
Growing Native: Managing and Restoring Native Plant Communities

Summary: Now that students understand the differences between invasive and native plant species and the importance of those differences, they are ready to help create or manage a native plant community in their area. Establishing a native plant community will build an understanding of the local ecology and how students can actively help improve wildlife habitat in their community

The first step is to choose a study site. The site can be a schoolyard, community park, state park, nature center or corporate site such as those engaged with the Wildlife Habitat Council. Once a site has been selected there are two approaches that can be taken. Each approach depends on the context of the site you choose.

If you choose to manage a pre-existing natural area students will most likely be involved with invasive species management and some native plantings. However, if you choose to reestablish a native plant community in an area of mowed lawn in a schoolyard or manicured park, the project will involve a different set of activities.

Objective: This activity will reinforce student's understanding of plant communities; it builds upon the cumulative efforts of previous lessons to characterize their composition and structure.

Grades: 6-8

Subject: Science, math , language and art

Skills: Organization, communication, mathematics, problem-solving and research

Materials: Variable-dependng on the project

BACKGROUND

For this lesson it is important that students know how to identify common native plant species. It would be best to have a natural resource professional, tour guide, scout leader, or knowledgeable parent out to the restoration site to assist the students in identifying the plant species during the field visits. The project will be more effective and rewarding for students if this type of expertise is available.

A restoration project is a long-term effort in which benefits/results may not be achieved for at least a year or more. This could be frustrating to students; however, this also can create a



meaningful project from which students can learn. Each class can record data on the site, and compare their data with past year's information.

The first step in this project is to identify a site for the restoration project. This ideally would be the school grounds, as this affords easy access for monitoring and maintenance activities. Monitoring activities could include recording data such as identification, plant species type, plant species density, and stem growth. Maintenance activities may include watering and managing for invasive plants. A local park, nature center, publicly owned property, or a Wildlife Habitat Council certified site might also be good candidates for a restoration project if you are not able to work on the school grounds.

A project that reaches beyond the school grounds develops a partnership between the school and the managers of the restoration site. Partnering with a natural area outside the school will bring additional expertise to the project through engaging the knowledge and experience of the site managers. A partnership will also help students connect their efforts to the community. Many local, county and state parks host stewardship and other volunteer opportunities to help them manage their natural areas. Park staff may be readily available to engage a class project with existing management activities. For example, a local park may need volunteer labor to help with seed collecting, invasive species removal, or assistance with spring plantings of seedlings.

The complexity of the data collected about the ecology of the site will depend on its accessibility. As the number of available site visits increases for a restoration project, so does the student's ability to collect more in-depth information.

Through this lesson students will understand the importance and challenges of reestablishing native plant communities. As a result of their restoration and/or management project, students will improve soil and water quality and increase the amount of quality wildlife habitat in their schoolyard, community and beyond.

Sample Time Line

January-February	Study plant communities and invasive species
March	Identify a restoration site
April	Plan a restoration project by identifying site preparation needs, a species list, planting time and monitoring and maintenance needs
May	Conduct site preparation
June	Implement the planting project
Next Fall	Revisit the site and observe and record the growth

ACTIVITY

A. Managing an Existing Natural Area

1. Lead a discussion summarizing what the students have learned about native plant communities. Explain that students will be using their knowledge of the natural heritage of the area for managing a natural area in their community, much like how an ecologist would manage land in a state park. If possible have the steward of the land give a short presentation about the property and its ownership and land-use history. Students should have an understanding of the native plant communities of their region and the invasive plants that threaten them.
2. Break students into teams who will work together gathering data on their plot.
3. Assign the teams to a 20' by 20' plot area; have the students demarcate the area with stakes. Assign each team a color to mark their stake in order to signify team ownership of the plots.
4. Have student's record information about their plots into site information sheets, this could include:
 - a) A map of the site with notations about low wet areas or areas with higher topography and significant physical features of the site such as rotting logs, large boulders or spots devoid of vegetation. Note the surrounding vegetation around the study plot and if there are any water features near the site.
 - b) Determining the soil type in the plot. Students can do this by digging a small hole in their study plot with a trowel and noting the texture of the soil. The soil can be categorized as sand, loam or clay. If possible, have soil pH test kits available to the students.
 - c) A description of the dominant growth form of the plant species found in the plot. Break the growth forms into the following categories, tree, shrub, wildflower, grass, fern, and aquatic plant.
 - d) Identifying as many different types of plant species as possible in the plot with their common and Latin names. Host experts such as local master gardeners or botanical club volunteers for help in identifying the plant species. Students should note vegetation layers. For instance, a forest would have an understory and an overstory component to the description.

- e) Noting any invasive species found in the plot. This should be based on student's previous research and knowledge of common invasive plants to the region.
 - f) Recording any animals or insects, or signs of them in the study plot. For example this could be an anthill, rabbit hole or deer tracks.
5. The students should summarize the information they collected into a report that will describe and define the study plot. Special attention should be paid to the different invasive plant species found in the plot and how they are affecting the growth of native species.
 6. Building upon that report students should then write a management plan for the plot, that describes control measures for the invasive species on the plot. This information should be available from research completed with the previous lesson, "The Power of Invasion". If keystone species are missing from the native plant community they are studying, they should address the need to re-establish those native plants at the site in the management plan.
 7. Arrange a field trip for the students to return to the site and implement some of the control measures at the their study plot. Hand pulling of the invasive species is the most reasonable option for students, as it does not involve chemicals. Biological control agents such as the *Galerucella spp.* beetle for purple loosestrife may also be an option for the students. Herbicide treatments to the study plot require coordination with the site land managers, who may be able to implement the student's recommendations with their own staff. Since this activity will most likely take place in the spring or fall, it may also be an opportunity to seed in native species that are missing from the target plant community.
 8. Students should summarize their activities and add a management timeline to their vegetation management report. If possible arrange for students to see their study plots the next season so they are able to evaluate their control methods and recommendations.

B. Restoring a Native Plant Community

1. This type of activity is a large undertaking and can be approached as a class project. Before determining what type of plant community to establish, students should have visited the site at least once to be able to make decisions on a planting plan. Once a site for a native plant restoration project has been identified, students must decide what type of plant community to establish at their site. Choosing an appropriate plant community for the site is critical to the success of the project. Through previous lessons students should have observed which plant communities are native to their region and how they fit together. The chosen plant community should be well suited to the conditions of the planting site and its natural habitat. This includes factors such as soil type, water regime and climate. This should be based on understanding of the site conditions and previous

research on native plant communities. Students will develop a species list appropriate to the type of plant community they are restoring.

2. Developing a species list will build upon previous knowledge of plant communities. Students should consult regional plant lists, called floras or ask a local naturalist for advice. Check the WHC website for information on native plant producers. Having native plant catalogs handy will help students design a plant list. Developing a species list will also help the students prepare a budget for the project and begin gathering funds. The plants can be purchased or donated. Ask the community to donate time, equipment and resources. Acquiring donated plants can be tricky, as the goal of the restoration project is to establish “native plants”, and not “horticultural varieties”. Often the PTA or a local business can be of help in raising funds

3. Students should then develop a site plan. This can be accomplished through drawing a map of the site. The plan should include a drawing of the planting area and illustrate where the plants or seeds will be placed. A site plan is a detailed picture of the finished project. The most important function of a site plan is to illustrate where the plant species will be placed. For example, if students are re-creating a prairie ecosystem they will indicate the areas to be seeded or plugged with prairie wildflowers and grasses. If students are doing tree plantings they will indicate where the trees will be placed on the site plan. Some other important considerations for a site plan include
 - a) How much of the area is to be planted? Where?
 - b) What are the surrounding land uses to the site?
 - c) Will the new plantings complement surrounding habitat by connecting fragmented natural areas?
 - d) Are there topographical features to be considered that will require plants with different soil and water needs?
 - e) Are access trails for the site planned into the restoration project?
 - f) If the project is in a man-made setting, such as a schoolyard or manicured park, are there spots for interpretive signage?
 - g) How much site maintenance will be required?
 - h) What types of animals will live in this plant community? Have the needs of wildlife, food, shelter and space, been considered?

4. Site preparation is very important to the success of a restoration project. If you are working at a site with mowed lawn it can easily be killed off with black plastic, tilling or herbicide application. An old-field ecosystem populated with weeds requires more

complex controls and a natural resource or landscaping professional should be consulted. Students should decide upon what site preparation method would be best for their site given their time and resources.

5. The next step in the process is to acquire the plants for the restoration project. These can be obtained from native plant producers in your region, or they can be grown from seed. Collecting seed and growing it in the classroom is an ideal way to teach students about the plant life cycle. Seed should only be collected if permission is granted from the landowner, and do not pick the seed of endangered plant species. Often the County Extension Service has “Gro-Labs” that classrooms can borrow or buy that make classroom seed sowing easy.
6. The next step is to establish a planting day. This occurs after the site has been prepared and the plant materials for the project have been secured. Invite parent volunteers and other classes to help out. If just seed is being used it makes the project much simpler. If plugs or larger trees are being planted, ask parents to donate tools for the project. Depending on the scale of the project it may be most appropriately done on a weekend. Make sure factors such as watering and mulch are considered when planning the agenda for the day.
7. Monitoring and maintenance of the restoration project are important. Especially in areas that have been just been seeded and have recently disturbed ground. If the project is off-site, the site managers will have this responsibility. If the project is on the school grounds, students should monitor the site for the invasive plants they have become familiar with through the lessons. In addition, periodic surveys of the plants and animals using the site should be conducted. Students could be asked to keep a journal of their observations of the habitat once a week.