

Invasive Species Identification and Management

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Invasive Species Identification and Management

Designed to be implemented with students in 7th and 8th grade receiving special education services.

Goals and Objectives as related to **Vermont Standards**

A. 3.9 Sustainability: *Students make decisions that demonstrate understanding of human and natural communities, the ecological, economic, political, or social systems within them, and awareness of how their personal and collective actions affect the sustainability of these interrelated systems.*

B. 4.6 Understanding Place: *Students demonstrate understanding of the relationship between their local environment and community heritage and how each shapes their lives.*

C. 7.16 (Proposed Natural Resources): *Students demonstrate understanding of natural resources and why and how they are managed.*

Goals and Objectives: A. Students will be able to identify at least five common invasive plants listed by the VT Department of Agriculture. The five most common (perennials gone wild) to Vermont are listed below. They will be able to state the effect the invasion each species has on the economy and ecology of an area and identify action that individually or collectively they could take to be a part of an acceptable management solution. (*3.9 Sustainability*)

* **Purple loosestrife**, also known as the "purple plague," an ornamental plant promoted for its purple flowers, has the ability to produce millions of seeds which spread easily by wind or water. Once limited to gardens in the Northeast, it now chokes wetlands across the country.

* **Japanese knotweed** is a fast-growing herbaceous perennial that frequently forms dense bamboo-like patches along waterways. This plant has escaped cultivation and been naturalized throughout eastern North America, actively reducing species diversity and wildlife habitat.

* **Common and glossy buckthorn**, deciduous perennial shrubs that reach up to 20 feet in height, can establish dense stands and choke out native shrubs and herbaceous plants. Native to Europe and Asia, these shrubs were originally introduced for hedges, forestry uses, and wildlife habitat.

* **Honeysuckle**, with its tubular flowers and many-seeded berries, can alter native woody and herbaceous plants by decreasing light availability. Honeysuckle berries are readily

eaten by birds which spread them across the landscape. Troublesome varieties include Morrow, Tatarian, and Hybrid.

* **Japanese barberry** grows along roadsides, in old fields and open woods. Tolerant of sun, shade and a variety of habitat types, this spiny, woody shrub is a particular threat to open, second-growth forests where, once established, it can crowd out other under story plants. (*The Nature Conservancy of Vermont, 27 State Street, Montpelier, VT 05602*)

Goals and Objectives: B. Students will be able to demonstrate understanding of their surroundings and how it has been shaped by tradition and the impact this has on their lives today and in the future. (*4.6 Understanding Place*)

A. Identification. Around the Upper Valley (White River Junction and surroundings) there are areas of invasion by undesirable species. Students will identify the areas from their own research (observation) of public areas.

B. Evaluation. They will be able to evaluate how and why a certain species has become established in a specific area. (Sustainability 3.9 dd.)

C. Eradication. They will identify various ways to eradicate undesirable species in designated areas. They will evaluate (with consideration given to location and habitat) the best process and time for eradication of a species in specific public and private areas. (Sustainability 3.9 cc.)

D. Repair. Students will learn how to repair the area to its natural state.

Goals and Objectives C: Students will through observation, evaluation and research be able to understand and apply principals of management of evasive species. (*7.16 Natural Resources*)

A. Research. There are different means by which each species can be slowed down, manage and/or eradicate. Research on eradication methods and time of year for administration and application will be evaluated.

B. Application. Designated areas within a short distance of the school will be targeted for management and will be followed for two years.

Methods:

The group of students I will be working with are receiving special education services and have difficulty in organization and sustained attention. Units must be presented in a systematic format with frequent changes in activities and continuous monitoring on my part to assure that each student is on track. The students respond well to group discussions, Power-Point presentations, outdoor activities, and hands-on activities in class as well as outdoors. Some invited speakers have been particularly successful in presenting information to my students. Careful planning with the guest speakers on

presentation and information is essential to a successful educational experience. Speakers are available through state and private agencies. Donald Jarrett has volunteered to be part of a field trip. With his background in education and interest in management I would certainly ask him if he would join us on a field trip.

I will begin the unit with thought provoking questions such as:

1. What are invasive plant species?
2. Why are they called invasive species?
3. Where did they come from?
4. What are the problems associated with the continuous growth of the species?
5. How do they effect the environment?
6. How do they affect the habitat?
7. Are animals affected by the invasion of evasive species?

I will encourage students to ask their parents, community members, educators and anyone they think might have information to share. I am always amazed at the amount of resources that are available in the community. Other ways to obtain information on invasive plant species, management, and effect of habitat are from books, the internet and state and federal agencies. Two agencies, Nature Conservancy of Vermont 802-828-2431 and the Vermont Department of Agriculture 802-929-2431 have considerable information available through their web sites, by phone and at their offices.

More information can be obtained through the school library resources and its service available to obtain other books in the state.

Overview

Invasive species is a segment of a greater unit on tree identification. The tree identification unit involves the identification of trees. The students learn the distinguishing characteristics that separate one tree species from another. Using their tree identification books, teachers and volunteers they will examine tree type (deciduous or conifer, tree or a shrub). They will use the leaves, bark, fruit, twigs and the form of the tree to identify it.

Time: Two weeks class time with double periods on Fridays and follow up with two periods for maintenance, observation, recording and making recommendations for the future of the area.

Procedure:

Week One - Students will:

1. Learn what an invasive plant is, where it came from and why they are called invasive.
2. Learn what the problems associated with the continuous growth presents.
3. Learn how and why the invasive plants are detrimental to the habitat.
4. Learn the common name and identification of the five most common (perennials going wild) invasive plants listed by the VT Department of Agriculture.
5. Determine if there is any value to invasive plants in general and specifically the five most common invasive perennials we are studying. (Edibility, beauty, etc.)

Materials: Students

Clipboard: for outdoor activities and taking notes and drawing.

Pencils: colored and two regular (#2 is best).

Loose Leaf Binder: to keep all information together

Materials: Teacher needs to secure

Reference Books: for information and identification

Computer Access: for information and identification

Power Point Presentations: downloads from “Invasive Plant Atlas of New England”

Volunteers: for field trip

Speakers: Possible VINS, VT Dept. of Agriculture, Fish and Wildlife, etc. (careful planning needs to be taken in having speakers.) The students I work with need to have material presented in an interactive, visual, hand-on approach.

Week One Field Trip Friday (Two periods)

There will be a field trip to identify invasive species and areas in need of control. There are several areas around the school that have been taken over by invasive species. (The field trip is part of a unit. Tree identification will also be ongoing.)

Week Two – Students will:

1. learn various methods to control invasive species.
2. learn the most effective method to use in control of each of the five species.
3. learn the advantages and disadvantages of each method.
4. learn how the control will change the environment.

Week Two – Field Trip Friday (two periods)

Students will work in controlling and/or eliminating an invasive species in a targeted area. (two class periods)

Follow-up Session

The follow-up session will involve observation of the area that was worked on to eliminate/control a species and planting of a non invasive species compatible to the area.

Evaluation/Assessment:

1. **Project.** The students will identify invasive species on public land within a short distance from the school.
2. They will research and determine the best means to eradicate/control the invasive species.
3. They will work at the site to eradicate/control the species.
4. They will observe the work site at a later date and plant a non-invasive species compatible to the area.

Assessment: *(note: The students I work with have alternative testing to the customary paper and pencil test since reading and writing are areas of difficulty.)*

1. Students will be assessed on: (1) their ability to identify the five (perennial gone wild) invasive species, (2) involvement with the research, (3) carrying out the project, and (4) revitalization of the designated area.
2. The students' notebooks will be graded. The notebooks should contain information to answer the original thought-provoking questions. They should contain sketches, photocopies, internet information, notes on information gained from other sources and books.
3. Evidence that students are meeting the standards will demonstrate through group discussion and understanding of:
 - a. how and why natural resources need to be managed, (7.16 Natural Resources.)
 - b. the effect of personal and collective actions on the environment, (3.9 Sustainability) and
 - c. the relationship between environment and community and how it shapes their lives. (4.6 Understanding Place).

4. Students will learn research procedure skills, organization, identification, evaluation, decision-making skills. With the new skills and information on the environment and knowledge of the positive and negative impact people can have on the environment it is hoped the students will make better and more well-informed decisions regarding the environment.

In closing, an Aldo Leopold quote is appropriate.

"We shall never achieve harmony with land, any more than we shall achieve absolute justice or liberty for people. In these higher aspirations the important thing is not to achieve, but to strive."

Leopold, Aldo: *Round River*, Oxford University Press, New York, 1993

References

Myers, Judith H. *Ecology and Control of Introduced Plants* Cambridge University Press, Cambridge, New York 2003.

Agencies:

United States National Arboretum, 3501 New York Avenue, NE., Washington, D.C. 20002-1958.

Vermont Agency of Natural Resources, Department of Environmental Conservation, Waterbury, VT 05671, Phone (802) 241-3770 Website: www.wanr.state.vt.us/dec/waterq/ans/plpage.htm

Vermont Fish and Wildlife Department, 103 South Main Street, Waterbury, VT 05671, (802) 241-3701

United States National Arboretum, 3501 New York Avenue, NE., Washington, D.C. 20002-1958.

Vermont Institute of Natural Science (VINS), Woodstock, Vermont

Internet:

Invasive Plant Atlas of New England
<http://invasives.eeb.unconn.edu/ipane/weedwisdom/powerppt.htm>

Exotic Plants <http://www.iisgcp.org/EXOTICP>

Bioscience <http://www.cabi-bioscience.org>

Ecology <http://www.econetwork.net>

Invasive Species Project <http://www.sfin.saskatoon.sk.ca/science/slep/common>

The Nature Conservancy <http://nature.org/wherewework/northamerica>

Invasive Plants Association <http://www.ipaw.org>

Connecticut Botanical Society <http://www.ct-botanical-society.org>