logging roads, and skid trails with appropriate herbicides where permitted during the growing season prior to seed production.
- When possible, defer entry into a site until a plan has been developed for sites already invaded.

During a timber harvest, maintaining equipment hygiene is critical to containing the spread of some invasive plant species. Cleaning mud and other debris off of boots, vehicles, and other equipment will stop the spread of seeds from site to site.

It is just as important to manage for invasive species control post-harvest as it is pre-harvest. It is recommended that treatments should be implemented for at least three years after the harvest has been completed.

- Designate skid roads or other trails as access points to facilitate vehicle access for mowing or herbicide dispersal in areas of high risk.
- Visit the harvest site during the growing season to track the rate of spread, ideally before seed out.
- Treat areas of high risk before the plants seed out with the proper technique relative to the species.

For more information, read "*A management guide for invasive plants in southern forests*" by Miller et al (2013). <u>https://www.srs.fs.usda.gov/pubs/36915</u>

