Resource for School Forest Stewardship Plans: Additional Information and Resources

Information below can be selected and added to the end of a School Forest plan specific to that site. These are meant to provide further information on management techniques, hazards, invasive species removal, etc. Information can be edited to fit the needs of each school and plan.

**ADA Requirements:**

Consider ADA requirements when developing trails or other areas to be accessed for outdoor learning purposes.

**BioBlitz:**

A BioBlitz is an activity in which teams of volunteer scientists, families, students, teachers, and other community members work together to find and identify as many species of plants, animals, microbes, fungi, and other organisms as possible.

**Hazard Trees:**

A “hazard tree” is a tree with structural defects likely to cause failure of all or part of the tree, which could strike a “target” that can be a place where people (students) gather such as an interpretive sign along a trail, designated outdoor classroom area, play equipment, picnic tables or other seating, a structure such as a building or fence, or vehicle, for example.

The important concept is that there must be a defined target, as briefly described above. In a natural forest environment, dead and dying trees serve an important purpose for wildlife and soil development so these trees should be left to natural processes if deemed safe to do so.

A trained arborist or forester should be consulted to conduct a hazard tree assessment and recommend a plan for mitigation. Ideally, because this is a school/public place, an assessment should be conducted for the entire grounds. Implementing a plan for mitigating potential hazards can be accomplished based on safety priorities and available funds. Areas deemed unsafe can be cordoned off with warning signs until the hazard is removed.

For more information, reference the USDA Forest Service publication “How to Recognize Hazardous Defects in Trees” at <http://www.treesaregood.com/treecare/hazards.aspx>.

**Invasive Species Management:**

Amur Maple

Amur maple is a small tree up to 20' high with a broad crown and is sometimes pruned as a hedge. Twigs are smooth and light colored. It displaces native shrubs and understory trees in open woods, and shades out native grasses and herbaceous plants in savanna habitat. A prolific seed producer, Amur maple is becoming invasive in the northern U.S. Extensive wild populations have been found in Illinois and Missouri. It resprouts easily from the cut stump. Amur maple is a native of central and northern China, Manchuria and Japan, it was introduced to North America in the 1860s. It is still being frequently sold commercially as an ornamental, and for wildlife and shelterbelt plantings.

For more information on Amur maple, reference the MN DNR webpage: <http://www.dnr.state.mn.us/invasives/terrestrialplants/woody/amurmaple.html>

Bittersweet Nightshade

Information from the “Minnesota Wildflowers” website: <https://www.minnesotawildflowers.info/flower/bittersweet-nightshade>

While this plant isn't as deadly as its common names suggests, the berries can make you sick if eaten in any quantity. This is likely a very under-reported weed in Minnesota, commonly found in yards, field and woodland edges, vacant lots, shorelines, and other disturbed, partly shady, average to moist soils. Left to its own devices it will spread like crazy, but isn’t too difficult to control with hand pulling followed by a thick layer of mulch.

Buckthorn:

The first priority is to identify and remove female seed-producing plants. The second priority is to monitor previous removal sites for sprouting and/or seedings and continue to remove any regeneration.

Reference the MN DNR publication “Buckthorn: What You Should Know. What You Should Do” at <http://www.dnr.state.mn.us/invasives/terrestrialplants/woody/buckthorn/index.html> for more information on best methods to control and manage buckthorn as well as planting native replacement species. Hard copies can be obtained through the DNR School Forest Program.

Buckthorn is the only green-leafed deciduous shrub/tree in the forest in November. Fall into early winter is an easy time to identify and treat/remove.

It is important to understand that buckthorn is a very successful and persistent invasive woody plant that takes time and patience to control and manage, but it can be done. The best approach is to properly identify it (as compared to native woody plants such as cherry or dogwood) and strategically remove it (female seed-producing plants first) as your/volunteer time and resources allow. Pulling small, manageable plants is best when the entire root system can be removed, however, chemical treatment will be necessary for larger plants that have to be cut, or the buckthorn will sprout back creating a worse problem.

Emerald Ash Borer (EAB):

Reference the MN DNR publication “EAB Alert: A Guide to the Emerald Ash Borer” or the websites listed below for more information.

Emerald ash borer is a fairly new and serious pest to Minnesota’s ash trees having been found in St. Paul in 2009. It was first discovered in the U.S. in Michigan in 2002. Ash is a very common species planted on school grounds and in residential areas and is also common in native habitats.

Emerald ash borer cannot currently be eradicated and is expected to have a significant impact on our boulevard, backyard, parks and natural ash tree resources, much like Dutch elm disease. However, there are strategies for dealing with this pest that include the following:

* Identify, map and record all ash trees on your property, not just in the designated school forest area.
* Assess the condition of each of the ash trees for health and function (is it healthy and providing significant shade or is it not very vigorous and mixed in a woodland area). This will help you determine if the tree is worth trying to save or not. What will be lost if it dies?
* Decide what trees should be saved, left to die, or be immediately replaced:
	+ Trees to be saved:
		- Chemical treatments are proven to be effective against EAB
		- There are costs associated with treatments and should be researched thoroughly before deciding if and how to proceed
		- Contact tree care companies that have ISA Certified Arborists on staff for additional information on services and costs
	+ Trees to be immediately replaced:
		- For all remaining trees not being chemically treated, develop a plan for immediate replacement of those that provide the most benefit due to location and function and those that are least healthy. For example, if an ash tree is in severe decline but is in a situation where it provides significant benefits (such as shade), consider cutting that tree and replacing it immediately. Or, if an ash tree is currently providing a great deal of shade in a high use area and is in reasonable health but is not healthy enough to chemically treat, look for a nearby space where a replacement tree can be planted and grow while the ash declines. The declining ash should be removed at the time the replacement tree has grown enough to begin to replicate the benefits.
	+ Trees left to die without replacement:
		- There are many situations where cost, logistics or other factors will not allow for saving an ash tree and replacing it is not a viable option. These trees are simply left to die. Often these trees are in situations that they will ultimately need to be removed, such as along streets, around play areas, or where their decline could pose a safety risk. Other trees are in more natural areas where they are left to die, fall and recycle into the environment. These trees need to be evaluated for potential safety risk if there is a trail, bench, educational station, etc.
* There are many resources relating to EAB with a few listed below:
	+ MN Department of Natural Resources:
		- <http://www.dnr.state.mn.us/invasives/terrestrialanimals/eab/index.html>
		- <http://www.dnr.state.mn.us/forestry/urban/community_eab.html>
	+ MN Department of Agriculture: <http://www.mda.state.mn.us/plants/pestmanagement/eab.aspx>
	+ UMN Extension: <http://www.extension.umn.edu/issues/eab/>

Garlic Mustard:

Identifying and removing garlic mustard is important and will be to try to contain its spread. Garlic mustard is a significant ecological threat by spreading into high quality forests and woodlands, upland and floodplain forests, not just into disturbed areas. Invaded sites undergo a decline in native herbaceous cover within 10 years. Garlic mustard alters habitat suitability for native insects and thereby birds and mammals.

Garlic mustard is a prolific seed producer which helps it successfully spread. One pathway the tiny seeds take is through soil attached to footwear. Please be aware of this when walking in areas with garlic mustard and be sure to clean footwear before entering un-infested areas. Interpretive signage in the areas where it is located may help students, staff and visitors identify this invasive plant and take precautionary measures to prevent its spread.

For more information on garlic mustard, reference the MN DNR webpage:

<http://www.dnr.state.mn.us/invasives/terrestrialplants/herbaceous/garlicmustard.html> for information on best methods to control and manage garlic mustard as well as planting native replacement species.

Exotic Honeysuckles:

Exotic honeysuckles replace native forest shrubs and herbaceous plants by their invasive nature and early leaf-out. They shade out herbaceous ground cover and deplete soil moisture. The seeds are readily dispersed by birds, making them very invasive. Some research suggests that the plant inhibits the growth of other plants in its vicinity. These species were introduced to North America as ornamental shrubs and beneficial to wildlife.

For more information on exotic honeysuckles, reference the MN DNR webpage:

<http://www.dnr.state.mn.us/invasives/terrestrialplants/woody/exotichoneysuckles.html>

Reed Canary Grass:

Reed canary grass is a major threat to natural wetlands. It out competes most native species and presents a major challenge in wetland mitigation efforts. It forms large, single-species stands, with which other species cannot compete. If cut during the growing season a second growth spurt occurs in the fall. Invasion is associated with disturbances, such as ditch building, stream channeling sedimentation and intentional planting.

For more information on reed canary grass, reference the MN DNR webpage: <http://www.dnr.state.mn.us/invasives/terrestrialplants/grasses/reedcanarygrass.html>

Siberian Elm:

This tree species is particularly aggressive and can invade and dominate disturbed prairies and forests in just a few years. Seed germination rate is high and seedlings establish quickly in sparsely vegetated areas. It grows readily in disturbed areas with poor soils and low moisture. A native of eastern Asia, Siberian elm was introduced to the U.S. in the 1860s for its hardiness, fast growth, and ability to grow in various moisture conditions. It is still sold commercially as a shelterbelt and windbreak tree.

For more information on Siberian elm, reference the MN DNR webpage: <http://www.dnr.state.mn.us/invasives/terrestrialplants/woody/siberianelm.html>

Spotted Knapweed:

Spotted knapweed especially threatens dry prairie, oak and pine barrens, dunes and sandy ridges. Spotted knapweed is poisonous to other plants (phytotoxic) and spreads rapidly in artificial corridors, gravel pits, agricultural field margins and overgrazed pastures. It is a native of Europe and Asia it has become a serious problem in pastures and rangeland of the western states. Spotted knapweed is a MN Department of Agriculture listed p[rohibited noxious weed.](http://www.mda.state.mn.us/plants/badplants/noxiouslist.aspx)  It is known to be in the Blaine Preserve SNA. For more information on spotted knapweed, reference the MN DNR webpage: <http://www.dnr.state.mn.us/invasives/terrestrialplants/herbaceous/spottedknapweed.html>

**Deer Protection for New Plantings:**

It is known that deer utilize the school forest and that they can damage seedlings and small trees and shrubs. Therefore, it may be necessary to protect newly planted trees and shrubs through a variety of techniques including wire cages, paper bud capping, and surrounding a seedling with a pile of downed woody material or planting in somewhat inaccessible places. Note winter deer trails and avoid planting along those routes or be sure to protect the plants if you do.

**Monitor:**

Monitoring is to observe and check the progress or quality of (something) over a period of time; to keep under systematic review. This is critical to know if your projects are successful and learn what may need to be adjusted or redone. For example, it can be as simple as monitoring mulch for replacement or new plants for watering. For buckthorn removal projects, this monitoring is important to assess if chemical treatments worked and to manage buckthorn seedlings.

Monitoring can be developed into a fun and educational project for your students.

**Mowing and snow removal:**

When implementing any aspect of your management plan, it is important to work closely with facilities and grounds maintenance staff to ensure that what you do does not adversely impact their work, nor does their work adversely impact your projects. For example:

* Learn what equipment is used for lawn/landscape maintenance, such as the size of the mower deck, pesticides, weed whips, etc.
* Learn how snow is moved and where it is placed during heaving snow events, as well as where salt and sand is used
	+ plant salt tolerant vegetation along sidewalks
	+ do not plant any vegetation in areas where significant amounts of snow is moved into
* When planting any vegetation (trees, shrubs, plants) consider how the site is maintained and work with facilities/grounds maintenance staff to:
	+ determine the best locations for plantings (if there are options) to avoid maintenance and snow removal conflicts
	+ agree on the use of mulch around trees and other vegetation plantings
		- consider grouping trees and plantings within a mulched area so the mower can go around that entire area instead of having to weave between trees
		- mulch up to structures such as fences and buildings to avoid small strips of lawn that need to be maintained
	+ agree planting boundaries so no inadvertent damage is caused, especially when plants are small and vulnerable

**Mulch:**

Reference the Missouri Department of Conservation publication “[Mulch: Your Tree’s Best Friend](http://mdc.mo.gov/sites/default/files/resources/2010/04/3792_1460.pdf)” at for details on mulch placement and benefits. Organic mulch material, recommended for uses around vegetation, quickly recycles and needs regular replacement. As indicated above, regularly monitor areas where organic mulch is used and replace as needed. Sources of mulch may include your City’s Forestry or Parks Department or local tree care companies who grind their tree waste material before transporting.

**CAUTION:** Know the content of the mulch before using to ensure that no weed or exotic invasive seeds are mixed in!

**Nesting Boxes:**

Blue bird:

Install 3 pairs of blue bird boxes (6) along the perimeter of the woods facing grassland areas.

* Boxes are placed in pairs because tree swallows will usually occupy one of the boxes in a pair and bluebirds will occupy the other. Because both bluebirds and tree swallows are territorial with their own species, the paired arrangement increases the chances a pair of bluebirds will take up residence in one of them.
* Paired boxes should be placed out of sight of another pair or at least 500 ft apart.

**Pruning:**

Pruning is the removal of live or dead branches to improve the quality and value of the tree and clear trails or designated learning areas. A high-quality saw is used, and the branches are removed flush with the trunk when pruning coniferous trees and outside of the branch collar when pruning deciduous trees. Pruning should be done in the late-fall and winter when the trees are dormant.

**Poison Ivy (native)**

Western Poison Ivy is on the noxious weed list for Minnesota due to its toxic, rash-producing properties, as well as its propensity to form large colonies from underground rhizomes. Western poison ivy is a smallish, nonclimbing shrub usually about knee high, with a single stem and only a few stubby branches or no branches at all. The leaves can be relatively large but always with three leaflets that are shiny and are large-toothed along the edges. Western poison ivy occurs essentially statewide and is common everywhere except the northern tier of counties. Although it is primarily a forest species, it is adapted to a remarkably wide range of ecological conditions. The sap contains a toxic oily compound (3-n-pentadecyl-catechol) that is found in the leaves, flowers, stems, and roots. If any portion of the plant is bruised or broken, the poison may exude onto the surface, which is how people typically come in contact with it.

For more information on Western poison ivy, reference the MN DNR webpage:

<http://www.dnr.state.mn.us/trees_shrubs/deciduous/poisonivy.html>

**Release:**

Small trees and seedlings that are being over-topped by grass, brush and undesirable trees are released to grow freely by removing the inhibiting vegetation. If not released, these plants will grow slowly or may die.

**School Forest Committee Objectives**

The preceding *current conditions* and *management objectives* sections of the School Forest Stewardship Plan provide a current picture, as well as a vision for the future, of the Scenic Heights School Forest. This section outlines the steps necessary to bring the School Forest from the current picture to the desired future condition of the site:

* Annually appoint a School Forest Management Committee to guide the development and continued visioning of the School Forest.
* Review the goals of the School Forest Stewardship Plan annually to update completed activities, current conditions, redefine goals and objectives, identify new opportunities and activities, and update the Future Forest Stewardship Projects table (see below) as needed.
* Using the Future Forest Stewardship Projects table, develop an annual plan of work for the School Forest, which outlines the steps that will be taken the current year to meet one or more of the objectives outlined in the School Forest Stewardship Plan.
* At the completion of the year, submit a report to the DNR School Forest staff that highlights the activities, the steps taken, and objectives addressed during the year. This report should also document any unexpected outcomes or difficulties in meeting the stated objectives.

**Soil Information:**

Soil Test: Has a soil test been done on the grounds or within the school forest? Check records. If not, it might be a good idea to (and a great project for students) to collect soil samples and submit them for testing to the UMN Soil Testing Laboratory: <http://soiltest.cfans.umn.edu/>. This would be wise to do for any new plantings.

**Stinging Nettle (native)**

Information from the “Minnesota Wildflowers” website: <https://www.minnesotawildflowers.info/flower/stinging-nettle>

The sharp stinging hairs cause an immediate burning sensation upon contact with bare skin. Unlike poison ivy, Stinging Nettle rarely produces a blistery rash and the worst of the uncomfortable sting typically diminishes within a few hours.

To remove you can pull or dig roots and rhizomes while wearing gloves and arm protection or apply herbicide.

**Tree Care:**

There are many aspects to proper tree care and maintenance for “yard” trees or woodland trees including proper planting, fertilizing, mulching, staking, watering, pruning, and others. Information on all of these can be found at the MN DNR webpage: <http://www.dnr.state.mn.us/treecare/index.html>

Who provides that care is critical. Improper techniques can cause significant damage or even kill a tree, whether it is newly planted or mature. Many things can be done by anyone, but there are certain situations where it is best to work with a trained arborist. An arborist is a specialist in the care of individual trees. There are also certified arborists who are tree care professionals certified by the International Society of Arboriculture. For more information on arborists and how to locate one, visit these webpages:

* <http://www.treesaregood.org/treecare/hire_arborist.aspx>
* <http://www.treesaregood.org/findtreeservices/FindTreeCareService.aspx>

**Thinning:**

As trees grow, they require more space to obtain their light, moisture and soil nourishment. They must be thinned when they become crowded. Crowding will stunt the growth of trees and will cause health problems such as insect and disease attacks and excessive loses to drought.

Unmanaged hardwood stands normally contain large numbers of defective and poorly formed trees, and also trees of undesirable species, i.e. buckthorn, boxelder, and prickly ash. These trees should be removed when they are competing with the desirable or crop trees. When thinning conifers, the suppressed or poorer trees are removed leaving the healthy and larger tree.

Several methods are employed to remove trees in a thinning operation. Trees may be felled, poisoned or girdled (cutting a double notch around the trunk). Your forester will advise as to the best method for the circumstance.

**Walking Trails**

1. Maintain existing walking trails to provide educational and recreational access to the property.
2. Expand trail network, as appropriate, to reach other cover type areas, meet student population numbers and accessibility requirements.
3. Reinforce and improve walking trails where erosion is occurring on steep slopes.
4. Hazard trees will be identified along the edge of the trails on an ongoing basis for removal. Guidelines for the identification of such trees will be developed for risk management purposes. These guidelines will also serve to keep many trees surrounding the trails from being removed unnecessarily
5. Develop plan for new trails if desired with assistance for your forester.

**Wildlife –General Habitat Recommendations:**

The objective of these recommendations is to improve and maximize habitat for a variety of wildlife species. As outlined above in the forest management recommendations, much of what is listed below will be accomplished by implementing those activities:

* Mast-producing[[1]](#footnote-1) trees and shrubs attract many different species of wildlife. Plant only native species that are locally adapted to the soils and climate (as opposed to exotic, non-native species). Birds particularly favor shrubs and small trees like highbush cranberry (*Viburnum trilobum*), juneberry (*Amelanchier* sp.), elderberry (*Sambucus canadensis*), cherries (*Prunus* sp.), dogwood (*Cornus* sp.), hazelnut (*Corylus americana*), mountain ash (*Sorbus americana*), American plum (*Prunus americana*), hawthorn (*Crateagus* sp.) and nannyberry (*Viburnum lentago*). Desirable hardwood trees include oaks (*Quercus* sp.), hickories (*Carya* sp.), and basswood (*Tilia americana*).
* A diversity of forest types and age classes benefits a diversity of wildlife. Thinning hardwood stands creates more structural diversity by having a variety of ages in the forest. Preserving old-growth areas that are utilized by certain species of wildlife is also important. Older trees contain cavities that are utilized by wildlife. Also preserve younger, brushy areas that provide habitat for a different suite of species.
* Create brush piles and down woody debris. Many species of wildlife utilize brush piles for cover, including rabbits, chipmunks, woodchucks, coyotes, and songbirds. Brush piles can be an easy way to improve structural diversity.
* Coarse Woody Debris – Logs and rotting material on the forest floor provide important micro-habitat for mosses, lichens and fungi, as well as cover for small mammals, reptiles, and amphibians.
* Snags and Den Trees - Dead and dying trees are very important for woodpeckers, chickadees, nuthatches, bluebirds, squirrels, bats, wood ducks, furbearers, and many other animals. Leave most dead trees or cavity trees standing – unless they may present a hazard (see information below regarding hazard trees) with a goal to have at least 3 per acre. Also reserve some live large-diameter trees for future snags. You can create snags by girdling (cutting through the bark all the way around the tree) undesirable trees.
* The zone (riparian area) around the pond and wetland area is teaming with life because it supports species of both aquatic and terrestrial habitats. Preserve and buffer these areas from negative impacts such as invasive species (reed canary grass) and soil erosion.
1. Mast refers to fruits, nuts, and seeds from trees and shrubs. [↑](#footnote-ref-1)